Addressing Climate Change Vulnerability Through Small Livestock Rearing in Matobo, Zimbabwe

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Abstract

Livestock rearing is a popular climate change adaptation strategy among farmers in Matobo District, Zimbabwe. In this chapter we reveal how farmers in Matobo District have benefited immensely from rearing small livestock in response to climate change. Although the descriptor “small livestock” generically refers to different types of livestock, in this chapter we limit it to goat and sheep rearing. The purpose of the chapter is (1) to discuss the efficacy of small livestock rearing as a response to climate change and (2) to use smallholder farmer’s narratives to evaluate the success of government interventions in enhancing small livestock production. Utilizing an inductive approach, data was gathered through five (5) key informants, five (5) focus group discussions, and 50 in-depth semi-structured interviews. Our study reveals that small livestock are suitable and adaptable to climate change impacts in Matobo. We recommend that government and its development partners prioritize and avail funds for the increased uptake of small livestock rearing among smallholder farmers in Matobo District and beyond.

Keywords

Adaptation · Climate change · Small livestock · Smallholder farmers · Matobo · Zimbabwe

Introduction

Small-scale communal livestock rearing plays an essential role in sustaining livelihoods in developing countries. Livestock is central to food security, nutrition, organic fertilizer (manure) production, non-mechanized ploughing, and income generation initiatives (Nandhini and Suganthi 2018). However, as climate change impacts are increasingly being felt across the world, poor countries are most affected owing to poor adaptive capacity and budgetary constraints compared to more developed countries in the global North (Chaudhury 2017). Developing countries’ vulnerability is worsened by their strong dependence on rain-fed agriculture and free range pasture-fed livestock, which are susceptible to the negative effects of changing climate (Dube and Phiri 2013; Brazier 2015; Apraku et al. 2018a). Livestock plays an essential role in sustaining the fragile economies of most developing countries, with more than half of the rural population being sustained by livestock production (Kaasschieter et al. 1992; Assan and Kumar 2009; Assan 2014). Kaasschieter et al. (1992) note that “the largest share of the world’s livestock population is found in developing countries: 61% cattle, 43% sheep, 79% goats, and 57% pigs.” Of the stated livestock, “the production of small livestock like goats and pigs strengthens the capacity of communities to adapt to climate change” (Ndlovu 2010; Girus et al. 2008). Small livestock have higher chances of surviving under climate change conditions like increased droughts compared to bigger livestock since they require smaller grazing land and less amount of water and are less affected by the depletion

of pastures. Assan (2014) argues that livelihoods sustainability in rural areas can be achieved through livestock production in the face of rapidly changing climate that weakens crop production especially in arid climates like Zimbabwe. It is against this backdrop that the International Union for Conservation of Nature and Natural Resources (2010) observes that rural livelihood systems in Southern Africa are converting from mixed crop-livestock to pure rangeland systems. Although livestock production in arid agroecological regions of Zimbabwe is yet to be endorsed as an agricultural policy, there is increased support for the uptake of livestock rearing from the government's Livestock Production Department (LPD).

Given the foregoing, the research thus examined the efficacy of small livestock production as a climate change adaptation strategy in Matobo District compared to the much traditionally desired cattle rearing. This switch is being pioneered by Khulasizwe which is a nongovernmental organization (NGO) operating in Matobo wards 3, 4, 10, and 19 with the aim of enhancing household livelihood security. Khulasizwe has thus far distributed goats to 380 households in the targeted wards (World Vision 2015). It is crucial to investigate community narratives (and experiences) about the effectiveness of this technical adaptation strategy. The study sought to answer the following research questions: What benefits (if any) are Matobo community members deriving from the switch to small livestock production? What has been the uptake of this strategy in the broader Matobo community over and above the project beneficiaries?

The Impact of Climate Change in Zimbabwe

There is consensus that climate change is causing more socioeconomic, health, and environmental harm in developing countries (Van Aelst and Holvoet 2016; Kahsay and Hansen 2016; Apraku et al. 2018a, b). The harm is exacerbated by the fact that most of the population these countries is heavily reliant on the natural environment for survival, both of which are highly susceptible to climatic changes. Consequently, climate change is negatively impacting the livelihoods of the poor as well as deepening poverty in many developing countries (Africa Partnership Forum 2008; Nyong 2009; Phiri et al. 2014, 2019). In Zimbabwe, the adverse impacts of climate change are particularly felt in the rural areas where the majority of the population (67%) lives and mostly depend on agriculture-based livelihoods (ZIMSTAT 2013). Within the context of the unfolding adverse effects of climate change, vulnerable communities are adapting to these conditions by "rearing small drought resistant livestock such as goats" (Zimbabwe's National Climate Change Response Strategy 2014).

Climate Change and Vulnerability

Climate-induced variability increases the vulnerability of rural livelihoods and reduces the ability of households to deal with risks, shocks, and stresses (Prowse and Scott 2008). Dulal et al. (2010) and Ndlovu et al. (2019) concur with the above

argument that, since households typically have limited assets, they are at increased risk (exposure) and their ability to cope is restricted. Cutter et al. (2000) and Dube et al. (2017) point out that livelihood vulnerability to climate change can be usefully understood as an outcome of biophysical and social factors. Firstly, biophysical climate change vulnerability refers to the level of exposure communities' physical impacts of sea level rise, increase in sea surface, or atmospheric temperatures. Secondly, social vulnerability is explained as partially the product of those factors that shape the susceptibility of communities to harm and those that govern their ability to respond. It also includes "place inequalities" – those characteristics of communities and the built environment, such as the level of urbanization, growth rates, and economic vitality – that contribute to the social vulnerability of particular places (Cutter et al. 2000; Shah et al. 2013).

Moss et al. (2001) add a third dimension as an external assistance, which is defined as "the degree to which a region may be assisted in its attempts to adapt to change through its allies and trading partners, diasporic communities in other regions, and international arrangements to provide aid." In contrast to the United Nations (2004), this conceptualization of vulnerability includes factors outside the vulnerable system, such as characteristics of the stressor and the expected level of external assistance.

Four dimensions have been identified as defining a vulnerable situation within the literature. The first dimension consists of human-environment system, population group, economic sector, geographical region, or natural system (Downing and Patwardhan 2004). They note that other researches limit vulnerability to social systems coupled with human-environment systems (Turner et al. 2003) whereas others apply it to any system that is potentially threatened by a hazard (Mcbean 2012). The second dimension is the attribute of concern. Examples of attributes of concern include human lives and health; the existence, income, and cultural identity of a community; and biodiversity, carbon sequestration potential, and timber productivity of a forest ecosystem (Downing and Patwardhan 2004).

The third dimension is the hazard. United Nations (2004) defines a hazard broadly as "a potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation." Hence, a hazard is understood as some influence that may adversely affect a valued attribute of a system. A hazard is generally but not always external to the system under consideration. For instance, a community may also be threatened by hazardous business activities or by unsustainable land management practices within this community. Hazards are often distinguished into discrete hazards, denoted as perturbations, and continuous hazards, denoted as stress or stressor (Turner et al. 2003).

Finally, the fourth dimension is the temporal reference which denotes the point in time or time period of interest. Specifying a temporal reference is particularly important when the risk to a system is expected to change significantly during the time horizon of a vulnerability assessment, such as for long-term assessments of anthropogenic climate change (Downing and Patwardhan 2004).

Adaptation Strategies in Zimbabwe

Adaptation strategies need to be understood using the concept of “adaptive capacity.” Adaptive capacity has been defined as the ability or potential of a system to respond successfully to climate variability and change, and this includes adjustments in both behavior and in resources and technologies (IPCC 2007). Other scholars define it as the potential of a system to adjust itself to change (Watts and Bohle 1993; Smit et al. 2000; Turner et al. 2003; Fussel and Klein 2006). According to Armitage and Plummer (2010: 6), adaptive capacity is:

generally referred to as the capability of a social-ecological system to be robust to disturbance, and to adapt to actual or anticipated changes (whether exogenous or endogenous). From a social systems vantage point adaptive capacity is determined by the suite of resources (technical, financial, social, institutional, political) held, and the social processes and structures through which they are mediated (i.e. governance).

From the perspective of the social sciences, adaptive capacity does not just explain how people cope with change but reflects an ability to learn, experiment, and foster innovative solutions in complex social-ecological circumstances (Cutter et al. 2003; Armitage and Plummer 2010). Therefore, the capacity of households and communities to adapt to climate change cannot be under emphasized. In response to the negative climate change impacts, smallholder farmers are adopting a variety of adaptation strategies in Zimbabwe. There is consensus that rural communities in Zimbabwe have not been mere passive victims of climate change but have been action oriented in adapting to climate variability (Gukurume 2013; Dube et al. 2018; Kahsay and Hansen 2016). Crop diversification, mixed crop livestock systems, changing planting times, and conservation farming are some of the strategies that have been adopted by communal farmers in Zimbabwe (Munhande et al. 2013; Musarurwa and Lunga 2012; Makuvaro et al. 2014).

In addition, Mano and Nhemachena (2006) argue that climate change has severely reduced chances of rain-fed crop farming in arid regions of the country such that they suggest livestock production as the most suitable strategy that can drive communities out of food insecurity and poverty. Gukurume (2013) notes that livestock production was on the increase in Bikita and other places in dry regions, indicating that farmers are replacing crops with livestock production in order to promote livelihood sustainability. The government through its departments is also encouraging farmers in areas prone to increased dry spells to invest more on livestock, because they can withstand the harsh weather conditions induced by climate change. Small stock like goats, sheep, and indigenous poultry are becoming dominant as people try to cope with drought in areas continuously receiving little rainfall (Gukurume 2013). However, Munhande et al. (2013) observed that climate change hugely contributes to extreme temperatures, severe water scarcity, and reduced fodder for livestock, especially large stock leading to poor animal production.

Water harvesting techniques (WHTs) are another climate change adaptation strategy available to communities. Rain-water harvesting (RWH) technologies are a range of techniques used for collecting, storing, and conserving rainfall and surface runoff in arid and semiarid regions (Mutekwa and Kusangaya 2006). WHTs are more amenable to “small livestock” because they consume less water compared to “large livestock” like cattle.

A very traditional and significant adaptation strategy that had been practiced particularly for rural communities is livestock herding. According to Leichenko and O’Brien (2002) livestock herding, including nomadic pastoralism, remains one of the indigenous strategies best adapted to frequent droughts in dry land areas such as in Namibia and Botswana. Seasonal movement of livestock, splitting up of herds, changing herd composition, and distributing livestock among relatives and friends in different areas minimize risk from droughts, floods, or diseases. Appropriation of the wetter areas and water sources for cultivation and fencing inhibits these crucial strategies, however.

Study Site and Context

The study was conducted in Matobo Rural District of Zimbabwe which lies in ecological regions IV and V characterized by low and erratic rainfall (450–650 mm/year) with very high temperatures. Of the 27 wards in Matobo District, the study wards were (Gwezha, ward 3; Marko, ward 4; Makhasa, ward 10; and Zamanyoni, ward 19). Climate change has worsened the already extreme weather patterns in the district. Drought is an example of this phenomenon that has affected Matobo District in a negative way. Data emerging from the interviewed farmers shows that the prolonged droughts have dried up natural water points such as streams, rivers, and swampy areas (Fig. 1). Consequently, their pastures and grazing lands for their livestock have been depleted. **The study was conducted from March to September 2017.**

Materials and Methods

The research employed a qualitative methodology which was more suitable for capturing community narratives and experiences about the appropriateness and effectiveness of small livestock production within the context of a changing climate in Zimbabwe. As highlighted by Turner et al. (2003), the primary strength of the qualitative approach to cultural assessment is the ability to probe for underlying values, beliefs, and assumptions. Data collection tools employed included the use of in-depth semi-structured interviews (50 households), 5 focus group discussions, and 5 key informants conducted using purposive sampling in 4 selected wards of Matobo District of Zimbabwe. The limitations of the study are that findings on how small-holder farmers adapt to climate change through small livestock in Matobo District cannot be generalized to other districts in Zimbabwe and beyond. Success of these

Fig. 1 Map of Zimbabwe (showing Matobo District)

technical climate change adaptation strategies is location specific. However, important lessons can be drawn from the narratives of the smallholder farmers in semiarid districts and go on to influence policy.

Results and Discussions

Small Livestock and Climate Change Nexus in Matobo

Small livestock, namely, sheep and goats, are relatively more adaptive to negative changing climatic conditions compared to cattle. Goats are both grazers and browsers, while cattle are limited to the latter (Girum et al. 2008). The chances of survival for small livestock are higher compared to cattle in the context of a changing climate. Moreover, on the basis of their size, the goats consume less from the pastures in a specified area in comparison to cattle that demand more feed due to their sheer size. The amount of water drunk by goats and sheep is far less than that of cattle. Small livestock have a comparative risk aversion advantage in that respect. The suitability and appropriateness of small livestock in a climate change environment are premised on the aforementioned characteristics.

Goat Production

In the context of the study area, a key informant justified the rearing of small livestock when he explained that:

Even in times of drought, small stock (goats) herd will multiply because they reproduce at two to three times the rate of cattle. A goat may produce one to four kids in a year as opposed to one birth every one and a half years to two years for cattle. The farmers in Matobo can attest to that. It is a known fact in Matobo that goatherders fare well in comparison to cattle herders in general. (Key Informant 4, Khulasizwe Trust)

Furthermore, another important statement was made in respect to small livestock rearing in Matobo. Key informants 1 and 3 indicated that:

Small livestock are particularly important and useful during and after a drought or disaster period. It is easy for farmers who are keeping goats for instance, to sell the goats for cash, give goats as a gift, or slaughter for food or traditional ceremony. This is because the amount of money and food generated by a single goat is optimal for day to day transactions. (Key Informant 3, AGRITEX)

The most popular small livestock that the farmers keep are goats. Pigs are shunned because of religious reasons...and generally because they need to be fed a lot which is highly cost ineffective and therefore not sustainable particularly for rural communities who are already struggling enough to meet household needs. The sheep herd is relatively small as well because there is too much work involved in rearing them. Sheep need special care. (Key informant 1, World Vision)

Similarly, the views raised by interviewed smallholder farmers were in tandem with what was also raised by the key informants.

Three of the respondents from different wards commented that:

Small livestock are a good insurance against crop failure. When our harvest is low— we have an easy alternative that is of slaughtering a goat. We value our goats because they give us meat, milk and manure for our gardens. We also use the goat skin as a carpet and sell to obtain cash for petty trading. (Household Respondent 26, Marko)

Goats are doing very well for me despite the heavy rainfalls and hot temperatures this year. I started with 5 goats but I now have 27 goats in less than 3 years. They multiply faster compared to cattle provided that they are dosed regularly. I love rearing goats because they do not demand stock feed like cattle. Moreover, they can even feed on groundnuts and round nuts leaves. Goats are basically easy to maintain in a climate change environment. (Household Respondent 33, Makhasa)

I do not have a lot of goats myself but I have friends who are rearing a lot of them. I know of one farmer who possesses over 50 goats. From my observation, these small livestock don't collapse and die due to high temperatures and drought. They survive unlike cattle. They feed close to the homestead and can easily be watered by the owners. In times of crisis, goats can be exchanged for money or grains for food or feeding the community during a funeral wake. (Household Respondent 21, Zamanyoni)

A key informant from AGRITEX emphasized that even those who do not have cattle perceive goats and sheep as a symbol of wealth. One of the commentators in a focus group discussion indicated that there is a lot of contempt in society for one that does not have any kind of livestock and few villagers are likely to attend his funeral. For most farmers who do not have cattle, goats are a good source of relish during funerals when villagers gather in the bereaved homestead. The key informant added that small livestock are also kept for security reasons. They are likely to cushion the farmers during times of drought when the harvest from their fields is very low. They

can be eaten or exchanged for grain or sold for cash to buy other household consumables during hard times. This point was also raised by interviewed smallholder farmers earlier in the discussion. It is clear from the above comments that small livestock, specifically goats, play a pivotal role as a livelihood strategy in Matobo District.

The smallholder farmers are aware of the competitive advantage of rearing goats over cattle in their specific area of habitation. Firstly, as a source of food, goats are easily slaughtered to obtain meat to meet food needs at the household level or feeding community members in funeral wakes and traditional and cultural rituals like weddings. Goat milk is also a preferred source of food in selected households specifically for children. Secondly, goats are acknowledged to be easy to keep and maintain in a harsh climatic environment compared to cattle because they consume less food and are more drought resistant compared to cattle. Thirdly, goats are utilized by farmers as a medium of exchange to pay school fees, hospital bills, and other urgent needs of the households. Interviewed farmers unanimously indicated that it is easier to sell goats than cattle.

It emerged from the sampled respondents that the Matabele goat is common in Matobo District because it is an indigenous breed that has been kept there since time immemorial. However, the key informant from AGRITEX indicated other breeds like the Boer goat and Kalahari red are common in areas like Gwanda and Beitbridge. This is so on account of farmers' cross-breeding them due to the proximity and accessibility of South Africa at the Limpopo province. The Mashona goat is mainly confined to Mashonaland province of Zimbabwe (Table 1).

Experts in the field of small livestock rearing concur that goats are an effective strategy for adapting to climate change in the study area. Their views go beyond the perception of interviewed farmers who are yet to fully appreciate this knowledge beyond merely keeping goats as a tradition. The key informant from Khulasizwe justified the rearing of small livestock like goats over cattle for a number of reasons. He noted that:

Goats can withstand the harsh climatic changes and are not prone to collapsing like cattle. They feed on vegetation not used by other domestic species of animals since they are browsers. Goats do not easily succumb to diseases. Farmers living in marginal agricultural areas can keep them. Moreover, they are easy to handle and can be looked after by children and women. (Key Informant 4, Khulasizwe)

Another key informant from the Department of Livestock Production and Development gave a lengthy response in showing the viability and effectiveness of goats' production over cattle production. He narrated that:

Goats multiply very easily and flocks expand in a relatively short time forming a major part of the family asset base in a harsh changing climate. Goats have an economic advantage over large ruminants because they are cheap to buy hence they provide an opportunity for vulnerable people to own them. They can quickly and easily be sold off for cash to meet family emergency needs like health costs, educational needs, in times of death and therefore are an easily disposable asset during times of poverty and calamities. With goat rearing, there are none or few social, religious and cultural taboos associated with keeping them in Zimbabwe. (Key Informant 5, DLPD)

Table 1 Common goat breeds in Zimbabwe

Goat breed	Characteristics
Matabele goat	This breed is found mostly in the southern part of the country. It is large framed animal
	Mature weight can reach up to 50 kg plus for males and between 35 and 40 kg females
	It is a dual-purpose breed (meat and milk production)
	Has multiple colors ranging from white through brown, mixed to black
	Can give birth to singles, twins, and triplets
	Adapted to local conditions
	Gestation period is between 145 and 154 days
Mashona goat	Can be mated for the first time at 18 months of age
	It is small-framed breed
	It is highly prolific
	Tolerant to local diseases
	Found in the northern parts of the country
	Mature weight is 30 and 35 kg for females and males, respectively
	Color ranges from white, mixed to black
	Edible and saleable proportion after dressing is 48% of the live body weight (equivalent to 12–14.5 kg)
Boer goat	Sexual maturity is 7 months but a relatively slow growth rate. Goats are mainly kept for meat
	They have good potential for selection to increase productivity
	It originates from South Africa and is well adapted to the southern parts of the country
	This is a large framed breed, with white body and a brown neck and head
	Adult female can grow up to 60–70 kg and males up to 70–90 kg
	It is mainly for meat production
	Very stocky body, well-muscled, strong bones
	Ears are pendulous and horns are prominent
	Very prolific breed, kidding rate of 1, 5 (three times in 2 years)
Saanen goat	50% twins and 7% triplets
	Valuable for meat, milk, and skin but has been promoted for its meat potential
	Originated from Switzerland or France
	Large size, white color with black spots on the nose, ears, and udder
	Hair coat is short; ears are erect and forward and upward
	Face is straight, slightly dished
	Good body conformation

Source: Khulasizwe File Report (2018)

From a technical point of view, it was evident that small livestock especially goats are a viable adaptation strategy to climate change effects. Key issues raised in support of their breeding were by virtue of their size in comparison to cattle; the risk of loss is small. It was suggested that for every cow one has an equivalent of six goats. The land size for communal farmers is small, and therefore keeping goats rather than cattle enables them to reach economies of scale. The eating habits of

goats (grazers and browsers) mean they have a more varied diet and can survive in drier areas. They basically can survive in any terrain that can either be hilly or flat terrain. In addition, it was revealed by the key informants that where water is scarce, goats can survive without drinking water for 2 days. However, the conscious decision to rear small livestock for the purpose of responding to climate change is yet to be understood by the smallholder farmers depending on efforts by government and its partners to spread that knowledge and the willingness of the respondents to accept that reality.

Sheep Production

Data gathered from the study area also revealed that 20% of the interviewed farmers rear sheep. However, despite their resilience to the impact of climate change, they are not produced en masse in Matobo District in comparison to goats and chickens. The reasons given by two interviewed households were that:

Sheep easily get lost because they can hardly re-track their way back if they feed a distance away from home. Due to that fact, sheep demand more labour than other livestock since they require close attendance almost all the time. (Household Respondent 24, Gwezha)

Keeping sheep is hard work and not ideal for these reasons. When thieves and predatory animals like jackals and hyenas pounce in the night, they do not make any noise. We are not alerted that there is impending danger the same way goats make a loud noise when disturbed. As a result, we have lost quite a number of sheep due to this problem. We are therefore, reluctant to rear them in our village. (Household Respondent 40, Zamanyoni)

On a different note, the interviewed farmers who are rearing sheep had other reasons that they gave for doing so besides their adaptability to climate change. The reasons are purely religious beliefs. The following views confirm that:

We keep sheep for the purpose of enterprising especially with white garment churches known as apostolic sects. They believe that the tail of the sheep on which they extract fat brings good luck. Whether that is true or not is not an issue for me. As long as I can make money out of them, I do not care. I am keeping 53 sheep. It's a big market for me and my household. (Household Respondent 3, Marko)

Most of those households that keep sheep are superstitious. They believe that if you rear sheep your homestead can never be struck by lightning. Climate change has also come about with lightning and terrifying thunder. As a protection measure, sheep are kept to ward off that risk. For sure, I know no household in the village that has been struck by lightning that kept sheep. (Household Respondent 19, Makhasa)

The key informants acknowledged that specific farmers in the district held such indigenous knowledge beliefs about sheep being said to prevent lightning and the supernatural powers they possess to ward off bad luck and bring good fortune. Their belief system primarily informs their choice of rearing sheep. The production of sheep for the purpose of adapting to climate change is secondary under those circumstances. In this instance, small livestock keeping is a tradition passed on through generations and is not intended as a direct response to climate change. All household respondents kept one form of small livestock or another. However, it should be noted that it is not attributed to responding to climate change per se but a

continuation of what has always been the norm in the district since time immemorial. The findings also show that because of the traditional inclination to goat rearing, farmers' knowledge on which types of goats are reared is lacking and immaterial. Farmers in Matobo are not really concerned about the types of breeds that they are rearing; they keep whatever breed that they can access or obtain. This lack of knowledge on breed types has however an implication on the effectiveness of small livestock as adaptation options to climate change. Sustained and successful adaptation strategies demand a level of knowledge and understanding about livestock breeds and their resilience to the adverse effects of climate change.

Feminization of Small Livestock Rearing in Matobo

In Matobo, rearing of sheep and goats is mostly relegated to women. While men do keep small livestock in Matobo, it is understood that it is a feminine exercise. On that basis, men play a peripheral role in small livestock rearing and would prefer to focus on owning cattle. It is an unwritten law that women (especially those that are married) may not slaughter a beast under any circumstances without prior approval of their husbands. This points to a strong patriarchal culture that is predominant even in climate change adaptation strategies.

Constraints to Small Livestock Rearing

Despite the fact that small livestock have a comparative advantage in adapting to climate change over cattle in the study area, the production is beset by subtle challenges that threaten its viability and effectiveness. For instance, the key informant from the DLPD commented that:

While goats' production is a good option for adapting to climate change in Matobo, they have their own share of problems. Goats can be destructive animals only if overgrazing in areas occurs, resulting in reduced or loss of tree regeneration. Moreover, goats have a tendency to stray and eat neighbours' crops. Therefore, goats should be herded properly. (Key Informant 5, DLPD)

The respondents in the study area were more concerned about the security of their livestock more than anything else. Thieves and predatory animals like hyenas and jackals threatened the viability of their small livestock. The following comments were made during a focus group discussion:

Jackals are a big problem in our village. Four jackals can chase one goat till they catch and kill it. Sometimes we see the jackals during the day. They are so daring these days. I recently lost 3 of my goats as a result of jackals. Unless, one devises a mechanism of herding them throughout the day— they will get eaten. I am actually better off— my neighbor lost 12 goats within a month. Jackals are really a menace. (Marko Focus Group Discussion, Participant 2)

Stock theft is a common occurrence in our village. The incidences are rampant probably because of hunger perpetuated by what you call climate change. Crop yields are no longer enough to feed the communities throughout the year. Sadly, some people in the village resort

to stealing chickens and goats to make ends meet. I own 65 goats. I lost 13 just last year to thieves. It's not acceptable. (Zamanyoni Focus Group Discussion, Participant 9)

Hyenas have cost me a great deal of my goats. They target the kid goats especially. Twenty-one of my goats got eaten by hyenas. We cannot even hunt them down because it is a criminal offence. The government is not doing anything to protect our goats from the menacing hyenas. (Gwezha Focus Group Discussion, Participant 5)

The interviewed farmers also narrated that thieves are so daring in certain instances. It was noted that thieves can even drive goats in broad daylight when they have observed that they are not herded by any one. The villagers suspect that they sell them in nearby urban areas like Bulawayo where there is a ready meat market. The key informants from World Vision, Khulasizwe, AGRITEX, and DLPD confirmed the issues raised by farmers on losses of their small livestock as a result of thieves and predatory animals. As a result, some livestock security strategies have been developed by community members. Plate 1a, b is a new idea of goat and sheep kraals in Matobo District.

Plate 1 (a and b) Goat and sheep kraals

The key informant from DLPD commented that they are encouraging the construction of these kraals because:

...they are constructed in an elevated manner to prevent hyenas and jackals from killing the sheep and goats. They also serve the purpose of protecting the sheep from harsh weather conditions like intense heat and heavy rainfall. Traditional kraals which are constructed at ground level were not as secure as this new model. Thus, farmers are able to protect their livestock from being attacked and also prevent diseases caused by exposure from the heat and intense precipitation. (Key Informant 5, DLPD)

The Department of Livestock Production and Development in conjunction with local NGOs has been instrumental in encouraging farmers in the study area to construct these new kraals to preserve and protect their small livestock.

Another very important challenge that negatively affects the interviewed farmers is the diseases that reduce the number of their small livestock. Diseases like liver fluke, round worms, aching eyes, lump skin, pulp kidney, and heart water have affected livestock in the study area in varying degrees. In the face of these challenges, interviewed farmers seem to be helpless. There is little that they have done to treat their animals despite the few trainings received from the veterinary department. Farmers do not seem to understand the kind of diseases that are affecting their livestock. When asked about what kind of diseases affect their livestock, the farmers usually respond by describing what happened; they fail to state the disease that has led to the mortality of their livestock either in vernacular or in English. They just refer to them as *igazi (blood)*, or any other terms that describe the symptoms not the disease. Three interviewed farmers commented that:

Out of 35 goats, I lost all 16 in a single year through a strange disease, but could do nothing about it. I just watched helplessly. Some of us don't believe that drinking stagnant water can affect our livestock. Our goats used to drink from the same rivers and dams which are said to be causing their death. We don't understand why. We don't have money to buy the chemicals to treat our animals. (Household Respondent 41, Makhasa)

We have received training on how to identify diseases and cure them from the Veterinary Department. The medication for dosing and injecting our goats are both expensive and not accessible in Maphisa. Bulawayo is too far where we are referred to. We end up resorting to traditional medicines to cure our livestock. The Veterinary Department discourages us from doing so. But what other options do we have? (Household Respondent 27, Zamanyoni)

Goats and sheep are affected by liver fluke and bowels due to drinking stagnant water. There are no signs or symptoms for these two diseases, one just discovers after the death of the animal. I have lost three goats because of liver fluke. (Household Respondent 15, Gwezha)

Over and above the lack of disease knowledge, the expensive medication from the veterinary department is also responsible for the high mortality rate of goats and sheep. The farmers are too poor to purchase the recommended medication to cure their animals. Consequently, they suffer heavy losses due to diseases like liver fluke, round worms, aching eyes, lump skin, pulp kidney, and heart water. Farmers were clueless on how some of those diseases could be dealt with. Moreover, there is some resistance on dipping goats which solves the tick problem. Farmers are used to

dipping cattle. They are reluctant to dip goats and sheep. That attitude allows their livestock to easily succumb to tick borne diseases.

The views of the respondents concur with other studies which also show that communities in Africa grapple with what are called multiple stressors (Adger et al. 2003; Osbahr et al. 2008; Drimie and Gillespie 2010). Multiple stressors (in this case predatory animals and thieves) are other challenges that come about or are in existence when communities are attempting to adapt to climate change. These multiple stressors complicate the ability of farmers to adapt to climate change smoothly. The AGRITEX official summarized the challenges faced by interviewed farmers when he remarked that:

There are a number of challenges faced by the small livestock farmers ranging from diseases, thieves, predators and lack of finance to buy treatment for their livestock. For most of the constraints that they face, nothing has been done much to help them. For fear of retribution through current legislation, they watch as their livestock are mauled by the hyenas and jackals. They have not taken meaningful steps to address the diseases that affect their livestock. Thieves sometimes help themselves to their livestock and for those that are able to keep significant numbers they find themselves with a dilemma of markets to sell their livestock. (Key Informant 1, AGRITEX)

He however further suggested that the attitude of farmers also needs to be worked on. They do not classify themselves as goat farmers. They do not keep records. Livestock production is something to invest time and resources on. Few are taking steps to exploit the huge potential that lies with small livestock production. It was also apparent that interviewed farmers rear goats without an awareness of the type of breed which they keep. For all the interviewed farmers, a goat is appreciated just because it is a goat, what breed it is does not matter.

Institutional Mandate Response on Small Livestock Production

The Livestock Veterinary Department in partnership with AGRITEX has been very instrumental in the study area in promoting small livestock rearing. The Livestock Veterinary Department offers technical support to the smallholder farmers at no charge to assist them to improve on small livestock production. Two household respondents from different wards remarked that:

The veterinary department has been very helpful to us as farmers in our village. They conduct training and workshops to teach us on small livestock breeding. We have been taught that are goats must be dosed and well-sheltered so that they are not exposed to too much heat and precipitation. Our goats are now dipping although some farmers still find it strange to do that because we grew up knowing it is cattle that dip. They respond fast even when there is an outbreak of a disease that affects our chickens as well. (Household Respondent 34, Makhasa)

I am one of the few farmers that have benefited from teachings facilitated by the Veterinary Department. I was trained at Maphisa to be a paravet for a week. Because of my passion in goat rearing I have over 50 goats now from the mere 14 I had before I was

trained. All my goats go for dipping every month. I dose them regularly. I have thus constructed this new kraal to prevent them from being mauled by hyenas and jackals. (Household Respondent 50, Zamanyoni)

However, another research participant in the study area had a different view on the role of the veterinary department. He exclaimed that:

Our Veterinary personnel are not well capacitated in our district in terms of resources to serve the farmers. They have lots of literature in their office but they have no transport to go around distributing the literature and equipping farmers as they should. They do not even have up to date statistics because they don't have the means to get to where the people are. (Household Respondent 22, Gwezha)

It was clear from the 67% interviewed farmers that the Livestock Veterinary Department is making great strides in capacitating smallholder farmers to enhance the production of small livestock in the study area. They acknowledged that they have received information through field visits on issues relating to small livestock dipping, dosing, climate friendly shelter, and dealing with diseases. However, 33% of the interviewed farmers felt that the department is limited by resource constraints from the central government. They argued that the technical experts from the veterinary rarely do field visits and that they only avail themselves during emergency situations such as disease outbreaks threatening small livestock. They also claimed that they occasionally come when they have a joint program with NGOs like World Vision. Given such a scenario, smallholder farmers are forced to be initiative and deal with some diseases using traditional medicine or fork out money to travel from their village to Maphisa Centre to get technical advice. There was also a concern that even if one travels to Maphisa, medicine is not readily available, and therefore farmers are compelled to further go to Bulawayo which is difficult due to financial constraints.

Khulasizwe (local NGO) which used to operate in the study area from 2009 to 2013 played a crucial role in the promotion of goat production. They mainly distributed three female goats per household to promote food security and create a market for Bulawayo butcheries where the demand for goat meat was high. The researcher identified two beneficiaries who had benefited from the Khulasizwe project. They commented that:

Khulasizwe gave me 3 goats in 2009. They also gave me and other beneficiaries cement, asbestos to build shelter for goats. Khulasizwe offered a 50/50 deal where you also paid half prize of stock and they paid the other half. They offered vaccines. This has improved livestock production in Matobo. I currently own 27 goats from the original 3 I received from Khulasizwe. (Household Respondent 49, Makhasa)

Goats have a huge potential of saving not only Matobo farmers but the whole nation from a potential disaster caused by climate change. There is therefore need for the government to help the small livestock farmers to go commercially and to produce for the nation. A little more of the government presence on the ground can make a huge difference. (Household Respondent 50, Makhasa)

Conclusions

Farmers in the study area are agreed that goats and sheep have increased their adaptive potential in the face of adverse climatic condition. Unlike cattle, the survival rates of small livestock is high in the drought prone areas like Matobo District and have proved more viable and effective. Most households from the sample kept one form of small livestock irrespective of the knowledge on the breeds that they kept. The success and viability of small livestock production largely depend on the input of government and other stakeholders like the Department of Livestock Production and Development, Jairos Jiri, World Vision, and Khulasizwe working closely with farmers. Their contribution to farmers through expert training and provision of small livestock is key to successful adaptation. Therefore, that working relationship should be strengthened and maintained.

Recommendations

Based on the above findings, this study recommends the following:

The government, at local and national level, can facilitate and implement adaptation strategies through policies that support farmers and make resources available. The government has documented action plans and strategies to tackle the challenges of climate change through the Ministry of Environment, Water and Climate. However, there is need for government to “walk the talk” and implement what is documented on paper and implement it on the ground. There is a discrepancy over what the government intends to do and what communities experience in their environment.

There is need for government and NGOs like AGRITEX, EMA, Department of Livestock Production and Development, World Vision, Khulasizwe, and Jairos Jiri to coordinate their activities. Research participants noted overlaps in how such programs are implemented. Coordination among them assists in avoiding or at least reduces overlap of activities. Climate change adaptation strategies if coordinated well can help in discovering of existing gaps in need of implementation.

Adoption of technical adaptation strategies like small livestock rearing should be broadened through knowledge dissemination and awareness in all wards. The challenge currently is that interventions target a few farmers and leave out others. Going forward, knowledge and training should be emphasized until communities fully appreciate the adaptation options suitable and appropriate for their areas. Raising awareness of climate change issues can be done through the local media and extension staff. Dissemination of climate change information from national and local meteorological stations to farmers through extension agents is also very critical.

References

- Adger WN, Huq S, Brown K, Conway D, Hulme M (2003) Adaptation to climate change in the developing world. *Prog Dev Stud* 3(3):179–195
- Africa Partnership Forum (2008) Climate challenges to Africa: a call for action. Available from: <http://www.africapartnershipforum.org>
- Apraku A, Moyo P, Akpan W (2018a) Coping with climate change in Africa: an analysis of local interpretations in Eastern Cape, South Africa. *Dev South Afr*. <https://doi.org/10.1080/0376835X2018.1482199>
- Apraku A, Akpan W, Moyo P (2018b) Indigenous knowledge, global ignorance? Insights from an Eastern Cape Climate Change Study. *S Afr Rev Sociol* 49(2):1–21. <https://doi.org/10.1080/21528586.2018.1532813>
- Armitage D, Plummer R (2010) Integrating perspectives on adaptive capacity and environmental governance. In: *Adaptive capacity and environmental governance*. Springer, New York, pp 1–19
- Assan N (2014) Goat production as a mitigation strategy to climate change vulnerability in semi-arid tropics. *Sci J Anim Sci* 3(11):258–267
- Assan JK, Kumar P (2009) Introduction: livelihood options for the poor in the changing environment. *J Int Dev* 21(3):393–402. <https://doi.org/10.1016/j.foodpol.2008.01.003>
- Brazier A (2015) Climate change in Zimbabwe facts for planners and decision makers. Konrad Adenauer Stiftung, Harare
- Chaudhury M (2017) Strategies for reducing vulnerability and building resilience to environmental and natural disasters in developing countries. World Resources Institute, United Nations Department of Economic and Social Affairs, Division of Social Policy and Development, New York
- Cutter SL, Mitchell JT, Scott MS (2000) Revealing the vulnerability of people and places: a case study of Georgetown Country, South Carolina. *Ann Assoc Am Geogr* 90(4):713–737
- Cutter SL, Boruff BJ, Shirley WL (2003) Social vulnerability to environmental hazards. *Soc Sci Q* 84(2):242–261. <https://doi.org/10.1111/1540-6237.8402002>
- Downing TE, Patwardhan A (2004) Assessing vulnerability for climate adaptation. In: Lim B, Spanger-Siegfried E (eds) *Adaptation policy frameworks for climate change: developing strategies, policies, and measures*. Cambridge University Press, Cambridge
- Drimie S, Gillespie S (2010) Adaptation to climate change in Southern Africa: factoring in AIDS. *Environ Sci Pol* 13:778–784
- Dube T, Phiri K (2013) Rural livelihoods under stress: the impact of climate change on livelihoods in South Western Zimbabwe. *Am Int J Contemp Res* 3(5):11–25
- Dube T, Moyo P, Intauno S, Phiri K (2017) The gender-differentiated impacts of climate change on rural livelihoods labour requirements in Southern Zimbabwe. *J Hum Ecol* 58(1–2):48–56
- Dube T, Mlilo C, Moyo P, Ncube C, Phiri K (2018) Will adaptation carry the future? Questioning the long-term capacity of smallholder farmers' adaptation strategies against climate change in Gwanda District, Zimbabwe. *J Hum Ecol* 61(1–3):20–30
- Dulal HB, Brodnig G, Thakur HK, Green-Onoriose C (2010) Do the poor have what they need to adapt to climate change? A case study of Nepal. *Int J Justice Sustain* 15(7):621–635
- Fussel HM, Klein RJT (2006) Climate change vulnerability assessments: an evolution of conceptual thinking. *Clim Chang* 27:301–329. <https://doi.org/10.1007/s10584-006-0329-3>
- Girum G, Degefa T, Getachew G (2008) Risk perception and coping strategies among the Karrayu pastoralists of upper Awash Valley, Central Ethiopia. *Nomadic People* 12:93–107
- Gukurume S (2013) Climate change, variability and sustainable agriculture in Zimbabwe's rural communities. *Russ J Agric Socio-Econ Sci* 2(14):89–93
- Intergovernmental Panel of Climate Change (2007) Climate change 2007: impacts, adaptation and vulnerability. Working group II contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge
- International Union for Conservation of Nature (2010) Building climate change resilience for Africa livestock in sub-Saharan Africa. World Initiative for Sustainable Pastoralism, Nairobi

- Kaasschieter GA, de Jong R, Schiere JB, Zwart D (1992) Towards sustainable livestock production in developing countries and the importance of animal health strategy therein. *Vet Q* 14(2):66–75
- Kahsay AG, Hansen LG (2016) The effects of climate and adaptation policy on agricultural production in Eastern Africa. *Ecol Econ* 121:54–64
- Khulasizwe Small Livestock Production in Matobo District (2018) Quartely Report. Unpublished
- Leichenko RM, O'Brien KL (2002) The dynamics of rural vulnerability to global change: the case of Southern Africa. *Mitig Adapt Strateg Glob Chang* 7:1–18
- Makuvuro V, Walker S, Munodawafa A, Masere TP, Murewi C, Chagonda I (2014) An overview of current agronomic practices of smallholder farmers in semi-arid Central and Western Zimbabwe. *Afr J Agric Res* 9(35):2710–2720
- Mano R, Nhemachena C (2006) Assessment of the economic impacts of climate change on agriculture in Zimbabwe: a Ricardian approach. CEEPA discussion paper no. 11. Centre for Environmental Economics and Policy in Africa, Pretoria
- McBean GA (2012) Integrating disaster risk reduction towards sustainable development. *Environ Sustain* 4:1–6
- Moss RH, Brenkert AL, Malone EL (2001) Vulnerability to climate change: a quantitative approach. Technical report PNNL-SA-33642, Pacific Northwest National Laboratories, Richland
- Munhande C, Mapfungautsi R, Mutanga P (2013) Climate risk management: actors, strategies and constraints for smallholder farmers in Zimbabwe: a case study of Chivi District. *J Sustain Dev Afr* 15(8):240
- Musarurwa L, Lunga W (2012) Climate change mitigation and adaptation: threats and challenges to livelihoods in Zimbabwe. *Asian J Soc Sci Humanit* 1(2):25–32
- Mutekwa V, Kusangaya S (2006) The contribution of rainwater harvesting techniques to rural livelihoods in Zimbabwe: the case of Ngundu Ward in Chivi District. *Bull Anim Health Prod Afr* 32(3):437–452
- Nandhini DU, Suganthi S (2018) Livestock importance in organic farming. *Approaches in Poverty, Dairy and Veterinary Sciences* 5(1). <https://doi.org/10.31031/APDV.2018.05.000602>
- Ndlovu L (2010) Food, nutrition and health. In: Swanepoel FJC, Stroebe A, Moyo S (eds) *The role of livestock in developing communities: enhancing multifunctionality*. CTA, Wageningen
- Ndlovu S, Mpfu M, Moyo P (2019) Debunking the effectiveness of in-kind transfers in alleviating urban household food insecurity in Bulawayo, Zimbabwe. *Dev South Afr*. <https://doi.org/10.1080/0376835X.2019.1584031>
- Nyong A (2009) Climate change impacts in the developing world: implications for sustainable development. In: Brainard L, Jones A, Purvis N (eds) *Climate change and global poverty: a billion lives in the balance?* Brookings Institution Press, Washington, DC
- Osbahr H, Twyman C, Adger WN, Thomas DSG (2008) Effective livelihood adaptation to climate change disturbance: scale dimensions of practice in Mozambique. *Geoforum* 39(6):1951–1964
- Phiri K, Ndlovu S, Chiname TB (2014) Climate change impacts on rural based women: emerging evidence on coping and adaptation strategies in Tsholotsho, Zimbabwe. *Mediterr J Soc Sci* 5(23):2545–2552
- Phiri K, Dube T, Moyo P, Ncube C, Ndlovu S (2019) Small grains “resistance”? Making sense of Zimbabwean smallholder farmers’ cropping choices and patterns within a climate change context. *Cogent Social Sciences* 5(1):1622485
- Prowse M, Scott L (2008) Assets and adaptation: an emerging debate. *IDS Bull* 39(4):42–52
- Shah KU, Dulal HB, Johnson C, Baptiste A (2013) Understanding livelihood vulnerability to climate change: applying the livelihood vulnerability index in Trinidad and Tobago. *Geoforum* 47:125–137
- Smit B, Burton I, Klein RJT, Wandel J (2000) An anatomy of adaptation to climate change and variability. *Clim Chang* 45:223–451
- Turner BL, Kasperon RE, Matson PA, McCarthy JJ, Corell RW, Christensen L, Eckley N, Kasperon JX, Luers A, Martello ML, Polsky C, Pusipher A, Yauch CA, Steudel HJ (2003) Complementary use of qualitative and quantitative cultural assessment methods. *Organ Res Methods* 6(4):465–481

- United Nations (2004) *Living with risk: a global review of disaster reduction initiatives*. United Nations International Strategy for Disaster Reduction, Geneva
- Van Aelst K, Holvoet N (2016) Intersections of gender and marital status in accessing climate change adaptation: evidence from rural Tanzania. *World Dev* 79C:40–50
- Watts MJ, Bohle HG (1993) The space of vulnerability: the causal structure of hunger and famine. *Prog Hum Geogr* 17(1):43–67
- World Vision (2015) *Goat Rearing in Matobo District, Zimbabwe, Annual Report*. Unpublished
- Zimbabwe's National Climate Change Response Strategy (2014) Government of Zimbabwe Ministry of Environment, Water and Climate: annual report. Institute of Environmental Studies, Harare
- ZIMSTAT (2013) *Poverty and poverty datum line analysis in Zimbabwe 2011/12*. ZIMSTAT, Harare

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