



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



A Measure of Pastoralist Women's Vulnerability to the Impact of Seasonality: Evidence from Nigeria

Aderinoye-Abdulwahab, S. A.* and Chingonda-Nkhoma, J. J.

Received: 29 October 2014,
Accepted: 13 December 2014

Abstract

Keywords:
*Livelihoods, Pastoralists,
Vulnerable, Coping ability,
Capacity*

This paper examines factors that predispose pastoralist women to social and environmental vulnerability and how the women cope with their livelihoods when their husbands relocate with cattle during dry season. The paper adopts a case study research design to select Kwara State of Nigeria where focus groups discussions and interviews were held to elicit information. It was found that food insecurity, low incomes, seasonal changes, conflict, and culture deter women from sustaining a well-being. The study recommends that organisations and policy makers should capitalise on indigenous knowledge when designing measures to reduce people's vulnerability as this would enhance their livelihood sustainability.

INTRODUCTION

Much has been reported scientifically in terms of what make people vulnerable as there have been various attempts to conceptualise and measure vulnerability (Berkes, 2007; Fordham, 2004; Miller *et al.*, 2010; Paul, 2011). In his opinion, Wisner (2004) states that the definition of vulnerability depends on the user and on its effect in the society. By vulnerability, Wisner (2004) suggests that it is the capacity to expect, manage, and recover from the impact of a natural hazard. Vulnerability is therefore, a measure of exposure, as well as the capacity to respond to risks and hazards (Miller *et al.*, 2010). By implication, vulnerability involves a combination of factors that determine the degree to which a person's livelihood is put at risk. Livelihood vulnerability is an outcome of factors such as environment, affluence, education, gender, demography, technology and above all, preparedness (Paul, 2011). In the same vein, Wisner *et al.* (2004) proposes that various factors such as economic, demographic, political and geographical locations all contribute to the differing levels of vulnerability of diverse groups. Therefore, one can argue that vulnerability stems from unsafe conditions. It can be contextualised from an individual, household, environmental, social, economic, and institutional perspective (Paul, 2011).

Many groups of people in the developing world, especially pastoralists, are among the most vulnerable (Catley *et al.*, 2013). Vulnerability affects the way people construct and sustain their livelihoods that depend on environmental and ecological factors. It therefore becomes important to explore the factors that determine the people's vulnerability and how they deal with the situation. It has been established that when people greatly depend on natural assets, they tend to depend less on social and economic capital. By implication, vulnerability of people to natural calamities depend on how much they rely on natural resources. This puts them at higher risk of environmental vulnerability such as the impact of seasonality. Pastoralists, who largely depend on natural resources, lack the ability to mitigate the effect of marginalisation and inequalities inherent in their communities. They are vulnerable as a result of environmental factors such as seasonality

that drive them to the margins. We may therefore want to know which attributes enable social or ecological systems to maintain their structure without many disturbances such as effect of seasonality and drought. In other words, how do pastoralist women cope, when environmental, social, and economic conditions threaten their survival? This paper is structured into six sections. This first section introduces the study while section two highlights the concepts of livelihood vulnerability, coping and adaptation for pastoralists. Three is the materials and methods section while four presents the results. Section five discusses the results while six concludes the paper.

Individuals, societies and nations have had to cope with seasonality and climate change depending on their abilities. The ability of pastoralists to deal with seasonal variability may be closely linked to the extent to which they can withstand shocks and stresses that impart on their livelihoods. Several studies have been carried out about pastoralists (Catley *et al.*, 2013; Kandagor, 2005) however the studies have not paid adequate attention to pastoral mobility and its impact on vulnerability of wives of the male pastoralists. It becomes increasingly important to further investigate how pastoral households, particularly the women, survive in the absence of their major source of livelihoods (cattle).

Water and grazing land shortages often extrapolate into over population in newly inhabited areas by pastoralists (Anderson and Hoffman, 2011; Sen, 2007). One of the consequences of population growth is that more marginal land is being settled (Wisner *et al.*, 2004). Therefore reducing vulnerability is tied to increased resource access and empowerment of marginal groups. To reduce people's vulnerability, there is need for a meaningful disaster response that recognises people's perception of risk (Heijmans, 2004). Although vulnerability to disaster is a matter of perception, there is no consideration given to the view of local people by most aid agencies (Heijmans, 2004). Thus, failure to recognise local custom will be hazardous to understanding their perception of livelihood vulnerability. According to Tierney and Bruneau (2007), vulnerability denotes the lack of resilience to the occurrence of uncertain events known as risks.

Resilience has been described as a shock absorber or buffer which promotes sustainable livelihoods (Paul, 2011). Despite this, Folke *et al.* (2003) submit that the concept of resilience is useful in refining the theory of vulnerability. Miller *et al.* (2010) further argue that resilience is the ability to adapt and live with, rather than avoiding, change. They stated that the attempt to block or avoid a change from occurring often generates a systemic vulnerability (Miller *et al.*, 2010). Hence, resilience is the capacity of an individual or a group to respond to and recover from extreme events.

Vulnerability discourse now goes in tandem with discourses of capacities and resilience (Miller *et al.*, 2010) as the definition of capacity and adaptability are imbued in resilience context (Paul, 2011). Linking capacity with vulnerability has been increasingly seen as a key element in developmental issues (Wisner, 2004). This is because capacity is regarded as the ability to protect one's family and re-establish one's livelihood (Anderson and Woodrow, 1989). Those households who do not have the capacity to cope with and recover from short or long term adversities eventually fail to make their livelihoods sustainable (Folke *et al.*, 2003).

Coping may be defined in different ways and this implies that livelihood coping strategies is situation and environmental specific. It can therefore, be regarded as short term measures to deal with shocks and stresses (Osbahe *et al.*, 2008). On the other hand, adaptation according to IPCC (2007) are methods employed by people to respond to shocks and stresses brought by the changes in nature such as seasonal and climatic effects (IPCC, 2007). Similarly, adaptation specifically refers to the adjustments made in natural or human systems in response to actual or expected threats (Adger, 2000). One can immediately notice that adaptation involves longer-term shifts in livelihood strategies to respond to change in environment than coping (De Stage *et al.*, 2002). When properly implemented, however, adaptation strategies can help limit the loss of life and livelihood from changes in mean temperatures and the more-frequent and intense extreme climate (IPCC, 2007). Most rural dwellers also diversify in their livelihood strategies to cope and adapt with seasonal

changes. In the same vein, pastoral communities adopt various coping mechanisms, such as migration, to deal with pressures and changes in their environment.

Climatic variability characterised by extreme weather episodes such as increased frequency of droughts has the worst impact on people who are least able to cope (Adger *et al.*, 2003). Therefore, it is necessary to strengthen coping strategies of local communities so that their vulnerability to the risk of seasonality and climate change could be further reduced (Orindi and Eriksen, 2005). In fact, it has been stated that all strategies should aim at reducing vulnerability which is key to reducing climate change risk (O'Brien *et al.*, 2006). It is worth mentioning that some communities use livestock to cushion the effect of shocks. For example, when drought occurs and crops refuse to thrive as a result, livestock sales generate money for rural families to purchase food thereby sustaining their livelihoods (Hoddinott, 2006). This study was consequently based on the premise that pastoralists are migrants who go in search of water and grazing land when the weather is not suitable for rearing their livestock. We therefore, aim to find out: (i). the factors that make pastoralist women vulnerable and (ii). How pastoralist women are able to cope with the vulnerabilities. The knowledge gained may then make it possible for researchers and stakeholders, alike, to begin to understand why and how particular choices and decisions are made by vulnerable people especially pastoralist women. It would also avail planners the opportunity to design appropriate measures of reducing the impact of vulnerability on vulnerable people.

MATERIALS AND METHODS

The study was carried out in Kwara State, north central Nigeria purposely because it is among the recognised buffer areas of the country where pastoralists have migrated in large numbers (Medugu *et al.*, 2008; Medugu *et al.*, 2011). It is an area characterised by savannah vegetation and is divided into four agro-ecological zones. The majority of the state's population live in rural areas where agriculture is the primary means of livelihood. The State accommodates different tribes and ethnic groups with diverse



Figure 1: Map of Nigeria highlighting Kwara State
Source: FAO Country Data Profile, 2010

cultures. Among these tribes and culture are: Yoruba, Fulani, Hausa, Nupe, Bororo, Igbira, Baruba, and others. Figure 1 shows the map of Nigeria highlighting the study area.

We adopted a case study research design to sample pastoralist women and employed qualitative method of data collection. Focus group discussions and interviews were used to draw information from 66 pastoralist women in pastoral households using a multi-stage sampling procedure. In an attempt to integrate the dynamic aspects of vulnerability, this study employed the Capacities and Vulnerability's Analysis (CVA) of the gender analysis frameworks to analyse the data generated. The CVA was designed for humanitarian interventions and for disaster preparedness (March *et al.*, 1999). It helps people to build on existing strengths to achieve long term socio-economic development goals. The analysis is based on the fact that people's existing capacities and weaknesses determine the impact that a crisis will have on them (March *et al.*, 1999). The advantage of using the CVA is that; it encourages a

long-term perspective of socio-economic development. Thus, it ensures that vulnerabilities are removed and capacities are enhanced over time. It also highlights real situations in vulnerable areas. Therefore, it can be useful in development or relief work and can also aid the planning of a response. Like the other analytical tools, the CVA has its limitations. It has the tendency to make its user focus on one sex rather than both sexes. However, this problem was not a source of concern as the study already focused on the feminine gender. To maintain anonymity of the research participants so as to ensure ethical compliance of the study, pseudo names have been used where narrations are presented.

RESULTS

Livelihood vulnerability of pastoral households

The pastoralists in this study often find it difficult to cope with their livelihoods once dry season sets in. The women in pastoralists' households are put in a more vulnerable situation because men relocate to greener areas as a result of water and grazing land scarcity.

Box 1 Vulnerability of pastoralist women during dry seasons

When our husbands have moved to Oyo town (about 70 km away from our locality), we are faced with series of hardships. Usually, it is our husbands and older sons that plant but when they have relocated, we are faced with the stress of planting crops by ourselves. If not, we might miss the planting season. Women weed the crops all by themselves. This is contrary to our tradition before the relocation of our husbands where the boys join their mothers to weed. As a result of these predicaments, women work for longer periods in the fields and this tends to leave more gaps in other areas of household chores. Not only is this, but, we are also prone to illnesses during this period due to the excess work under the sun.

Our culture does not allow us to mingle with unrelated men. When our husbands are away, we find it difficult to call for assistance if our small livestock fall sick. As a result of this, we lose a lot of our livestock during this time. The loss of livestock at this time leads to poor nutrition and insufficient cash because these livestock are what we fall back on when our livelihoods begin to experience financial strains. A few of the cattle are left behind when our husbands are relocating to serve as livelihood booster. However, women are faced with the stress of milking these cattle, a task we did not perform previously. Hence we are more physically and financially stressed during the period of dearth. This translates to poor diet and low income during the period.

Although, it is our responsibility to care for the children, however the presence of our husbands instils discipline in them. Once our husbands are away grazing, the children are less responsive to our instructions because they know their fathers are not around to rebuke them when necessary. These instances increase our risks and social vulnerabilities, thereby causing emotional setback as we feel the absence of our husbands in all spheres of our livelihoods.

Afusatu¹, one of the research participants, illustrates that the absence of their husbands increases their vulnerability to illnesses as a result of excess workloads. Lumbabatu¹ also stressed that when their husbands move to greener areas, a gap is created in the households that often lead to loss of livestock as well as reduction in incomes. Summaya¹ also relates that vulnerability of pastoralist women to seasonality when their husbands have relocated poses an emotional setback on them (Box 1).

This study also found that pastoralist women practise kulle² and this hinders them from maximising opportunities that can come from outside their communities. A statement by one of the participants in the focus group discussion further reiterated this assertion.

“If anyone comes from city to preach to us about modern technologies, they would have to see our husbands first. We can only see or talk to them if our husbands permit. The norm

in our community is for visitors to consult with the village elders who comprise male representatives and they will pass on the information to our husbands..... (Talatu, Gaa Bolunduro Focus Group, Field Survey, 19th September, 2012).

Food insecurity as a source of vulnerability for pastoralist women

Women in this study mainly derive their incomes from selling milk products from cattle. They become financially vulnerable during dearth periods when their husbands have migrated with the cattle. This makes it difficult for them to maintain a source of livelihood. The women in the focus group discussions complained of insufficient milk, food and income during dry season (Box 2). According to Tawakaltu³ in one of the focus group discussions, pastoralists engage in farming on a subsistence level, but the problem is that the

¹ Afusatu, Summaya, and Lumbabatu are pastoralist women from Gaa Jombo.

² Kulle: women being restricted from mingling with men with whom they are not related.

³ Tawakaltu is one of the focus group participants in Gaa Isolo held on the 2nd of August, 2012.

Box 2 Low incomes among pastoralist women as a result of husbands' relocation

Tawakaltu who is a second wife stated that their husbands go for a minimum of three months and up to six months. She informed that husbands' move their herds when there are no more grasses in their surroundings for livestock to feed on. She also mentioned that the family fall back on the grains that were kept from the last planting season. However this does not suffice because, already, they would have been low in stock before the dearth period arrives.

Other participants emphasised that their husbands also pack some of these produce along with them when moving to the new areas. Sometimes when the men run out of food, they send the younger ones home to re-stock. The women stressed that there is physical, social and economic vulnerability in the form of hunger and very low income for the women and children that are left at home. Social vulnerability because their husbands see those at home as being better off than those abroad. Consequently, the food stuff at home gets depleted and the children starve the more.

Another narrator maintained that not only do they run out of food stuff, but their children also become malnourished leading to other diseases. She however, informed that women also try to cultivate their own farms to augment family diets.

produce do not last them through to the next planting season. Box 2 presents the narrations of participants in a focus group at Gaa Isolo. They explained that their children not only starve as a result of food depletion, but they also get malnourished during the periods when their husbands are away.

Vulnerability as a result of seasonal changes in pastoral livelihoods

This study further established that pastoralist

women lack adequate knowledge of the effect of seasonality on their livelihoods. They have inadvertently got used to change in seasons so much so that they believe it is inevitable. Zuber⁴ in a focus group related that there is nothing that can be done to prevent dry season. She however expounded that rainy season also brings along diseases that threaten the survival of their livestock. Box 3 gives an account of Zuber's narration.

Box 3 Effect of seasonal changes on the livelihoods of pastoralists

Dry seasons affects our productivity and ultimately our incomes but what can we do about it? It is during this time that we get together to gossip about our households. This is because we have less economic activities to carry out at this period. We rely on the produce from last planting season during dry seasons, but when the food finishes, we try to augment by buying whatever we need from markets in neighbouring towns. This, however, always proves difficult as we do not have the cash backing to actualise this.

Another interesting thing to note is that, we are equally affected by rainy season. During this season, the weather is poor and the cattle fall sick easily. This can result to death of some of the animals. Rainy season also entails buying medicine for the animals. In view of this, all weathers affect us.

We are also particular about the attitude of government to pastoralists. The people in government do not care about us. We are not supported with infrastructural facilities, no hospitals, not even schools for our children.



Figure 2: A herd of cattle eating a farmer's crops

Conflict as a source of vulnerability for pastoralists

Reuveny (2007) has argued that the competition for resources and other factors such as ethnic tensions can aggravate conflict among pastoralists and farmers. Furthermore, conflicts occur particularly when localised groups spill and one group of herders decide to encroach on the neighbouring community rangelands. In the same vein, this study found in a key informant interview conducted with Mallam Aliyu (*Gaa Jombo Focus Group, 27th August, 2012*), that the biggest problem encountered by pastoralists in their community is the issue of conflict with farmers in the neighbouring villages. It was ascertained that pastoralists' cattle feed on farmers' crops; as a result, farmers make exorbitant claims regarding the value of their crops. Sometimes, it is obvious that the cattle could not have consumed as much as the claims from the farmers. For example, Mallam Aliyu wondered how a pastoralist, who has only six cows in his herd, can be asked to pay a compensation for the damage which could have been caused by twenty cows. Figure 2 shows a herd of cattle grazing on a farm plot.

Coping and adaptive strategies adopted by pastoral households in the study

The importance of coping and adaptation capabilities is highlighted by Reuveny (2007): 'The key issue is not how strong a calamity is per se, but rather how strong it is relative to the ability of people to withstand it'. It is on this basis that this section uncovers the steps taken as well as the measures pastoralist women apply to deal with the vulnerabilities highlighted.

This study established some measures of coping adopted by pastoralist women to deal with the adverse weather conditions. A few support networks were in place for the women to assist one another in times of need. For instance, there was a woman who lost her property to flood and the other women rallied round to donate mats, cooking utensils and some food stuff while she recovers from the shock.

"...heavy rain fell and blew my hut away. I was devastated, but other women within the community came to my aid. They gave me mats and foodstuff, as well as cooking pots. It has been the practice to help one another in times of need." (*Juwairiyya - Gaa Abdullahi Focus Group, 4th August, 2012*).

Although, it was found that the women gave

Table 1a: Capacities and vulnerability's matrix for pastoralist women

	Vulnerability	Capacity/Coping strategy
Physical/Material Factor		
What productive resources, skills and hazards exist?	The women in the study highlighted the following as factors making them vulnerable: low income, poor diet, inappropriate allocation of time to complete their household activities, transportation problems, bad roads and conflict between pastoralists and farmers. The majority of the evidence raised here are from the Boxes and narrations discussed earlier.	Wives of pastoralists, who keep small livestock such as goats and chicken, sell these in the event of serious deficiency so as to boost their diets and incomes. Women sometimes join their husbands to plant on the farms to increase production. Pastoralist women walk long distances to meet the demands of the households. For example, they walk to neighbouring markets to sell their produce and buy other household needs. The women also walk long distances to fetch firewood. There is almost nothing on ground to cushion the effect of conflict. The strength of pastoralists in this regard is the hope that government would create grazing routes so that there will be less interaction between farmers and herders.

Source: Author's Construct, 2012

the impression that they were coping well in the area of food, it could be seen that there is very little coping in the areas of infrastructure and other social commitments.

"If there is no money to buy additional food, we could borrow from neighbours or sometimes neighbours do give one another from their food stuff. That is how we cope." (Zainabu – Gaa Bolunduro Focus Group, 21st August, 2012).

It was apparent that the children of pastoralists rarely attend schools. A few that makes the attempt to attend were discouraged for reasons such as proximity and engagement in livestock herding. Whilst the pastoralist women do not benefit from good road networks that could link them to neighbouring towns, they resort to walking long distances to markets where they could sell their produce and buy their needs. Provision of potable water is not available for pastoralists in the study area. They therefore depended on water from streams or well.

".....There is only one well in this community and it is not sufficient for us. It is completely dry during drought seasons and we have to walk long

distances to the stream to fetch water." (Mujidah-Gaa Jombo Focus Group, 27th August, 2012).

"....There are no schools in our community. The few - of our children, who go to school have to walk long distances to neighbouring villages." (Samura- Gaa Feudu Dangi Focus Group, 20th September, 2012).

Given that livelihood has been defined as ways in which an individual, households and communities sustain themselves using a combination of physical, social, cultural, environmental and economic resources (Scoones, 2009), it thus became necessary to analyse the vulnerabilities and capacities of pastoralist women in this study based on the mentioned factors. The factors considered in determining their capacities and vulnerabilities were physical/material, social/organisational, and motivational/attitudinal factors. The capacities and vulnerability's analysis matrix helped to determine the weaknesses of pastoralist women and whether they were able to cope with their livelihoods during periods of lack or not. The matrix (Table 1a and b) helped to draw informed conclusions on the efficacy of

Table 1b: Capacity and vulnerability's matrix for pastoralist women.

	Vulnerability	Capacity/Coping strategy
Social/Organisational What are the relationships between people and what are their organisational structures?	Some of the women in the study were able to diversify into other petty trades, but many did nothing.	Women form support networks by assisting one another. There are instances when women give neighbours foodstuff when they notice that there is food insufficiency. Pastoralist women also go as far as lending cash to one another (Box 2 and the narration of Juwairiyya).
Motivational/Attitudinal How does the community view its ability to create change?	Most of the women believe there is nothing they could do about seasonal variability. Pastoralist women visualise seasonality as a natural occurrence which cannot be prevented (Box 2).	Wives of pastoralists consume farm produce from last harvest. The women also engage in economic diversification such as sale of small livestock and farming.
How does culture and religion affect their livelihoods?	Women are disadvantaged because religion and culture should be followed strictly. Any form of professional advice is believed to come through their husbands (story of Talatu and Box 1).	There is no identified strength or capacity for the women in this regard.

Source: Author's Construct, 2012

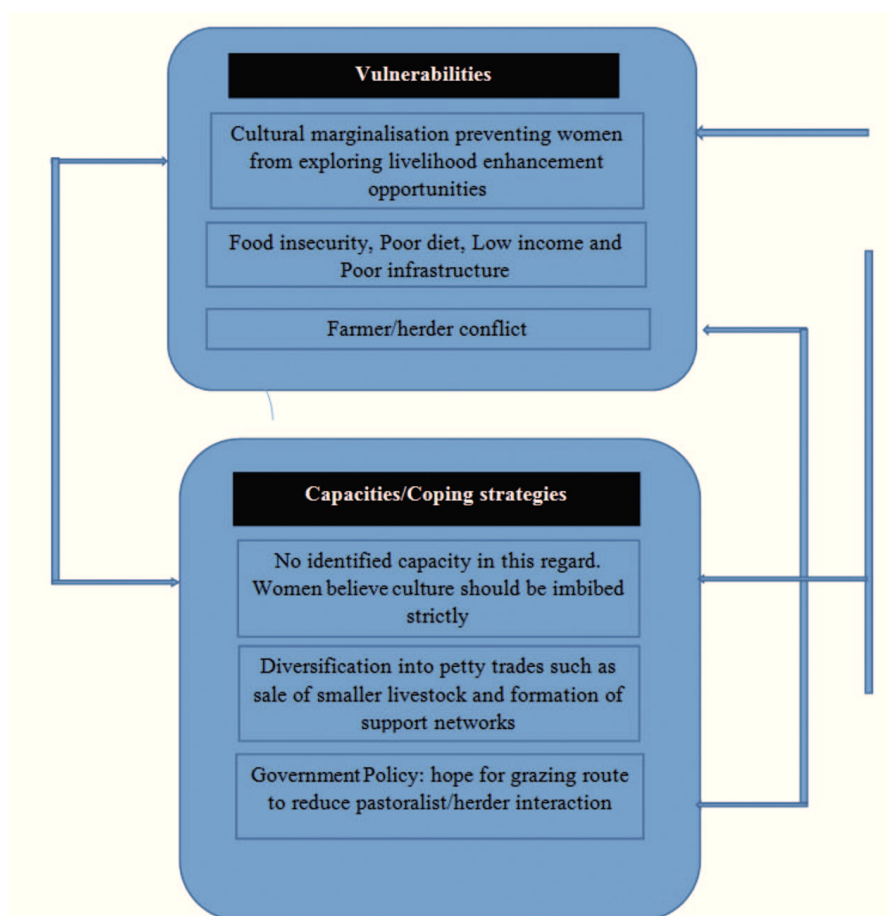


Figure 3: Vulnerability Indices and Coping Capacities for pastoralist women.
Source: Authors' construct, 2012

the coping strategies adopted by the women in their areas of vulnerabilities. It could be argued from the observations raised that if their productivity is not increasing, there cannot be any significant improvement in their livelihoods.

Adaptive mechanisms on the other hand, are planned or anticipatory methods people have developed over a long period of time to respond to the effects of environmental hazards. Long duration hazardous events such as drought are predictable in terms of timing as well as location. For this reason, they offer opportunities for adjustment. The persistence of drought spells over the years has made farmers and pastoralists alike to always expect it to recur (Below *et al.*, 2011). As such, farmers and pastoralists have realised that there is need for them to diversify in their sources of income. This study therefore explored the vulnerabilities and capacities of pastoralist women in Figure 3 so as to determine how these indices contribute to their adaptation, and by extrapolation, how the indices affect their livelihoods.

DISCUSSION

It is not drought that makes pastoralists vulnerable, but their inability to deal with it (ODI, 2009). Once weather and climate impart on the environment, the resultant effect will change the functioning of the ecosystem thereby affecting human land-use and livelihoods. Vulnerability differs between women and men in many societies and women are more vulnerable to environmental changes because of their responsibilities in the family, which are exacerbated by the impact of seasonal variability. Women's workload has increased as a result of scarcity of basic needs and natural resources, such as food, water, and fuel (Dankelman *et al.*, 2008). It was also argued that vulnerabilities weaken people's ability to cope with hardships or emergencies (March *et al.*, 1999). It was emphasised in this study that children become malnourished as a result of food shortages. This is in line with the report of Heffernan *et al.* (2001) who observed that livestock management serve as food, source of protein and income generation for rural economies. Thus, it can be argued that when households experience strained economic resources and low incomes, they depend on live-

stock products to manipulate the family's diet (Jaitner *et al.*, 2001). This can help to prevent malnutrition and other health conditions caused by insufficient protein in the body. Food security encompasses adequate availability, accessibility and food utilisation (Gregory *et al.*, 2005). Devereux and Edwards (2004) reported that countries in the tropical region will experience more food losses as a result of climate change in a similar way that this study has found that pastoralist women are food insecure. In addition to the formation of support networks, the study found that women cope with their livelihoods during drought seasons by diversifying in economic engagements. Among the diversification methods the women adopt are selling of smaller livestock such as poultry to augment incomes, farming on a subsistence level, engaging in petty trading, and socially and financially supporting one another by forming social networks based on communal friendship (Table 1).

Cultural vulnerability according to Wisner (2004) implies a situation where certain beliefs and customs undermine people's capacity for self-protection. It complicates people's situations and sometimes exposes them to greater or more frequent hazards. For example, Reuveny (2007) states that women are bound by economic dependence and cultural ties to remain in a violent household or community. Therefore, it is not surprising that culture hinders pastoralist women from exploring full potentials to maximise incomes. Nonetheless, women groups could be formed where relevant stakeholders could engage women in training sessions, workshops, and capacity building courses. Women can learn and unlearn various cultural traits that may eventually work on their cultural psyche so as to give room for change and livelihood improvement.

As it is known that pastoralism entails mobility and herds may be difficult to control by pastoralists, the chances of conflicts between the two parties may be heightened. There are frequent complaints between herders and farmers regarding damage of crops. The pastoralists in this study claim that they are asked to pay more than the worth of the crops. They believe farmers inflate the worth of their crops and this further leads to issues which are often irresolvable.

It can be argued from this insight that many of the conflicts stem from disagreements between pastoralists and farmers. This is in line with the submission of Benjaminsen *et al.* (2009) who indicate that although farmer-herder conflicts in Africa are seen as being caused by environmental factors and scarcity, they however feel the situation should be addressed from a broader policy context. Thus, pastoralists in this study hope for grazing routes which should reduce farmer/herder interaction.

The pastoralists in this study have adopted relocation and settlement to more conducive and bearable lands as their method of adapting to the extreme weather conditions. Unfortunately, this method has put their wives in a vulnerable situation where they tend to run short of food, cash and social support that goes with the absence of their husbands (Box 1). Pastoralist women experience socio-economic constraints which hinder their ability to explore other sources of income. Livestock keeping is one area that women could use to diversify diets and incomes (UNDP, 2002). Thus, it becomes unacceptable to find that rainy seasons bring along diseases and ailments for livestock of pastoralists in this study (Box 3). Given that pastoralist women sell their livestock during dry seasons when there is no milk from cattle, they therefore cannot allow diseases to wipe out their stock. They call agriculture experts who might not necessarily be veterinary doctors to take care of their livestock during such occasions.

CONCLUSION

In this paper we present the findings of factors that make pastoralist women vulnerable and the measures they have put in place to deal with the vulnerabilities. First, we explore the meaning of vulnerability for different people, particularly pastoralists. Second we identify how pastoralist women have been dealing with the shocks and stresses. We investigated this by carrying out a capacity and vulnerability analysis using the Capacity and Vulnerability Analysis (CVA) matrix of the gender frameworks. Lastly, we contribute to the debate of vulnerability and coping strategies of people whose livelihoods depend on ecological and natural resources by showing that pastoral or marginalised people are somewhat

resilient to factors that make them vulnerable. Drawing from the experiences of participants in the study, we tend to conclude that pastoralist women might be able to survive adverse situation even when environmental, physical, social, and economic conditions are not favourable. This study paves the way for relief organisations, policy makers, researchers, and individual stakeholders to have a better understanding of how pastoralist women survive, given their livelihood vulnerabilities. It also makes clear, ways that can be explored to reduce women's vulnerability, increase their capacities, and ultimately improve their livelihoods.

ACKNOWLEDGEMENT

The participation and cooperation of pastoralists in the study area is greatly acknowledged.

REFERENCES

- 1- Adger, W. N. (2000). Social and ecological resilience: Are they related? *Progress in Human Geography*, 24(3), 347-364.
- 2- Adger, W. N., - Huq, S., Brown, K., Conway, D., & Hulme, M. (2003). Adaptation to climate change in the developing world. *Progress in development Studies* 3(3), 179-195.
- 3- Anderson, M., & Woodrow, P. (1989). *Rising from ashes: Development strategies in times of disaster*. London, Westview.
- 4- Anderson, P. M. L., & Hoffman, M. T. (2011). Grazing response in the vegetation communities of the Kamiesberg, South Africa: Adapting a plant function type approach. *Journal of Arid Environments*, 75(3), 255 - 264.
- 5- Barnett, J., & Adger, W. N. (2007). Climate change, human security and violent conflict. *Political Geography*, 26(6), 639-655.
- 6- Below, R., Guha-Sapir, D., Vos, F., & Ponserre, S. (2011). Annual disaster statistical review 2010. Centre for Research on the Epidemiology of Disasters.
- 7- Benjaminsen, T. A., Maganga, F. P., & Abdallah, J. M. (2009). The Kilosa killings: Political ecology of a farmer-herder conflict in Tanzania. *Development and Change* 40(3), 423-445.
- 8- Berkes, F. (2007). Understanding uncertainty and reducing vulnerability: lessons from resilience thinking. *Natural Hazards* 41(2), 283-295.
- 9- Catley, A., Lind, J., & Scoones, I. (2013). *Pastoralism and Development in Africa: Dynamic*

change at the margins. Pathways to Sustainability. London and New York, Earthscan from Routledge.

10- Dankelman, I., Alam, K., Khurshid, A., Ahmed, W.B., Gueye, Y.D., Fatema, N., & Kutin, R.M. (2008). Gender, climate change and human security: Lessons from Bangladesh, Ghana and Senegal. Retrieved 8th January, 2013, from www.gdonline.org/.../WEDO_Gender_CC_Human_Security.pdf.

11- De Stage, R., Holloway, A., Mullins, D., & Nchabaleng, L. (2002). *Learning about livelihoods: Insights from Southern Africa*, Periperi Publication, Oxfam GB, UK.

12- Devereux, S., & Edwards, J. (2004). Climate change and food security. *IDS Bulletin* 35(3), 22-30.

13- Folke, C., Colding, J., & Berkes, F. (2003). *Synthesis: building resilience and adaptive capacity in social-ecological systems*, Cambridge University Press, Cambridge, UK.

14- Fordham, M. (2004). *Gendering vulnerability analysis: Towards a more nuanced approach. Mapping vulnerability disasters, development & people*. G. Bankoff, G. Frerks and D. Hilhorst. London, Earthscan.

15- Gregory, P. J., Ingram, J. S. I., & Brklacich, M. (2005). Climate change and food security. *Philosophical Transactions of the Royal Society B: Biological Sciences* 360(1463), 2139-2148.

16- Heffernan, C., Misturelli, F., & Nielson, L. (2001). Restocking and poverty alleviation. Perceptions and realities of livestock-keeping among poor pastoralist in Kenya. Reading, England, Veterinary Epidemiology and Economics Research Unit, University of Reading.

17- Heijmans, A. (2004). From vulnerability to empowerment. *Mapping vulnerability disasters, development & people*. G. F. Greg Bankoff, Dorothea Hilhorst, Earthscan.

18- Hoddinott, J. (2006). Shocks and their consequences across and within households in rural Zimbabwe. *The Journal of Development Studies*, 42(2), 301-321.

19- IPCC (2007). Climate change 2007: the physical science basis, intergovernmental panel on climate. The Physical Science Basis, New York. Agenda 6: 07.

20- Jaitner, J., Sowe, J., Secka-Njie, E., & Dempfle, L. (2001). Ownership pattern and management practices of small ruminants in the Gambia—implications for a breeding programme. *Small Ruminant Research*, 40, 101-108.

21- Kandagor, D. (2005). Rethinking pastoralism

and African development: a case of the Horn of Africa. Retrieved from URL: <http://www.codesria.org/IMG/pdf/kandagor.pdf>: [14 June 2012].

22- Lybbert, T. J., Barrett, C. B., Desta, S., & Layne Coppock, D. (2004). Stochastic wealth dynamics and risk management among a poor population. *The Economic Journal*, 114(498), 750-777.

23- March, C., Smyth, I., & Mukhopadhyay, M. (1999). *A guide to gender-analysis frameworks*. Oxford, Oxfam GB.

24- Medugu, I. N., Majid, M. R., & Choji, I. D. (2008). A comprehensive approach to drought and desertification in Nigeria: A brief evaluation of government policies. *International Journal of Climate Change Strategies and Management*, 19, 690-704.

25- Medugu, N. I., Majid, M. R., & Johar, F. (2011). Drought and desertification management in arid and semi-arid zones of Northern Nigeria. *Management of Environmental Quality*, 22, 595-611.

26- Miller, F., Osbahr, H., Boyd, E., Thomalla, F., Bharwani, S., Ziervogel, G., Walker, B., Birkmann, J., Van Der Leeuw, S., Rockström, J., Hinkel, J., Downing, T., Folke, C., & Nelson, D. (2010). Resilience and vulnerability: Complementary or conflicting concepts? *Ecology and Society* 15(3).

27- O'Brien, G., O'Keefe, P., Rose, J., & Wisner, B. (2006). Climate change and disaster management. *Disasters* 30(1), 64-80.

28- ODI (2009). Getting it right: Understanding livelihoods to reduce the vulnerability of pastoral communities. A Synthesis paper of the Overseas Development Institute, April, 2009. London, Overseas Development Institute. <http://www.odi.org.uk/resources/docs/4307.pdf>.

29- Orindi, V. A., & Eriksen, S. H. (2005). *Mainstreaming adaptation to climate change in the development process in Uganda*, Acts Press, African Centre for Technology Studies.

30- Osbahr, H., Twyman, C., Neil Adger, W., & Thomas, D. S. G. (2008). Effective livelihood adaptation to climate change disturbance: Scale dimensions of practice in Mozambique. *Geoforum* 39(6), 1951-1964.

31- Paul, B. K. (2011). *Environmental hazards and disasters. Contexts, perspectives and management*. West Sussex, John Wiley & Sons.

32- Reuveny, R. (2007). Climate change-induced migration and violent conflict. *Political Geography*, 26(6), 656-673.

33- Sen, A. (2007). Population and reasoned agency:

Population growth and food security. *Development*, 50(S1), 98–102.

34- Scoones, I. (2009). Livelihoods perspectives and rural development. *The Journal of Peasant Studies*, 36, 171-196.

35- Tierney, K., & Bruneau, M. (2007). Conceptualizing and measuring resilience: A key to disaster loss reduction, TR News 250, May-June 14-17.

36- United Nations Development Programme (UNDP) (2002). UNDP Mission Report on Drought Damage Assessment and Agricultural Rehabilitation for Drought Affected Districts of Rajasthan Draft 2. Retrieved 9- January, 2013, from [http://www.undp.org.in/dmweb/RAJASTHAN %20DROUGHT.pdf](http://www.undp.org.in/dmweb/RAJASTHAN%20DROUGHT.pdf).

37- Wisner, B. (2004). *Assessment of capability and vulnerability. Mapping vulnerability. Disasters, development & people*. G. F. Greg Bankoff, Dorothea Hilhorst. London, Earthscan.

38- Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At Risk. Natural hazards, people's vulnerability, and disasters*. London, Routledge.