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Exploring the Relationship between Gender-differentiated Land Rights and Climate Change Adaptation for Food Security in Western Kenya

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Supervised

BY:

Professor Mulala Danny Simatele

A thesis submitted to the University of the Witwatersrand, Johannesburg in fulfilment of the requirements for the degree of Doctor of Philosophy in the Department of Geography and Environmental Studies.

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Declaration, Plagiarism

I, Linda Sarah Mutesi Etale, declare that this Thesis, including the data, figures, tables, and any other information is my original work. I have, where necessary acknowledged the source of the material that has been used.

This Thesis contains my own writing, in areas that I have used the other person's ideas; I have duly acknowledged the sources. I have paraphrased ideas that have been borrowed from other authors and in instances where their ideas have been used, word for word, I have duly enclosed these ideas in quotation marks and referenced accordingly.

Furthermore, this thesis is being submitted for the award of the degree of Doctor of Philosophy to the Faculty of Science at the University of the Witwatersrand, in Johannesburg, the Republic of South Africa. This is the first time I am submitting this Thesis for examination and the award of the degree thereafter. It has never been submitted to any other university before for a similar purpose.

Signed:

Linda Sarah Mutesi Etale



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Abstract

This study argues that gendered-land rights majorly undermine efforts towards sustainable food security within households amid adverse changes in climate. Women's contribution to adaptation is also acknowledged despite the existing challenges of insecure access to land. Secure access to land alone is not a guarantee to food security within the context of changing climate. This being the case, this study aimed to investigate whether increased access to land could be a starting point towards equipping households with a tool (land) to begin the process of practicing sustainable agriculture for food security. The study sites were in Kenya where land is predominantly owned and controlled by men, with women majorly accessing it through male relations. The vulnerability of female-headed households to the effects of climate change and resultant food insecurity where their land rights had been denied, was also explored. The study examined policy and legal frameworks that protect women's land rights in light of the predominant cultural practices, increased climate change and food insecurity episodes. In addition, the study explored practices that women engaged in towards adaptation and meeting the food security needs of households. Ultimately, the study examined the relationship between land access, climate change, and food security. This is in addition to identifying strategies that women can use in response to land rights challenges, to build resilience to climate change and achieve food security. Lastly, the study identified strategies that can be applied to protect vulnerable women's land rights. This study used a descriptive research design to conduct a cross-sectional study in Matungu and Mumias East sub-counties in Kakamega County, in western Kenya. The research design is feminism, and data were collected through review of literature, focus groups, key-informant interviews and questionnaires. Through this approach the study allowed respondents including farmers, Government officials, NGO representatives, and other professionals to give their experiences concerning climate change, adaptation, food security, and women's land rights. The study makes a contribution to initiatives targeted at creating sustainable solutions in adaptation for food security in Kenya and Sub-Saharan Africa.

The study found that despite having a robust legal framework that addresses land rights injustices, Kenya still grapples with competing customs and practices that seemingly undermine efforts towards adaptation. Patriarchy still predominantly informs actions that mostly disfavor women in terms of rights to the capital of production yet they are a major contributor to labor and knowledge

in agriculture development. The study recommends strategies that can be used to inform policy and practice towards the true transformation of communities in terms of livelihood development and food security. These include the adoption of climate responsive agricultural techniques, embracing indigenous knowledge, implementation of the relevant legal frameworks.

Keywords: *Climate Change, Adaptation, Gendered-Land Rights, Food Security, Power Relations, Context, Time, Space, Community Transformation, Indigenous Knowledge*

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List of Abbreviation and Acronyms

CSA	Climate Smart Agriculture
FAO	Food and Agriculture Organisation
FGD	Focus Group Discussion
FSA	Food Systems Approach
GDP	Gross Domestic Product
GHG	Greenhouse Gas
IFAD	International Fund for Agricultural Development
IPCC	Intergovernmental Panel on Climate Change
KSH	Kenya Shillings
NECHIP	Nabwabini Environmental Health Care Intervention
Ph.D.	Doctor of Philosophy
SACCO	Savings and Credit Cooperative Organizations
SDGs	Sustainable Development Goals
SHG	Self-Help Group
THVCs	Traditional High-Value Crops
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WFP	World Food Programme
WHO	World Health Organisation

CHAPTER ONE
FRAMES OF REFERENCE

1.1 Background of the Study

Agriculture, one of the key developmental sectors in developing countries, continues to be majorly affected by of climate change and variability. Developing countries also generally tend to be more vulnerable to climate change than developed countries, because of the greater importance of rain-fed agriculture, lower health standards and the stricter financial, institutional, and knowledge constraints on adaptation (Abeygunawardena, P., Vyas, Y., Knill, P., Foy, T., Harrold, M., Steele, P., Tanner, T., Hirsch, D., Oosterman, M., Rooimans, J., Debois, M., Lamin, M., Liptow, H., Mausolf, E., Verheyen, R., Agrawala, S., Caspary, G., Paris, R., Kashyap, A., Sharma, R., M, 2002; Marx, 2012). In Kenya agriculture contributes about 20 percent of the country's GDP employing 75 percent of the population, and accounts for 60 percent of total export earnings (Ministry of Agriculture, 2015). Kenya continues to battle severe droughts made worse by interrupting rainfall patterns that lead to grave consequences including harvest failure, reduced pasture, reduced water availability and loss of livestock, among others. As farming is affected by these challenges, the farmers have continued to adapt to the situation in various ways including crop diversification. The latter has only been viable for the few who have the knowledge and resources but a sizable number look for off-farm jobs while others subdivide their land for sale, a portion if not all. This reduces the parcel sizes of land under agriculture with women and children bearing the brunt of being landless and food insecure.

Women in developing countries such as Kenya are pivotal to food security. They are involved in various processes of food production, access (distribution) and utilization through land preparation, planting, weeding, harvesting, threshing, transportation, storage and allocation (Habtezion Senay, 2012; Carr & Thompson, 2014). FAO (2015) estimates that facilitating the full participation of women in the agricultural sector would increase agricultural yields by 20-30% and that the number of undernourished people would decrease 12-17% i.e. 100-150 million fewer people living in hunger (FAO, 2015).

One of the factors that seemingly remain frustrating to the women's contribution to agriculture and ultimately food security is insecure access to capital of production. Women have long had access to land in sub-Saharan Africa, but men and women have rarely, if ever, had identical kinds of claims to land, largely because the genders have very differentiated positions within the kinship systems that are the primary organizing order for land access (Whitehead & Tsikata 2003). Kenya has made progressive steps towards advancing women's rights to property and land, more so through legislation. Despite these steps, women still face challenges in terms of access to land and resources within exposing them and their dependents to disease, malnutrition and other impacts of climate change. Historically, Kenya's land laws were developed against a customary law system that limited women's rights to access or use, giving men absolute power over ownership and control (Whitehead & Tsikata 2003). The patriarchal nature of Kenyan society often limits the rights of even those women not living on land governed by custom with some estimates indicating that as little as 1% of the land is titled in the names of women and 5-6% is titled jointly by women and men (LANDESA, 2014).

1.2 Thematic Considerations of the Study

What is happening at the global level as regards the changing climate, agriculture, and to a larger extent gendered-land rights is not at variance to the local situation in rural Kenya, a position that guides this study. Agriculture remains one of the pivotal contributors to the economy of Kenya and a source of income for rural communities and women in particular. Further, in countries such as Kenya women are acknowledged as major contributors in agriculture, specifically in terms of labor (Chauvin, Mulangu & Porto, 2012; Fischer & Qaim, 2012; Carr & Thompson, 2014). It also follows that these women depend on agriculture as a major source of livelihood, and stresses emanating from changing climate largely leaves them and their dependents food insecure. This reality is also coupled with unequal land rights, limited access to credit facilities and technologies required for adaptation to climate change scenarios. Therefore, this study aimed to understand the relationship between climate change adaptation and women's access to land and how these two combine to affect the food security of households. It was also the interest of this study to investigate the extent to which gendered differences in land access has affected adaptation efforts and food security in rural Kenya.

Kenya's agricultural production is largely rain-fed and the country's food security remains negatively impacted by the effects of climate change. It is estimated that the central economic costs of climate change for Kenya could be equivalent to 3% of GDP each year by 2030 (Watkiss, Downing & Dyszynski, 2009). Kenya adopted the Kenya Vision 2030 as a development plan and within it, agriculture is identified as a key sector for economic growth specifically singling out smallholder agriculture as a focus area. The blueprint (Government of Kenya, 2007) further identifies women as disadvantaged in accessing labor markets, productive resources and limited access to capital of production (land) and highlights that specific policy measures will be taken to correct the glaring gender gaps among others access to and control of resources. Evidence (Kenya, 2011) shows that women in Kenya provide up to 80 percent of farm labor and manage 40 percent of smallholder farms, but own only 1 percent of agricultural land and obtain only 10 percent of agricultural credit. It is, however, notable that the Vision 2030 does not strategically include plans to deal with climate change in major agricultural areas such as those of this study. This is the case despite the fact that agriculture is the dominant economic activity in Kenya and currently is immensely affected by climate change. It seemingly only identifies with Arid and Semi-arid Lands (ASAL) and high-risk disaster zones in terms of climate change. On the other hand, the Kenya Climate-Smart Agriculture Strategy-2017-2026 is focused on enhancing the adaptive capacity and resilience of farmers. Further, the strategy (Government of Kenya, 2017) identifies the limited capacity of women to participate in climate-smart agriculture even as it recognizes that weak policies, legislations, enforcement, and overlap of mandates among institutions involved in coordinating efforts towards adaptation of climate-smart agriculture (CSA), have contributed to Kenya's inability to effectively address vulnerability regarding climate change.

The National Food and Nutrition Security Policy (Kenya, 2011) recognizes that access to, and control of, productive resources such as land and capital is mainly in the hands of men in Kenya, identifying this with poor nutrition and food insecurity within households. Further, the Kenya National Adaptation Plan: 2015-2030 considers gender and its associated vulnerability when it comes to participating in socio-economic activities, particularly mentioning widows and orphans among others. The Plan (Kenya, 2016) pays particular attention to vulnerability associated with exposure to changing climate when women and children continue to face discrimination in terms of access to and control of resources such as capital, credit, and land. These three resources are

identified in the Plan (Government of Kenya, 2016) as those which can aid in coping with climate shocks and stresses.

The Sustainable Development Goals (SDGs), specifically Goal 2 hopes to end hunger, achieve food security, improve nutrition and promote sustainable agriculture. The FAO (2016) in relating to SDG 2 recognizes that both developed and developing countries are contending with the diminishing availability of land, degraded soils, and frequent and severe weather events, as the situation is compounded by the impact of climate change on agriculture. Cotula, Toulmin, and Quan (2006) rightly note that as resources such as land become scarcer, their value also increases and those with weak rights to these resources such as women will tend to lose out. This is the case in Kenya where women's secure access to capital of production is frustrated by culture and seemingly poor implementation of that which is secured by law. Gender biased access to land for women in western Kenya (as other parts of the country) also denies women access to credit facilities and farm inputs because these are tied to providing collateral, especially in financial/credit institutions.

In reference to the aforementioned strategies and plans, one of the common threads that need to be addressed for sustainable food security is the recognition of women's role in food security especially in areas where climate change was not an issue of major concern a couple of decades ago. Secondly is the capacity of women in agriculture in terms of their access to secure capital of production if food security is going to be sustainably addressed in Kenya. Generally, despite these strategies put in place, the Kenya Government is still grappling with feeding its population and this study explores one of the critical issues that impede the county's progress in as far as food security is concerned i.e. gendered-land rights at a time when changing climate is affecting agriculture in rural households. In addition to climate change, gendered-land rights continue to hamper efforts towards adaptation to climate change in Kenya as a whole. Land in Kenya is majorly owned and controlled by men with women accessing rights through their male relations. Kenya has made progressive steps towards advancing women's rights to property and land more so through legislation. For instance, the supreme law, the Kenyan Constitution of 2010 has gone to great lengths to prescribe the rights of both men and women to land. Foremost, Article 60 (f) of the Constitution calls for the elimination of any form of discrimination based on gender in law, customs, and practices related to land and property in land (Government of Kenya, 2010). Despite

these women still face challenges in terms of access to land exposing them and their dependents to disease, malnutrition and other impacts of climate change. According to Whitehead and Tsikata (2003), historically, Kenya's land laws were developed against a customary law system that limited women's rights to access or use, giving men absolute power over ownership and control (Whitehead & Tsikata, 2003). Kameri-Mbote and Muriungi (2018) estimate that a paltry 1% of women in Kenya are sole registered owners of land and only 5% of women are registered owners of land jointly with their husbands.

1.3 Rationale of the study

It is, therefore, clear that gender-differentiated land rights can exacerbate the impacts of climate change-induced food insecurity and, as a result, impede effective climate change adaptation. However, little is known about the extent of the effect of this link for Kenya. It is possible that despite intense adaptation efforts, gender-differentiated land rights in this important breadbasket of the country may impede the attainment of positive results and as such compromise the food security of the region and possibly the country at large. There is, therefore, a need to explore gender roles and their link to climate change adaptation in this region particularly with respect to situations where women's roles as primary providers of sustenance and livelihood may be enhanced by better land rights.

Secure access to land alone is not a guarantee to food security within the context of changing climate. This being the case, this study aimed to investigate whether increased access to land could be a starting point towards equipping households with a tool (land) to begin the process of practicing sustainable agriculture for food security. The ultimate aim will be to highlight the effect of gender-differentiated land rights on climate change adaptation with respect to food security and enable development practitioners to delineate practical ways through which to support adaptation practices within communities.

This study will, therefore, focus on how gendered differences in land access affect climate change adaptation and food security in rural Kenya. Kenya's population is still largely rural and dependent on small-scale farming for survival with women providing the bulk of labor with unsecured rights on the parcels of land. Women do not culturally own land and resources within and their user-rights are largely tied to their relationships with men as relatives. This makes women's access to

land for productive purposes a fragile issue thereby impeding their socio-economic roles within their communities.

> *Emerging evidence suggests that when women hold secure rights to land, efforts to tackle climate change are more successful, and responsibilities and benefits associated with climate change response programs are more equitably distributed. Conversely, without effective legal control over the land they farm or the proceeds of their labor, women often lack the incentive, security, opportunity, or authority to make decisions about ways to conserve the land and to ensure its long-term productivity* (Asia Pacific Forum on Women, 2016).

Because women's rights to land are already skewed due to gender discrimination practices, their plight is made worse with climate change impacts that are rife. This, therefore, places rural women and their dependents at risk due to their heavy dependence on land for subsistence. In the long term, food insecurity is exacerbated, a decline in health/nutritional standards is experienced, land degradation and overall unsustainable land use occur.

The study will investigate the relationship between land access, climate change, and food security in rural households within Matungu and Mumias East sub-counties in Kakamega County, in western Kenya. It will examine policy and legal framework that focus on women's land rights taking into consideration the predominant cultural practices, amid adverse changes in climate and increasing food insecurity. The study will also examine the strategies that women use in response to land rights challenges while building resilience to climate change and achieve food security.

1.4 Research Questions

In view of the above observations, the following questions guided the research process:

i. In what ways are rural agriculture-dependent people in Matungu and Mumias East Sub-Counties of Western Kenya adapting to conditions brought about by climate change?
ii. What policies exist to protect women's rights to access land in light of increased climate change and food insecurity episodes?
iii. What are the implications of the findings of this study in a wider context?

1.5 Research Aims and Objectives

The aim of this study was:

i. To investigate women's access to land and how this relates to adaptation to climate change and household food security.

In view of this aim, the objectives of the study were to:

i. To identify the adaptation strategies used by rural communities in response to land rights challenges, to build resilience to climate change and achieve food security;
ii. To create an inventory of strategies that could be put in place to protect women's land rights in light of the climate change-food security nexus;

1.6 Theoretical Considerations and Literature Review

Numerous studies show evidence of the existence of climate change and its impacts on different sectors of the economies and human well-being, including agriculture. The significance of the agricultural sector impacts national revenues of countries, livelihoods, and nutrition for households. FAO (2016), Boko *et al*. (2007), and Carlsson-Kanyama (1998), among other literature, draw closer attention to the reality that climate change is adversely compromising food production in countries and regions that are already high food insecure. However, it is also notable that agriculture in itself is not what would be referred to as an "innocent bystander" because this sector when inappropriately managed is a major contributor to the causes of climate change. This is mainly through land-use changes and emission of GHGs in the farms. McMichael, Powles, Butler, and Uauy, (2007) concur observing that GHGs emissions from the agriculture sector account for about 22% of global total emissions; this contribution is similar to that of industry and greater than that of transport (McMichael, A. J., Powles, J. W., Butler, C. D., Uauy, 2007). The impact of climate change on food security is undisputed, more so in developing economies of sub-Saharan Africa. Further, as observed by Zewdie (2014) that unlike food availability, food utilization and food accessibility have not been well investigated. As rightly noted by Zewdie (2014) food availability alone will not grant food security and nutrition without sustained enhanced capacity of people to access and proper utilization of nutrients.

Women in sub-Saharan Africa are overrepresented in agriculture, mainly provide labor and knowledge. Climate change affects men and women differently and therefore the vulnerability of

both genders is also different. Crucially pointed out is that women are the most vulnerable of the two genders when it comes to the effects of climate change. A major contributor to women's vulnerability to the impacts of climate change and resultant food insecurity is the lack of secure access to capital of production. According to reports by UN Women, gender disparities as regards land access is due to the assumptions that men, as head of households, control and manage land- implicitly meaning that land is "lost to another family" in instances where women are given access, control or ownership (UN-Women, 2012; United Nations, 2013). In instances where there is flexibility around access women's parcels are usually of a smaller size and lower quality than men's land parcels (Denton, 2002). However, there seems to be a missing link between linking land access for women and improved food production and sustainable livelihoods. Terry (2009) argues that there is a paucity of hard evidence on gender and climate change, creating difficulty in discerning the many and complex links. If gender is mentioned at all as a climate-change issue, it is usually with reference to the particular vulnerability of poor women in the South (Terry, 2009). Additionally, secure land rights for women is often linked to improved agricultural productivity and food security, the two being heavily dependent on women's input especially in terms of labor (FAO, 2011a; Fischer and Qaim, 2012)- and not as an effort to address women's vulnerability to climate change.

The literature reviewed emphasizes that African countries continue to grapple with creating a balance between the legal and customary frameworks when dealing with women's land rights. Wickeri and Kalhan (2010) assert that the use of legal frameworks alone in areas where women's land rights issues are mediated by customary law would be inadequate. The Office of the United Nations High Commissioner for Human Rights (2015) also observes that,

> "discrimination against women violates the principles of equality of rights and respect for human dignity, is an obstacle to the participation of women, on equal terms with men, in the political, social, economic and cultural life of their countries, hampers the growth of the prosperity of society and the family and makes more difficult the full development of the potentialities of women in the service of their countries and of humanity". (The Office of the United Nations High Commissioner for Human Rights, 2015)

Predominantly for marginalized women, institutions play a critical role in building resilience and reducing their chances of being vulnerable to the impacts of climate change. Although many

studies have demonstrated the existence of the relevant policy and institutional interventions, adaptation by communities has been slow. One of the intergovernmental institutions that are dedicated to adaptation and food security is the UNFCCC that has required countries to formulate and implement adaptation measures(Caripis, 2014). Ongugo, Langat, Oeba, Kimondo, Owuor, Njuguna, Okwaro, and Russell, (2014) argue that despite there being frameworks, adaptation preparedness remains inadequate; mainly attributed Government plans not taking into account the overarching policy framework till the devolved level. As a result, interventions are implemented as stand-alone activities, which render them less effective (Ongugo *et al.* 2014).

In view of the preceding discussions from varied literature, there are areas that are understudied and may be considered as limitations to women adapting to climate change for food security and sustainable livelihoods. Firstly, food utilization and food accessibility as important components of food security have not been well investigated which exposes communities to limitations on access and proper utilization. Opportunities abound in addressing such a gap, especially of livelihood diversification. Secondly, there seems to be a missing link between linking land access for women and improved food production and eventually sustainable livelihoods, especially for rural families. Thirdly, there is a paucity of hard evidence on gender and climate change thereby making it hard for practitioners to discern the many complex links especially in the context of land rights. It is notable in the literature reviewed that if at all gender is mentioned as a climate-change issue, it is usually generally with reference to the particular vulnerability of poor women in the South. Fourthly, attempts to deal with this obstacle to access to land for women targets the specific owner of the parcels of land- typically, this would be men. This, therefore, misses the intended mark. This could mean that interventions target the wrong audience and the cycle of food insecurity and poverty continues.

In reference to the preceding discussions, the relevance of this study cannot be overemphasized. There is a great deal of effort that has been placed on literature regarding climate change adaptation, resilience and livelihood development, food security among others but more needs to be done particularly on incorporating women's issues on the same. This will require questioning the stereotypes about gender roles, women's role in developing strategies on adaptation and food security and sustainable land management practices. The study will also attempt to look into climate change adaptation and gender relations because the relationship between these two remain

unseen and left uninvestigated gender inequalities will be exacerbated. The place of public policies and development programs on enhancing the role of women in climate change adaptation and food security in light of women's land rights still needs investigation. In finality, it is clear that climate change impacts will be gendered and expanding knowledge that can bring solutions to these would add value.

1.5 Summary of some Methodological Considerations

The methodological approach used in this study was majorly qualitative. However, both quantitative and qualitative methods of data collection were used in pursuit of accurate descriptions and analysis during the investigation of the relationship between climate change adaptation for food security and gender-differentiated land rights within the study sites. The quantitative methods used were surveys through questionnaires as described by Goertzen (2017) and Marvasti (2018). The study drew data from four wards in Matungu and Mumias East sub-counties of Kakamega County in the western part of Kenya. The four wards are Malaha-Isongo-Makunga and East Wanga both in Mumias East Sub-County and Namamali and Khalaba in Matungu Sub-County. The average landholding is 1.5 acres within Kakamega County, mainly dedicated to rural agriculture. The study sites are located at the lower medium ecological zone that has been dedicated mainly to sugarcane farming as a cash crop targeting local millers. Subsistence farming is also practiced mainly within the same parcels of land dedicated to cash crop farming. The study focus took cognizance of the fact that climate change affects the majority of rural households in Kenya especially those whose livelihoods and food security are dependent on agriculture. The study sites were also a representation of the general Kenyan situation whose patriarchal nature as regards land access is impacting on climate change adaptation for food security and sustainable livelihoods development.

To access the sample population for the FGDs the researcher primarily worked with an identified non-governmental organization in the sites to obtain the participants. The FGDs allowed the researcher to obtain information pertaining to experiences of respondents as regards land access, food security, and livelihood experiences. The researcher further used a convenience sampling technique to reach out to targeted persons especially from institutions such as relevant ministries and county government agencies. Here, key-informant interviews allowed the researcher to access information on policy and legislative progress, processes, and opportunities. The study also used

narratives as supplemental data collection technique where respondents told narrated experiences with land access, climate change adaptation, food security, and livelihood development.

The study used interview guides with open-ended questions for both focus groups and key informant interviews in the study sites. Information collected was recorded on a computer that is only accessible to the researcher and protected with a password. The use of a digital recorder helped in capturing accurate information from the interviews and focus groups. The researcher also reviewed reports, policies, statutes, and peer-reviewed material. Further, specific data was collected through questionnaires. The researcher used themes and codes to assist in making sense of the information collected. Qualitative data analysis for this study involved pursuing the relationship between categories and themes of data seeking to increase the understanding of the phenomenon as described by Hilal and Alabri (2013). The phenomenon, in this case, makes reference to the thematic focus of this study which looks at achieving sustainable livelihoods and food security for women in light of the ever-changing climate and the challenge of differentiated land rights. To analyze quantitative data, the study mainly used descriptive analysis letting the researcher know the basic qualities of the data collected. Some of the descriptive statistics involved looking at the frequency and proportion of particular information.

1.6 Scope and limitations of the study

The focus of this study was on food security and sustainable livelihoods from the perspective of gendered land rights and the obtaining context of the adverse effects of the changing climate in Kenya. This is in a bid to inform current and future sustainable practices and policies in Kenya within the realization that climate change is a phenomenon that cannot be ignored and therefore, adaptation becomes relevant, especially in rural-agriculture dependent areas. In addition, the context of this study was in study sites where land access, control, and ownership are gendered. Further, the reality is that relevant legal framework on land and agriculture and those of land and property rights continue to operate in an opposing manner. Culturally western Kenya as in the majority of Kenya, the land is the preserve of men with women drawing certain rights from their relations with men. Therefore, despite the fact that gendered land rights are almost universal in Kenya, the study confined itself within western Kenya and in particular four wards in Matungu and Mumias East sub-counties of Kakamega County in the western part of Kenya. The four wards are Malaha-Isongo-Makunga and East Wanga both in Mumias East Sub-County and Namamali

and Khalaba in Matungu Sub-County. A preliminary review of the 4 study sites revealed a connection between reliance on the land for food production and livelihood development and the reality that is patriarchy and patrilineal way of life governing land rights. The communities within were also grappling with similar challenges of adapting to climate change as a somewhat relatively new phenomenon. In exploring the aforementioned, the study did this by looking at legal frameworks within Kenya that are relevant to the study in order to identify opportunities and gaps in addressing matters of food security, adaptation, and land rights. Accordingly, data was collected from farmers (both men and women), government, and non-governmental organizations' officials. Within the farmers category were special groups such as widows, persons living with HIV/Aids, and never-been married women. The study, however, did not attempt to look at these categories separately from each other.

This study recognized that there are two ways to deal with climate change i.e., adaptation and mitigation but this study is limited to adaptation. This is with respect to agricultural activities and livelihoods and how these are adaptable to climate change for the sake of food security within rural households. This study, however, also recognizes that mitigation can also be a form of adaptation but that was not the major focus of the study. It is undeniable that agriculture and climate change both present opportunities for rural households and an agriculture-dependent country such as Kenya and therefore, investigating impediments such as insecure land rights was imperative.

A significant limitation to the study was that there were times during data collections that it was hard to get the right number of people to participate in the focus groups. This was mainly due to the fact that the study was conducted during a weeding period where farmers had to attend to their farms amid other priorities. This meant that the researcher had to plan according to the schedules of the farmers and find ways of moving meetings closer to their nearest accessible venues. A number of problems were encountered during the data collection in the study sites that related to unforeseen expenses that required the researcher had to make alternatives arrangement including using her stipend to finance them. Even though the Ph.D. was financed by the National Research Fund, the funds were not enough to cater for more expenses than had been initially planned for. One of the unforeseen expenses emanated from the longer than planned stay in the field when collecting data. Compounding the aforementioned was that the researcher had to travel long distances on motor bikes (commonly known as boda boda) to access research sites that were not

accessible by road. A few times, the rains made the motor bike journeys harder through the uneven roads and paths.

Another limitation of the study involved the unavailability of temperature and rainfall trends for Matungu and Mumias East sub-counties. This information was not readily available from the Government offices. The researcher had to use information provided by another study which was done in the study sites. One of the reasons provided by the Government officers is that climate information based on the new devolved system of governance (county and sub-county) is not available yet. Finding a clear map that represents the study sites was also a difficult task to do both on websites and through the Government offices the researcher visited. The reason given for the unavailability of climatic trends within the new devolved system of government, was given for the maps. I had to use the clearest map that the researcher could find on Google.com to show the reader where the study sites are.

There was a limitation in terms of language barrier, albeit not too much because the researcher managed to work with an interpretor on several occasions. Despite understanding the local language, the dialects within the main language were a bit of a challenge to understand especially in focus groups where it would not have made sense to keep on interrupting the sessions just to obtain clarification.

Though information obtained through the returned questionnaires were overall helpful in providing certain required data, they were insufficient for the purpose of explaining the reason for the research. It was not entirely possible to use the questionnaires for instance, to obtain the respondents perceptions on gendered-land rights. These matters are qualitative and using questionnaires missed out on the explanations that interviews and focus groups would provide. When discussing land rights issues it was important to note that these are politically influenced within the study sites and such issues cannot be captured sufficiently using questionnaires. Despite this, the researcher was confident that information obtained through in-depth interviews with the village elders, judicial officers, Government administrative officers was sufficient to compliment what the local people discussed in focus groups.

The researcher would have preferred to have a longer stay in the field to discuss the outcome of the data collected in detail with certain individuals that assisted the process but time and funds constraints could not allow.

1.7 Ethical Considerations

The researcher obtained clearance from the Ethics Committee in the School of Geography, Archaeology and Environmental Studies at the university to conduct research in Kenya. The ethics certificate is attached as Appendix G. Further, permission was sought from local Government administrators within the study sites before meeting respondents. Throughout the study, the researcher ensured that informed consent was received from respondents. Permission was sought before using the digital recorder. To address the issue of anonymity the researcher explained to non-assurance of this aspect of the study, especially in focus groups and interviews. No identifiers such as names and addresses that would link the participants to the results being reported or publications were collected against the will of participants. Nonetheless, the researcher used pseudonyms to conceal identities. Further, through the information sheets and consent forms the researcher briefed the participants on who will have access to data collected, how data will be stored, how reporting will be done. The researcher took the time to explain the nature of the study and the importance of their participation before seeking consent. The focus of the study which explored the reality that is gender-differentiated land access and how this contributes to women's vulnerability particularly in relation to food insecurity and underdeveloped livelihoods were elaborated. Having understood this they were further informed that the study was towards the attainment of a PH.D. by the researcher. They were informed that the data collected will be handled with the utmost confidentiality ensuring that the security of participants is not compromised. The researcher also advised the participants on the availability of the research findings which will be reported as a PH.D. Thesis and access will be through wired space.

1.8 Structure of the Thesis

The thesis is a monograph comprised of six (6) chapters. **Chapter 1** of this doctoral thesis provides information on climate change, agriculture, food security, gender, and land rights, from a general perspective within the sub-Saharan region. It also highlights the research questions and objectives of the study. **Chapter 2** of this doctoral thesis is dedicated to the review of existing literature on the themes of this study and outlines some existing thematic gaps, providing the justification for

the study. **Chapter 3** is dedicated to the Methodological Consideration that has been designed to guide the manner in which research is to be conducted, information organized and analyzed. **Chapter 4** of this doctoral thesis is dedicated to Empirical Evidence whereby findings of the data collection processes are presented as described in the preceding chapter. **Chapter 5** is concerned with the analysis and discussion of the findings realized during the course of research. **Chapter 6** of this doctoral thesis summarizes the discussions from preceding chapters of this thesis and provides recommendations for future research and implementation.

1.9 Conclusion

This chapter provides the context into the work that took to determine why the research topic is a problem that needs to be studied. The theoretical necessities to reach the objectives of the study have been outlined. Key areas of focus were on agriculture as one of the key developmental sectors in developing countries and that which women are heavily represented in terms of labor and expertise. Further, the place of women in households' food security was also looked in a bid to situate the women within the development space, including the various challenges they face and chiefly with the capital of production. The aims, objectives and questions to guide the study are also clearly outlined together with the rationale for the study which will investigate the relationship between land access, climate change, and food security in rural households within Matungu and Mumias sub-counties in Kakamega Country in Western Kenya. The key focus will also be on examining the policy and legal framework that focus on women's land rights taking into consideration the predominant cultural practices, and adverse changes in climate change and increasing food insecurity. Further, the study will also examine the strategies that women use in response to land rights challenges while building resilience to climate change and achieve food security. Briefly outlines is the methodological consideration guiding the study accompanied by limitations that the study has recognized.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Climate change has turned into a reality more rapidly than the different scenarios could have predicted in the past. The Inter-Governmental Panel on Climate Change (IPCC) defines climate change as any change in climate over time, whether due to natural variability or as a result of human activity (Martin, Osvaldo, Palutikof, van der Linden, Hanson, 2007). The is a small disparity with the UNFCCC definition which refers to climate change as a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods (UNFCC, 1992). Its impacts are no longer discussed as an environmental problem that would only be articulated by scientists but currently, it is an issue that ordinary persons can articulate. According to the IPCC (IPCC, 2014), changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Numerous studies also specify that the primary contributors to these climatic changes are humans. The IPCC (IPCC, 2014)further highlights that it is 95 percent certain that the more human activities disrupt the climate, the greater the risks of severe, pervasive and irreversible impacts for people and ecosystems.

The IPCC Fifth Assessment Report (AR5) projects a continuous increase in global temperature if greenhouse gas (GHG) emissions persist unabated (Adhikari, Nejadhashemi and Woznicki, 2015). With an average global temperature increase of 0.72°C since 1950, climate change continues to impact a myriad of sectors including agriculture and forestry, water resources, coastal zones management, energy, and health. In agriculture and subsequently food security, higher temperatures precipitate water and plant stress, and further causes unpredictable patterns of rainfall that increase the frequency and severity of floods (Wheeler and Braun, 2013). It is also increasingly acknowledged that as these changes occur, adverse effects will mostly be felt by inhabitants of developing nations (Rosenzweig & Parry, 1994; Trouet, Esper, Graham, Baker, Scourse, & Frank, 2009; Adhikari, Nejadhashemi & Woznicki, 2015).

People in the developing world face multiple stressors such as droughts, plant diseases, policy changes, and market fluctuations and in East Africa, droughts and climate variability, in general,

are among the most important stressors (Paavola, 2008). Any system's vulnerability to climate change and climate variability will be determined by its exposure to the impacts of climate, its baseline sensitivity to those impacts, and its adaptive capacity (Yohe & Schlesinger, 2002). Therefore, low-income countries have lesser coping capacities when compared to their counterparts in high-income countries, mainly among other reasons, low capabilities to cope within existing institutions and insufficient resources (Adger, Agrawala, & Mirza, 2007; Tol, 2009). It is clear in the literature that the effects of climate change have not been homogenous within both high-income and low-income countries. This is because particular economic sectors (like agriculture), regions (like coastal zones), and age groups (like the elderly) and gender differences are more heavily affected than others (Tol, 2009). Climate change has affected the economic wellbeing of countries characterized by loss of productive land, land-based resources, reduced income and consumption levels, among others. The value of primary resources thus falls, with the exception of land, which is getting scarcer (Bosello, Roson & Tol, 2007). Poor communities, in particular, continue to be vulnerable, especially those in concentrated high-risk areas as they tend to have limited adaptive capacities (Parry, 2007). Further, these poor communities are more dependent on climate-sensitive resources such as water making them more vulnerable.

To emphasize the magnitude of climate change, the IPCC describes it as a phenomenon characterized by increases in global air and oceans temperatures, widespread melting of snow and ice and rising global average sea level (Herrero, Ringler, Van de Steeg, Thornton, Zhu, Bryan, Omolo, Koo, & Notenbaert, 2010). The organization further brings out its causes as that arising from natural variability or as a result of human activity (Parry, 2007) that ultimately results in increased emissions of greenhouse gases (GHGs) that warm the atmosphere. Herrero et al. (2010) emphasize that the effects of the warming atmosphere continue to cause severe human suffering and hamper economic development and efforts at poverty reduction.

That the impact of climate change in the agricultural sector is immense, especially developing countries that cannot be overstated. Agriculture in these countries is heavily dependent on rain-fed agriculture and it is estimated that yields from such could be reduced by up to 50% by 2020 according to the IPCC. Further, stricter financial, institutional, and knowledge constraints on adaptation makes these developing countries more vulnerable to climate change

(Abeygunawardena, Vyas, Knill, Foy, Harrold, Steele, Tanner, Hirsch, Oosterman, Rooimans, Debois, Lamin, Liptow, Mausolf, Verheyen, Agrawala, Caspary, Paris, Kashyap, & Sharma, M, 2002; Marx, 2012). The overall state of food security and progress made towards achieving the same is considered uneven across the regions. The regions that have made significant progress in reducing hunger include the Caucasus and Central Asia, Eastern Asia, Latin America and Northern Africa (FAO, 2015). In two regions, Southern Asia and Sub-Saharan Africa, progress has been slow overall (FAO, 2015), with the latter having the highest proportion in malnutrition (Schlenker & Lobell, 2014). Staple foods in areas such as South Asia require huge amounts of water and energy whose sources are currently under stress due to increased demand for competing uses and uncertainty due to climate change (Rasul, 2016). In Sub-Saharan Africa food prices for staple foods such as maize, rice and wheat are expected to increase (4, 7, and 15 percent higher respectively) by 2050, due to climate change (Ringler, C., Zhu, T., Cai, X., Koo, J., and Wang, 2010). This could dampen the purchasing power of the population and further negatively impacting on nutrition and livelihood standards. The IPCC predicts that by 2050, crop yields in Sub-Saharan Africa will have declined by 14% (rice), 22% (wheat) and 5% (maize) pushing the vast number of already poor, who depend on agriculture for their livelihoods, deeper into poverty and vulnerability (Kabubo-Mariara and Kabara, 2015).

Women, particularly in developing countries, are pivotal to food security. They are involved in various processes of food production, access (distribution) and utilization through land preparation, planting, weeding, harvesting, threshing, transportation, storage and allocation (Habtezion Senay, 2012; Carr and Thompson, 2014). As such, climate scholars are increasingly recognizing the impact of gender on climate change adaptation, particularly with respect to agricultural production and food security. The FAO estimated that 906 million of the 925 million people that were undernourished in 2010 were in the developing world. These estimates also showed that facilitating the full participation of women in the agricultural sector would increase agricultural yields by 20-30% and that the number of undernourished people would decrease 12-17% i.e. 100-150 million fewer people living in hunger (FAO, 2015). Additional gains would also be seen through improved child nutrition, health outcomes, educational attainment, and overall family well-being.

As countries put in place measures to tackle food insecurity, there is a constant push towards the commercialization of farming. Modern contract-farming arrangements leave out women because they lack secure control over land, family labor and other resources required to guarantee delivery of a reliable flow of produce (FAO, 2011b). At the same time, arable land is increasingly becoming scarce in various parts of the world including Africa, South Asia and Latin America whose growing population is highly dependent on agriculture as a source of livelihood. This has resulted in the titling of land which continues leaving out the majority of women farmers because they do not own land and resources or control family labor. Further, women's access to land is still majorly determined by marriage or extended family member's decisions on inclusion.

In Africa, agriculture is the mainstay of 70 percent of the continent's population and this critical sector is the most impacted by climate change (Habtezion, 2012). It is in this area that women play a pivotal role in food production, distribution, and utilization all of which are heavily reliant on access to land; the three factors being critical components of food security (Habtezion Senay, 2012; Jost, Kyazze, Naab, Neelormi, Kinyangi, Zougmore, Aggarwal, Bhatta, Chaudhury, Tapio-Bistrom, Nelson, & Kristjanson, 2015). Women have long had access to land in sub-Saharan Africa, but men and women have rarely, if ever, had identical kinds of claims to land, largely because the genders have very differentiated positions within the kinship systems that are the primary organizing order for land access (Whitehead & Tsikata, 2003). It is estimated that 15 percent is the average for land ownership by women in Sub-Saharan Africa although figures vary from as low as 5% in Mali to as high as 30% in Botswana, Cape Verde, and Malawi. Sub- Saharan Africa (SSA) is one of the poorest regions in the world, where an estimated 386 million people (48% of the region's total population) live on less than $1.25 a day (Ravallion, 2012). This group of people is considered the most vulnerable to climate change as they possess minimum financial and technical resources to cope with climate change (Adhikari, Nejadhashemi & Woznicki, 2015). Further, agriculture is a major economic sector in the region, employing 65% of the labor force and contributing 32% to the countries' national gross domestic products, and is characterized by low productivity and lack of modern farming technologies (Chauvin, Mulangu & Porto, 2012).

Residents of developing countries are particularly vulnerable to these catastrophic risks for three reasons: first, they rely primarily on natural resource-dependent income sources for their livelihoods; second, they have few resources with which to adapt to the anticipated change in

climatic patterns; and, third, lack of planning and poor management at the central level impedes or delays recovery from climate-related shocks, and in some cases even leads to increased economic and social damage (Kabubo-Mariara & Kabara, 2015).

2.2 Conceptual Framework

What is happening at the global level as regards the changing climate, agriculture, and to a larger extent gendered-land rights is not at variance to the local situation in rural Kenya, a position that guides this study. Agriculture remains one of the pivotal contributors to the economy of Kenya and a source of income for rural communities and women in particular. Further, in countries such as Kenya women are acknowledged as major contributors in agriculture, specifically in terms of labor (Chauvin, Mulangu & Porto, 2012; Fischer & Qaim, 2012; Carr & Thompson, 2014). It also follows that these women depend on agriculture as a major source of livelihood, and stresses emanating from changing climate largely leaves them and their dependents food insecure. This reality is also coupled with unequal land rights, limited access to credit facilities and technologies required for adaptation to climate change scenarios. Therefore, this study aimed to understand the relationship between climate change adaptation and women's access to land and how these two combine to affect the livelihoods of households. It was also the interest of this study to investigate the extent to which gendered differences in land access has affected adaptation efforts and food security in rural Kenya.

Kenya's agricultural production is largely rain-fed and the country's food security remains negatively impacted by the effects of climate change. It is estimated that the central economic costs of climate change for Kenya could be equivalent to 3% of GDP each year by 2030 (Watkiss, Downing & Dyszynski, 2009). Kenya adopted the Kenya Vision 2030 as a development plan and within it, agriculture is identified as a key sector for economic growth specifically singling out smallholder agriculture as a focus area. The blueprint (Government of Kenya, 2007) further identifies women as disadvantaged in accessing labor markets, productive resources and limited access to capital of production (land) and highlights that specific policy measures will be taken to correct the glaring gender gaps among others access to and control of resources. Evidence (Kenya, 2011) shows that women in Kenya provide up to 80 percent of farm labor and manage 40 percent of smallholder farms, but own only 1 percent of agricultural land and obtain only 10 percent of agricultural credit. It is, however, notable that the Vision 2030 does not strategically include plans

to deal with climate change in major agricultural areas such as those of this study. This is the case despite the fact that agriculture is the dominant economic activity in Kenya and currently is immensely affected by climate change. It seemingly only identifies with Arid and Semi-arid Lands (ASAL) and high-risk disaster zones in terms of climate change. On the other hand, the Kenya Climate-Smart Agriculture Strategy-2017-2026 is focused on enhancing the adaptive capacity and resilience of farmers. Further, the strategy (Government of Kenya, 2017) identifies the limited capacity of women to participate in climate-smart agriculture even as it recognizes that weak policies, legislations, enforcement, and overlap of mandates among institutions involved in coordinating efforts towards adaptation of climate-smart agriculture (CSA), have contributed to Kenya's inability to effectively address vulnerability regarding climate change.

The National Food and Nutrition Security Policy (Kenya, 2011) recognizes that access to, and control of, productive resources such as land and capital is mainly in the hands of men in Kenya, identifying this with poor nutrition and food insecurity within households. Further, the Kenya National Adaptation Plan: 2015-2030 considers gender and its associated vulnerability when it comes to participating in socio-economic activities, particularly mentioning widows and orphans among others. The Plan (Kenya, 2016) pays particular attention to vulnerability associated with exposure to changing climate when women and children continue to face discrimination in terms of access to and control of resources such as capital, credit, and land. These three resources are identified in the Plan (Government of Kenya, 2016) as those which can aid in coping with climate shocks and stresses.

The Sustainable Development Goals (SDGs), specifically Goal 2 hopes to end hunger, achieve food security, improve nutrition and promote sustainable agriculture. The FAO (2016) in relating to SDG 2 recognizes that both developed and developing countries are contending with the diminishing availability of land, degraded soils, and frequent and severe weather events, as the situation is compounded by the impact of climate change on agriculture. Cotula, Toulmin, and Quan (2006) rightly note that as resources such as land become scarcer, their value also increases and those with weak rights to these resources such as women will tend to lose out. This is the case in Kenya where women's secure access to capital of production is frustrated by culture and seemingly poor implementation of that which is secured by law. Gender biased access to land for women in western Kenya (as other parts of the country) also denies women access to credit

facilities and farm inputs because these are tied to providing collateral, especially in financial/credit institutions.

In reference to the aforementioned strategies and plans, one of the common threads that need to be addressed for sustainable food security is the recognition of women's role in food security especially in areas where climate change was not an issue of major concern a couple of decades ago. Secondly is the capacity of women in agriculture in terms of their access to secure capital of production if food security is going to be sustainably addressed in Kenya. Generally, despite these strategies put in place, the Kenya Government is still grappling with feeding its population and this study explores one of the critical issues that impede the county's progress in as far as food security is concerned i.e. gendered-land rights at a time when changing climate is affecting agriculture in rural households. In addition to climate change, gendered-land rights continue to hamper efforts towards adaptation to climate change in Kenya as a whole. Land in Kenya is majorly owned and controlled by men with women accessing rights through their male relations. Kenya has made progressive steps towards advancing women's rights to property and land more so through legislation. For instance, the supreme law, the Kenyan Constitution of 2010 has gone to great lengths to prescribe the rights of both men and women to land. Foremost, Article 60 (f) of the Constitution calls for the elimination of any form of discrimination based on gender in law, customs, and practices related to land and property in land (Government of Kenya, 2010). Despite these women still face challenges in terms of access to land exposing them and their dependents to disease, malnutrition and other impacts of climate change. According to Whitehead and Tsikata (2003), historically, Kenya's land laws were developed against a customary law system that limited women's rights to access or use, giving men absolute power over ownership and control (Whitehead & Tsikata, 2003). Kameri-Mbote and Muriungi (2018) estimate that a paltry 1% of women in Kenya are sole registered owners of land and only 5% of women are registered owners of land jointly with their husbands.

2.3 Effects of Climate Change within the East African Countries

It is projected that the changing climate is more likely than not to increase temperature and precipitation variability in the East African region. The East African region comprises Kenya, Uganda, and Tanzania for the sake of this study. In their useful study, Niang, Ruppel, Abdrabo, Essel, Lennard, Padgham, and Urquhart, (2014), found that temperature in Africa is projected to

rise faster than the rest of the world which could exceed 2°C by mid-21st Century and 4°C by the end of the 21st Century (Niang, I., Ruppel, O.C., Abdrabo, M.A., Essel, A., Lennard, C., Padgham, J., Urquhart, 2014). East African countries like other developing countries are adversely exposed to the effects of climate change such as droughts, floods, unpredictable weather among others. The impacts of these changes are demonstrated through insecure food and livelihood sources, poor health and newer forms of conflict over natural resources including water.

2.2.1 Insecure sources of food and livelihoods

The Food and Agriculture Organization of the United Nations (FAO-UN) defines food security as *when all people, at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for active and healthy life* (FAO, 2009). The ability of communities to obtain adequate amounts of good-quality food is majorly reliant on favorable climate. Additionally, empirical evidence suggests that climate variability can impact the way individuals sustain their sources of livelihood. However, links between food security and climate change are complex because the latter involves food and its production, trade, and nutrition as well as access to food over time in the face of multiple stresses (Ziervogel & Ericksen, 2010). Climate change will affect all four dimensions of food security, namely food availability (i.e., production and trade), access to food, the stability of food supplies, and food utilization (Schmidhuber & Tubiello, 2008). Nonetheless, it is noted that the focus on the impacts of climate change on food security has been on availability and production but less on accessibility, utilization, and stability of food systems (Schmidhuber & Tubiello, 2008; Conway & Schipper, 2011). Conversely, it is also notable that agriculture in itself is not what would be referred to as an "innocent bystander" because this sector when inappropriately managed is a major contributor to the causes of climate change. This is mainly through land-use changes and emission of GHGs in the farms. McMichael *et al.,* (2007) concur observing that GHGs emissions from the agriculture sector account for about 22% of global total emissions; this contribution is similar to that of industry and greater than that of transport (McMichael, A. J., Powles, J. W., Butler, C. D., Uauy, 2007). Overall, the impact of climate change on food security is undisputed, more so in developing economies of sub-Saharan Africa.

2.2.2 Poor health

One of the most significant areas of current empirical research involves climate change and its effects on the health of individuals. McMichael (2007) argues that the health risks from climate change are the topic of increasing research attention and policy development (McMichael, A. J., Powles, J. W., Butler, C. D., Uauy, 2007). The IPCC goes further to emphasize that climate change will exacerbate existing health problems over the coming decades (Collins, *et al.*, 2013). It is, therefore, important not to downplay the importance of climate change on health by placing it into the context of this study. For instance, extreme weather events such as droughts and floods are associated with certain disease outbreaks, research indicates. It's articulated that many infectious agents, vector organisms, non-human reservoir species, and rate of pathogen replication are sensitive to climatic conditions (McMichael, Woodruff, & Hales, 2006; Franchini & Mannucci, 2015). Some of these diseases sensitive to climate change and variability include allergic illnesses such as asthma and water-borne infections such as cholera. In East Africa, for instance, climate warming and the resulting altered length of seasons in the East African highlands have led to an increased incidence of malaria (Franchini & Mannucci, 2015). Franchini and Mannucci (2015) further indicate that some of the diseases result from unsafe water supply especially after prolonged dry seasons in this region. In Kenya for instance, the World Health Organization (WHO) projects an increase in malaria and other vector-borne diseases in future years due to changing climate conditions (WHO, 2016).

2.2.3 Conflict over natural resources

Climate change is no longer viewed exclusively as an environmental issue but now it is at the heart of security agenda across the world. This is after it has been understood that climate change and variability play a key role in exacerbating or putting pressure on existing resources within communities. The underlying fact is that the relationship between climate change and conflict is complex, more especially when it comes to natural resource access. It is, therefore, difficult to single out climate change and variability as the only cause of violence incidences due to other drivers, even though its role cannot be overlooked. In the African context, livelihood resources such as land, water, forest cover, and pasture are under pressure from exploitation. As described by Conway and Schipper (2011) and Niang et al., (2014), there is a relationship between degradation of a natural resource and climate change, the result of which is a higher probability of conflict over the distribution of the same resources. There is a growing body of scholarly literature

on climate-related environmental change and violent conflict in East Africa. These show that environmental changes such as changing rainfall patterns, droughts, changes in vegetation cover and increasing resource scarcity have contributed to various types of violent conflict. For instance, Gichuki (2002) cites that water scarcity due to prolonged droughts in Upper Ewaso Ng'iro North River basin in Northern Kenya has greatly contributed to conflicts between irrigators, pastoralists and fish farmers (Gichuki, 2002). Similarly, in Uganda, the pastoralists' cattle corridor, Stark (2011) notes that even though there is a constellation of contributing factors that contribute to conflict between farmers and cattle keepers, it would be shortsighted to fail to recognize climate change as exacerbating resource scarcity such as pasture (Stark, 2011). An example is given of the Karamoja pastoralists and the different farming communities as the pastorals migrate into newer areas (including farmlands) as a coping mechanism. Equally, conflict in Northern Kenyan is also associated with persistent drought as a result of climate change that gravely reduces resources such as pasture and water (Gakuria, 2013). This is further echoed by Schilling, Scheffran, and Weinzierl (2012), that as climate change is considered as causing one of a range of factors causing natural resource scarcity, the referenced scarcity also causes conflict (Schilling, Scheffran & Weinzierl, 2012).

2.4 Climate Change Impacts on Rural Agriculture and Food Security

Despite being a large sector of the national economies, agricultural production systems in SSA are largely rain-fed and thus, their success is sensitive to climate variability (Adhikari, Nejadhashemi & Woznicki, 2015). This is in addition to the rapidly growing population which exerts pressure on the limited food and resources. Indeed, studies lay emphasis that developing countries that are largely dependent on rain-fed agriculture will experience their agricultural yields reduced significantly. This is as observed by the 2007 IPCC Synthesis Report and the Summary for Policy Makers of the Working Group I, II and III (IPCC, 2007). Further, newer studies continue to confirm the predicted climatic risks for African agriculture and food security (Habtezion, 2012; Adhikari, Nejadhashemi & Woznicki, 2015). The significance of the agricultural sector runs across a continuum beginning with it being a substantial contributor to national revenues of countries, to being a source of livelihood, nutrition and ultimately food security for communities. Boko *et al.* (2007), makes this clear by noting that the average contribution to economies is 21% when these countries are assessed (Boko, *et al.*, 2007).

The importance of the agricultural sector to developing countries such as Kenya, Uganda, and Tanzania is not being disputed in the literature reviewed. For instance, in Kenya, the agricultural sector contributes to over a fifth of the GDP and more than fifty percent of foreign exchange earnings, the sector being majorly steered by sixty-five percent of the population that is rural (CKDN, 2014). A report compiled by Delloite (2017) confirms that agriculture employing 65% of the population contributed 29% to Tanzania's GDP in 2015 and 29.1% in 2016 (Deloitte, 2017). In Uganda the sector employs approximately 69% of the population and contributes about 26% to the GDP in 2015 (Deloitte, 2016). In view of the importance of agriculture and challenges therein, FAO contends that the impacts of climate change on agriculture and its implications for food security are already alarming. Further, FAO (2016), Boko *et al*. (2007), and Carlsson-Kanyama (1998), among other literature draw closer attention to the reality that climate change is already seriously compromising food production in this region that is already high food–insecure (Carlsson-Kanyama, 1998; Parry, M., Canziani, O., Palutikof, J., van der Linden., Hanson, 2007; FAO, 2016). The linkage between agriculture and food security in East Africa is twofold: in that food is produced for consumption by the populace, and agriculture is a source of livelihood. It is not possible to separate agriculture from climate variability and food security as they are intertwined. Usually, when climate variability is not anticipated, farming communities do not cultivate accordingly and therefore, agricultural yields decline and the resultant food insecurity and loss of livelihood prevail. Climate change is expected to affect food security in several respects: increased vulnerability to climate change due to dependence on rain-fed agriculture; high levels of poverty; and low levels of human and physical capital as well as generally poor infrastructure (Kabubo-Mariara & Kabara, 2015).

2.5 Climate change impact on food production

That sustainable food production is critical to meeting the food security demands and challenges faced by agriculture in East Africa, is not in dispute. Empirical evidence posits that climate change significantly impacts food production in the sense that there are reduced water availability and increased temperatures. With the East African region exhibiting considerable climatic and topographical variability, much spatial and temporal variation in response to different crops to climate change can be anticipated (Thornton, P. K., Jones and Alagarswamy, G., Andresen, J., Herrero, 2010). The impact of climatic changes in many cases is negative as arable land is lost, there is reduced precipitation impacting rain-fed agriculture, and unexpected yields from

farmlands. However, conversely, the impacts have also been recorded to be positive. For instance, according to the African Development Bank (2014), the combination of increased temperature and rainfall changes in East Africa could result in lengthened growing seasons potentially benefiting certain crops. Despite this, the overall picture in the region is one that is still grim as empirical evidence suggests that agricultural loses and food shortages will be severe due to over-dependence on rain-fed agriculture (AfDB, 2014). In this case, food insecurity is and will be made worse by expected fast population growth vulnerable to climate change.

Literature reviewed (Kurukulasuriya and Rosenthak, 2003; Maliondo, Mpeta and Olson, 2012; Nuwagaba and Namateefu, 2013; Niang, I., Ruppel, O.C., Abdrabo, M.A., Essel, A., Lennard, C., Padgham, J., Urquhart, 2014) recognize that there are other challenges facing the rural agricultural sector that are made worse by the changing climate. Climate change has enhanced long-term water and other resource shortages, worsening soil conditions, drought and desertification, diseases and pest outbreaks on crops and livestock (Kurukulasuriya & Rosenthak, 2003). These challenges are compounded by deteriorating soil nutrients, high costs of farms inputs, poor infrastructure to access markets, and so on, that are made worse by the changing climate(Chauvin, Mulangu and Porto, 2012; Adhikari, Nejadhashemi and Woznicki, 2015; Perez *et al.*, 2015). IFAD also notes that food production in developing countries is usually labor-intensive, utilizing mainly unskilled labor (IFAD, 2008). FAO argues that in the long run unless measures are put in place to halt and reverse climate change, food production will not meet human needs in countries such as Kenya, Uganda, and Tanzania (FAO, 2016). Sharing the same view as various other researchers, Ziervogel and Ericksen (2010), argue that the impacts of climate change on food production have not yet been well researched when compared to access and utilization.

2.6 Climate change impact on food utilization

Food utilization refers to the use and processing of food by individuals and further defines the health status of populations. According to the WFP utilization of food requires a diet that provides sufficient energy and essential nutrients and so on (WFP, 2007). The literature reviewed recognizing that food utilization is a crucial determinant of the state of a population's food security. However, it is noted that less is known about the role of climate change for food stability and utilization, at least in quantitative terms (Schmidhuber & Tubiello, 2008). This is so due to the other factors that come into play such as differences in socio-economic development paths which

greatly impact the ability to cope with problems of food instability, be they climate-related or caused by other factors (FAO, 2006; Schmidhuber & Tubiello, 2008).

2.7 Climate change impact on food access

Food accessibility for many people in developing countries remains closely tied to local food production (FAO, 2009). Additionally, in East Africa as in many other developing regions, access to this food is greatly determined by the extent to which climate extremities such as floods and droughts affect critical infrastructure. For instance, where roads are destroyed by floods and heat stress, farmers are unable to effectively deliver their produce to available markets. The result of which is lower food accessibility due to increased prices of the reduced quantities that reach markets, increases in malnutrition, especially for young children (Agrawal, Kononen and Perrin, 2009; Herrero, M., Ringler, C., Van de Steeg, J., Thornton, P., Zhu, T., Bryan, E., Omolo, A., Koo, J., Notenbaert, 2010; Lalthapersad-Pillay, 2010). On the other hand poverty and vulnerability also play a central role in food accessibility as espoused by Ziervogel and Ericksen (2010). Their view is such that food accessibility is centrally concerned with the purchasing power of households and individuals and the social dynamics governing access (Ziervogel & Ericksen, 2010). The presence of climate change therefore, exacerbates the challenges that come with poverty when it comes to sufficient access to nutrition.

The Impact of food marketing and pricing cannot be overemphasized when it comes to livelihood development and food security in the rural areas within the East African Region. Jayne, *et al. (2006)* argues that in terms of food marketing systems in the region, it is dual in nature in that both the governments and private sector are involved directly. With both stakeholders being involved it is expected that the welfare of the rural farmers would be secure especially when they are the major contributors in food production. However, evidence shows that they have insignificant control over the pricing of their produce. Pinckney (1993) further argues that the government attempts to stabilize food prices, especially of staples, which have been expensive and ineffective. Moreover, these countries have been unable to prevent food prices from exceeding import parity levels in certain years, precipitating extensive hunger (Pinckney, 1993; Jayne, *et al*., 2006). This places rural farmers at a disadvantaged position and ultimately results in food insecurity and poverty. Redressing these instability-related causes of low productivity and food insecurity are major challenges facing African policymakers (Jayne, *et al.,* 2006).

2.8 Women's Land Rights in East Africa

It is not in dispute that land is an asset of enormous importance for billions of rural dwellers in the developing world even though the nature of rights to the same varies on among other things, gender (Cotula, Toulmin and Quan, 2006; Prosterman, Mitchell and Hanstad, 2009; Prosterman, 2013). Men and women in East Africa, for the most part, do not enjoy equal land rights despite the reality of women bearing significant responsibility for the family subsistence. Research explains that in most cases rights to land are allocated by the lineage authority to the male household head; as women have secondary, derived rights, obtained through their relationship with male family members (Cotula, Toulmin & Quan, 2006). Having come to terms with the injustices that relate to land access by women, women have been at the forefront fighting for the land rights of women. The face of the movement has mainly been organizations both at the grassroots and at the East African region level. At the national level, these organizations include among others the Kenya Land Alliance, Uganda Land Alliance and the National Land Forum in Tanzania. These organizations work towards breaking various barriers that place women at a disadvantaged position in terms of their land rights. This being the case, Tripp (2001) argues that while the focus of these movements has been on customary land practices, they have also been concerned with the negative effects of the privatization of land (Tripp, 2001). Their concern has been on the major elements of the insubordination of women's land rights by both cultural and contemporary law regimes.

Having established the aforementioned, research by Prosterman, Mitchell, and Hanstad (2009) shows that land tenure systems in developing countries such as those in East Africa are often pluralistic (Prosterman, Mitchell & Hanstad, 2009). By pluralistic, they refer to land administration that is governed by both customary laws and modern market-oriented laws. After interrogating both regimes on land administration it is clear that customary law continues to be an impediment to the realization of women's land rights because it is clear that a woman is not supposed to own land. On the other hand, when governments through different statutes encourage women to own land, women in the family are prevented by traditional dynamics within the culture from owning land or using it (Whitehead and Tsikata, 2003; Jennifer Smith, Theano and Lauren Torbett, 2008; Bomuhangi, Doss and Meinzen-dick, 2012).

2.9 Women's Land Rights and Climate Change Adaptation

An emerging area of research is the gendered nature of vulnerability to climate change; as climate change affects labor and income opportunities, and availability of natural resources such as land and water, the outcomes of which differ for men and women (Ziervogel and Ericksen, 2010). Further, this review has appraised the place of women in food production and contribution to food security in an era of climate change. This is because women, especially in sub-Saharan Africa, are overrepresented in agriculture (especially rural agriculture) as they mainly provide labor in the farms. This position is reemphasized by Habtezion (2012) who further recognizes that these women also undertake a range of community-level activities that support agricultural development, such as soil and water conservation, afforestation and crop domestication (Habtezion, 2012). To put this into further perspective it is important to note that literature has dedicated itself to making it clear how men and women are affected by climate change. This review has noted that climate change affects men and women differently and therefore the vulnerability of both genders is also different. Crucially pointed out is that women are the most vulnerable of the two genders when it comes to the effects of climate change. This is attributed to records that estimate women as accounting for 70 percent of the world's poor and a significant contributor to this situation is social relations that disadvantage women prior to disasters such as those caused by climate change. In the case of the 2004 Asian Tsunami in Indonesian, records indicate women constituted 70 percent of those that died (Wonders and Danner, 2015) this being attributed to social norms that placed most women at home (close to the sea and mainly dependent on men) at the time of the incidence as compared to the men. UN Women (2009) further stresses that generally, women in the regions of the world most affected by climate change bear the brunt of decreased food production, and increased hunger and poverty (UN-Women, 2009).

Since a wide array of literature supports the fact that women are overrepresented in the agricultural sector it means that their survival relies heavily on the land. And since land as a resource has not been spared by climate change, the risks associated with heavily relying on the resource continue to be profound. Wonders and Danner (2015) emphasize this argument, that climate change is causing the expansion of drylands into agricultural areas impacting on livelihoods of women (Wonders & Danner, 2015). Additionally, as part of agricultural development for resilience and livelihood diversification, these women make up a majority of small business owners in local markets trading in food crops- a field that is dominated by male traders and brokers. The impact

of climate change on women's livelihood is undisputable but this does not happen in a vacuum. A major contributor to women's vulnerability to the impacts of climate change and resultant food insecurity is the lack of secure access to productive resources such as land. According to reports by UN Women, gender disparities as regards land access is due to the assumptions that men, as head of households, control and manage land-implicitly meaning that land is "lost to another family" in instances where women are given access, control or ownership (UN-Women, 2012; United Nations, 2013). In instances where there is flexibility around access women's parcels are usually of a smaller size and lower quality than men's land parcels (Denton, 2002). However, there seems to be a missing link between linking land access for women (who are considered stakeholders in agriculture and food security as a sector) and improved food production and eventually sustainable livelihoods, especially for rural families. Some of the literature including those from the UNDP recognizes the greater burden for women in responding and adapting to climatic stresses but only mentions a lack of access to land amidst other restrictors. Lamping the issue of land access with others often dilutes its gravity especially when it's one of the major contributors to women's vulnerability to stressors of climate change. Further discussions point out that, because women's land rights are already often tenuous and insecure due to both de jure and de facto gender discrimination, within the context of climate change they often come in last (LANDESA, 2014).

In summary, there are powerful arguments for addressing women's issues in the context of changing the climate. However, due to the paucity of hard evidence on gender and climate change, it is often difficult to discern the many and complex links (Terry, 2009). If gender is mentioned at all as a climate-change issue, it is usually with reference to the particular vulnerability of poor women in the South (Terry, 2009). Additionally, secure land rights for women is often linked to improved agricultural productivity and food security, the two being heavily dependent on women's input especially in terms of labor (FAO, 2011b; Fischer and Qaim, 2012)- and not as an effort to address women's vulnerability to climate change.

Returning briefly to the discussion women and food security discussed earlier, food in sub-Saharan African countries is mainly produced by women who have low capital with the majority being poor. Additionally, these women's situation is compromised further by the lack of secure access to land for food production and secure livelihoods development. Ndiritu *et al.* (2014) sum these

challenges by stating that these women face additional constraints such as weaker land tenure security, poorer quality of land and little access to credit (Ndiritu, Kassie & Shiferaw, 2014). This situation is compounded further by the impacts of climate change on agriculture and food security making women vulnerable. This is because women's capacity to feed their families or dependents and generate income is compromised thereby affecting their overall quality of life. One of the major factors that contribute to women's vulnerability is that access to land is heavily dependent on their male relatives as has been mentioned in other sections above. Attempts to deal with this obstacle to access by development practitioners and government agencies have majorly targeted the specific owner of the parcels of land- typically, this would be men. This, therefore, misses the intended mark. Ndiritu *et al.* (2014) confirm this position indicating that with few exceptions, many studies typically look at the gender of the household head rather than the specific plot or farm manager within the household (Ndiritu, Kassie & Shiferaw, 2014). Mainly it is the women who work in these farms and are therefore it would make sustainable sense for them to be targeted as rightful managers by interventions. The literature reviewed emphasizes that this situation can be improved once development practitioners, government agencies and society as a whole recognize that the solution to women's vulnerability to climate change lies heavily insecure access to land by these women. There exists a large body of research that brings to attention the benefits that can or usually arise from securing women's land rights within their households and communities at large. Further, there are greater possibilities of these women engaging in stewardship of the land for its optimal use. Prosterman (2013) explains that securing women's access to land would allow the women to focus on production rather than continuously using the land out of fear of being deprived of longer-term access if the land is even temporarily unused (Prosterman, 2013). With secure access to land these women would use the resource to adapt to climate change and build their resilience and by extension their communities' in numerous ways. For instance, the women could use the parcels of land as collateral for credit from financial institutions both small-scale (e.g. Savings societies) and large scale (banks). The financial support received from these institutions can be used to further develop agricultural input within the farms thereby majorly impacting food security.

In the case of the three East African countries, the situation is no different from other sub-Saharan countries. Women provide the bulk of farm labor especially in the rural areas despite the fact that they have unequal rights as regards access to land. For instance, as clearly observed by Ndiritu *et*

al. (2012) and Heyer (2006), women in Kenya have unequal opportunities and access to a range of productive resources, including land (Heyer, 2006; Ndiritu, Kassie and Shiferaw, 2014). Further, they also note that the situation exists having been founded in land registration and legislation from the colonial period that has favored male ownership and control over land. Interestingly, typical of rural areas in Kenya, men continue to be dependent on their female counterparts, mainly wives, to manage their land while they are often away raising income off the farm. The labor provided by these women has been secured through marriage and more so through men's control over land. It also seems that from colonial times, the state appeared to have strengthened male dominance over the land through land registration processes in the 1950s. This is elucidated by Heyer (2006) who further explains that this "collusion" made it impossible for women to have access to land, except through purchase (Heyer, 2006).

2.10 Institutions and Institutional Frameworks on Land Access, Adaptation, and Food Security

Pressure on land as a resource is set to increase over time especially due to population increase, globalization of markets and most importantly climate change. This, therefore, means that vulnerable groups and in particular women will continue to have their access rights diminish unless they are purposefully secured. One of the pathways that have been suggested is through legal frameworks as well as borrowing from positive customary "laws". The literature reviewed emphasizes that African countries continue to grapple with creating a balance between the two frameworks (contemporary and customary) when dealing with women's land rights. For instance, Wickeri and Kalhan (2010) underscore this observation stating that the use of legal frameworks alone in areas where women's land rights issues are mediated by customary law would be inadequate (Wickeri & Kalhan, 2010). The need for engaging with both types of frameworks to be able to identify positive avenues that can grant women access to resources is not without emphasis in this review. One glaring obstacle to achieving access to land rights as noted in the review is the fact that many women are not aware of the opportunities within legal frameworks. These statutory opportunities would promote women's rights to land irrespective of marital status only if awareness is created and abilities to invoke the same encouraged as explained by among others, SIDA 2014 (SIDA, 2015). Conversely, the United Nations Economic Commission for Africa observes that the "removal of legal clauses that discriminate on women will not change day-to-day cultural and social behavior, but discrimination in the form of customary land tenure will

continue until long-term sensitization and education campaigns influence traditional norms, values, and laws to make it easier for women to own and control land".

Kenya has made strides in terms of addressing women's land rights issues including access and ownership especially with the latest marriage-inclined laws; the Matrimonial Property Act of 2013 and the Marriage Act of 2014. The opportunity presented recognizes women as bonafide beneficiaries of matrimonial property including land. But the limitation exists within the Matrimonial Property Act, 2013 which places a caveat on the property that is considered ancestral which places the majority of rural women at a disadvantaged position. They are not able to incisively make decisions regarding land use because they do not primarily have the right. In fact, estimates indicate that as little as 1% of the land is owned by women and 5-6 percent is titled jointly by women and men (LANDESA, 2014). Uganda's Land Act 1998 with its amendments, requires the prior written consent of both spouses in transactions involving family landholdings and prohibits decisions affecting customary land that deny women access to ownership, occupation or use of any land (Asiimwe, 2014; Hannay, 2014; Naybor, 2015). Though the Land Act is fairly progressive in establishing protections for women's land rights, it stops short of establishing co-ownership rights among spouses (Hannay, 2014). Additionally, when it comes to the property rights of married men and women, it is notable that the current regime of marriage laws does not clearly spell out the rights of women especially on land. The Constitution of the United Republic of Tanzania and other laws concerning land issues recognize equality in accessing land for both genders (Moyo, 2017). For instance, the Land Act provides specific safeguards for the marital home by requiring documented evidence of consent by all spouses prior to the mortgage of a matrimonial home (Duncan, 2014; Moyo, 2017).

Predominantly for marginalized women, institutions play a critical role in building resilience and reducing their chances of being vulnerable to the impacts of climate change. To be specific these institutions provide the physical infrastructure and regulate rights to the property such as land and also coordinate decision making. Agarwal (2009) further argues that institutions have the ability to affect the impacts of climate-related phenomena and allocate resources to individuals and communities among other important roles (Agrawal, Kononen & Perrin, 2009). He also recognizes a limitation to the aforesaid, that despite the recognition of the critical role of local institutions, little systematic analysis has been done to identify the factors that strengthen climate resilience.

One of the strengthening factors would be the sustained push for secure access to land by women which apparently is a struggling area for most institutions despite the availability of legal frameworks in countries such as Kenya.

There is quite an array of climate change adaptation and resultant food security policy instruments that have been developed and adopted by nations. This review will make reference to a few. What is notable as a starting point is that although many studies have demonstrated the existence of relevant policy and institutional interventions, adaptation by communities has been slow. One of the intergovernmental institutions that is dedicated to adaptation and food security is the UNFCCC that has required of countries to formulate and implement adaptation measures (Smit and Skinner, 2002; Caripis, 2014). In Kenya the National Climate Change Response Strategy (NCCRS) and the Action Plan (NCCAP) have been formulated to prioritize planning for improving livelihoods, provision of climate information and general technical support towards achieving food security. Ongugo *et al*. (2014) argue that despite there being frameworks, adaptation preparedness remains inadequate; mainly attributed Government plans not taking into account the overarching policy framework till the devolved level. As a result interventions are implemented as stand-alone activities, which render them less effective (Ongugo, P.O., Langat, D., Oeba, V. O., Kimondo, J. M., Owuor and Njuguna, J., Okwaro, G., Russell, 2014).

2.11 Theoretical Framework

There are a number of theories that have been advanced on matters climate change adaptation, land rights and food security. This study critically considered some of these theories and approaches based on factors such as contexts and subject matter. The entitlement theory espoused by Amartya Sen is recognized as one of the lenses through which matters food security can be viewed, for instance when investigating matters famine. Amartya Sen challenged the popular belief that famine means shortage of food (Osmani, 1993). Sen explained that famines occur not because there is not enough food, but because people do not have access to enough food; and of course the availability of food being near to the household (Young, Jaspars, Brown, Frize & Khogali, 2001). It is undeniable that availability of food within accessible distance for both rural and urban households is essential for the households' food security. Having asserted so, this study recognizes that climate change is now a relevant factor that affects food availability as it impacts

farming and production processes. In summary, Amartya Sen assertions about the entitlement approach thinks of famines as a socio-economic problem as opposed to a food availability problem.

In attempting to situate this study within the assertions of the Sen's entitlement theory, it is imperative to indicate at this juncture that increasing the per capita availability of food alone is not enough to reduce hunger within households, as argued by Delgado, Townsend, Ceccacci, Hoberg, Bora, Martin, Mitchell, Larson, Anderson and Zaman, 2010. Delgado *et al.,* (2010) further postulate that the study of famine has shown that the key to reducing hunger is to increase the "food entitlement" or command over food of individuals, which may or may not be linked to per capita availability of food in markets. Delving into the aspect of food entitlement Delgado *et al.,* (2010) uses Sen (1981) argument that these occur through changes in a variety of factors including policies, environment, technologies, and individual characteristics that affect how individuals secure access to food. It is at this point that climatic changes and variations become apparent in terms of factors that impact food availability and food entitlement within households if one looks critically at Sen's arguments, particularly when referring to the environment in which is under study.

The entitlement theory helps to draw analytical attention to other sources of food apart from production as argued by Vincent and Cull (2010) by drawing more attention to the need for more empirical research and modeling on the likely effects of climate change on other components of local and national food systems.

> *It is clear from various literature that entitlement theory argues that problems associated with famine such as household food insecurity and increased mortality rates are as a result of people lacking the adequate ability to obtain food; the aforementioned inability is associated with not being able to purchase, exchange or engage in transfers that would bridge the food security gaps within households (Osmani, 1993; Young et al., 2001; Matlin & Walmsley, 2010).*

Osmani (1993) posits that the 'entitlement approach' focuses attention on people having or not having enough command over food as distinct from there being or not being enough food to be eaten. Further, Matlin and Walmsley (2010) in their review of Amartya Sen work titled 'Poverty and famines an essay on entitlement and deprivation', note that famines are economic disasters not

'just' food crises. While identifying those vulnerable to famine and its effects Bohle, Downing and Watts (1994) argue that it is not necessarily the poorest who face the greatest risk including hunger and malnutrition. Their argument is that in addition to income, there are many other factors that co-determine whether an individual will go hungry; in fact, this is the heart of Sen's notion of different commodity bundles, mixes of food sources derived from one's own production, labour or market exchanges, and donations or relief (Bohle, Downing & Watts, 1994).

While investigating Sen's entitlement approach it is often that the livelihoods approach comes to fore. Vincent and Cull (2010) posit that the entitlement approach operates best at the micro-level of households or livelihood groups [e.g. farmers, landless labourers], often in combination with a livelihoods framework. There is value in using the entitlement approach in investigating climate change effects on rural households seeing that their livelihoods is majorly dependent on agriculture. Adaptation through crop diversification and particularly viable drought-resistant crops for rural households determines those that will be more vulnerable to the effects of climate change. Poor farmers with undiversified livelihoods and few asset buffers are most vulnerable of all, because they lack alternative sources of food when their harvests fail (Vincent & Cull, 2010). It is also important to note that in the same rural setting affected by the effects of climate change there will be members of certain households that will diversify their sources of livelihoods including renting out their farmlands and providing labor in other farms to eke a living that will give them the food purchasing power. Some affected people will opt to move into other regions including urban areas to find other sources of livelihood that are not directly dependent on agriculture. Contrary to Sen's lens of entitlement failure, hunger does not necessarily lead to starvation and eventual death (Young, H., Jaspars, S., Brown, R., Frize, J., and Khogali, 2001; Yaro, 2004). Famine victims are not passive victims waiting to be overwhelmed by demand and supply forces; rather, they mitigate the forces of demand and supply and other exogenous forces that impede their continuous existence (Yaro, 2004). Further, the entitlement theory argues that when people are faced with hunger they dispose of their assets or endowments to meet their immediate needs of food (Sen, 1981). Sen's assertion implies a linear progression in the manner in which people facing hunger would deal with an adaptation which is contrary to existing evidence in the literature that people preserve their assets against future vulnerability (Corbett, 1988; Yaro, 2004). In actual sense, pastoralists appear to be generally unwilling to sell or slaughter livestock; whereas those households which rely mostly on crop production for food are likely to be more willing to part

with their animals (Corbett, 1988). Despite the aforementioned, as Vincent and Cull (2010) underline while citing Adger and Kelly (1999), the application of entitlements analysis for climate change is important as it recognises that humans are not passive recipients of impacts: rather their exposure to physical phenomena is embedded in and mediated by, the social determinants of the particular human context.

Another approach to understanding food security is through the food systems approach (FSA) which describes the different rudiments in our food system and the relationships between them (Ericksen, 2008; Ingram, 2011; van Berkum, Dengerink and Ruben, 2018). It looks on the one hand at all the activities relating to the production, processing, distribution and utilization of food, and on the other hand at the outcomes of these activities in terms of food security (including nutrition), socio-economics (income, employment) and the environment (biodiversity, climate) (Ingram, 2011).

What sets apart the FSA from other approaches such as farming systems, sector or chain approaches, in which interventions are often designed to make optimum use of the means of production (natural resources, labour, capital), is the systems thinking component (van Berkum, Dengerink & Ruben, 2018). This is a defining feature is that it views the behaviour of a system as an interplay of interacting subsystems, in which feedback plays a key role, rather than as a simple chain of cause-effect relationships.

Food systems thinking steps back as it were from the place where the intervention occurs, thereby providing an opportunity when analysing the outcomes of policy interventions to include feedback from outcomes outside the activities that relate directly to food production and consumption (van Berkum, Dengerink & Ruben, 2018). An important aspect of food systems thinking involves resilience of individuals and households from shocks that are as a result of climate change.

Citing (Ge *et al.*, 2017), van Berkum, Dengerink and Ruben (2018) explains that the FSA considers an integrated system solutions which encompasses its holistic nature that does not just focus on the production component of food. In highlighting some of the contributions of the FSA, van Berkum, Dengerink and Ruben (2018) also cites UNEP (2016) which includes the implications of the food system for health and malnutrition, while also shedding some light on non-linear

processes and feedback loops in the food system, and on the trade-offs between different intervention strategies.

The FSA espouses four dimensions that are important: availability, access, utilization, and stability. These are also referred to as food security outcomes as explained by Ingram (2011). It is imperative to note that when we analyze the effects of climate change on food security, taking into account all these aspects is critical. This brings to fore the food systems approach which comprehensively brings our clear perspectives on the food security analysis theory. There has been the tendency to interrogate food security on the basis of food availability and not always intentionally including matters utilization, stability and access. This takes the discourse back to the theory of entitlement by Amartya Sen. Ericksen (2008) refers to Amartya Sen (1981; Dreze and Sen, 1989) that universally credited with establishing the importance of access to food, as opposed to only availability, as critical to food security. Access to food is determined by how well people can convert their various financial, political, and other assets into food, whether produced or purchased (Ericksen, 2008). Access draws attention to the fact that, even with bountiful supplies, many people still go hungry because they are too poor to produce or purchase the food they need (Hamm & Bellows, 2003). On the other hand as explained by Ericksen (2008) food availability refers to the amount, type and quality of food a unit has at its disposal to consume, and food utilization refers to individual or household capacity to consume and benefit from food. Hamm and Bellows (2003) draws from FAO's encapsulation of what food stability means, which refers to minimizing the probability that, in difficult years or seasons, food consumption might fall below consumption requirements.

It is essential to understand how to position food security within the global environmental changes that are largely brought about by anthropogenic causes, keeping in mind that the poorest people would have less likely contributed to. Climate change a major issue in as far as global environmental changes are concerned, and its effects on food security is undeniable. To take a holistic approach to understanding global environmental change and food system interactions, Ericksen (2008) proposes a broad framework for food systems, which includes feedbacks and interactions among drivers and considers multiple outcomes. This approach inherently accepts that ecosystems are managed (directly and indirectly) for human benefit and that one set of services may be emphasized (e.g. food production) at the cost of another (e.g. clean water for fish) and that

these goals may be in conflict. Ericksen (2008) citing Holling and Meffe (1996) explains that this framework adopts the idea behind adaptive management that an appropriate conceptual framework will lead to better decisions in the face of uncertainty and unpredictable outcomes. Ultimately, the normative goals of the framework are food security and sustainable environmental management (Ericksen, 2008). In the interest of sustainability, a food system is essentially designed as a set of interrelated functions that include production, processing and distribution (McCullum, Desjardins, Kraak, Ladipo, & Costello, 2005). All these activities require inputs and result in products and/or services, income and access to food, as well as environmental impacts (van Berkum, Dengerink & Ruben, 2018).

Integral theory, developed by American philosopher Ken Wilber, is another theory that this study considered because of its focus on climate change and specifically on adaptation. Integral theory helps conceptualize climate change in the sense that it provides an innovative framework that can contribute to the process of adaptation (O'Brien & Hochachka, 2010). This framework takes into account the bigger picture in which climate change is occurring, and thus it can offer insights on the types of responses and strategies that are necessary to confront the challenge (O'Brien, 2010).

> *According to O'Brien and Hochachka (2010), they argue that an integral approach to adaptation recognizes that adaptation cannot be solely conceptualized or engaged as behavioral and systemic changes. It must also include interior changes, both personally and culturally. Adaptation involves a changed sense of self, not as a passive subject to shifts in the climate system that are outside of one's control, but as an active player in the future of the community and world- all of which relate to worldviews, values, beliefs, and self-definitions.*

In the deep sense, this means that individuals and humanity as an entity have also to challenge their world views if sustainable adaptation is to occur. As O'Brien and Hochachka (2010) posit, it calls for individuals and societies to use a more integral approach to adaption which means including both objective and subjective dimensions of adaptation to inform both climate change adaptation theory and practice.

O'Brien (2010) attempts to have a discourse giving reasons that would provide integral theory the basis for appropriate response to climate change. Here, the argument is that the study of climate

change cannot be exclusively done from the traditionally objective framework but also by being subjective. Integral theory draws attention to the role of individual cognition and consciousness, and to the importance of collective values and beliefs as influences on behavior and systems (O'Brien, 2010).

Integral Theory discloses four domains of reality that are important to acknowledge and include in any adaptation intervention (O'Brien & Hochachka, 2010). The four perspectives (subjective, intersubjective, objective, and inter objective) recognize that phenomena can be seen in different ways: from an inside or an outside perspective, and from a singular or plural perspective (O'Brien & Hochachka, 2010 citing Wilber, 2006; Esbjörn-Hargens, 2009). These four perspectives are also referred to as the quadrants ((I, we, it, its) must be consulted when attempting to fully understand any issue or aspect of reality (Esbjörn-hargens, 2009). Further, that all four quadrants are closely related, and cannot be seen as isolated or independent from each other (O'Brien, 2010). The links between the systemic processes associated with climate change are linked to human development: the impacts of climate change can influence human development, just as human development can influence the future climate system (O'Brien, 2010). One of the most important feature of the integral theory that can be used to understand the climate change phenomena lies within the 4 quadrant perspective. For instance delving into that a holistic understanding would require one to investigate how climate change is influenced by a host of factors and variables such as political, social, economic, and geographical factors; that there is no single cross-cutting solution to climate change and variability (Esbjörn-hargens, Zimmerman & Wilber, 2009; O'Brien, 2010).

The theory of patriarchy was also considered as it is associated with the struggles of women all over the world, in this case a struggle of productive resources through domination and exploitation. Patriarchy literally means rule of the father in a male-dominated family. It is a social and ideological construct which considers men (who are the patriarchs) as superior to women (Ray, 2002). Sylvia Walby in her writing on "Theorising Patriarchy" refers to patriarchy as "a system of social structures and practices in which men dominate, oppress and exploit women" (Walby, 1990).

Citing Heywood (2003), Ray (2002) tries to underline the foundation of patriarchy as that which blurs the distinction between sex and gender and assumes that all socio-economic and political distinctions between men and women are rooted in biology or anatomy. Gender like social class,

caste, race or religion is a significant social cleavage and it is important to analyse it to understand social inequalities, oppressions and unequal relationship between men and women (Ray, 2002). Walby argues that patriarchy operates in a more complex manner through six unique structures: production relations in the households, paid work, patriarchal state (exemplified in policies), male violence, patriarchal relations in sexuality and patriarchal cultural institutions (Politics, 1990).

Of importance to note is that although some authors contend that matriarchy preceded patriarchy, patriarchy did not replace matriarchy as argued by (Roberson, 2004). He, (Robertson, 2004) posits that the two social systems originated in different parts of the world, and they are antithetical systems in that they are based on very different principles. He goes on to explain that in the African conception, a matriarchy is a society in which maternal energy and mother love are socially cohesive forces; thus, matriarchy is not, like patriarchy, a dominating ruling system—it is a social organization focused on the power of women as mothers and on the on the matrilineal ownership of the home and wealth (Roberson, 2004). The traditionalist view accepts patriarchy as biologically determined and as the biological functions of men and women are different, the social roles and tasks assigned for women are also different (Ray, 2002). Feminists have a different view from the traditionalist point of view. They argue that the biological difference might lead to some difference in their roles, but should this reality provide a basis of a sexual hierarchy in which men are practice dominance over women (Foord and Gregsoni, 1986; Ray, 2002)? The general perspective among various research material is that patriarchy is oppressive to women and further to men too especially in a predominantly capitalistic world that we live in. Roberson (2004) argues that it is as an all-encompassing oppressive paradigm whose transformation doesn't seem possible without a revolutionary questioning of every concept involved, beginning with the evolutionary model proposed by the classical theory of 19th-century Western writers.

So how do women in predominantly patriarchal societies access and use resources such as land? According to Kabeer (1999) negotiation is a process through which women as individuals or groups of individuals challenge the status quo or position them- selves so as to access, control and utilise resources located in the public sphere of men. It is also notable that patriarchy is an open gender power system whereby the men and women are constantly searching for ways and opportunities for enhancing their power base, rights and privileges (Kalabamu, 2006).

As Buchner (2014) notes, there is hardly any positive review of patriarchy, especially in Africa. This is especially so from the perspective of feminists. Buchner (2014) delves into the practice and perception of patriarchy by men and women in the African context.

> For women suffering under patriarchy, the Bible can be very liberating, and exegeting stories like those of Ruth and Tamar are excellent examples of how this can be done. For males, the Old Testament is non-Western, and quite African in terms of its concept of time

In as much as feminism endeavors to represent the lived experiences of women in various context, it is difficult to do so in societies that are predominantly patriarchal. Brandth (2002) puts this well as she argues that within a patriarchal society where men define the world, women are unable to understand their situation in an undistorted form. It is imperative to note that feminism (the core of all feminism theories) is theory that men and women should be equal politically, economically and socially and does not subscribe to differences between men and women or similarities between them, nor does it refer to excluding men or only furthering women's causes (No name, 2004). This study will not delve into the specific branches of feminism namely; liberal, radical, socialist, and womanism, but would rather look at feminism as a whole. As Kiguwa (2019) posits, feminism's potential impact in influencing social change for women must encompass a much broader analysis of gender as an organising structure and lived materiality that affects all gendered subjects in society. She goes further to argue that, feminist research benefits from a broader vision of critical work on gender in society and its myriad enactments and sociopolitical formations. Feminism as a social movement and epistemology aims to challenge the arbitrary dichotomy between individual and social explanatory frameworks of gender (Kiguwa, 2019). This study also recognizes that feminism might not perceived and understood universally in the same way. For instance, Atanga (2013) poses that since Africa is very diverse in present experiences and histories, would it not be viable to use the term African feminism(s); as an alternative to the essentialist-sounding 'African Feminism'. However, there are those who argue that African feminism cannot be distinguished from feminism (understood here as 'Western feminism') in that many of the problems faced by women in Africa, in terms of oppression, repression and discrimination when it comes to gender relations, are also faced by women elsewhere in the world (Atanga, 2013). In essense, African feminism is concerned with getting to the bottom of African gender relations and the problems of

African women- illuminating their causes and consequesnces- and criticizes the them (Arndt, 2002).

2.12 Conclusion

In view of the preceding discussions from varied literature there are areas that are understudied and may be considered as limitations to women adapting to climate change for food security and sustainable livelihoods. Firstly, food utilization and food accessibility as important components of food security have not been well investigated which exposes communities to limitations on access and proper utilization. Opportunities abound in addressing such a gap especially of livelihoods diversification. Secondly, there seems to be a missing link between linking land access for women and improved food production and eventual sustainable livelihoods especially for rural families. Thirdly, there is a paucity of hard evidence on gender and climate change thereby making it hard for practitioners to discern the many complex links especially in the context of land rights. It is notable in the literature reviewed that if at all gender is mentioned as a climate-change issue, it is usually generally with reference to the particular vulnerability of poor women in the South. Fourthly, attempts to deal with this obstacle to access to land for women targets the specific owner of the parcels of land- typically, this would be men. This therefore, misses the intended mark. This could mean that interventions target the wrong audience and the cycle of food insecurity and poverty continues.

There is a great deal of effort that has been placed on literature regarding climate change adaptation, resilience and livelihood development, food security among others but more needs to be done particularly on incorporating women's issues on the same. This will require questioning the stereotypes about gender roles, women's role in developing strategies on adaptation and food security and sustainable land management practices. Further research should attempt also attempt to look into climate change adaptation and gender relations because the relationship between these two remain unseen and left uninvestigated gender inequalities will be exacerbated. The place of public policies and development programs on enhancing the role of women in climate change adaptation and food security in light of women's land rights still needs investigation. In finality, it is clear that climate change impacts will be gendered and expanding knowledge that can bring solutions to these would add value.

CHAPTER THREE
METHODOLOGICAL CONSIDERATION

3.1 Introduction

This chapter is dedicated to the discussion on methodology which by definition refers to the systematic course of outlining the various activities and processes that the researcher engages in, to gather relevant information. This information is then used to respond to the research questions and further, to achieve the aims and objectives that would have already been set out by the researcher. To sum this up, Vosloo (2014) discusses that methodology looks into the researcher's general approach in carrying out the research project (Vosloo, 2014). Similarly, Kothari (2004) observes that methodology outlines a way to systematically solve the research problem. This methodology chapter is also informed by the researcher's assumptions, interests and purpose for the study. In addition, this section expounds on the kind of data to that was collected, how and where the data was collected and finally, how analysis was done. This process identifies the suitable research methods, and the methodology used focuses on the research process including identifying the right tools and procedures employed.

In view of the description above, the structure of the chapter is made up of 3 main sections. The first section is the philosophical approach followed by research design. Research design will compose of a description of the research sites, target population and sampling procedure, data instrumentation, and data analysis. The third section will be a reflection of the research methodology.

3.2 Philosophical Position/ Research Approach

The philosophical approach that informs this research is *feminism.* In essence feminism seeks to change social inequality by removing power imbalances, and also starts to look at standpoints and experiences of women in different settings. Ardovini-brooker (2002) briefly describes feminism as a framework that informs women's lives with the main purpose being to understand women's oppression in order to end it (Ardovini-brooker, 2002). In observing the same attempt to define feminism, (Creswell, 2007) notes that it draws from different theoretical and pragmatic orientations, different national contexts, and dynamic development as noted by Creswell (2007). Where does the line between a woman, an experienced land rights and food security expert and

researcher become defined, if at all? This is the question that the researcher continues to ask herself as she engage in this study. The researchers experience in practice has exposed her to interacting with the reality that, women continue to face the uphill task of negotiating their space when it comes to property ownership. This is in the context of a dominant culture that is considered patriarchal. Creswell (2007: 25) rightly puts it as "gender domination within a patriarchal society". This type of culture has managed to deepen its roots lending patriarchy dominance and in a manner that denies women their rights. Women are heavily relied upon in their communities to fend for their families, provide labour and sustain livelihoods. This is happening even as these women continue to face harsh realities such as lack of access to resources (for this study-land) on which they would meet their societal obligations. To further exacerbate the situation is the current and unrelenting context where climate is changing and having a major impact on agricultural practices and food security.

Feminism as an approach guided the methodology used and had the "political aim of creating emancipatory knowledge" as (Reinharz and Davidman, 1992) would assert. First, feminist researchers have long advocated that feminist research should be not just on women, but for women and, where possible, with women (Mathew, 2008 citing (DeVault 1990, 1996; Edwards 1990; Fonow & Cook 1991, 2005; Neilsen 1990; Ramazanoglu & Holland 2002; Reinharz 1992; Smith 1987, 1989, 1999; Stanley & Wise [1983] 1993). Feminist researchers are concerned to carry out research to explore what is going on in women's lives (Khan, 2014 citing Letherby, 2003), and is distinguishable by the questions feminists ask, the location of the researcher within the research process, within theorizing and the intended purpose of the work produced (Khan, 2014). The researcher recognizes that the nature of knowledge that this study may produce could be gendered because socialization and culture has brought me up to be a female. Therefore, her interpretation of issues is considerably informed by my experiences as a female or woman if you like. This brings to the fore feminist epistemology as this is connected to the methodology identified by this study. Feminist methodology is connected to feminist epistemology, which challenges issues of adequate theory of knowledge or justificatory strategy and traditional theory and methods (Ardovini-brooker, 2002 citing Harding, 1987).

Before delving much into feminist methodology, it is imperative to make clear what informs my decision particularly through feminist epistemology. Essentially epistemology refers to the study

of knowledge and how we get to know what we know. How feminist epistemology differs from traditional epistemologies in that it integrates women's knowledge and experiences. Further, its essence is in the multiplicity of women's voices and also observing that there is no "single truth" as espoused by traditional epistemologies (Ardovini-brooker, 2002 citing Duran 1991). History paints a picture that situated the production of knowledge on gender issues as predominantly in the domain of men researchers and male experience (Sprague & Zimmerman, 1989; Westmarland, 2001; Mathew, 2008). As the researcher contemplated the repercussions of choosing to use feminist research methodology she came to terms with the challenging reality that there are traditional "accepted" concepts that were created by males making it seem the norm and a basis for the epistemological beliefs and practices. The researcher realized that finding my place in this kind of research might be a difficult task requiring of me to be critical as she undertook the study.

It is critical to point out that in embracing feminist research, this study does purport to speak for all women but hopefully to bring out new knowledge grounded in the realities of the day to day experiences of women. Eventually this study will attempt to provide basis for pushing for changes in our world that uplift women and society as a whole. There are various principles that lay the basis of feminist epistemology but the crucial one for this study is that of having an intention to deal with inequalities that are based on gender. Further, that which contributes to change that will empower women. As much as it is brought out by other studies that feminist research is favored as research that is primarily conducted by women for women (Sprague & Kobrynowicz, 1999; Westmarland, 2001; Ardovini-brooker, 2002), this study attempts to steer clear of such stereotype. This is because the researcher believes that men can also be successful in feminist research as long as they have developed adequate 'feminist consciousness. The researcher digresses. What was clear in this study is that both men and women were involved because of the critical experiences and knowledge that women possess comes to be with men being in the picture. Let it be made clear at this juncture that as researcher believes that it is by the interaction between men and women that a non-stereotypic study on gender will come about. However, this approach does not take away from the main agenda which is to address issues of societal injustices, both intentional and non-intentional; but that we exist in a binary world. Feminist research focuses on the experiences of women in natural social settings, where the aim is to 'make women visible, raise their consciousness and empower them' (Gelling, 2013, citing Holloway & Wheeler 2013). Feminist research often sees itself as a tool for the empowerment of women, and its processes and results

should enhance the lives of research participants directly (Simms & Stawarska, 2000). Gelling (2013) further observes that in adopting this approach to research it influences what questions are asked and how the researcher will think about their data; but it does not usually influence how data is managed or analyzed.

Since the researcher has previously worked in the study sites and experienced some of the experiences of the women that will be studied, she recognizes that she will have an active presence. Feminist research recognizes this obtaining context seeing that as researchers our lives experiences are entangled with those of the participants, and our phenomenological époche demands that we become aware of it (Wambui, 1998; Simms & Stawarska, 2000; Mathew, 2008). This entanglement is not something that needs to be erased but recognized and that our co-existentiality can function as a tool for hearing the voice of the other more genuinely (Simms & Stawarska, 2000). This brought in the aspect of reflexivity in feminist research as one of its distinctive features (Wambui, 1998; Gelling, 2013). This aspect allowed the researcher to reflect upon her personal, political and intellectual location with research participants as well as producing, interpreting and theorizing research data and information (Khan, 2014). This aspect of research allows one to be self-critical and self-conscious when analyzing information received from participants during and after the field work (England, 1994; DeShong, 2013). This was important to the researcher as it allowed her to explore and understand the participants' experiences as regards land access and food security. Reflexivity allows the researcher to be aware of their own preconceptions and prejudices about what is being studied and how their perspective influences all the aspects of the study (England, 1994; Wambui, 1998; Simms & Stawarska, 2000; Mathew, 2008). Mathew (2008) goes further to state that reflexivity helps to clarify the researcher's own participation in the creation of research data. It further enables the researcher to challenge their own perception about issues and also implores him/her to be welcoming of the challenges posed by those being studied. There are instances when this aspect of qualitative research allows the researcher to be confused once their own perspective is challenged by the participants; challenges the researcher and gauges if he or she is open to new encounters in research which if embraced leads to growth (England, 1994). It is important to note that feminist research has to do "double book-keeping" (Simms & Stawarska, 2000) in that what is noted is that which the research participants say, but also uncovering what they do not or cannot say. Having noted so, the lived experiences being shared

by participants have to be treated with empathy even though interpretation will be from a critical perspective.

3.3 Research Design

Herein *research design* refers to the overall plan or framework with which this study is anchored, thereby creating the necessary boundaries that provide the much-needed focus and control. Kothari (2004) says that it constitutes the blueprint for collection, measurement and analysis of data. However, Creswell, 2007 citing Bogdan and Taylor, 1997 argues that research design starts at an even earlier stage that includes conceptualization of a problem (Creswell, 2007). Further, other researchers point out that, research design is that which provides maximum control over factors that may interfere with the validity of the findings in a study (Enayet & Supinit, 2016 citing Burns & Grove, 2003). Therefore, research design provides a logical sequence to the processes and procedures used to answer questions in research.

The dominant research paradigm that was employed by this study was *qualitative*. However, the study also used *quantitative* techniques to gather specific data, despite the reluctance to disregard this approach by some feminist research proponents. Westmarland (2001) points out the dangers that come with total rejection of quantitative methods. She argues that linking feminist research with qualitative methods simply reinforces traditional dichotomies that may not be in the best interests of feminist research (Westmarland, 2001 citing O'Leary, 1977). This is part of stereotyping that would make it easy to conclude that feminist research involves academic feminists using qualitative methods to reveal the insights of nonacademic women (Sprague and Kobrynowicz, 1999)- which is not the case. This kind of thinking actually further perpetuates reducing of multifaceted experiences to measurable variables, hence cementing continued domination by traditional research frameworks. I think it is more beneficial for this study to look at quantitative as complimentary to qualitative research framework.

As the analysis of quantitative data can be complemented by a contextualized understanding of women's everyday lives provided by qualitative data, and the interpretation of qualitative data can be assisted by the broad picture provided by quantitative methods, using multiple methods in a single study may provide a more complete understanding of the questions at hand (Kwan, 2001). However, it is not lost to think that qualitative research frameworks are capable of reflecting the intricacies and richness of women's lived experiences. From a feminist research point of view

these kinds of experiences cannot be quantified lest the essence of the study is lost. It is impossible to fairly present these experiences using numbers and especially when the researcher is working to present certain live connections being displayed by participants. These connections come out through women's feelings and interactions with others during the study platforms. These feelings and interactions were noticed by the researcher through unobtrusive observation bringing out data that is holistic and that which embraces the obtaining context. What was paramount in this study was to use the appropriate research methods with the research questions keeping in mind the critical feminist concerns.

Qualitative research in this study used open-ended questions which allowed participants to express their views on the subject matter being researched. Since in this type of research data is generated through interacting with participants, its process was largely inductive with the researcher generating meaning from the data collected (Wilson, 2000; Creswell, 2003). For this study quantitative methods were useful in describing certain measurable aspects of women's experiences for instance, number of women who own land. The quantitative method used was survey through questionnaires. Such variables as land sizes, age, sex that are relevant to this study are considered extraneous variables which are best handled through quantitative methods. Therefore, quantitative methods were considered helpful in bringing forth a broad "view" of women's current situations as described by Kwan (2001). Further, since this study also looked at policy issues, quantitative methods were considered suitable in providing statistical data that usually have a higher credibility with policy and decision makers. One of the major goals of feminist research and for this study too is to influence social change through a non-patriarchal political lens, hence the relevance of quantitative methods that complement qualitative ones (Sprague & Kobrynowicz, 1999; Simms and Stawarska, 2000; Mathew, 2008). Data collected through quantitative research design is presented in a descriptive manner for example in the form of graphs in a bid to enrich representation of qualitative data.

Therefore, adopting the feminist lens allowed the researcher to unravel the enabling conditions and practices that hinder communities from achieving food security due to gender-differentiated land rights. Understanding the issue of power relations between men who are regarded as custodians and decision-makers as concerns land is also very important to this study. This helps to bring out power hierarchies within the family which is the primary unit within the study sites. And

so, feminist approach to research offers a lens to illuminate the power hierarchies through the study participants.

3.3.1 Description of the Research sites

In 2010, Kenya promulgated a new constitution that brought in a devolved system of governance. As prescribed in Chapter eleven of this Constitution, a two-tier system of governance established the national government and 47 county governments. Further, the County Government Act of 2012 gave effect to Chapter Eleven of the Constitution by providing specifically for county governments' powers, functions and responsibilities to deliver services and for connected purposes (Government of Kenya, 2012). Each county consists of a county assembly and a county executive committee, and is presided over by an elected governor and a deputy governor. The County Assembly is vested with the legislative authority of county laws, general oversight of the County Government and representation of the people. It consists of Members of County Assembly (MCAs) elected from different Assembly Wards in the county, nominated MCAs representing special interests such as persons with disability and the youth as prescribed by an Act of Parliament, and the Speaker who is an ex-officio (Kenya National Bureau of Statistics, 2015). According to the County Government Act, 2012 every County Executive Committee will consist of a County Governor, a Deputy County Governor and other members, not surpassing ten, selected by the County Governor, with the endorsement of the County Assembly (Government of Kenya, 2012). As prescribed in the County Government Act, 2012, each county is divided into electoral wards for the purposes of election of county assembly members. A ward is an electoral area within a county delimited in accordance with Article 89 of the Kenya's Constitution for the purpose of the electing a the member of the County Assembly (Kenya National Bureau of Statistics, 2015). On the other hand, in accordance with the County Governments Act, 2012, sub-counties were also created as decentralized entities through which the county governments provide functions and services.

This study is situated in Kakamega County in the Western part of Kenya, bordering Vihiga County to the South, Siaya County to the West, Bungoma and Trans Nzoia Counties to the North and Nandi and Uasin Gishu Counties to the East. It is spread across an area of 3,051.3 km² with an altitude of between 1,240 meters and 2,000 meters above sea level. The County's annual rainfall ranges between 2214.1mm and 1280.1 mm per year, temperatures range between 18° C and 29°C,

average humidity is 67 percent, and altitude ranges from 1,240 to 2,000 meters above sea level (The County Government of Kakamega, 2013). There is also presence of an escarpment called Nandi, several hills, 8 main rivers, 3 gazetted and one non-gazetted forest which occupy 244.25 km2 and 26.5 km2 respectively (The County Government of Kakamega, 2013). The figure 3.1 below shows Kakamega County wherein Matungu and Mumias East sub-counties study sites are located.

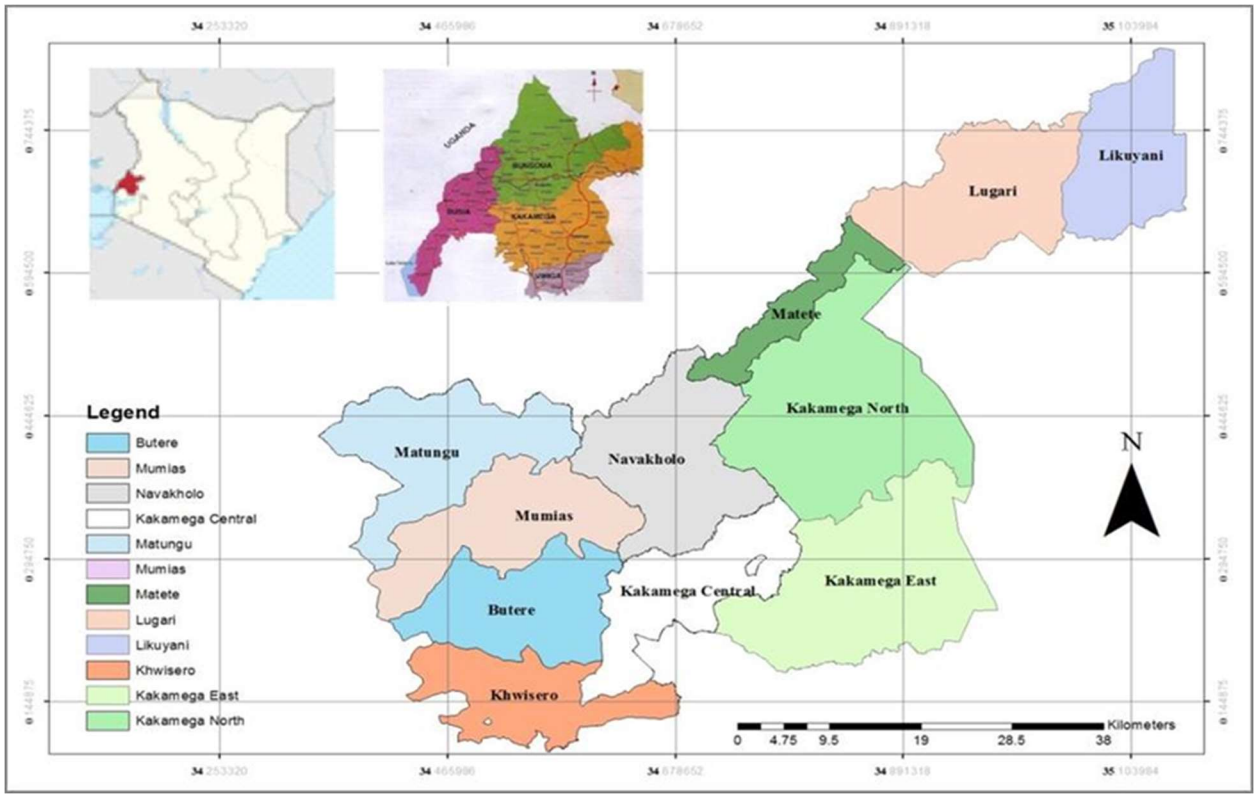


Figure 3.1 Location of study sites in Kakamega County of Kenya (Source: google.com)

Kakamega County has a predominantly crop farming economy with Sixty-one percent of households engaged in this kind of production that takes place under 255,483 ha of land (MoALF, 2017). Livestock farming takes a significantly small portion of the land. According to the most recent Kenyan Population and Housing Census of 2009 Kakamega County has most of its inhabitants employed in the agricultural sector, approximately 756,711 people (The County Government of Kakamega, 2015). Other sectors employing people include cottage industries, mining and the transportation sector mainly involving motorcycles. The average land holding is

1.5 acres within Kakamega County, mainly dedicated to rural agriculture. The chief crops grown are sugarcane, maize, beans, cassava, finger millet, and sorghum. Maize, sugarcane are generally grown on large-scale farms while bean, millet, and sorghum are grown on small-scale farms (MoALF, 2017). The main storage facilities in the County are the traditionally made granaries which are used by a greater percentage of the population (The County Government of Kakamega, 2013) even as it is common for crop yields to below; with maize and bean yields being below 0.9 tons per ha (MoALF, 2017). The County has natural gazetted forest covering 188.7 km2 and one non-gazetted forest that occupy 26.5 km2 whose products in firewood and charcoal as fuel, medicinal plants, honey for commercial and domestic consumption, and timber for construction of houses (MoALF, 2017).

The proportion of people living below the poverty line in Kakamega county is 51.3 percent as compared to the national level of 45.9 percent (MoALF, 2017). According to the Economic Survey of 2018 by the Kenya National Bureau of Statistics (KNBS), Kakamega County's food poverty rate is at 33.3% and an overall poverty rate of 35.8% (Kenya National Bureau of Statistics, 2018b). To further underscore this, the KNBS survey conducted in 2018 for the 2016/17 period, Kakamega County is among the six counties with high numbers of poor people that collectively account for 26.4% of the national total of 14.5 million food poor individuals at 4.3% (Kenya National Bureau of Statistics, 2018a).

As mentioned above, the study is situated in Kakamega County which is made up of 12 sub counties and 60 county assembly wards. The population of this county was placed at 1,698,567 by the Kenya Population Census of 2009, with 819,284 males and 879,292 females (Kenya National Bureau Of Statistics, 2017). Even as the country plans to conduct the next census in 2019, the KNBS projected the population of the County to be at 1,875,532 with 913,036 males and 962, 496 females as at 2016 (Kenya National Bureau Of Statistics, 2017). However, considering the vastness of the County, its huge population and the nature of the study, the researcher decided to collect data from four wards within two sub-counties. These are Mumias East and Matungu sub-counties. These two sub-counties were selected because of the following relevant reasons: (i) farmers transitioning from sugar-cane farming that targeted local milling plants to farming other crops, (ii) food insecurity in the area (iii) gendered-land rights including female-headed households. Mumias East Sub-County is approximately 135.5 square km in size with a population

of about 100,956 people while Matungu Sub-County is approximately 275.9 square km in size with a population of about 146,563 people (The County Government of Kakamega, 2013). The four wards mentioned above are Malaha-Isongo-Makunga and East Wanga both in Mumias East Sub-County and Namamali and Khalaba in Matungu Sub-County. Malaha-Isongo-Makunga has a population of 31,004, East Wanga 32,343, Namamali 31,568 and Khalaba 19,778.

The selection of the ward sites was guided by criteria including accessibility, diversity, and availability of Government officers, NGO officers, and farmers that would contribute to the study. They were also selected because they are also a representation of the general Kenyan situation where patriarchy dominates decisions on land use, access, control and ownership. The aforementioned cannot be disregarded when studying issues of food security. The research sites have unique characteristics that would be relevant to the study. For instance, Mumias East Sub-County has recognized women groups specifically comprised of categories of females who head households such as widows and those living with HIV/Aids (Government, 2007). These are mainly self-help groups with women who have come together to deal with issues that uniquely affect them including lack of access to land. The research sites are a representative of many rural regions in Kenya whose inhabitants continue to grapple with poverty especially that which concerns food. Lastly, resources and time allocated for the study also limited the scale at which the study could be conducted and therefore, the two chosen sites sufficed. In view of the above description these study sites gave the researcher a good scenario on how to conduct a study of the nature that had been envisaged.

3.3.2 Target Population and Sampling Procedure

In order to obtain the number of men and women that would be interviewed, the study referred to the statistical information provided in section 3.3.1. The four wards mentioned above are Malaha-Isongo-Makunga and East Wanga both in Mumias East Sub-County and Namamali and Khalaba in Matungu Sub-County were used as study sites. The target population for the study was 114, 693 that was obtained by adding up the number in the four wards identified as study sites. See table below:

Table 3.1 Population by Ward

Ward	**Population**
Malaha-Isongo-Makunga	31,004
East Wanga	32,343
Namamali	31,568
Khalaba	19,778
Total	**114,693**

Source: County Government of Kakamega website (2018)

In order to obtain the Sample size the following procedure was used as espoused by Check Market (2009). According to Check Market (2009) it is impossible to survey 114,693 people within the research sites but a sample of these targeted people would offer a solution. The formula that Check Market (2009) espouses provides a solution to the number of people in the sample and would save on resources such as time and money. There are two measures that affect the accurateness of the data i.e. margin of error or confidence intervals and confidence level (Check Market 2009). In this case, the confidence intervals refers to the deviation between the opinions of your respondents and the opinion of the entire population, while the confidence level tells you how often the percentage of the population that you are conducting the study on actually lies within the boundaries of the margin of error (Check Market, 2009).

Formula $S= Z^2 * P * (1-P) / M^2$

I.e. SS = (Z-score) ^{2} * p*(1-p) / (margin of error) ^{2}

Z-score = 1.96 for confidence level 95%

Proportion p is your expected outcome. If you don't have any idea about the proportion, you can take 0.5. This will maximize your sample (Check Market, 2009).

S = $(1.96)^2 * 0.5 * (1-0.5) / (0.05)^2$

= 3.8416 * 0.5 * 0.5/ 0.0025

= 3.8416 * 0.5 *200

=3.8416 * 100

Therefore, S = 384.16 which is the sample size

Further, the study sought to obtain an adjusted sample for the target population of 114, 693 with the following procedure:

Formula Adjusted S = (S)/1 + [(S-1) / Target Population]

Adjusted S = (384.16)/1 + [(384.16-1)/ 114, 693]

=384.16 + [383.16 / 114, 693]

=384.16 + 0.003

=384.16 (384)

Therefore, the adjusted sample size according to the target population of the study is 384. Adjustment of the sample size is important to the research process as it ensures that the size is not too large resulting in wasting scarce resources when collecting data. It ensures that the researcher only reaches the right number of participants (Anderson, Kelley, Maxwell, 2017).

Further, in order to obtain the study sample by gender, the study utilized county gender based percentages provided by the Kenya National Bureau of Statistics, i.e. 48% of the total population at the County are males and 52% are women (The County Government of Kakamega, 2013).

Therefore, to determine the number of men to be reached the study sample the following calculation was used: 48/100 * 384= 184 males. The remaining number of the study sample (52%) were targeted as females= 348-184= 236.

Having established these representative numbers, the study made a deliberate effort to ensure that the 384 number of people are reached. When it came to identifying participants of interviews systematic random sampling method was used. Here, knowing that the total number of persons to be reached is 384, the study took 384 and divided it by 184 (384/184) to obtain 2.1. This result meant that once in the research site, the researcher had to interview every second man after the

first man. This also ensured that the women were also interviewed even as the men were interviewed in that sequence.

To begin with, the researcher obtained information through focus groups. A total of 23 focus groups were conducted and thereby reached 184 people where the average group consisted of 8 persons. To obtain the gender ratios, the researcher ensured to include every second man after the first man, with women also being incorporated. Focus groups were important to the study because they enabled the researcher to obtain information pertaining experiences of female-headed households as well as men as regards land access, food security and livelihoods experiences. They also provided the opportunity for the researcher to observe non-verbal responses to questions asked through observing tones and emotions while participants expressed themselves. To mobilize participants, the study used existing contacts in the study area, an organization that aided in mobilizing within the study sites. The researcher was aware of instances that could arise where the use of local contacts might be criticized for being biased in selection of participants, easily resulting to volunteer bias. With this in mind the researcher ensured that the systematic random sampling method described above was used. To mobilize and conduct these focus groups, the researcher had to inform the local government administrators such as Assistant chiefs. They did not hinder the processes involved in collecting data but were rather interested in the outcome of the study. The researcher ensured that those participating in the focus group added value to the discussions and were not necessarily those that were influential in the community. This was ensured by working with the local organization to contact potential participants based on their expertise in the subject matter being investigated. Apart from the identified local organization mobilizing, the study also used the snowball sampling technique to identify other respondents. This happened when a number of respondents within the focus groups referred the researcher to other respondents that they considered relevant to this study. This technique played a major role in obtaining relevant interview participants for face to face interviews especially decision-makers within the study sites. These included assistant chiefs, land board members, agriculture extension officers, nutrition officer, and a judicial officer. Official emails and phone calls were made and after initial contact and interviews were conducted. The face to face interviews allowed the researcher to access information on policy and legislative progress, processes and opportunities that relate to women's land rights, food security and livelihoods among others. A total of 21 interviews with key informants from government and non-governmental organizations were

conducted across the study sites. For questionnaires, the researcher also used convenience sampling to obtain respondents whereby the researcher targeted specific days and activities such as church services and markets within the study sites. Using this technique the study was able to reach over 200 people with the questionnaires. 181 questionnaires were returned.

3.3.3 Data Instrumentation/ Data Collection Tools

The techniques that were used included: focus group discussions (FGDs), unobtrusive observation, interviews, and questionnaires. They are discussed below:

I. Focus Group Discussions

As a qualitative method for gathering data, focus groups bring together several participants to discuss a topic of mutual interest to themselves and the researcher (Morgan & Spanish, 1984). As a research technique, the focus group employs guided, interactional discussion as a means of generating "the rich details of complex experiences and the reasoning behind [an individual's] actions, beliefs, perceptions and attitudes" (Powell & Single, 1996). Originating in market research, focus groups are now widely used in social science and applied research (Ennis & Chen, 2012). The study's focus groups consisted of 6-12 persons per session and a total of 23 focus groups were conducted. The rationale for the range of focus group size (6-12 persons) stems from the goal that focus groups should include enough participants to yield diversity in information provided, yet they should not include too many participants because large groups can create an environment where participants do not feel comfortable sharing their thoughts, opinions, beliefs, and experiences (Onwuegbuzie *et al.*, 2009). Each session was structured to be conducted for a period of 90-120 minutes this being informed by the complexity/nature of the discussions that each group will present. Prior notification of approximately 10 days was given to the intended groups' participants to allow them to plan their schedules to include these additional engagements. This is in recognition that the target research participants are mainly engaged in farming child rearing, trade and formal employment among other activities that take up a substantial amount of their time. The meeting venues were sought out in settings considered to be neutral or places that would be convenient for the research participants. These included schools, open-air markets, Government administrative offices, homes and small hotels, taking into consideration accessibility to the appointed venues. As Powell and Single (1996) insist that this kind of settings allow for frank,

unhampered and, if necessary, critical discussion and expression of negative views. There was a moderator whose role involved facilitating uninhibited non-judgmental discussions and note-taking. Unobtrusive observation was also used during the discussions because the researcher was interested in expressions from body language. Paying particular attention to these kinds of details provides proper dynamics of the discussions or opportunity of relaunching certain topics where necessary, while in the process of collection data (Tecau & Tescasiu, 2015). During focus groups it is easy to ignore body language to the detriment of the quality of information collected from participants. The moderator was quick to look out for gestures that suggested confusion, boredom, insecurity, lack of openness among others. These were addressed with proper interventions.

Taken into consideration was the timing of the discussions so that meaningful information is extracted from the participants. It was important to make the participants feel comfortable right away by creating a warm atmosphere which included personally greeting them and thanking them for availing themselves. This was taking into consideration that they all had abandoned their daily engagements to attend the sessions. Ice-breaking to allow research participants to feel comfortable with each other before the discussions began was done. Introduction of each participant was done, with each saying a little bit about themselves including their family and occupation. This information is very critical for the data that was being collected as it would make the researcher better understand the participants in relation to the study objectives. Housekeeping rules were agreed upon at the beginning of each session which included stating the duration of discussions and what was expected of each participant. The intention of the research was laid bare and reiterated whenever it was deemed necessary during the sessions. These sessions were structured in a manner that allowed for fairly general questions to begin with followed by more specific one while adhering to the outlined interview guide. It was important for the moderator to remain neutral especially not to ask leading questions which would influence the participants' answers. The moderator's aim was to extract as much information as possible from these sessions within the appointed time limits. Moderating and timing each session was a challenge at first as participants proved to be engrossed in discussions but this was dealt with the help of the interview guides. It was important to reiterate to the participants that their contribution to the discussions was valued but at the same time manage the discussions in a manner that extracts as much relevant information as possible. Objective setting was also another important aspect of the interviews having realized that similar activities have been carried out by both Government and Non-Governmental

Organizations and compensation was expected. This matter was clarified and it was agreed that the only compensation was a token that would facilitate their transport back home.

It is argued by Onwuegbuzie *et al.* (2009) that it is ideal for the focus group to have a moderator team comprising of moderator and assistant moderator. This made sense for this study and was adopted, whereby the moderator was responsible for facilitating the discussions, prompting the participants to speak, requesting overly talkative members to let others talk, and encouraging everyone to participate (Tynan & Drayton, 1988; Margaret and Melissa, 2009; Onwuegbuzie *et al.*, 2009; Ennis & Chen, 2012). This must be achieved as far as possible without alienating or embarrassing respondents, which would destroy the group cohesiveness (Tynan & Drayton, 1988). Both the moderator and the assistant would take notes but more especially the main moderator would do so to inform potential emergent questions to ask within the particular sessions (Powell & Single, 1996; Onwuegbuzie *et al.*, 2009). Tynan and Drayton (1988) cites Langer (1978, p. 10) listing some traits of a good moderator to include empathetic, able to admit their own biases, flexible, animated, spontaneous, expressive of their own feelings, among others. These were very critical during the sessions as situations arose especially when discussions did not go as planned.

The nature of the focus groups was semi-structured interviews which had the aid of an interview guide with questions developed in advance but at the same time allowed the moderator to stray from the guide. This allowed the moderator to ask questions and make follow-ups as believed appropriate because the participants would at times bring forth information that was unexpected. Most often than not, this would require further probing. As noted by Margaret and Melissa (2009), this kind of interview collects detailed information in a style that is somewhat conversational allowing the researcher to delve deeply into a topic. To keep the participants attentive and interested in the discussions, the moderators ensured to express an understanding of the information provided by doing brief summaries and asking follow-up questions. Interviewees quickly lose interest when they realize that the interviewer is not focused on the topic or is simply collecting 'data' (Ennis & Chen, 2012). After the first focus group discussion in one of the study sites, it became imperative to co-opt an interpreter after realizing that the luhya dialect was a bit challenging to the main moderator. At the end of each day the two moderators met to exchange notes and observations which enriched the outcomes of the discussion groups. This also meant

taking into consideration the possibility of 'editorializing', where the translator could insert some of their own beliefs and perceptions into the 'answers' (Food Grains Bank, 1993).

a. Focus Group schedule

The focus group discussion guide (see appendix A) was designed to investigate the current situation regarding food security based on land access in Matungu and Mumias East sub-counties. The discussions were guided by open-ended questions to allow for additional probing as appropriate. The guide had three sections with the first focusing on gauging the knowledge of participants regarding food security. There after finding out the current status of food security within family set ups as well as the community at large. Perceptions and realities surrounding the rights of women on land as a resource formed the second section of the guide. The researcher was concerned with obtaining information on land ownership, particular by women and the overall experience of women as regards access to land for food security. It was also critical for the study to identify possibilities of how the community has been able to support female-headed households to access land and the role that particular institutions have played as regards the same. The third section focused on the capacity development concerning food security and securing women's right to land.

II. In-depth interviews

This is another method that the study used to collect data. It is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation (Boyce & Neale, 2006). This type of interview usually involves one participant at a time and therefore, useful in obtaining the perspective of an individual regarding a particular subject rather that in a group setting. In-depth interviews are also effective in capturing nuances on certain issues that would likely be missed when in a group setting. For participants – whether members of the study population or someone related to the population in a professional capacity – in-depth interviews offer the opportunity to express themselves in a way ordinary life rarely affords them (Mack, Woodsong, MacQueen, Guest, & Namey, 2005). This is important as the study interviewed a category of participants such as NGO workers and Government officers regarding their interaction within community members in the study sites. The interviews were conducted through the use of corresponding interview

guides. During these interviews, the interviewer was able to establish rapport with the research participants which was helpful in facilitating generation of insightful responses. During in-depth interviews, the persons being interviewed are considered the expert and the interviewer was considered the student whose techniques were motivated by the desire to learn everything the participant could share about the research topic (Milena, Dalnora & Alin, 2008). It is also easier for the researcher to make follow up after the interview where further questions arise. This aspect helps generate a richer understanding of perspectives and experiences from target participants. Unlike focus groups in-depth interviews are devoid of distractions or peer pressures that sometimes arise.

While preparing and conducting the in-depth interviews, the researcher endeavored to ask questions that were clear and devoid of jargon which was important in ensuring comprehensibility to the interviewees. These questions were open-ended allowing room for the participants to answer on their own terms. The questions were supported by further probing using additional questions by the interviewer which aided in enriching the information that was being collected. Probing also helped the interviewees understand the depth of information that was required from them. Care was taken to phrase questions in a manner that encouraged the participants to elaborate on their contributions without misleading them from the main agenda. One important aspect of these interviews that the moderator had to keep in mind was body language because information that was passed along during interviews was somewhat perplexing at times. The moderator had to be careful not to display any form of negative reaction which would probably have thrown off the participants.

a. Interview Schedule

The interview guides (see appendix B, C and D) for the in-depth interviews were designed with open-ended questions which allowed for additional probing to obtain clarity. The guide has 5 sections. The first section was confined to demographic information which helped to identify the interviewee's position in government or civil society. It was also important to find out the period served by these respondents within their institutions. The second section was on women's land rights in their areas of jurisdiction, specifically how female-headed households are supported in accessing land. The third section concerned the interviewees' knowledge and action as regards food security and the specific role of women on the same. It was also important for these interviews

to identify the linkage between access to land by women determines food security within the communities. Further, how rural female-headed households can be strengthened to achieve food security. The fourth section was centered around policy interventions on food security and also women's land rights. It was critical that the interviews interrogate how the officers interact with policy development and implementation and how these have translated into opportunities and changes within the communities.

b. Audio-recorder

An audio-recorder in the form of a digital phone was used to record proceedings as an adjunct (Morgan and Spanish, 1984) to other techniques of data collection during both focus groups and during in-depth interviews. Seale and Silverman (1997) observe that compared to notes taken during data collection sessions, recordings such as audio offer a highly reliable record to which researchers can return to when doing analysis. Markle, West and Rich (2012) citing Rapley (2007) argue that the actual process of making detailed transcripts enables the researcher become familiar with the data that is being collected as they listen to the recording again and again. By using audio-recordings the researcher is able to capture what they would routinely fail to notice, fail to remember, or be unable to record in sufficient detail by taking hand-written notes (Markle, West & Rich, 2012). Transcribing of the information that had been audio-recorded was done within a day or two of the interviews which made it easy to relate to the data produced.

III. Questionnaires

The study utilized a standardized questionnaire that were dropped off and picked up from respondents in the 4 research sites in Matungu and Mumias East sub-counties. These respondents were both male and female and were approached within their homesteads, churches and market centers. The questionnaire focused on gathering data regarding food security and gendered-land rights. The questionnaire was designed to have three sections, Section A, B and C (Appendix 3). Section A was based on background information of the respondents and therefore asked questions concerning gender, age, occupation, sub-county and village, marital status, and identification of heads of families. The details in this section helped the researcher to have an overview of the kind of persons the questionnaire had been administered to. Gender was an important aspect because the researcher was looking out for input from both male and female respondents. The age of the

respondents was required in order to have a clear understanding of perceptions about the topic at hand from various ages of people. The occupation of the respondents would also guide the researcher in obtaining an understanding of the how respondents developed their livelihoods; the effects of occupation on land value, and understanding of food security. Section B gathered information on access to land for food security. Here the researcher was interested in finding out how many respondents owned land, the acreage and how much is dedicated to agriculture. It was also critical to find out who owns land in a marriage set up and to find out if there were instances of joint ownership between husband and wives. The issue of land and property inheritance was also critical especially from the gender perspective. Land use was also investigated to have a picture of how the communities in the research sites interact with their land and who makes decisions on land use. Land use would also help link land and livelihood development which is essential in linking adaptation practices for food security. This last section comprised of yes and no answer questions as well as those that allow for choices tick boxes. This questionnaire tool allowed the researcher to have the opportunity to reach out to a large number of respondents within a short period within the study sites.

3.3.4 Pre-testing data collection instruments

The initial phase of the research involved piloting of the data collection instruments which included survey questionnaire, FGD, and interviews. The testing was done two in each of the sub-counties (Matungu and Mumias East) under study to test the relevance and effectiveness of the tools. Also, this was done to obtain an idea of how long the potential respondents will take to give feedback that is required. The piloting took place between 25th and 26th of April 2018 within the two selected sites in each sub-county with the aim of ascertaining whether the respondents will turn up for the meetings. I piloted two FGDs, 2 in-depth interviews, and 9 questionnaires. At this stage, the FGDs had between 8 to 10 persons both male and female. I also wanted to find out whether these tools will provide the much needed information concerning gendered-land rights, adaptation to climate change, food security, and relevant legal framework engagements within the study sites. This stage also served as an important time to do initial observations and pick out non-verbal cues while the piloting was being done.

The piloting process provided a firm basis to ascertain whether the objectives of the study are in accordance with the questions being asked, and are they in line with the issues identified in chapter

1 of this thesis. Further, the purpose of the piloting phase was determine the relevance of the questions to the topic being studied and also whether the timing was appropriate for the kind of questions being asked. These piloting activities were preceded by introduction of the researcher and a clarification of the research and the importance of the respondents within the study. The general observation was the eagerness of the respondents in participating in the study as they could relate to the topic. It is at this point that the researcher undertook keen observation on the questions that needed clarification. Also, how the discernments of respondents to questions asked influenced how they responded. There were also instances that certain questions generated more discussions and led to further questioning to obtain a better understanding by the researcher. This piloting also gave the researcher the opportunity to pilot the interpreter who was familiar with the dialect that was spoken in the study sites.

3.3.5 Data Analysis

I. Questionnaires

The responses within the questionnaires were edited and clarified for consistency and thereafter entered into an Excel spread sheet. This tool helped organize, sort, edit, code and analyze the data. The motivation behind using Excel is that it has lots of features that make handling and integration of different types of data very flexible (Niglas, 2007) and also because it easily integrates into other Microsoft Office software products, which can be helpful when preparing reports or presentations (Rose, Spinks & Canhoto, 2015). The primary focus for this process was to make sense of the magnitude of data collected by primarily focusing on descriptive statistics to then help in summarizing the information and identify key findings. Since the questionnaires were anonymously filled by respondents, subject numbers were provided, then the data coded and item names created. The product of analyzing data using Excel spreadsheet produced frequency and custom tables with different variables. These descriptive statistics were used to draw conclusions and make sense of the data. The results were then presented in frequency charts, figures and tables as deemed appropriate.

The information collected from the filled out questionnaires was imputed on Excel spreadsheet for analysis and presentation of data. Each questionnaire was identified using a unique identification e.g. R1, R2, R3 …etc. The R was used in place of the word “respondent”. Another unique identifier was letter Q e.g. Q1, Q2a, Q2c, Q3 ….etc, in place of the questions within the questionnaires.

Factors that influence women's land rights in the study sites were also assessed through responses from government officials and information was in terms of low levels of awareness, culture and traditions, low income levels and lack of interest which had codes of a, b, c, and d. Statistics in terms of frequency and proportion were obtained represented in a table. The study sought to obtain perceptions on activities that cause of climate change from the respondents. Eventually their Reponses were grouped into clearing of land for agriculture, lumbering activities, charcoal burning, clearing land for settlement, other causes, and not sure whose codes were d, a, I, cb, s, o, and n. Statistics in terms of frequency was obtained a graph on "Perceived Activities that Contribute to Climate Change" was developed.

Further, through excel, the study endeavored to obtain statistical information in terms of respondents by gender and age. Coding was done number 1 for female and 2 for male. On age categories were used with a range of 10 years starting from 20 years to 99 years. The codes used for the age ranges were 1 for 20 to 29 years, 2 for 30 to 39 years…etc. Eventually tables were created based on "females' age ranges" and "males' age ranges" and both frequency and proportion were realized. Information on marital status of the respondents was presented using married, single, widowed, divorces, single parent and coded as m, s, w, d, and sp respectively. Information on frequency and proportion based on the data collected was presented in table format.

The aforementioned are some of the ways that excel was used to analyse and present data collected though questionnaires.

II. In-depth Interviews and Focus Group Discussions

Transcription of data collected from one-on-one interviews and focus groups were transcribed and where relevant from Luhya and Kiswahili to English. Taking into consideration that data was also collected using an audio-recorder; the researcher listened to all the recordings and wrote down all the information. During transcription, the researcher was able to make sense of the information that was being passed on by the participants. Thereafter content analysis was carried out for both the interviews and focus groups. Content analysis is a method used to analyze written, verbal or visual communication messages in an objective and systematic manner (Elo & Kyngäs, 2008; Zhang & Wildemuth, 2009; Elo, Kaariainen, Kanste, & Polkki, 2014). The information collected from both the interviews and focus groups were edited where necessary and followed by coding;

the latter being done separately for each data collection method. The coded information from the interviews and focus groups was then categorized for each method and the relationships drawn. Inductive approach to content analysis was used in the preparing, organizing and presenting data. First, the researcher used open coding where notes were written and headings provided where necessary throughout the text. This is a process that was done repeatedly in order to make sense of the data in a manner that summarizes what was transcribed. Categories were also created in a manner that puts together similar data and those that are not in other categories. As advised by Elo *et al.* (2014) each category was named using content-characteristic words through a process called abstraction. Sub-categories to help describe what in contained in the categories were also created as necessary. All these were to help make sense of the data collected.

Through Excel, the village elders' (men and women) attitudes and perceptions on women's land rights was also gauged using the terms unacceptable, forbidden, partly acceptable, and acceptable with codes for responses as u, f, p, and a respectively. Statistics on frequency and proportion were derived and a graph represented the findings. The study also sought to find out how land is acquired in the study sites with the main modes of acquisition being through inheritance, purchase and spousal benefit. Coding was done using i, p, s, respectively and statistics on frequency and proportion were derived. Land ownership by gender was another study area as the study sought to find out the gender differences in land ownership. This was an open-ended question that was answered by "yes" or "no" with codes y and n respectively. Statistics on frequency and proportion were derived and graphs developed on the proportion of land ownership by men and women.

There was a question on *Understanding of Women's Land Rights* trying to figure out the level of knowledge on land rights for both men and women. These were represented in a table. Responses on the *attitudes on women's land right* was also looked at in four perspectives i.e. those who perceive these rights as unacceptable, forbidden, partly acceptable, and acceptable. The responses were coded using u, f, p, and a respectively. Thereafter, statistics on frequency and proportion were derived and graphs were developed to show the community's attitude towards women's ownership of land.

The aforementioned are some of the ways that excel was used to analyse and present data collected though in-depth interviews and focus group discussions.

3.4 Methodological Reflections

This study used both qualitative and quantitative approaches to investigate food security as impacted by gendered land rights within the research sites. Views and opinions were collected from people through focus groups, interviews and questionnaires in Matungu and Mumias East sub-counties. The process of identifying the research participants was not difficult because the researcher liaised with a local organization that implemented projects within the study sites. There were also common instances where referrals were made to the researcher to interview certain members of the community that were deemed relevant to the study. The local administrators such as village chiefs also acted as gatekeepers through whom the researcher sought to inform in order to carry our research within the community. It was clear that the nature of the study and its intentions were of importance to the local administrators whose work involved dealing with issues of food security and land rights. There were instances where the local administrators referred the researcher to certain persons that were deemed relevant to the study. There were two instances where area assistant chiefs helped in mobilizing village elders for interviews and two focus groups.

While distributing the questionnaires, it was notable that returning of the same was not guaranteed. There were days where I had to stay around the respondents in order to collect the filled out ones. There were cases where discussions emanated from the questionnaires which contributed to enriching the study. This reality brings forth one of the disadvantages of using questionnaires to collect data. Respondents at times want to say more than what the questionnaire would allow them to. In order reach some respondents, I had to navigate un-roadworthy areas through the use of a motorbike or walking which was time consuming and tiring. The nature of participants in the focus groups were both men and women who could be mainly identified as married, never been married, widowed and divorced. The classification of these marital statuses was not always a criterion for selection of participants; nevertheless, it was important to have these types of classifications. However, it was imperative for the composition to be balanced in the group discussions especially in terms of gender. Contrary to this expectation, there were instances where focus groups ended up with women as the only gender. This did not stop me from collecting the needed data. I also observed that during certain focus groups where both genders were represented, the women contributed less especially those that would be less educated e.g. not attained secondary school education. However, there were instances where older women who were less educated were more vocal in their contributions. This could be attributed to the level of respect they command within

their communities due to age. In the same vein, men seemed to take their time to respond to questions asked within the groups especially where certain women appeared emotional in their contribution. The men appeared to be very cautious about responding to land rights questions in a group setting as compared to individual interviews.

One interesting focus group to note involved Land Board Members who are charged with among other duties to help in resolving land issues and disputes. The group had both men and women whose role as expected was to help women get their land rights. However, during the discussion two things stood out, (i) one woman made it clear in her submission that she would not want to inherit land from her father or obtain joint-titles of land with her husband because she did not want to be cursed. This woman was an agriculture officer who sits on the land board in one of the research sites. (ii) A senior government administrator who also sits on this particular land board held strongly the belief that he does not believe that women should inherit, own and control land. This includes her daughters and wife whom he will not bequeath any land or resources within. He strongly believed that women are sojourners as regards land and will get access to land wherever they get married. These kinds of responses to questions on land rights from people held in high regards and considered enlightened baffled the researcher. On the other had there were women in the other focus groups that believed that owning land though inheritance or purchase would lead to curses. After listening to these discussions, any preconceived ideas and knowledge about land and food security were immediately challenged. There were also instances where the information provided by a government officer was contrary to what the local residents gave during separate interviews. For instance, the officer insisted that her area of jurisdiction was food secure while focus groups held within the same area provided information that was contrary. In actual sense community members interviewed had no clue who the officer was and what their mandate was. It appeared that the officer was keen to appear as though they were doing their work effectively and efficiently.

The use of an interpreter proved essential when the researcher realized that the specific dialect being used in the discussions was different. Therefore facilitation was collaboration between the researcher and the interpreter, hence two moderators. In tandem with the philosophical approach that guided the research process, the researcher was keen to collect specific information regarding female-headed households. This category of women included widows, single mothers, women

whose husbands lived away from home and women who had never been married. It was important to have the voices and opinions of these women directly from them and in their natural settings, mainly being their dwelling places. The process of organizing focus groups proved to be costly and time consuming. Costly because those coming to the group discussions expected some kind of appreciation or compensation which the researcher had to device a cost-effective way to respond these kinds of expectation. Instead of giving monetary compensation, the researcher provided refreshments which were well received. The phone calls made to potential respondents were time consuming as they were hardly short because the call receivers required detailed explanations as regards the group discussions. As concerns individual interviews and focus groups with government officials the researcher had to financially compensate these individuals by paying for their transport to the meeting venues.

The reality of power dynamics within the community surfaced during the data collection. This prompted the researcher to seriously think about stakeholder engagement involving all people. The men appeared insecure about discussions that would threaten the status quo as relates to power that is derived from controlling resources. Patriarchy dominates power relations in the study sites where it appears that men own and control land and property. This is in spite of the fact that women provide majority of the labor force that works the land to produce food. This reality has informed past development workers in the region to design project interventions for instance food security and land use that majorly targets women in their design. This has left men feeling sidelined and their authority threatened especially when women feel emboldened to implement learned interventions back at home. The reality that the researcher confronted is that of men boldly saying that initiatives that do not actively involve them will not work. They do not want to feel sidelined. It was clear that projects that exclusively target women do not sit well with them; this especially those that involve land tenure. The men know that they control the major source of production which is land and they would let any development practitioner do as they please but ultimately, they know that they are the decision makers as regards land use, ownership and control. The men narrated how, for years they have felt sidelined by projects that view women as marginalized when it comes to land rights and go ahead to sideline men in their initiatives. The men expressed that they are misunderstood and ultimately sidelined by such projects. This reality challenges the whole discourse that has been known that men will stand in the way of women's progress. It gives a new dimension and perspective when juxtaposed to the literature reviewed that women have to seek

permission from their male relatives to till the land and produce food. This being the case some men will sit back and watch their women till the land and come after to challenge their food security centered initiatives. The reality is that men want to be involved in food security initiatives without their authority and position being challenged. Without acknowledging this reality and gender dynamics within such a patriarchal society, development projects will continue facing resistance.

Discussion about women's land rights seemed very emotive because they seemed to challenge the status quo and at some point the researcher almost got pulled into it. Being a woman the discussions resonated with me because I am from a similar setting where men are the controllers and owners of land. The discussions directed me into reliving experiences that were similar to those of the participants and there were moments where I had to hold myself back to sharing these experiences. I had to look at the extent to which feminism really explains these sensitive issues and avoid a situation that would potentially risk my study because I was looking at issues from the eyes of a woman. I did not want the men to begin looking at me from the lens of "those" development practitioners who come to continue the exclusion of men. Making reference to section 3.2 it was critical to remind myself that in embracing feminism this study to bring out new knowledge grounded in the realities of the day to day experiences of women. This cannot be achieved without listening to the men's perspective because the study attempts to provide a basis for pushing for changes that uplift women and the society as a whole. For there to be meaningful change in the society men cannot be excluded.

In conclusion, this research study appears unique in the sense that it seems to bring in a new dimension to development whereby it challenges the whole concept of development as has been known from a very Eurocentric perspective. By this I mean, it has been the norm for gender equality and equity issues to be addressed from a Eurocentric perspective without intentionally taking into consideration the realities such as power dynamics and relations within communities. From the experiences in data collection processes it is safe to indicate that the Kenyan landscape and specifically Western Kenya, Africans are actually challenging the inherited and sometimes imposed Eurocentric view of how equality and equity is actually defined. But the glaring issue here is, is anyone paying attention to these realities and acting on them from their unique perspective?

3.5 Conclusion

In summary the methodological approach described in this study is eclectic beginning with the philosophical approach (feminism) and with a research design that adopted both qualitative and quantitative paradigms, with the former being the dominant one. Further, the data was collected through focus group discussions, in-depth interviews, participants' observation, and questionnaires. The idea behind choosing using the various data collection tools and methods was for complementary purposes to ensure that the right kind of data was collected. The tools that aided in gathering data were survey questionnaires, interview schedules and an audio-recorder. The methods used to find study participants and location sites have been explained in detail as well as how the data was analysed.

CHAPTER FOUR

EMPIRICAL EVIDENCE

4.1 Introduction

This chapter presents the findings of the data collection processes described in the preceding chapter. It is organized to present the findings on; (1) perceptions and realities that surround access to land by women in rural communities, (2) how rural communities understand and interact with climate change, and its impact on food security, (3) adaptation to climate change by rural agriculture dependent women, and (4) Policy and Institutional framework for Women Empowerment. On the fourth aspect of the study, the focus is on the opportunities within policy, legislation and practice as regards women's rights to land as a resource. Part of the data in this chapter was used to develop a paper titled "Shifting Paradigms: Climate Change Adaptation for Food Security and Gendered-Land Rights in Western Kenya" that was submitted to the Journal on Asian and African Studies and is currently under review.

4.2 Demographic Information

This section presents the demographic information of the respondents who participated in the focus group discussions composed of between 8 to 12 participants, and survey by use of questionnaires. In order to create influence of respondents' demographic features, the study sought information concerning age, gender, and marital status.

Table 4.1: Composition of respondents by gender and age

Age	Gender				Total	Percentage
	Male	Percentage	Female	Percentage		
20-29	15	10%	17	8%	32	9%
30-39	28	19%	56	26%	84	23%
40-49	44	29%	62	29%	106	29%
50-59	28	19%	42	20%	70	19%
60-69	12	8%	18	8%	30	8%
70-79	13	9%	18	8%	31	8%
80-89	11	7%	1	0%	12	3%
Total	151	41%	214	59%	365	

Source: Field based data (2018)

The figures indicated in Table 4.1 above demonstrate that there were more women (59%) than men (41%) that took part in the FGDs and completed the questionnaires. The participation of the women below the age of 29 was minimal compared to the ages between 30 to 59 years. The same is noted for the male respondents within the same age ranges. The participation of the men between the ages of 80 to 89 (7%) was slightly more than those of the women respondents (0%). It is within the age-range of 40 to 49 that there were more respondents from both genders. Despite the fact that within the age-range of 40-49 being represented in equal percentages (29%) the numerical representation was significantly different. The men were 44 while the women 62.

Table 4.2: Marital Status of Respondents by gender

Marital Status	**Male**		**Female**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Married	129	85%	145	68%
Single	13	9%	21	10%
Widowed	7	5%	31	14%
Divorced	2	1%	5	2%
Single Parent	0	0%	12	6%
Total	151	100%	214	100%

Source: Field based data (2018)

Table 4.2 above shows that a higher percentage of the respondents were married compared to other categories for both genders. To be specific 85% for the men and 68% of the women were married. The proportion of single parents amongst the respondents was lowest in both genders with the men recording 0% while the women recorded 6%. Women recorded a higher percentage in instances of widowhood at 14% compared to the men at 5%.

4.3 Perceptions and Realities on Access to Land in Rural Western Kenya

4.3.1 Perceptions of the meaning of land as a resource

How men and women within the study sites perceived land was investigated using a qualitative approach. The responses to the question *what does land mean to you* were recorded, transcribed and subsequently an open coding process was used to obtain phrases that sum up what had been discussed. The table below shows the outcome of the discussions held in the study sites involving both men and women.

Table 4.3: The meaning of land according to respondents

Coding representing recurring responses	**Description of responses**
Land as a pivotal source of livelihood	All the respondents were explicit about their view of land as a resource upon which their livelihoods are anchored in their rural area. It is from land that they cultivate and produce food as well as feed their animals; out of which produce is sold in differing forms to raise money. One woman said (Focus Group, 2018), *if I do not cultivate land and take care of animals, my family will have no resources to meet every day needs. We depend on land for everything.* In another FGD one woman said (Focus Group, 2018), *land gives life […] the produce that comes out of my land is sold to meet needs of my children such as school fees. There are times when times are tough and I have had to take maize that I have harvested in exchange for school fees.*
Land as source of security and social status	That land ownership and access is a source of security and gives people a sense of identification and acceptance within the community was not disputable in the FGDs and interviews. One man stated (Focus Group, 2018) that *land is a source of pride for me, well, for other men too because. Having land that I can call my own places me at the same standing as other men in society.* The respondents also indicated that transactions over land such as

	leasing to neighbors created relationships amongst themselves. One woman said (Focus Group, 2018), *when you lease land to one another, you cannot afford to be enemies […]you have to be friends to have these transactions because most times they are carried out on the basis of trust.* One woman also added that being married to a man who has his own parcel of land gives them a sense of pride and belonging within their community, which regards land highly.
Land as a source of power	This was a question that resonated well with the male respondents. One man said (Focus Group, 2018), *a man has no voice within the family and community if they do not have land […] a man without land finds it hard to sit in men's congregations.* It was evident that the men drew their sense of power and pride on owning land; the bigger the parcel the more respectable one is regarded. The women were also keen on this particular discussion because it is important to them that men own land for various reasons, marital abode being one of them. *I would not want any of my daughters to get married to a man with no land and he has to subject her to the ridicule of others that she is kept at the market place,* one middle aged woman explained (Focus Group, 2018). Essentially, it was evident in the discussions that land is a source of power, especially for men in the rural areas. However, another interpretation of land as a source of power was raised by women. It was evident from their contributions to the discussion that women who own land are empowered compared to those who do not. Their (women) source of power comes from the fact that they no longer have to depend on men for access to land. Nevertheless, such women are viewed as untamable especially by men in the rural setting. *I have thought of purchasing my own*

	piece of land but the consequence of such as decision could be detrimental to my marriage, one woman explained (Focus Group, 2018).
Land as a resource for basic needs	The respondents explained how their basic needs are tied to land as a natural resource. These needs included food, shelter and clothing which are also universal needs. *Out of the proceeds of my work on the farm I am able to meet all my family's needs […] whichever way I look at it, I depend on land to meet these needs especially now that I am the sole provider*, explained (Focus Group, 2018) one woman. These words only echoed what the other participants said in their contribution to the discussions. *There are various instances where I have had to sell the proceeds of my farm to cater for my family's basic needs […] It is almost impossible to think about losing my land because I think my family will suffer,* stated one man (Focus Group, 2018).
Land as inheritance and a transferable asset	Despite the fact that land is proving not be an infinite natural resource because of the ever increasing population, the respondents made it clear that land is a generational resource. It is passed over to the younger generation. It was also evident that the respondents were worried about the ever increasing population who cannot all the accommodated. Further, the ever increasing search for more land, has made it possible for land to be a transferable resource to people who are not family. This was a contentious point of discussion especially for women who raised issues such as the inconsiderate disposal of land by the men in their lives. *My husband sold off an acre of our one and a half acre of land without consulting me […] raising my objection almost had be thrown out of my matrimonial home. This happened after he*

	married a second wife, explained (Focus Group, 2018) a middle aged woman.
Land as the main source of food	The FGDs and interviews carried out in the research sites unanimously presented the reality that land is the main resource upon which food is sourced. This was where rural inhabitants spent their energy and resources ultimately to put food on their tables. One woman said (Focus Group, 2018), *if I do not go out to the farm to cultivate and take care of my crops and animals, my family will have nothing to eat.* Another one adds (Focus Group, 2018), *the difference between my children going to bed hungry or going to be with full stomachs, is dependent of my efforts on the farm.* It was also observed that providing food for one's family also involved going out mainly as a farm laborer in other people's farms. *Since my husband passed on, over four years ago, I have to seek for casual jobs on neighbors' lands to be able to take care of my children. I have to do this because my brother in-law will not allow me to farm in my husband's land in peace,* narrated ((Focus Group, 2018) one woman. These were some of the interpretations by the respondents who are rural dwellers, in respect to land.

Source: Field based data (2018)

Table 4.3 displays the varying meanings of land to both men and women in terms of the value they place on the resource. It is evident that land provides a source of livelihoods that also brings forth food security factors in this rural setting. The respondents indicated that land provides a base for development of their families and to a larger extent the community. By this they stated that out of the proceeds of their farming activities they are able to educate their children, cater for medical expenses and provide shelter. On one hand, land is also seen as an asset that can be leased or sold to meet needs of families. On the other hand, land was treated as an asset that gets to be occupied and protected for generations of relatives within families. The respondents were able to describe how land has been passed down from one generation to another and how it is still somewhat considered a taboo to sell such land. Disposing of such land was considered to be an action that

would attract curses from ancestors. However, it seemed this belief was slowly being disregarded based on the feedback received from other respondents.

Generally, it seemed that this community placed a lot of value to land as a natural resource considering the level of participation that was evidenced during the discussions. It was also observed and by their own admission that those who had land were considered as better placed in society when compared to those who did not own land. However, this seemed to be more pronounced in the feedback from men more than the women. The women were more focused on the value of land as a source for food, shelter and other needs that their families have. But, there were instances where women expressed interest in owning their own parcels of land, albeit in subtle expressions.

4.3.2 Understanding of Women's Land Rights

4.3.2.1 Perceptions of women's Land Rights by local community members

When this question was asked concerning the understanding of *women's land rights,* an array of responses was recorded in the midst of heated conversations. The responses from the female respondents were varied, with some making reference to what the legal frameworks and some to culture. However, it was noted that for those who made reference to what the former, were not able to clearly state the provisions. These responses on rights were recorded and a distinction was made between what the women said and what the men provided as feedback. The reason behind the distinction is mainly for the purposes of understanding how these two genders perceive women's land rights. The following captures the responses by female respondents (Focus Group, 2018):

> *Our culture does not allow women to own land because our ancestors saw it right to have men own the land.*

It was evident through this response that was repeated in all the discussions, that land is a resource that culturally belonged to men. It was further explained that men are expected to marry and bring in their wives to their fathers' parcels of land. The land is therefore passed on to the men in the families through inheritance. However, the women were expected to be married off and go forth to own land with her husband.

> *Women are sojourners from the time they are born, therefore, are not to inherit land from their fathers,* claimed one female respondent (Focus group, 2018).

> *Women are creators of relations and friendships so they are expected to leave their fathers' land and go out and be joined to another family […] she cannot therefore, make claim to her fathers' land mainly because she is not allowed to bring her husband to live on her father's land,* responded another woman (Focus Group, 2018).

It was during these discussions and interviews that it became evident that it is widely expected that women will access land through their male relatives. In instances where a woman does not get married or is divorced, culture prescribes that the father or male relatives allow for allocation of land but not ownership. This was however, not devoid of challenges as elucidated by one woman (Focus Group, 2018),

> *When I left my matrimonial home, I was allocated land that I can only cultivate with much difficulty because it has rocks […] it is better than nothing because I get to provide for my youngest daughter that I came back home with.*

The discussions on widows and how they accessed land called for much debate especially within the focus groups. There were varied experiences and reasons behind how widows were treated where land matters. The following was one widow's contribution to one of the discussions (Focus Group, 2018).

> *When my husband died I was the next of kin and my sons cannot sell the land without my permission. In case someone sells the land without my permission I will press charges and they could go to prison for it is a crime…land belongs to both husband and wife as long as the man makes that decision before he dies.*

The above statements when juxtaposed to the next response from another widow (Focus Group, 2018), shows how widows in the same community could have differing experiences. One woman (Focus Group, 2018) said:

> *After the passing on of my husband, my brother in-law has progressively infringed on the boundaries that demarcate parcels of land that my father in-law had put in place. When he was confronted by other family members he claimed to be taking care of his brother's*

widow […] I gave up on seeking justice and my children are too young to fight for themselves.

The promulgation of the Kenyan Constitution in 2010 and its provisions resonated among the respondents, especially the women. One woman (Focus Group, 2018) said:

I've heard in the past that the Kenyan Constitution provides for our rights to land as women but I am not sure what exactly is contained within that document. My ignorance to the law set aside for women's rights to land and property is an important issue that needs addressing.

During these discussions it was apparent that women provided a higher percentage of labor that is required in the farms. Women also confirmed that they were the breadwinners in their families through farming; as more often than not, their male counterparts are involved in the post-harvest management of farming. With this said, one woman remarked (Focus Group, 2018) that

It does not make sense when I break my back in the farm to provide for my family yet I am not guaranteed ownership rights to my husband's land. Well, since the Constitution now protects my rights to land as a woman, I would really want to know how to access these rights.

It was also evident that there are cases where women have sought to break away from the norm and seek to purchase their own parcels of land. The consequences of such decisions were described by one woman's experience (Focus Group, 2018):

The unpleasant experience in my marriage has pushed me towards buying my own parcel of land […] happened after my husband married a third wife and brought her to his land. I realized that my husband's land was not going to be sufficient for the growing family so I saved up money and purchased an acre piece of land under my name which my husband has no knowledge of.

The reason behind the secrecy was that men are very insecure of women who have property and land under their name. Therefore, women with intensions to keep the peace in their marriage have to keep secrets. The women went further to explain that if a woman wants peace to reign in her marriage she would have to indicate the title of such a piece of land in the husband's name.

One female respondent interpreted her understanding of these rights as follows (Focus Group, 2018):

> *There are various ways that women can achieve their rights to land but within our society that would happen at the mercy of male relatives or if a woman purchases their own land. It is very uncommon in rural areas such as this to find women who have managed to buy their own land because it is expensive and cultural expectations would not be in support of women buying their own land especially when they are married. There are cases where women are forced to either have the title of the said land to their husbands or lose their marriage. Men are very insecure of women who have property and land under their name. Society has not socialized me to believe that women too can own land and have control over the same.*

The above response was repeated in almost all interviews and discussions concerning women's land rights.

In the unfortunate case of separation or divorce and a woman had no choice but try to return to her father's land, differing scenarios were presented by the respondents. One that stood out concerned a woman who was not able to bring forth children for her husband and was evicted from her matrimonial home. She narrated (Focus Group, 2018) her experience;

> O*n returning to my father's land my brothers chased me away claiming that I should go back to my husband's home. I now rent a small room in the market where I return to after doing odd jobs to cater for my needs.*

Similar cases were narrated by women who had either been exposed to such treatment or knew someone who had gone through the same. An old lady narrated (Focus Group, 2018) her experience with trying to go back to her father's land which she still lives on, as follows;

> A*fter losing my husband to death and being forcefully removed from my matrimonial home, I went back to my father's land. My brother accepted me back and when and allowed me to find abode on the land that my father's house still stands. However, I only have access to cultivate the land but I cannot claim ownership.*

These two cases were just but a few of the experiences that the female respondents shared during the discussions. Attempting to reconcile the reality and rhetoric concerning women's right to land and property in this society formed a contentious topic of discussion during the study.

Contributing to the rights of vulnerable women, a secondary school female teacher explained that women's land rights provided an avenue that helped women such as widows to access what was rightfully theirs. For instance, widows being allowed to be part of the succession process whenever land issues are being handled.

> *Many times women are not involved in such processes. If I became a widow I would like to have the right to give land to my children and not to be bypassed and land given to the children. If my husband dies, the land should automatically be under my ownership and control which thereafter I will give to our children, explained one woman* (Interview, 2018).

During the discussions it was made clear that women land rights provide an avenue to uplift women as primary providers and nurturers within families and in the community at large. Since these roles were well defined within this community, the achievement of the same is majorly dependent on land.

> *It is important that husbands consult their wives when disposing of land especially through selling. This is how I understand women's land rights*, explained (Interview, 2018) one female respondent.

Another respondent added (Interview, 2018) that:

> *Furthermore, it is told to women that their land is what they husband has, meaning that women have the right to be consulted at all times. Whether this is achievable in this community is another story all together*.

Trying to get a common theme that reigned throughout this discussion was challenging. Nevertheless, what resonated was that these rights refer to men involving women in decision

making where land as a resource is concerned. This is especially important because it is women who labor in the farms to provide for their families.

On the other hand, men were also eager to make their contribution clear to this discussion that would be considered emotive especially when experiences would be narrated. The following represents the responses received from the male respondents (Focus Groups and Interviews, 2018):

> *Women are visitors in their husband's homes; they therefore, cannot be decision –makers even though they till the land and provide for the family at large. Providing labour does not put her at the same level as the male relatives including her husband. What does she need land ownership for when she cannot sustainably take care of the land? If you give these so called rights to these women, they are going to be untamable and stand on the heads of their husbands. There is a system in which things work around our community and especially in the Luhya community. Land is owned and controlled by men and the women provide labor. However, the male relatives can work out a plan where women especially those that are heads of households such as widows to access land.*

This kind of response was repeated over and over throughout the interviews and discussions. One male village elder responded giving a different perspective indicating that there is an order in which things work within his community. In this way he expressed that it is undisputed that land is historically passed on from one generation to the next through the male relatives. However, there are instances where fathers have challenged the status quo by giving their daughters pieces of land with strict instructions for their decisions to go unchallenged. One man argued (Focus Group, 2018) that:

> *Many times these women cannot stay in these pieces of land peacefully. Some have decided to sell them off.* He also added that *when these girls get married their husbands mostly feel uncomfortable with the fact that their wives have land somewhere else. You know, a woman becomes untamable when they know they have alternative land, therefore, any quarrels would lead them to leave their matrimonial homes.*

Another village elder added (Focus Group, 2018) that:

> *We cannot have two men in the same house because that is what it means to have my wife having land that she calls her own.*

It was his opinion as well as others, that such land should be titled under the husband's name or transferred to the husband. In any case, when marriage takes place a man cannot move into the woman's land because he is the one marrying her and not vice versa.

In the unfortunate event that a woman has to leave her husband's land, she may be allowed to access the land that her father's house sits on and not more. This situation has led to many of such women to remarry even when they would not naturally do it because the harassment to return to her husband's home would be too much. It was explained that it is common for the brothers to such a woman would eventually throw her out of her father's home because her presence is not welcome. Nevertheless, there are situations that see the woman in this scenario allowed to live peacefully.

The fate of unmarried women was also discussed even as the respondents indicated that there are cases where certain women never get married or choose not to. In these cases, their access to land is still dependent on the decision of their father which means these women have to wait, and apportioning of the same is not guaranteed. An elderly man explained (Focus Group, 2018):

> *"You know, as a father, I would not want to be blamed for my daughters' failed marital status just because I provided alternative abode for them. Secondly, she most likely would be a cause for conflict with her in-laws because they would want her to leave. There is no direct way in dealing with unmarried women land rights in as much as it is said that the Constitution of 2010 prescribes their rights to be equal to those of men. Our community is still guided by our customs and traditions"*

One middle-aged man attempted to describe women's rights to land through a song and one line that stood out is that (Focus Group, 2018) *we are friends, we are friends because our women unite us…*The essence of this song was to explain why women are considered as sojourners from the time they are born. Women are meant to be married off so that relations with other neighboring communities are created. Therefore, women who leave their homes to get married in their husbands' lands cannot claim to still have land in their fathers' land. If they do, they will be destroying that new relationship. However, when questioned about the genuineness of these married women owning land in their husbands' homes (as they had been told when getting married), the men could not clearly demonstrate that it actually happens. Several times, the men

claimed that women are visitors in their husbands' homes and therefore, can only claim certain rights such as access to provide for the family.

In an attempt to capture what the respondents think of the right to land ownership by women, the study sought to use the graph below. These are mainly influenced by both culture and knowledge on legal frameworks by the local community members in the study sites.

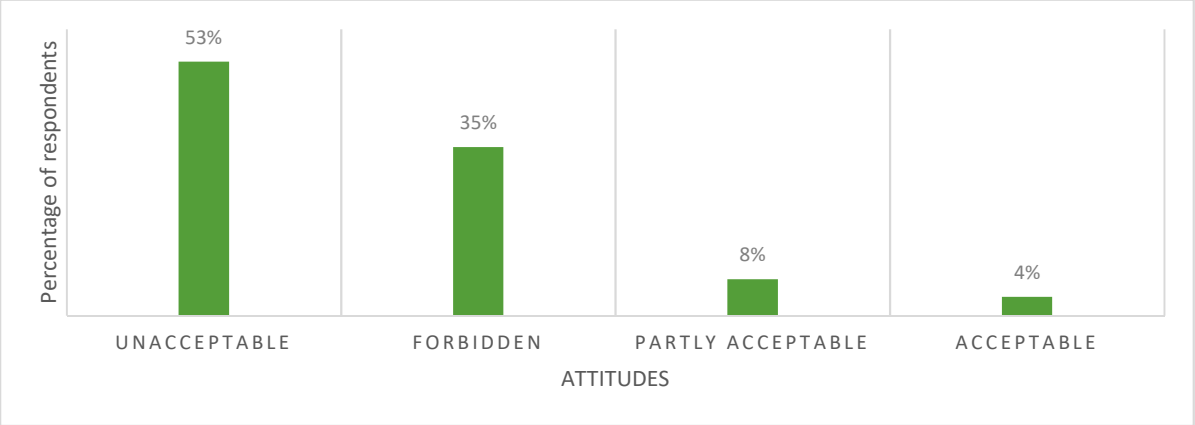


Figure 4.1: Community perceptions of women's right to own land (Source: Field based data (2018)

As depicted in the Figure 4.1 above, Out of the 181 respondents, a larger percentage (53%) of respondents reckoned that it is unacceptable for women to own land while 35% considered it forbidden for women to own land. Of importance to note is that 8% considers ownership of land by women as partly acceptable while 4 % find it acceptable.

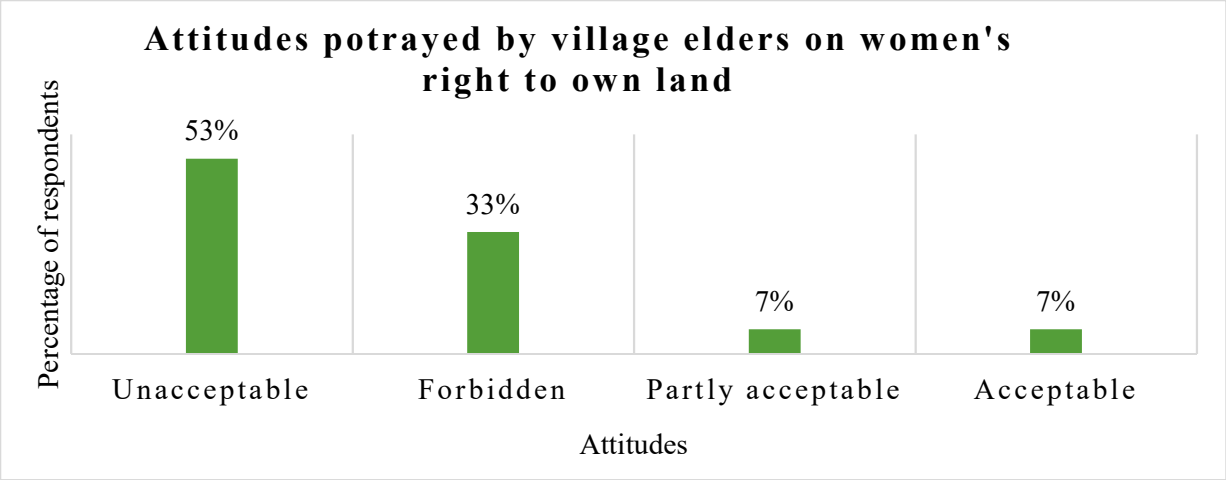


Figure 4.2: Village Elders perceptions on women's right to own land (Source: Field based data (2018)

The figure 4.2 represents the feedback received from village elders that were interviewed regarding their take on women owning land. It was important for this study to include the views of village elders because they are the custodians of traditions and customs and are considered very important in all aspects of community well-being. These elders are frequently called upon to mediate and make declarations where land matters are concerned, more especially on ownership and access disputes. It is depicted in figure 4.2 above that the elders consider land ownership by women are either unacceptable or forbidden. The percentage of those that find it acceptable for women to own land is almost negligible in this study.

4.3.2.2 Perceptions of women's land rights by Government Officials

Interviews were carried out with relevant Government officials working within the study sites, concerning women's land rights. These officials included Assistant Chiefs, Agriculture Officers, Home Economics Officer, members of Land Boards, and a Judicial Officer. The Judicial Officer's work deals with environment and land issues that need to be addressed within the study sites. These officials were important in the research as they possessed vital information regarding land issues, among others within the study sites. Discussions concerning land rights with these officials illuminated the reality relating to the manner in which land issues are dealt with in rural areas; where legal redress to land problems clash with local customs. The general consensus in the discussions was that customs generally impede women's access to land in this region. Access, ownership and control over land and its resources is traditionally the right of men with women

drawing benefits through the men. In harmony with the feedback from the FGDs, these officials explained that within this community, a woman is expected to get married and get access to land from their husband. One Assistant Chief added that it is only in cases where a man only gives birth to daughters that they might inherit the land. The Assistant Chief (Interview, 2018) added that,

> *In any case this is not devoid of interference from the extended family members to have these girls disinherited*.

The Home Economics Officer added that in instances where a man sires sons and daughters, all the land is bequeathed to the sons, leaving the daughters at the mercy of their brothers. She (Interview, 2018) went further to state that:

> *It is common for the sons to make it very uncomfortable for their sisters to continue living in their fathers' land. Many times this puts pressure on the women to get married even when they are not ready. In case their marriages fail, these women are not allowed to settle back on their fathers' land because they are unwanted. In instances where women save to purchase their own parcels of land, there would be husbands feel insecure to marry them because it is widely believed that a woman with land in their own name cannot be "tamed". It is further believed that such a woman has to relinquish that piece of land to their husbands if she has to save her marriage.*

An interesting addition to this narration by another Assistant chief was that the impact of such beliefs and practices has highly contributed to abuse in marriage from men because of the sense of insecurity that comes with an empowered woman.

Another Assistant Chief interviewed in the study site made it clear that all his four children will have equal rights to his land. This did not sit well with the other men in the focus group who questioned his decision. He nevertheless, explained that he considers his daughters' needs for land the same to those of his sons. The Assistant Chief (Interview, 2018) further explained:

> *When my daughters' husbands and family decide to mistreat them, my daughters will always know that they have a place of refuge in my home.*

Another response that seemingly was not as radical as the Assistant Chief's one was that women can access land in order to provide for their husbands and children but in consultation with their husbands or in-laws.

> *Nonetheless, these women should learn to live in peace with their in-laws so that they do not face any hindrances from their in-laws or male relatives*, concluded the respondent (Interview, 2018).

During the interview with one of the County Agriculture Officer, he mentioned that working with female-headed households (FHHs) has often revealed a sense of inferiority complex with these women. This he attributes to the fact that majority of them depend on their extended family members or in-laws to make progressive decisions because of cultural expectations. The County Agriculture Officer (Interview, 2018) said:

> *I have reached out to these households, especially widows, to encourage them to take up sustainable farming practices but the results are not encouraging. But when one does a casual research on such occurrences, they will more likely than not find out that these women have no protected land rights*.

He went further to explain that these women were used to situations where their male relatives and mainly husbands made decisions or even rescinded decisions. When these husbands are no more, it becomes very difficult to convince these women that taking certain decisions is fine. It is clear that there is the constant contest between customary and contemporary beliefs and practices when it comes to climate change adaptation, land rights and food security. The women also feel inferior to their male counterparts that even when scenarios present themselves where they could take up certain positive actions, they are unable.

A female Government Agriculture Officer (Interview, 2018) at the Sub-County level while giving her perspective on women's land rights, made an interesting observation that:

> *Yes, I believe women should be allowed to access land but this should not threaten the position of men in our society because our forefathers were not wrong in laying certain traditions in place. Why would a woman want to challenge her family by trying to fight for land ownership? If women live harmoniously with their families, more especially their in-*

laws, their use of land will be supported. Problems arise when some women are hard headed claiming to challenge customs and practices.

When questioned whether she would like to be given land by her father or own land jointly with her husband, this Government Officer indicated that she would not want to attract curses from her ancestors.

4.3.2.3 Perceptions on Women's Land Rights by Non-Governmental Organizations

Interviews conducted with NGOs concerning women's land rights in the study sites revealed vital information especially that on contemporary legal rights versus what local cultures prescribe. In essence these officers are caught in between what culture dictates and what their projects advocate as women's land rights. The organizations interviewed were locally established organizations normally referred to as community based organizations (CBOs), regional based NGOs and National NGOs. These have implemented projects concerned with gender-based rights, agriculture, livelihoods development, and health, among others. Women's land rights was a major concern for all interviewees with the common theme that these are essentially human rights enshrined in the Kenyan Constitution. However, what is lacking is that the Government has not taken up the initiative of awareness creation at the grassroots level. The position of these NGOs is that these rights need to be enforced in the study area because of the current state of vulnerable women. The irony behind these interviews on women's right to land was laid bare when some male officers interviewed stated that practicality of these rights being achieved is far-fetched. This is so because the practicality of it even on their initiative, they would still have a problem with implementing these rights.

I am an African man and I have been raised to respect the customs and beliefs of my ancestors […] it would therefore be hard for me to go against their wishes and give these rights to my wife and daughters, said a program officer (Interview, 2018).

Another officer chimed in and said that he would rather go out and purchase land for his daughters rather than set aside their parcels in his home.

I know that such a decision would lead to conflict within my family and my daughters would carry the brunt of the ruthlessness that may arise from their brothers or uncles, the Officer (Interview, 2018) concluded.

Conversely, a male Programme Manager in one of the local organizations made his stance clear that he believes all his children are equal and therefore should enjoy the same rights.

> *I have four sons and three daughters, all of whom I have managed to educate to the university level […] I have always treated them equally, a position that has been communicated to all them as concerns land rights,* the Program Manager (Interview, 2018) said.

Despite this it was clear that the wife is not a co-owner on this Programme Manager's estate which includes parcels of land with titles. When questioned why, the Program Manager (Interview, 2018) clarified saying:

> *What is mine is hers too, the title makes no difference.*

During these organizations' interviews, it was severally repeated that women do have rights to land and that they should be supported to attain them. This is the position against the background of culture where there are practices and beliefs on women land rights. This is still heavily entrenched in the minds of local people. Further, that the current debates on land around the country are not yielding much change on women's land rights. One officer (Interview, 2018) stated that:

> *We rely on government officials at the grassroots level to implement the laws guided by policies but these administrators are not aware of the contents of these frameworks […] it therefore remains that they deal with land rights issues from their own judgements. On the other side of this situation is women who are sometimes afraid of going against tradition to demand for their rights. Many believe that demanding for their rights and owning land would have them bewitched.*

From these discussions it was mentioned several times that the illiterate women suffer the most because they do not know where to begin to claim their rights and sometimes are very fearful of going against tradition. Further, that marriages have broken down due to women demanding for their land rights. Some women have been divorced because they bought their own pieces of land and refused to have the titles under the sole ownership of their husbands. There is also an element of lack of initiative on women to demand for their rights in a changing world. They have a clue on

what their rights are as enshrined in the Constitution but they expect the Government to come in and sort out their problems without their input. They do not want to seek the information.

At this juncture, it is notable to indicate that out of the seven local NGOs that agreed to be interviewed, only one was able to articulate the land rights legal frameworks. The others casually made reference to the Constitution of Kenya of 2010 but could not detail its contents on women's land rights.

4.3.3 Women and Tenure Security in Rural Western Kenya

It was important for this study to get a grasp of security of tenure in order to understand how rights are drawn for both men and women. The study sought to understand how land is acquired within the research through a survey whose results are represented in table 4.3 below.

Table 4.4: How land is acquired within study sites

Mode of Acquisition	**Frequency**	**Percentage**
Inheritance	294	89%
Purchase	27	8%
Spousal benefit	8	2%
Total Number of Respondents	329	100%

Source: Field based data (2018)

According to the information presented in Table 4.4 above, there is an indication that land within the study sites was mostly acquired through inheritance (89%). On the other extreme end of acquisition is that some community members acquired their land through purchase (8%) and through spouses at 2%. During these discussions it was apparent that ownership of land does not necessarily equate to being in possession of title deeds from the Kenyan Government. The investigation realized ownership within this context referred to the unofficial knowledge within the families and community that certain parcels of land belonged to certain people. This is especially so for those that own land through inheritance. Those that have purchased land have title deeds according to this study at 8% of the 329 people who were gave this kind of information. The percentage of those that own land through spousal benefit was a number that was hard to come across during the interview. These were women whose husbands had allocated land to them before their demise, essentially widows.

It was necessary for the study to present the reality of land ownership by gender. Figure 4.3 presents two charts that demonstrate the proportion of men and women who own land; information that has been deciphered from the number of respondents within the study sites.

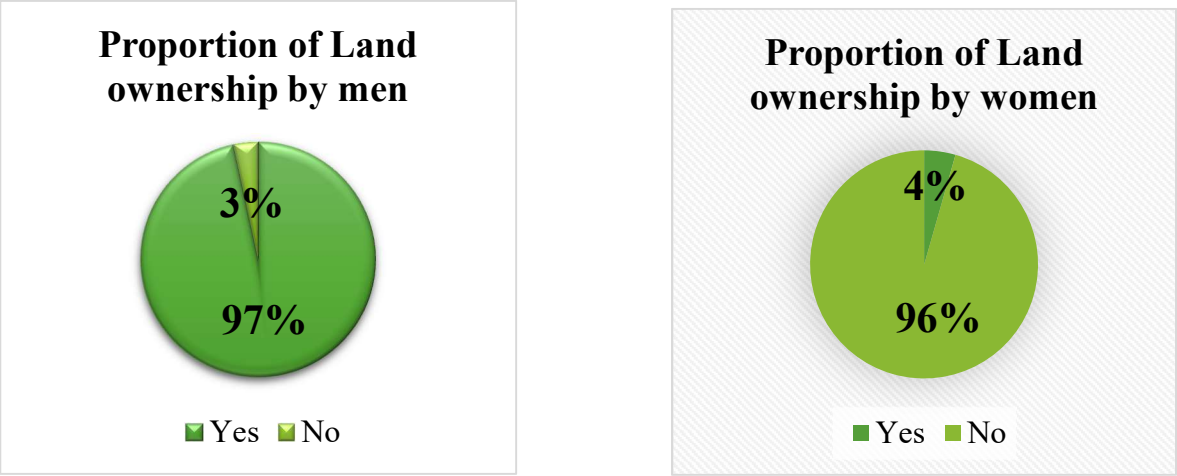


Figure 4.3: Land ownership by gender (Source: Field based data (2018)

In reference to Figure 4.3 and specifically to the chart of the left, it is evident that majority (97%) of the men that were interviewed claimed to own land, while a small proportion (3%) said that they do not own land. In reference to the men that claimed not to own land, these were men that indicated that they were living in rented houses within the local market areas. Conversely, still looking figure 4.3 on the right chart, the larger proportion (96%) of women claimed not to own land with majority of them living within either their fathers' homes, married, or within the local market areas. Those in the latter have rented houses, 4% of the women interviewed disclosed having ownership to land which was either through inheritance, spousal benefit or through purchase.

4.3.3.1 Factors that Hinder Women's Land Rights

Through interviews with Government officers and NGO officials, the study investigated the factors that influence women when it come to their rights to land. These factors were summarized into four categories namely; low levels of awareness, culture and traditions, low levels of income, and lack of interest. Table 4.5 below depicts these results.

Table 4.5: Perceived Factors that may Influence the Rights of Women to Land

Perceived Factor	Number of Respondents	Proportion of Respondents
Low levels of Awareness	4	21%
Culture and traditions	10	53%
Low income levels	3	15%
Lack of interest	2	11%
Total	**19**	**100**

Source: Field based data (2018)

From Table 4.5 above, it was evident that culture and traditions (53%) influence how women relate to opportunities of achieving land rights. Poverty levels that could be attributed to the low levels of income in the study area affect how women access their rights to land. This is at 15% of influence. Low levels of awareness was perceived by 21% of the respondents as influencing the way women seek their rights to land. Lack of interest was also discussed and it turned out to be the lowest form of influence at 11%.

4.3.4 Role of the family and community in women's ability to access land?

The discussions on this section were as follows included varied responses from respondents from the community, Government and also NGOs. These include:

1. The role of family in resolution of land issues for instance, boundaries and unfair allocations, among others. They resolve these matters through arbitration and mediation when a case is brought to their attention.
2. The role of local administrators in resolving land matters as it is common for vulnerable family members such as widows and orphans to be harassed by relatives. They mediate and more often than not their proclamations carry the day. Albeit there are cases that were mentioned where the situations escalated beyond their capacity to address. When this happens, if the complainant is not able to get representation within the judicial avenues, their case is sealed because the harassment will not stop. More often than not the cases that go the legal route get resolved within painfully extended periods of time.
3. Land is inherently owned by men within the family and community at large, and that is what our culture prescribed. This therefore, means that women's access to land is mainly

dependent on the decisions made by the men. It is the practice for men to make decisions on how land is going to be utilized and who has access within the home. It is common practice that women access land through their husbands and male relatives. There are rare instances where fathers allocate land to their daughters.

4. It was noted that in the predominant luhya culture in the study sites, it is expected that women are the next of kin in marriage setups, meaning that they hold the land for their children. Nonetheless, most women are oblivious of this and are frustrated out of claiming their rights. In holding the land as next of kin it means that they have access to their husband's land and can eke a living out of it. Women are mainly intimidated by their in-laws who sometimes bully them out of their rightful place within family land. There are instances where brother in-laws claim to be in control of a deceased brother's parcel of land in wait, and would relinquish control over the land once the boy children mature. More often than not, these male relatives end up infringing on the boundaries set by their families leading to conflict and loss of land as source of livelihood. See the narration below from a widow (Focus Group, 2018):

   > *I lost my husband five years ago who left me with young children among them, three boys. My brother in-law has over the past years been extending the boundaries of his piece of land into our one and a half acre parcel of land. I have tried addressing this issue with family which did not yield any change. I decided to the go through the Government land office in Kakamega but the process is too expensive for me. I have been making trips to their offices without any success and I do not really understand what they want seeing all that I was requesting for is a title for the piece of land. I gave up on the process and hope that my sons will be able to fight for their right to land that was left for them by their deceased father. Nonetheless, I do not see this happening without conflict between my sons and my in-laws' children.*

5. It was shared by the respondents that it is common for local administrators to make proclamations over land matters that families have to adhere to but this does not mean the women involved will live in peace. When men fail to evict a woman from a parcel of land they frustrate them in the hope that they will relocate. There are cases of women of who have left their homes and gone out to rent houses in market areas to live in peace. These

women end up in informal employment and petty trade in the local markets to provide for themselves and their dependents.

6. Some responses discussed the role of men in calling for caucuses to resolve land issues but the underlying issue is that we resolve these issues based on our cultural beliefs and practices. Land belongs and is owned by men in the family whether it is ancestral land or individually acquired land. This is because women are expected to get land from their matrimonial homes. In cases where women access land is because the husband has given them the access to utilize the land for the sustenance of the family. In the case of widows, the family will allow them to use the land to take care of her children. These women hold the land in anticipation for their sons who are expected to inherit when they come of age. In case the widow only had daughters she will be allowed to live and use the land but they will not inherit the land. Moreover, these daughters are expected to leave their father's land and get married in the future.
7. There are cases where the widow is not cooperative or submissive; such are evicted by their deceased husband's family because she needs to "lay low".
8. The respondents gave information where there are instances where deceased husbands had made it clear when they were alive for their daughters to be given parcels of land but this is uncommon. This sometimes could lead to future problems with their husbands who might not be comfortable with the idea that their wives have land elsewhere. These husbands feel insecure because they feel that their wives will not be submissive enough as they have alternative abode when issues crop up in their marriage.
9. In instances where daughters have inherited land from their fathers, they are not allowed to live in the said land with their husbands. Both the husband and his in-laws will find that unmanly and many times such women are forced to abandon their inheritance.
10. In cases where women have land either left to them by their husbands or inherited from their fathers, the land will more likely than not be inherited by her sons. In cases where the woman insists on giving land to daughters, her efforts and those of her daughters in the said land will be frustrated.
11. There are a few cases where men have decided to acquire land elsewhere in order to ensure that they leave and inheritance in terms of land and property to their daughters. They do this because they are aware of the opposition their daughters would face if they are to be

bequeathed land in the same parcel as their brothers. However, these cases are very few according to the respondents.

12. It was a common theme among female respondents claiming that at times women are too afraid to reach out for help because:
    i. They do not have money to pay the administrators for help to resolve cases. It is believed that they have to tip the administrators to have their cases resolved;
    ii. The women have been threatened especially by in-laws or their male relatives so most are afraid to seek help. They also do not want to make worse their situation but would rather be meek and hope that their in-laws would take pity on them and allow them to carry out permitted activities within their late husband's farm land.

4.3.5 The case of Female-Headed Households in Accessing Land

Access is not so much an issue compared to ownership and control. Having said that, access to land for these FHHs is majorly dependent on the relationship the woman has with her in-laws, siblings and other relatives within her clan. For instance, if a widow is not considered submissive by her in-laws, her efforts to access land might be frustrated intentionally so that she leaves her matrimonial home. There are occasions where she may be allowed to use land that no one else is interested in because it has fertility or access issues. There are occasions where widows have been frustrated by their own sons to relinquish control over land that her husband left behind. This is mainly because the son(s) would be interested in selling off a piece of land and she is not in support of the decision.

Having painted the above picture, families have many times had to intervene to resolve cases pertaining to land especially regarding widows. It is true that they get harassed by certain family members including their own siblings who would not want to see them come back to their fathers' land. There are instances where families endeavor to establish boundaries of parcels of land to ensure no one encroaches on what is not theirs.

There were few cases mentioned where fathers of unmarried daughters set aside land for these girls even as they do for their sons. However, the respondents claim that this rarely happens in this region due to cultural expectations of how land is passed on from one generation to the other. There are cases where fathers anticipate conflict that may arise if they give land to their daughters

in the same property as their sons; they decide to purchase land outside the ancestral land and bequeath their daughters. There are avenues that are used to address conflict over land especially where women are involved. The first conflict resolution avenue is through immediate family members who are called in to aid in resolving the conflict. However, there are occasions where the aggrieved might decide to seek further conflict resolution avenues and more likely this will be council of elders, local administrators and land tribunals. Nevertheless, there are cases that have to take the legal judicial route but this has always seemed costly for aggrieved parties such as widows.

The respondents further added that in FHHs cases, the men many times refuse to help because land is a sensitive issue therefore, any help will be most likely be based on benevolence and not rights of these women. The reality is that female-headed households exist and their needs as regards land rights are dire. There are instances where husbands work away from home for extended periods of time and they are sometimes harassed by their in-laws on use of land. Unless the father in-law takes a strong stance and protects the rights of such a woman, she will not have uninhibited access to her husband's land

4.3.6 Awareness of the opportunities within Legal Framework regarding women's rights to land

In this section, there were no clearly defined moments where respondents especially during FGDs, were able to identify these opportunities. Below are some of the responses (FGDs, 2018):

1. *I know that we have certain rights within the Constitution of 2010 but not sure of the specificities.*
2. *I have heard that daughters now have the right to inherit land from their fathers*
3. *I hear that the Constitution provides for rights to land that does not discriminate by gender.*

4.4 Climate Change and Variability in Mumias East and Matungu

4.4.1 Climate Change Perception by Farmers

Climate change as a phenomenon formed an important part of the interviews and focus groups discussions with varying contributions from people of various ages, education levels, occupations and professions. Being that study sites are majorly agricultural areas this topic could not have been more relevant.

4.4.1.1 Understanding of Climate Change

When the question *what is your understanding of climate change* was asked, responses were varied. This questioned was mainly responded to in relation to rural lifestyle that is largely dependent of agriculture. The responses were also mainly focused on precipitation and temperature aspects of climate. One respondent (Focus Group, 2018) said,

> *It is difficult to understand what is going on nowadays because the seasons are changing in ways that we are unable to adjust to them [...]. For instance, periods that we considered as drought are now shorter with rains disrupting them in manner that is unpredictable. The rainy periods are longer than they should and this negatively affects our crops.*

Another respondent (Focus Group, 2018) was able to relate the changes in climate to outbreaks of vector-borne diseases especially malaria.

> *Yes we already had these cases but the bouts seem to be more than usual*, a young mother (Focus Group, 2018) explained as she expressed worries in meeting expenses that arise with diseases.

Changes in temperature were also talked about with many noting that it is a strange occurrence that nights are getting warmer during rainy periods which were not the case. Further, that the periods that were usually cold are shorter. This is also the period when we get a lot of mosquitoes and cases of malaria rise.

Even as the rainy seasons become unpredictable in this region, further frustrations emanate from the intensity in which it pours. The intensity of the pouring is too much; hence destruction of crops and structures becomes inevitable.

> *Our crops do well when rains fall with measured intensity but not with what we see nowadays,* explained one young male farmer (Focus Group, 2018).

Another young woman (Focus Group, 2018) chimed in saying that the dry seasons have also become intense when compared to the 80s and 90s.

> *The heat is too much and the nights become uncomfortable, which was not the case before. It is also strange that during the wet season, the nights are uncomfortably warmer. It is also common to experience less cold during the cold seasons,* she continued to explain.

One notable response was that it is now uncommon to see dew on plants in the morning as was the norm before. Attempting to give more details on precipitation in the study sites one man explained that between December and January the region always received short rains that would support cultivation of certain crops but over the past few years, there has been no rain during this period. Further, that the long rains seasons used to commence in April and last till June of each year but up to time that this study was being conducted in the month of May, no rains had been received. He was concerned that this would have a negative impact on their farming activities like it had several years back.

> *Uncertainty is becoming the trend,* remarked on local administrator (Interview, 2018) in the study sites.

4.4.1.2 Perceived factors that contribute to climate change

The study investigated the perceptions of the respondents regarding the causes that contribute to climatic changes and Figure 4.4 below presents the responses.

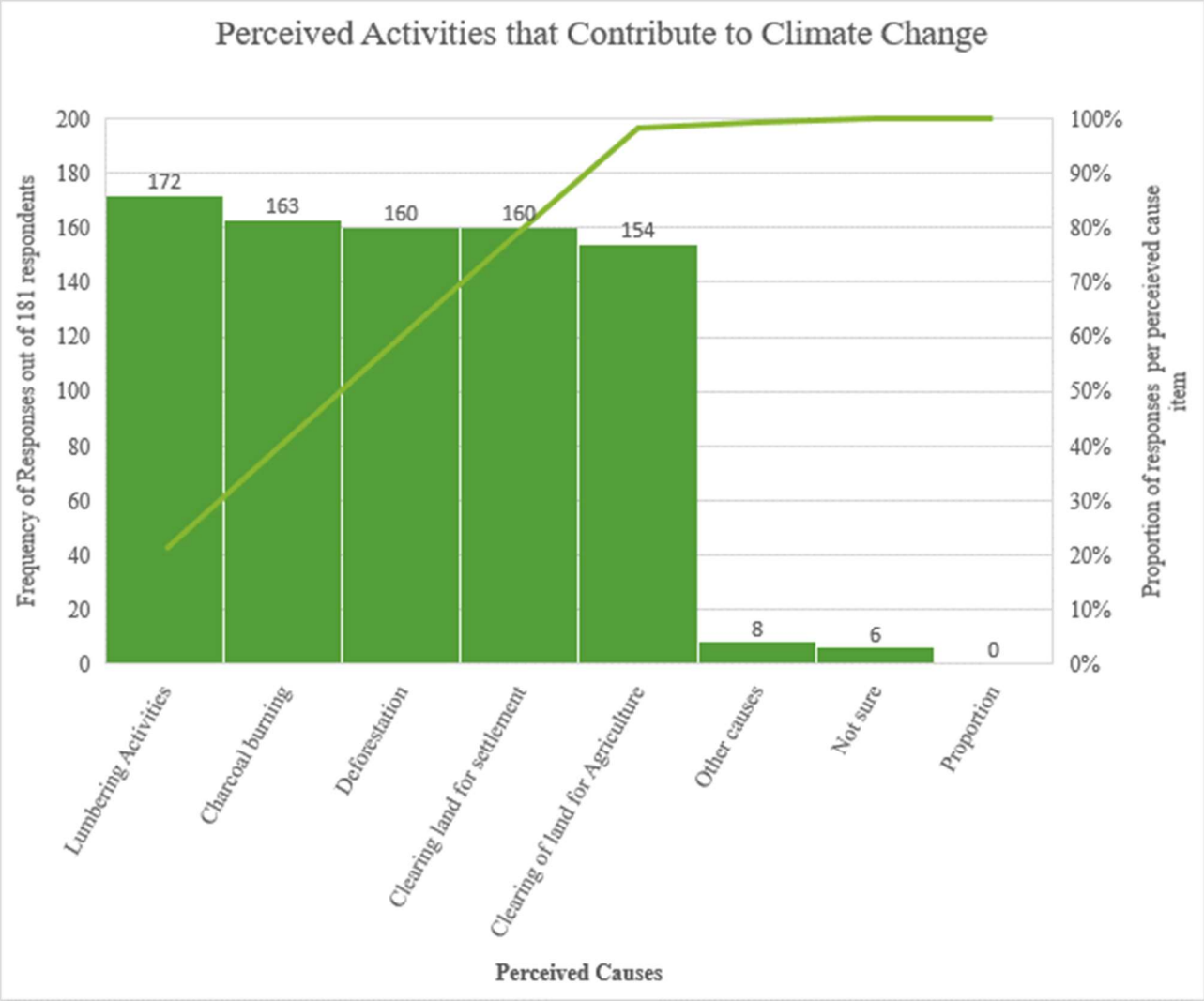


Figure 4.4: Representation of perceived of Climate Change causing factors (Source: Field based data (2018)

The common causes that resonated with most of the respondents involved Lumbering (21%), charcoal burning (20%), as deforestation, clearing of land for agriculture, and clearing of land for settlement all at 19%. There were 6 respondents who were not sure of the cause and 8 respondents mentioned other causes some of which were religious based. Some of the responses (Focus Group, 2018) are indicated below:

> *We know what is causing these changes and this is majorly due to the clearing of forests and bushes for settlement and setting up of markets. The population has increased*

exponentially over the years, for instance comparing the 60S and 70s and now, leading to deforestation. Wanton clearing of forested areas and bushes has contributed to longer dry spells, rivers and streams drying and flooding whenever it rains. Clearing has been necessitated by the ever increasing population that is need of land for settlement. There is also an energy sources need that is easily met by felling of trees to burn charcoal or convert the same to firewood. As a result, we have destroyed our environment.

Having lived over seven decades, I am afraid that the world is steadily headed to perilous times because this is not how to live. I am especially saddened by the destruction of indigenous trees forests. How do you make the decision to cut down a tree that is over hundred years old to burn charcoal that will only last you a few months? It does not make sense. But who is listening?

We have cut down trees over the decades and not replaced them at the same rate, knowing fully well that trees attract rainfall, break wind speeds, control surface runoff. Even when we replant trees, they are not the indigenous ones which used to encourage undergrowth that would aid in curbing destructive surface run-offs. In the 60s up to the 80s we used to walk through forests and bushes to get to neighbors but with increasing population these have been cleared to accommodate families.

4.4.1.3 Perceptions on Temperature Changes

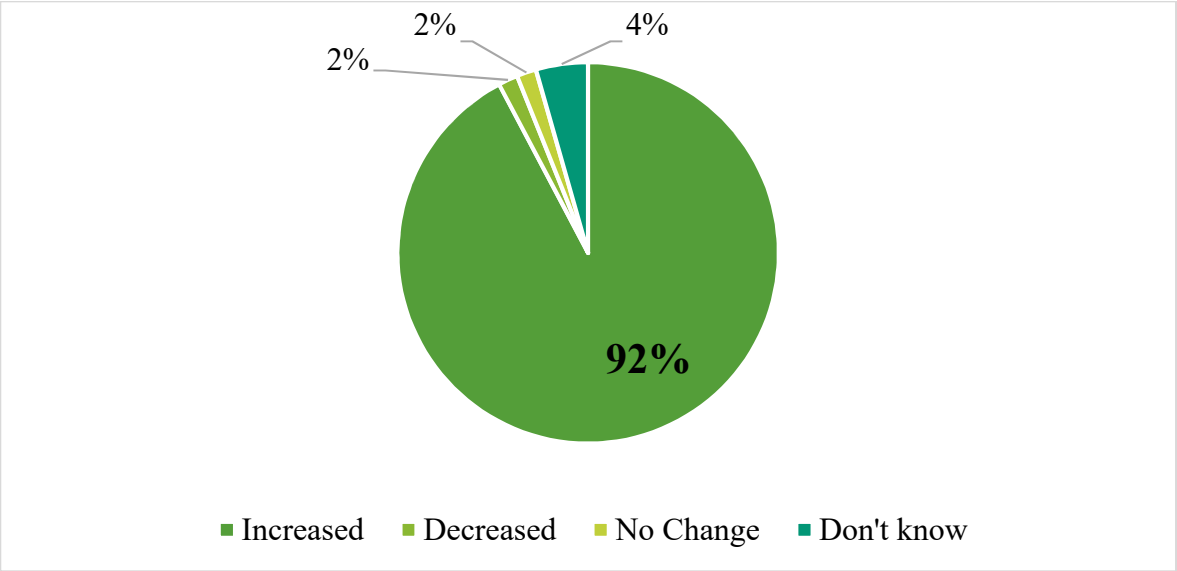


Figure 4.5: Perceptions in Overall Temperature Changes (Source: Field based data (2018)

According to Figure 4.5 above, about 92% (167 respondents) surveyed perceived long-term temperature changes. This percentage formed the bulk of views with other respondents indicating that they thought that temperatures had decreased (2%). Interestingly there is a very small percentage of those that did not know (4%) while another 2% indicated that they did not see perceive any changes in temperature.

4.4.1.4 Perceptions in Precipitation Changes

Figure 4.6 below represents the perceptions on precipitation changes according to respondents. 45% of the respondents reported that there was an increase in rainfall while (28%) indicated that precipitation was mainly erratic. Further, 26% expressed their perceptions on precipitation changes in terms of changes in the frequency of drought periods. Only 1 percent of the informants did not notice a change in the total amount of rainfall and another 1% indicated there was a decrease in precipitation. There was none that expressed their perception as not experiencing any changes.

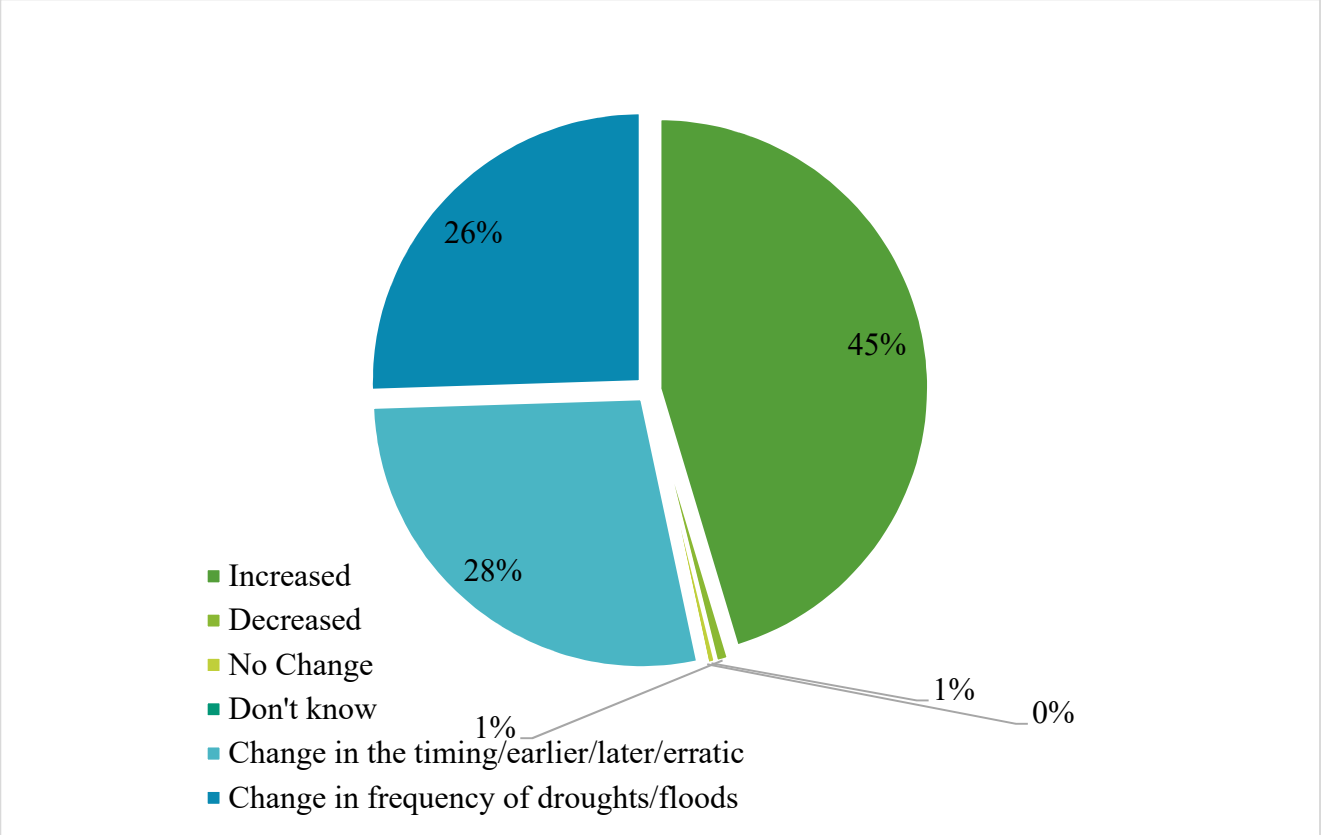


Figure 4.6: Perceptions of Precipitation Changes

Source: Field based data (2018)

4.4.2 Farmer Awareness of Climate Change and Variability

During the focus group discussions, the respondents were keen on describing the trends in how seasons are changing. The farmers explained that planting and harvesting seasons as were known several years have changed. For instance, February till April was planting season for staple crops such as maize and beans having received rain beginning of February. It meant that the months of April to June there would be less food in the homes but the months of July to September would usher in bumper harvests. Immediately there would be land preparation for maize and beans that are of a shorter maturing period to be planted in October and would be ready by December for harvest. The cycle would continue with land preparation in January in anticipation for rains and planting season that began in February. This cycle has changed such that, as reported by the respondents, in at least the last 5 to 10 years, it has increasingly become harder to predict the seasons. For instance by the time of this study in May 2018, rains had not been received as had been expected from February. One farmer (Focus Group, 2018) explained that as a result, those who went ahead and planted before the rains lost their crop.

> *We end up losing a lot of money, time and effort as a result of depending on rain-fed agriculture*, he concluded his remark.

Another woman (Focus Group, 2018) said,

> *It has become hard to feed our animals because the drought periods can be really intense in terms of sunshine that dries up grass and feeding areas. We are sometimes forced to sell off animals because we cannot provide for them. Those who keep them throughout the drought periods incur further expenses of buying feeds.*

These changes are a concern to these respondents as their lives and livelihoods are majorly dependent of agriculture. One woman expounded her concern indicating that contrary to how it used to be years ago, now both lowland and highland areas plant crops at the same time. The result of this has been famine, because of lack of food in the market during dryer periods; all the farmers plant food crops at the same time.

When the rains come, the intensity of the pouring is too much; hence destruction of crops and structures becomes inevitable.

> *You know crops do well when rains fall as expected and last as long as the crops require them to do*, explained one female respondent (Focus Group, 2018).

Even as the rains pour, they have been reported to cease too early and subsequently the crops flower too early. This results into crop loss and we have to cut down the same to feed to our animals.

4.5 Food Security in Mumias and Matungu

4.5.1 Understanding of Food Security

The study sought to obtain an understanding of food security as described by the respondents. How food is planted and harvested was an area of concern to all respondents. Rearing of animals and birds for both nutritional purposes and selling of by-products was investigated. Having sought the understanding of food security, the following were some of the responses:

Table 4.6: Summary of responses on understanding of food security

What is your understanding of food security?
1. Having enough food in the home to take care of my family's nutritional needs year round so that I do not have to rely on external assistance
2. Having enough food to the extent that I can sell some to meet other needs such as school and medical fees.
3. Being comfortable with my farm produce to the point that I can reserve some for sale during favorable market times.
4. Having enough food to store for future use.
5. I am food secure when the health of my children is uncompromised because we have enough to eat.
6. Food security means having enough food in my home so that there is peace between my husband and me. When there is scarcity of food, we fight a lot.

7.	It means that my children do not go without food and they can focus on working hard in school. You know these children do not learn well when they are hungry.

Source: Field based data (2018)

The common theme amongst these responses was having enough food to eat, store for future use, trade with to meet other family expenses.

4.5.2 Agricultural Practices in Mumias East and Matungu Sub-Counties

4.5.2.1 Land sizes

The study sought to determine the sizes of parcels of land that the respondents have set aside for agriculture and figure 4.7 below represents the responses. This depicts that while 42% of the respondents had 2 to 3 acres of land, 3% and 2% had 4 to5 and 5 and above acres of land respectively. Close to those that had 2 to 3 acres of land are the 38% of respondents that responded having over 1 to 2 acres of land. Only 7% had 1 acre parcels of land.

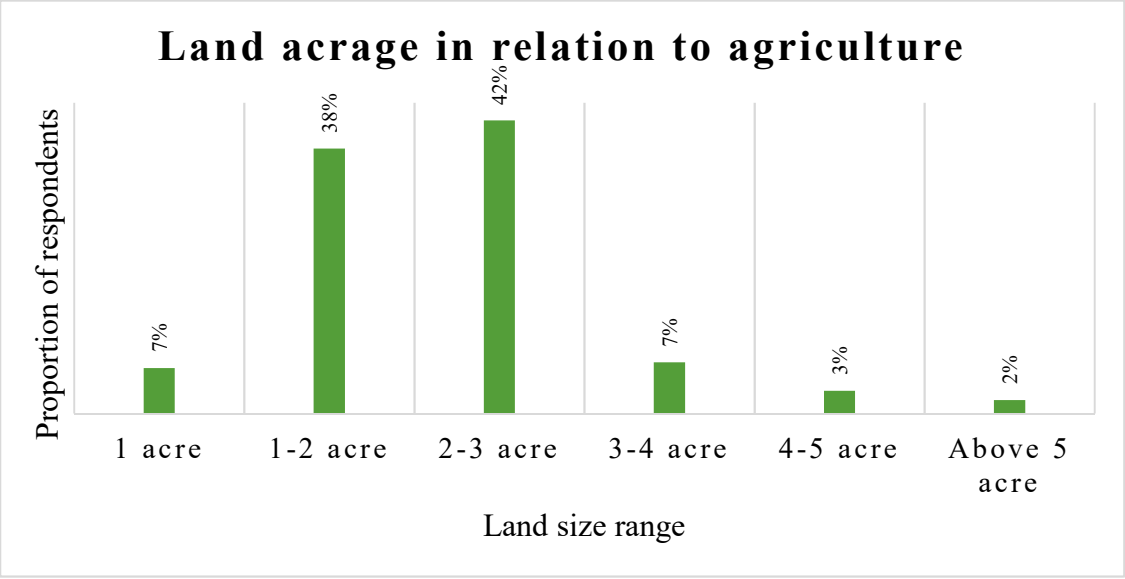


Figure 4.7: Representation of Land Sizes by Respondents (Source: Field based data (2018)

4.5.2.2 Food Crops grown in Study sites

This site sought to establish the main crops that are grown in the study sites by respondents who are largely considered small-scale farmers. This information is contained in Table 4.7 below.

Table 4.7: Main crops grown in Mumias East and Matungu Sub-Counties

Crop	Proportion
Maize	34%
Beans	24%
Sugarcane	17%
Indigenous vegetables	6%
Fruits	6%
Sweet potatoes	3%
Cassava	1%
Nuts	1%
Sorghum	1%
Millet	1%
Sunflower	1%
Bananas	4%

Source: Field based data (2018)

The results in Table 4.7 above show that Maize (34%) and beans (24%) are the most commonly grown food crops in the study areas followed by Sugarcane at 17%. Together, these three predominant crops count for 75% of the crops grown within Matungu and Mumias East sub-counties. In addition to the crops grown in the research sites, the study sought to get a grasp on the crops that are perceived to be abandoned by farmers. This was an important factor to consider when discussions were taking place on food security, with the farmers, administrators and technocrats from NGOs and Government. Figure 4.9 below carries the representation of the responses from farmers.

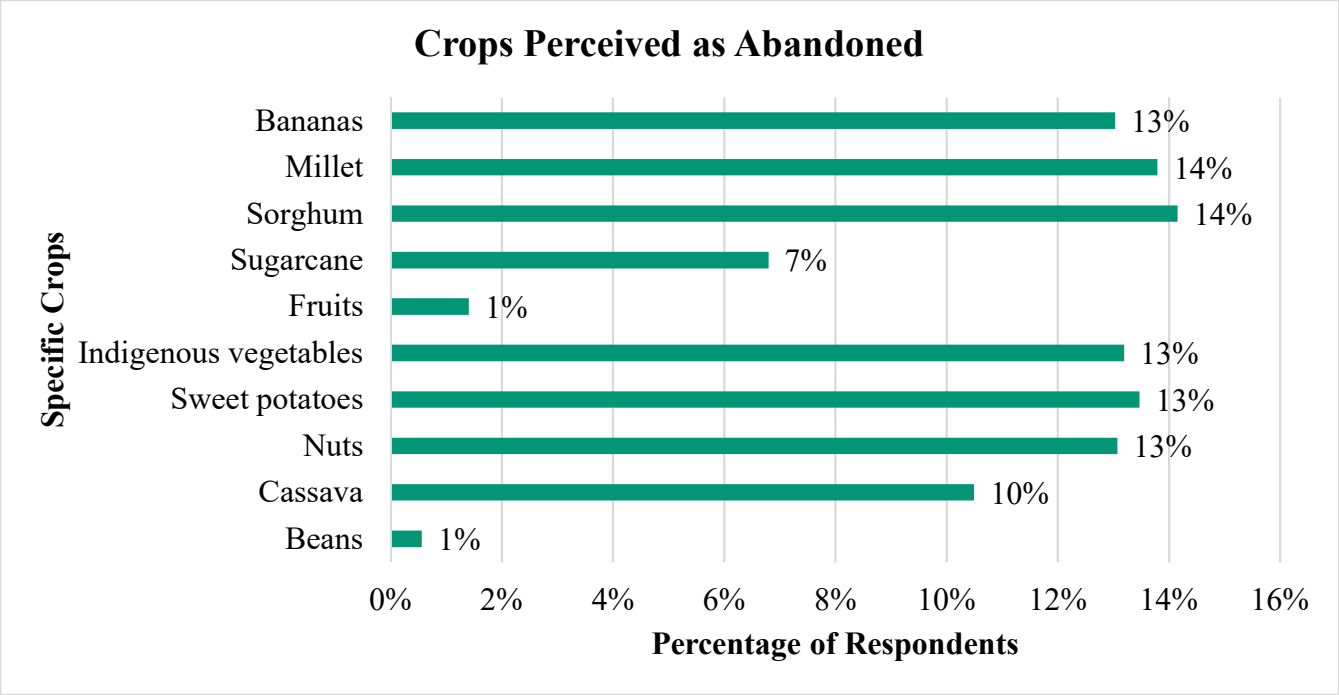


Figure 4.8: Perceived Abandoned Crops (Source: Field based data (2018))

According to the figure 4.8 above, some farmers reported to have abandoned the cultivation of crops, most of which are considered indigenous in the study sites. The crops with the highest responses as abandoned include millet and sorghum both at 14% and beans and fruits being the least abandoned both at 1% responses. During the discussions and surveys, there were reasons associated with the abandonment which included:

1. Adoption of sugarcane farming
2. Climate variability
3. Poverty
4. Attitude related to perceived backwardness of certain indigenous crops
5. Altered preferences
6. Labor intensiveness required to nurture certain crops
7. Changes in soil fertility
8. Lack of knowledge required to nurture certain crops
9. Alternative sources of crops such as markets

The field study found out that crops that are short-term maturing and drought tolerant had been abandoned with the advent of cultivation of sugarcane that targeted the sugar millers around the study sites. According to the respondents, sugarcane had also been abandoned in the past 5 to 10 years because it was no longer a viable crop for the millers who were operating under capacity. Instead of the farmers looking back to planting the short-term maturing and drought tolerant crops such as sorghum and millet, they quickly adopted planting of maize and beans as both cash crops and subsistence purposes. This is mainly attributed to the narrative that Western Kenya best produces maize and beans both for export and for internal markets, despite the unfavorable weather.

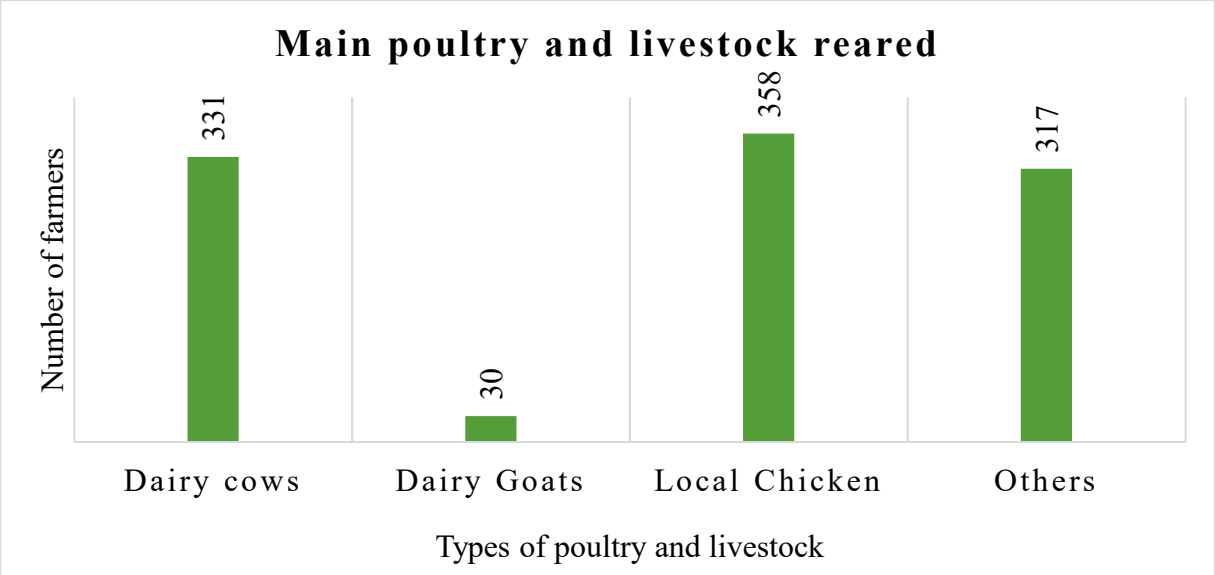


Figure 4.9: Rearing of Poultry and Livestock (Source: Field based data (2018)

The research further engaged the respondents to understand their livestock and poultry keeping practices within the study sites. The total number of respondents surveyed as represented in Figure 4.9 above was 365 and 331 of them indicated that they reared dairy cows while 30 dairy goats. Further, 358 indicated that keeping local chicken was part of their poultry keeping activities, with 317 indicating that they reared other animals and birds.

4.5.2.3 Incomes (Monthly) of Farmers from Farming

It was imperative for this study to establish the respondent's income associated with farming. What was obtained was monthly income in local currency Kenya Shillings. Figure 4.10 shows that 5% of the respondents reported having a monthly income of above KSH25, 000. On the extreme end of the scale, 8% responded by stating that they receive below KSH5, 000. Another 35% and 27% of the respondents confirmed that they receive a monthly income of between KSH5, 000- 10, 000 and KSH10, 000- 15, 000 respectively. Lastly there was a category of 16% that receive KSH15, 000- 20, 000.

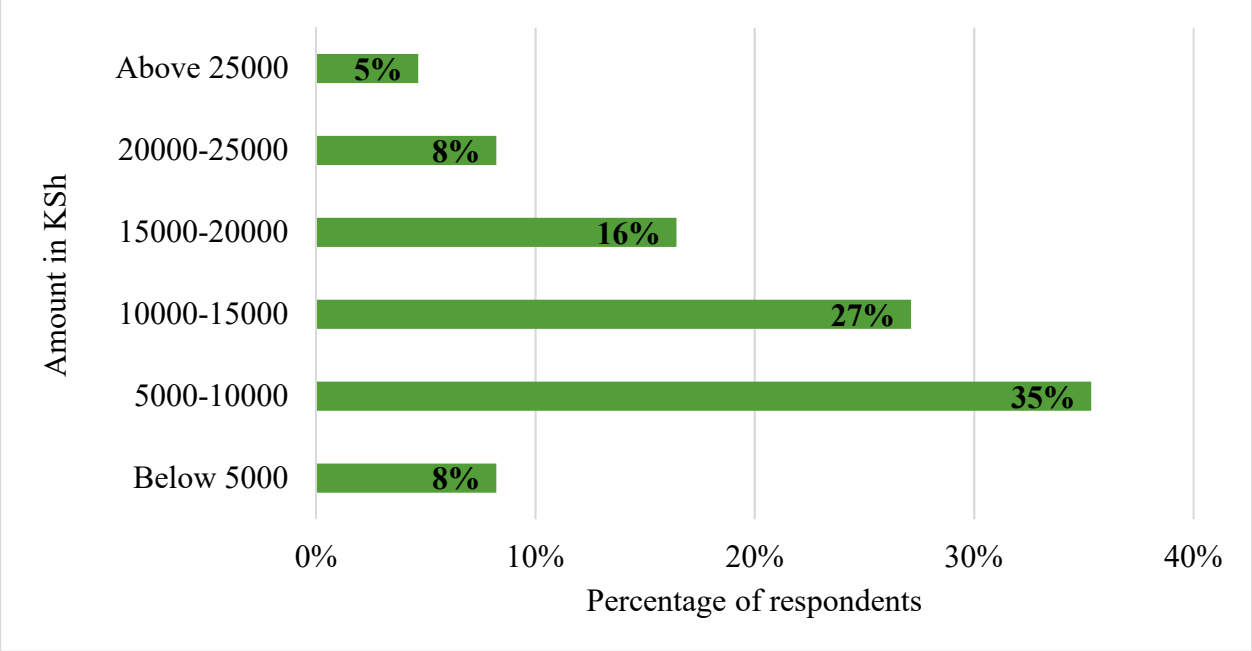


Figure 4.10 Monthly income of farmers from farming (Source: Field based data (2018)

4.6 Agricultural Adaptation to Climate Change

4.6.1 Role of Community in Ensuring Food Security

During the discussions and interviews, it was imperative that this study gather information on how the community perceives it role in ensuring food security within the study sites. The following was feedback:

4.6.1.1 Crop diversification

Crop diversification featured in all the discussions and interviews probably suggesting it perceived importance by the community. One female respondent (Focus Group, 2018) suggested that this approach would have families possess enough food to last through out the seasons. By this she also made reference to foods that were grown the older generations including cassava, sorghum, local vegetables, Bambara nuts, sweet potatoes and many others.

> *This is in addition to the maize and beans that we now grow*, she said. *The problem with our generation is that we see these crops as inferior yet they would serve as better through the unstable climatic conditions*, she concluded.

There were other similar responses that would be summarized as a suggestion to returning back to indigenous ways of farming that would also mean spending less on purchasing food.

4.6.1.2 Seed Bulking of Indigenous Crops

In as much as it is possible to purchase seeds of many food crops, the respondents agreed that it would make economic sense to begin saving seeds of indigenous crops. This would also present opportunities of preserving the right seeds and also ensuring that many community members access the same at lower costs.

4.6.1.3 Organic Farming

The respondents brought up the discussion on embracing organic ways of farming. One of them, a man shared experiences on the use of organic fertilizer stating that this approach has various advantages to it including its use of readily available resources and knowledge. However, another respondent made a remark pointing out the time and consuming nature of preparing such inputs. Another respondent (Focus Group, 2018) retorted saying:

> *The alternative to organic manure of commercial fertilizers that we buy from the local markets which are ruining our soils making them too acidic for any crops to thrive*.

4.6.1.4 Diversification of Livestock

The contributions to this aspect of farming was the consideration of trying new livestock such dairy goats, rabbits and poultry, all these targeting both local and distant markets. Some of the respondents added on claiming knowledge on the nutritional value of products of livestock such

as milk from dairy goats. Aside from nutrition these farm animals and birds were said to fetch better prices in the market.

4.6.1.5 Enhanced Food Storage

One female respondent (Focus Group, 2018) in sharing her views on storage of harvest said,

> *We need to learn not to sell our food but store some for future use especially drought periods […] these periods are not strange to us hence, when we decide not to plan for them our families suffer*.

Food storage was an area of discussion that seemed to concern most respondents as they made reference to having harvests that the Government and local markets could not take. They were grappling with storage as a factor of ensuring food security. One female farmer (Focus Group, 2018) added:

> *We have a lot of maize in our granaries but we are not sure these will hold because we knew our local Government Cereals Board would take in our harvests.*

4.6.1.6 Capacity Development Opportunities

There was discussion around embracing opportunities that may sharpen already existing capacities to farm in a manner that embraces the obtaining contexts. These include climate variability and its effects as one of the operating contexts. One respondent (Focus Group, 2018) noted the opportunities but impressively said:

> *The only problem is that a lot of women attend these meetings while men are not too interested. This makes it hard for the women to come back home and implement what they have learnt.*

What followed were responses to the aforementioned remark. One notable remark (Focus Group, 2018) that was reinforced by similar responses was from a middle aged man which can be paraphrased as,

> *These NGOs that come around taking our women through courses on food security and yet they do not seek our opinions and permission, we shall see where those women will practice what you have taught them […] you must realize that we are the owners of the land.*

Another respondent (Focus Group, 2018) added:

Yes, capacity building opportunities are there but the issue is that their target audience is vulnerable groups which mainly include widows and women in general. It is important to include men because we feel left out and our importance is overlooked. Look, anyone can come to tell these women about their rights and how we men need to support our women, but what about the men? We own the land, so how do you come along and turn our women into people that question our decisions and traditions on land matters. Why are men not as involved in these initiatives if it is true that you want to effect change in the way we deal with livelihoods development and food security. These NGOs can continue with their projects but as long as men are not actively involved, their efforts will be frustrated. We are the men!

Another feedback regarded self-help groups (SHGs) that are mainly associated with women but are now steadily catching up with men's involvement. For a long time these SHGs have been commonly referred to as *chamas* or *merry go rounds.* The men are however, more interested in what is referred to as Savings and Credit Cooperative Organizations (SACCO). These organizations were perceived as avenues to access credit, grants and other capacity development opportunities.

Below are a few other responses (Focus Group, 2018) in verbatim:

1. *Early planning and preparation of land and seeds in anticipation for rains and planting seasons*
2. *Agro-forestry will be of great intervention in our farms for example, fruit trees will be of importance as they will provide fruit, shade and reduce carbon in the atmosphere*
3. *Planting indigenous trees to control rainfall and attract rains*
4. *Adoption of activities such as soil sampling to ensure the health of soils and proper crop planting-research on soil fertility by Government agencies such as KARLO through NGOs and Government Agriculture Officers.*
5. *To ensure that food will be available throughout the year mixed cropping will be of great use in that we plant food of different lifespans. This way we will have food in abundance*

4.6.2 Role of Community in strengthening the role of women towards Food Security

Embracing societies and Saccos was mentioned once more as one of the avenues to help women improve their chances of providing for their families.

> *There should be a mechanism that allows the women to bank their harvests which can be used during hard times or when market prices are favorable,* one woman (Focus Group, 2018) expressed.

In addition access to credit was another avenue identified, through banking of harvests, upon which other family needs such as paying school fees, medical expenses and expanding agri-business ventures, can be met.

> *Secure access to land is a starting point in this matter*, an area female Assistant Chief (Interview, 2018) said. He continued to explain why? *It would be easier for our families to be food secure throughout the year if we had unlimited support from our male relatives to access land. It is frustrating for a woman not to be able to provide for her dependents because her male relations are not allowing her the freedom to use farm land. Many times, such women are forced to go and get casual employment in other people's farms to get money to feed their dependents including their husbands. There are times when women have had to lease land outside their homes just to have land to cultivate and provide for their dependents. This is because they have been denied access to land.*

Various respondents laid emphasis on the need for women to be supported by local leaders especially village elders and assistant chiefs. This is mainly in helping to identify cases where the rights of women to land are infringed upon. It was explained that women are also unable to raise the resources that would be required of them when their cases are being resolved at the local level. If these expenses can be waived it would increase their chances of getting justice using the local avenues.

Lastly, the role of male relatives such as husbands was discussed because they are the custodians of land within the study sites. The women were short of pleading with the men in the discussion groups to allow them secure access to land. Here is feedback from one of the women (Focus Group, 2018):

> *I wish my husband would allow us to lease part of our three acres land to raise money for me to engage in alternative type of farming that is not maize and beans. I want to engage in horticulture which will improve our diet and save money when I reduce the money I*

spend in the local market. These savings can be used for other initiatives. But he would hear none of it because he wants to be in control.

4.6.3 Institutions and Legal Framework

4.6.3.1 Perceptions about Climate change, food security and Women's Land Rights policy in Kenya

The relevance of policy and statutes was an area of discussion with the respondents. It was also noted that policy development at the grassroots level goes beyond that which is written in legal frameworks. In this set up administrators, the respondents mentioned that it is common for administrators to make certain decrees and declarations. These are tailored to address certain hurdles in the legal process that are to benefit their communities. During the study the administrators interviewed were honest to own up to the fact that they were not conversant with the policies and statues that govern land, environment and agriculture in the country.

The respondents noted that even though the Constitution of Kenya, 2010 took away executive powers that administrators had to declare certain policies at the grassroots; the reality is that they still make policies. There are many instances where the administrator has to put their foot down and make certain decisions because it is them that deal with issues such as liberalized markets that do not care about the food security status of FHHs. They continue to monitor and are forced to for instance, bar widows from selling their produce during unfavorable times. For instance, during the time this study was carried out, two kilograms of the staple maize would not fetch more than KSH50 (USD0.5). During the favorable market periods, the same would fetch about KSH100 (USD1).

The administrators interviewed laid claim to not having adequate opportunities to increase their knowledge of the legal framework. This also includes not having the frameworks physically to make reference to. However, there are ways that we contribute to the formulation processes, for instance by sharing reports to seniors from the grassroots of the realities on the ground that need to be addressed. Within the reports are also recommendations on ways to better address issues of climate change both in mitigation and adaptation. The reality is that people in these jurisdiction look up to the administrators to provide solutions to prevailing hardships such as food insecurity, high costs or absence of farm implements such as fertilizers and seeds. Since they are not involved in contemporary policy making forums as they should, they can only relay realities and

recommendations. The respondents hoped that the feedback is escalated to the required level of decision-makers. During the period of this study the administrators were working on a report on the effects of the recent floods in their respective regions. One of the issues that has been an eyesore is the loss of food crops and disease outbreaks in livestock and birds. They hoped that this report would paint a clear picture of the adverse effects of Climate change in the community but also to recommend solutions that are relevant within their settings. Reports made on sand harvesting, encroachment in riparian areas are observed shared with higher offices to take action.

4.7 Conclusion

In summary, this chapter presents detailed the results from data gathered during in-depth interview, focus group discussions and through survey questionnaires. The main objective was to look at how gendered differences in land access affect climate change adaptation and food security interventions in rural Western Kenya. The imperative findings are summarized as follows: 1) all the respondents were explicit about their view of land as a resource upon which their livelihoods are anchored in their rural area, irrespective of their gender, 2) that land ownership and access is a source of security and gives people a sense of identification and acceptance within the community, 3) that land is a source of power, especially for men in the rural areas, 4) women who owned land are viewed as untamable especially by men in the rural setting, 5) low awareness on the rights and responsibilities within legal framework on land rights, 6) perceptions about climate change were varied but common in the sense that the respondents could relate on unpredictability and its effects, 7) respondents were able to identify caused of climatic changes, 8) gauging the understanding of food security and types of food crops to the rural community members provided vital information on the state of food security, 9) Abandoned foods that are known as drought resistant and require less specialized treatment to thrive was discussed, 10) Activities focused on climate change adaptation and capacity development of farmers were discussed based on feedback from the respondents, 11) finally legal perceptions about Climate change, food security and Women's Land Rights policy in Kenya in the context of legal framework was presented.

CHAPTER FIVE
DISCUSSION

5.1 Introduction

This study explored the nexus between climate change adaptation and women's access to land and how the two affect the livelihoods and food security of all households. The focus of the study was on investigating the extent to which gendered differences in land access affect efforts towards food security in rural Western Kenya. This chapter focuses on the discussion of the findings realized during the course of research. The first (1) section delves into the relationship between land access and adaptation to climate change to achieve food security. The second (2) section focuses on adaptation to climate change strategies within the context of gendered land rights. Section three (3) considers an inventory of strategies to protect women's land rights in light of the climate change-food security nexus.

5.2 The Relationship between Land Access, Climate Change Adaptation and Food Security

5.2.1 Understanding climate change, its implications on livelihoods and food security

As Bryan *et al.,* (2013) argue that climate change is expected to adversely affect agricultural production in Africa, the same was expressed by respondents engaged in the course of this study. In fact, rural respondents were very emphatic about the hostile effects of climate change on crop production and changes in land used for agriculture. Further, they demonstrated how climatic changes affect their sources of livelihood that are directly dependent on agriculture and food production. Respondents in all focus groups and interviews stated that the climate in their locality has changed. They went further to draw differences between different eras (1970s, 1980s, 1990s and 2000s) and how these changes have affected their agricultural output and contributed to food insecurity. This situation is further complicated by the transition of most farmers from sugarcane as a cash crop to maize. The latter serving both as food and cash crop to support livelihoods and food security within households. According to the respondents, sugarcane had also been abandoned in the past 5 to 10 years because it was no longer a viable crop for the millers who were operating under capacity. Instead of the farmers looking back to planting the short-term maturing and drought tolerant crops such as sorghum and millet, they quickly adopted planting of maize and beans as both cash crops and subsistence purposes. This is mainly attributed to the narrative that Western Kenya best produces maize and beans both for export and for internal markets, despite

the unfavorable weather. Unpredictability of weather is still a new phenomenon to this rural community, which further complicates agricultural planning because climate information from Government institutions is not shared. Discussions with agricultural officers and local Government administrators indicate that information on climate is not readily available. In an era that has seen many rural inhabitants in Kenya access mobile telephony, sharing of such information should not be a problem. This was argued in most of the interviews and focus groups.

The older members of the rural community shared critical information on why the changing climate will continue to negatively affect agricultural production. They also shared mitigating opportunities that are at their disposal. For instance, they cited increasing population that is dealt with by wanton clearing of forests, rather than conserving indigenous trees that *attract* rain but also break the speed of runoffs. The Constitution of Kenya, 2010, the Land Act, 2012, Forests Act, 2012, among other statutes espouse environmental conservation and sustainability. In fact, the Constitution of Kenya 2010, the supreme law in Kenya, Article 69 (b) stipulates that the country should achieve and maintain at least ten percent of tree cover. It seems that despite both the Government and citizen's knowledge of the importance of conserving trees, there is some disconnect between the implementation of initiatives that would aid in conserving tree coverage, including those in farmlands. Interviews with some officers from the Kenya Forest Service (KFS) confirmed the availability of tree seedlings that could be accessed by farmers. However, coordination between KFS, Agricultural Extension Officers and the local Government Administrators to provide seedlings and conservation knowledge is not done effectively. Similar results have been found by Luwanda and Stevens (2015) who conducted an evaluation on the impact of Malawi's Community Based Rural Land Development Project (CRLDP) two years after its phase out in 2011. In this study, they was realized that access to extension services was a major challenge to project beneficiary groups; attributed to poor collaboration of stakeholders including the public sector private sector and the NGO sector in closing the service and information gaps needed.

This study found that agricultural extension officers ideally are expected to play a critical role in helping local farmers mitigate and adapt to climate change. The current situation as described by farmers is that they hardly reach out to them. Ndiritu *et al.,* (2014) argues that with few exceptions, services such as extension look at the gender of the household head rather that the specific plot or

farm manager (mostly women). A study by Akotia (1999) on the influence of gender relations on extension delivery in Dangme West District of Ghana showed that the relationship and participation in extension activities involving both male and female agents and farmers are skewed positively towards men as against women farmers. From this two scenarios, we can consider that the influence of gender and access to extension services be factored into policy development in African countries as this study indicates that this study is not an isolated case. It is, therefore, possible that climate change adaptation interventions are not targeted at the right audience in this instance. On the other hand, the extension officers claim that the farmers do not reach out to them for help. This study found that the approach to extension service provision by the extension officers denies the farmers opportunities to mitigate and adapt to climate change. In fact, Lopokoiyit, Onyango and Kibett (2013) recommend that extension management requires partnerships built on trust and effective communication with various stakeholders, and in this case farmers are critical to the success of such initiatives.

Nonetheless, one local NGO shared their previous five-year project activities that created a linkage between KFS and local farmers to access tree seedlings as they were encouraged to work towards having ten percent of their farmlands under tree coverage. It was also during the focus groups that farmers expressed interest in agro-forestry that would see them grow and protect fruit trees rather than other types of trees. There is a study by with results that demonstrate the important contribution of agro-forestry in adaptation and conservation, by Asena, Mugalavai, Nyandiko (2017). Their study was on enhancing farmers resilience to climate variability through agroforestry practices in Vihiga Sub-county located in Kenya. In their study they found out that farmers practiced agro-forestry for a number of reasons which include: for provision of buffer areas for crops against extreme heat, heavy downpour, and wine breaks. Another study by Mulinya, Ang'awa, Tonui (2015) presents other conservation practices that contribute towards food security within Kakamega County. One of the strategies is important for this study even though it was covered, i.e. taking covers to cushion from severe crop losses. It would be interesting to find out more in another study how this strategy has been embraced within the study sites, if at all.

Conversely, the older members of the community countered this approach by insisting that the younger generation should desist from cutting down indigenous trees. This type of discussion replicated itself in most focus groups. Even so, it was clear that the solutions to their current climate

change induced problems on agriculture could be found amongst themselves as community members. Finding a balance between local indigenous knowledge and contemporary expertise of the Government officers would help this community deal with the effects of climate change, as well as be better prepared for future uncertainties. To this end, the discourse on using indigenous knowledge to manage the effects of climate change, conserve the environment, and achieve food security can also be addressed from a gender perspective. Women are the main custodians of this knowledge passed down from one generation to another as they are a major participant in rural agriculture. In line with this, Denton (2002b) broaches the policy angle that is missing in the development and conservation of indigenous knowledge, and more so where women are concerned. Her study (Denton 2002b) argues that if climate change policy is about ensuring a sustainable future by combining development and environment issues, it must take into account the interests of all stakeholders. Through her study (Denton 2002b) she notes that minimal work, if any, is undertaken to hone women's indigenous knowledge and expertise- or policy makers tapping into this knowledge. Denton (2002b) concludes by arguing that unless efforts are taken to incorporate indigenous knowledge into mainstream policy, it will continue to be a case of standing knee-deep in the river and dying of thirst.

5.2.2 Access to information on climate change and adaptation

It was almost unanimous for farming respondents to claim that they had little to no access to sources of information on climatic changes and variations. Further, they expressed the dire need to have a clear source of such information to inform their farming activities as the weather has become unpredictable. Respondents recounted their experiences with crop losses and challenges with feeding domestic animals because they could not plan farming activities according to the unpredictable weather changes. Interviews with local NGOs showed that the Meteorological Department whose offices have been decentralized does not have a mechanism to effectively share climate information as is expected of them. One local NGO officer narrated their experience with past agricultural projects that used mobile telephony through messaging to share climate information. However, these initiatives collapsed due to lack of funding and follow up coordination between farmers and the Meteorological Department. This unsustainability experience is not only unique in such a rural area in Kenya. Saravanan and Bhattacharjee (2014) in studying mobile phone applications for agricultural extension in India explain how pilot projects are undertaken in project mode and after the project period sustainability becomes a major hurdle.

They (Saravanan & Bhattacharjee, 2014) recommend that instead of standalone projects focus should be on integrating such initiatives with ongoing agricultural extension programmes and methods, and also include public –private partnerships to implement integrated applications that cater to the farmer specific information and knowledge. This recommendation could be a starting point where both government and NGO extension programs can begin to look into programming that is sustainable.

The availability of mobile phones in rural Kenya has allowed farmers to have better access to information and it was the view of various respondents that this presents an opportunity to access climate information.

Chhachhar and Md Salleh Hasssan (2014) argue that in one study the use of mobile phone in Kenya to identify and manage livestock diseases enabled farmers to obtain agricultural and livestock information from relevant authorities. This provides evidence that replication in Western Kenya would meet the critical need for climate information by rural farmers. The local Government Administrators stated that their *barazas* (meetings) would present ample opportunities for Agricultural Extension Officers to convey relevant agricultural information to the farmers. This therefore, means that there are local solutions available for relevant stakeholders to deal with the challenge of lack of access to information on climate change and variations.

5.2.3 Understanding the implications of climate change on women land rights

According to the reviews conducted, there is a paucity of hard evidence on gender and climate change and by extension the direct connection to women's land rights. If anything, gender in climate change discourses and literature only seemingly includes gender issues as an appendage. In fact, Doss, Summerfield and Tsikata (2016) interpretation of this predicament has described the situation as chronic gender blindness of mainstream literature that has resulted in parallel development of gender literature. This study finds that there is a connection between climate change and increasing discrimination by gender on access to land. This was drawn by respondents in the study, especially from experiences of vulnerable women such as widows and the never-married women. In the study area, wanton cutting of tree cover is associated with men as women are not culturally allowed to cut down trees. Trees are majorly cut down for purposes of burning charcoal and lumbering for sale; exposing land and other resources to the negative effects of climate change. One woman whose husband is deceased mentioned losing fertile land that

belonged to her husband to her brother-in law and only allowed access to unfertile land that was devoid of tree and vegetation cover. The same land is rocky but she has had no option than to cultivate it.

There is a case study outlined by Wedeman and Petruney (2018) featuring the situation of landlessness of women who were prevented from gaining access to farmlands by their husbands, and these women live in seclusion (in a traditional practice called 'kubli'). The situation was made worse by scarce land resources, extreme poverty, high population growth, and most importantly by deteriorating drought conditions. This is an example of an extreme case where women's rights to land have been curtailed. In this case CARE Niger launched the "Women and Land Initiative" in 2010 and through awareness- and support-building campaigns, some women's groups have been able to lease community land and by 2012 the case of women inherited land within the region increased to 8% from 4% (Wedeman and Petruney, 2018). Such a case demonstrates that denial of land rigths based on gender is not unique to a rural areas such as that of this study, but there are solutions that can be borrowed and customized to fit the different contexts in terms of geographic space.

Another old woman narrated that deforestation has contributed to land losing its value as it gets exposed to flooding and increasing temperatures each year. This she explained had led to a decrease in fertile land of which women's access was dependent on their male relatives. Such discussions led this study to conclude that rural inhabitants are able to draw a connection between effects of climate change and women's vulnerabilities including insecure land rights. Indeed, estimates indicate that only a paltry 1% of women in Kenya are sole registered owners of land and only 5% of women are registered owners of land jointly with their husbands (Kameri-Mbote and Muriungi, 2018). Such statistics point to the fact that climate change is likely to aggravate the already dire case of women's insecure land rights. Kameri-Mbote and Muriungi (2018) further claim that assessment on the Kenyan case shows that lack of express allocation of finances from the state to institutions mandated by law to increase women's ownership and control of land despite the general consensus about the weak economic status of women that limits their ability to acquire land.

Vulnerable women such as widows lack the necessary financial and social resources to seek justice where their right to land and resources has been denied by family members. Compounding the

aforementioned is that the efforts put in place to solve women's climate change induced problems patently excludes them from the climate change decision-making process, as Denton (2002b) notes. This study confirmed this after women in the focus groups and interviews claimed not to have been directly engaged in solution-finding ventures by Government agencies or NGOs. Further, the women demonstrated having indigenous knowledge on food crops that would aid in adaptation. However, their ability to implement these solutions is inhibited by limited decision-making on crops to cultivate on the farmlands. One woman said that the men insist on planting cash crops such as sugarcane and maize which are greatly affected by climate variations. If given the opportunity to make decisions, she would plant traditional high value crops that are drought resistant, mature within short periods and are not affected by market dynamics.

5.2.4 Benefits of access to land for women and households

The land tenure system in Kenya comprises of private, public and community land, and for the case of the study site land tenure is private. Even though various legal frameworks secure women's right to land, they still face socio-economic hurdles that frustrate their efforts to have secure livelihoods and provide food for their households. Musangi (2017) and Kameri-Mbote (2015) argue that women's legal rights have been provided for but ignorance of such rights exacerbated by illiteracy and more importantly customary practices, result in women only enjoying secondary rights to land. Women in most focus groups stated that they do not own land but access it through their male relatives. They however, expressed knowledge of the importance of secure access to land as they are critical providers of food for their dependents. One woman said that if she does not work on her husband's farmland, her family will have nothing to eat. Another one added that the difference between her children going to bed hungry or going to bed with full stomachs, is dependent on her efforts on the farm.

Even though land was widely perceived as a pivotal source of livelihood by both men and women in the rural study sites, the issue of women's land rights elicited heated responses. The men almost universally agreed to the fact that women provided much needed labor and agricultural expertise in production of food and turning produce into marketable goods. What seemed agreeable with the men is access to land as capital of production by the women because they too benefited from women working the land. However, the issue of ownership and control was not debatable because culture dictates that land is owned and controlled by men. Nonetheless, during focus groups

women were divided on women's land ownership and control. In some cases, education levels seemed not to affect how women viewed ownership and access in the study sites. In fact, one female Government official indicated that she would not venture to seek her share of land inheritance from her father, nor expect her husband to co-own land with her because she "would not want to be cursed". This particular female respondent also sits in the County Land Board that is mandated with addressing land injustices according to the relevant legal frameworks. I was left to wonder what kind of decisions she influences once cases are presented to the Board, more so those involving vulnerable women. In the same Land Board another Government official indicated that he would not co-own land with his wife nor bequeath any of his daughters land because that would destabilize their future marriages. On the other hand, there were few women who expressed the desire to own their own parcels of land. One of them is a married woman who augments her income from farming activities by selling wares at the local market. She stated that she was saving up some money, however secretly, to purchase two acres of land after her husband married a third wife. She explained that her decision is based on the fact that she only has daughters and does not anticipate them inheriting any land from her husband who now has sons from the other wives. She would like to secure a home for her three daughters and herself when she grows older. Another married female respondent explained that she has bought her own plot of land near the local market with her name on the title. However, she would never disclose this to her husband because she would lose her marriage. The majority of key opinion leaders interviewed recognized the need to protect vulnerable women from discriminating and disenfranchising practices. However, they acknowledged the challenging aspects such as beliefs that are engrained within culture that the community observe. The discussions saw a link drawn between women's secure access to land and families' access to other vital welfare aspects such as healthcare and education. This was after the men acknowledged that women allocate most of their resources obtained from land accessed for agricultural activities to family welfare. This was also stated in other focus groups.

Overall, it seemed that the understanding of *access to land* bore different meanings for men and women interviewed. The men generally stated that women have access to land, however, the men make critical decisions on the activities within the farmlands. The women are there to provide much needed labor and ensure that the households are food secure. On the other hand, the women interpreted access to land to be without inhibitions because they are the ones who know the nutritional needs of members of their households. These discussions elucidated the underlying

issue of *power* that men derive and guard jealously from owning and controlling land. This is backed by culture that places men as the owners of land. The United Nations (2013) summarizes the aforementioned as follows:

> *In many communities gender disparities with regard to land and other productive resources are linked to assumptions that men, as heads of households, control and manage land – implicitly reflecting ideas that women are incapable of managing productive resources such as land effectively, that productive resources given to women are "lost to another family" in the event of marriage, divorce or (male) death, and that men will provide for women's financial security (United Nations, 2013).*

5.2.5 The intricate link between secure land access, adaptation and food security

Literature reviewed (Carr & Thompson, 2014; Jost *et al.*, 2015; Asia Pacific Forum on Women, 2016) among others, acknowledged that climate change makes it harder for women to obtain secure land rights. On the same note, Ziervogel and Ericksen (2010) argue that meeting both the climate change and food security challenges requires gender equity, especially in terms of resource rights. Securing women's land rights has been identified as one of the steps towards adaptation to climate change because women are heavily relied upon by households to provide food, and to do so sustainably. During focus groups and interviews, it was identified that the study sites are replete with agricultural projects by both Government and NGOs. However, the land rights for women remained a controversial issue because as mentioned above, women's right to land is tied to their relations with men. Through the focus groups and interviews it was established that *access* to land was an attainable goal if supported by the men. Both men and women seemed open to implementing adaptation interventions. The men were also very emphatic that they should be included in capacity development projects from the get go rather than involved as an afterthought. This point was repeated in several focus groups as men narrated the previous experiences where they have been systematically left out of development initiatives, terming them as *women empowerment projects*. One male respondent posed, "where do you expect those women that you have trained to practice adaptation strategies when you have not engaged their male relatives? Women do not own land here. Anyway, let them continue with their women empowerment projects, we as men will wait to see which farmlands they will use." Such statements are loaded

with solutions that can inform development strategies and programs within agriculture dependent communities where ownership and control of land is the preserve of men. Adaptation interventions need to be infused with awareness of the intricacies that define communities' ways of life that includes culture. Culture, whether retrogressive of progressive, possibly defines the success or failure of community development.

Ideally, adaptation interventions would transform livelihoods and bring forth food security where women own and control land, just as men. It is in the developing countries such as Kenya that women in agriculture-dependent communities, have equal rights to land as men, albeit in legal frameworks. The reality is that equal rights to land in these communities might take longer than desired to be achieved. While this seemingly appears to be the case, there is an opportunity to explore in terms of *access to land* for women, even as development partners and communities push for secure ownership and control of land. This study acknowledges that the pursuit of secure access to land is a challenge because it can only be sustainably achieved when secure ownership of land is obtained. Despite this, the researcher is convinced that there is a window of opportunity to achieve adaptation and food security if secure access, through involving relevant stakeholders, is employed.

On the other hand, this study observed that unlike popular perceptions that women would want to own and control land as a resource, this was not entirely the case in the study sites. Further, there were women who could demonstrate secure livelihoods and food sources within their households without owning land. This study had to juxtapose this reality against popular development approaches that espouse the empowerment of women through land ownership for food security. It was imperative to look further and understand how these women achieved food security in an environment that has been branded patriarchal and insensitive to women's needs. More than one female respondent described how they have managed to live with patriarchy and patrilineal nature of land management and provide food and other needs to their families. For instance, one explained that her husband worked away from home and whenever he came around and saw how well managed his farmland was in the hands of his wife, he has over time ceded uninterrupted access. The result of which was a motivated wife who has ensured food availability and secure source of livelihood for the family. Nonetheless, she alluded that her husband's decisions have been as a result of her good stewardship of resources over an extended period of time.

Agreeably, agriculture is the main source of livelihood and food in rural settings including that of this study. Consequently, the much needed household food security and capacity to adapt to climatic changes and variations is directly linked to access to land. It is also clear that land is the most important asset within households regardless of the gender of head of the household in the study sites. As FAO (2011a) would contend, land is a basic requirement for farming and control over land is synonymous with wealth, status and power in many areas. Noting the aforementioned, the men continue to seemingly protect this source of wealth, status and power and only ceding a certain amount of leeway for women's use. Literature (Iruonagbe, 2009; FAO, 2011a; Kassie, Ndiritu & Shiferaw, 2012; Holden & Ghebru, 2016) highlight the link between secure land access and secure food security within households in rural settings. However, the relationship between gendered-land rights, the ability of rural households to adapt to climate change and become food secure, leaves a lot to be desired. Nonetheless, as indicated above, there are opportunities to be exploited resulting in food security.

5.3 Land rights and Climate Change Adaptation

5.3.1 Adaptation in the context of gendered land rights

At this juncture it is evident that land rights in Western Kenya as in many parts of Sub-Saharan Africa are majorly anchored on gender. This reality is that secure access to capital of production might take longer than expected but there are opportunities to be exploited. This study ventured into understanding coping mechanisms that women have devised along the years to enable them live with the dominating nature of patriarchy in many African societies and more so in Western Kenya. Oduol and Kabira (2000) postulate that women cooperated and mobilized themselves to assist one another through self-help groups whose membership was based on friendship, kinship networks, and common need. Women would join efforts in working the farms to ensure that families are food secure. However, this has changed as women only go out of their farms to provide labor in exchange for money. The approach still exists in Western Kenya albeit with challenges that emanate from among others, poverty and growing nature of individualistic lifestyles. To further expound on this approach, Oduol and Kabira (2000) argue that the formation of women's self-help groups (SHGs) evolved as a coping mechanism in male-dominated societies whose patriarchal structure ensured that most women did not have adequate access to and control of resources, including land, cattle, and other basic commodities. Particular to this study, Wambui Karanja and Karanja (1991) sums up the prevailing situation where the registration of land titles

in men's names almost exclusively continues to ensure that women do not access credit with land as collateral and they have to rely on their husbands for money to invest in food crop production.

Taking cognizance of the importance of SHGs in adaptation, one local NGO continues to develop capacities of vulnerable women including widows and those affected by HIV/Aids. Their model has organized women into over 20 SHGs within the study sites to contribute money that they access as micro-credit to meet various adaptation needs. Adaptation activities include value addition on farm produce for sale at competitive prices, rearing of poultry and dairy goats, growing drought-resistant crops, farming vegetables in sacks and keeping kitchen gardens. These groups have also caught the attention of Government agricultural extension officers who support them with expertise on value addition and the co-operative movement. Members of two SHGs interviewed were unique in the sense that they had managed to include men, with the latter having been attracted to the model by the savings and loaning strategies of self-development.

Focus groups with members of cooperatives called Savings and Credit Co-Operatives (SACCOs) revealed that members have been able to contribute money and buy shares which secure micro-credit opportunities for development loans. This is proving to be a sustainable avenue for women who now do not need land as collateral to secure loans. One female respondent said that through the SACCO she has been able to start a local vegetable seed-saving from her kitchen garden business which she now supplies to other farmers. The local vegetables are also drought resistant. Another female respondent stated that access to micro-credit has given her leverage in terms of having her husband's ear in decision-making on the farm. As Zaei, Kapil, Pelekh, and Nasab (2018) put it, participation of women in micro-credit programmes can enhance their input within and outside their households and further could decrease male bias. Her husband often contributes to her savings in the SACCO because he realized that availability of micro-loans. She is also engaged in value addition of farm produce such as turning millet into flour that has a higher sale value than maize or maize flour. The SHGs have also allowed women to leverage their numbers in finding markets for their products. This avenue is different because (1) they are able to by-pass middle men who are said to have been unscrupulous (2) they can now target specific collection centers with better bargaining power. The analysis above provides alternatives to complete reliance on farming as a way to adapt to changing climate.

During the focus groups there were discussions raised on adoption of traditional high-value crops (THVCs) which are also considered drought resistant. Further, these crops are considered to take relatively shorter periods of time to mature as compared to current adopted crops such as maize and sugarcane. Generally, maize takes up to six months and sugarcane eighteen months to mature while THVCs such as orange-fleshed sweet potatoes, cassava, Bambara nuts, beans, local vegetables mature at between six weeks to two months. Imperative note is that crops such as maize and sugarcane are associated with chemical fertilizers which contribute to the degradation of soil while THVCs such as Bambara nuts infuse nutrients to the soil. Value addition is a strategy to help farmers in obtaining better prices for produce along with better nutrition for households continues to gain traction within the study sites through the SHGs. Value addition in the study sites included processing flour from grains and tubers, cooking products for sale such as porridge, pastries and snacks at local markets. These fetch better prices for the women who trade wares in the markets besides hawking within the villages. This is with the understanding that value addition determines the competitiveness of the farmers produce in the markets. However, the SACCOs within the study sites are still nascent and have not fully embraced important aspects of value addition including branding and full processing, hence losing out on potential higher returns.

Strategic planning of farming activities supported by climate information proves to be important to all initiatives geared towards adaptation. Maliondo, Mpeta and Olson (2012) as well as other literature (World Food Program, no date; Orindi and Ochieng, 2005) contend that inadequacy in conveying information on weather and climate forecasts increases the vulnerability of rural farmers to extreme climatic events. Lack of access to climate information stood out in the discussions with farmers who were eager to have a reliable source. One older female respondent recounted how predictable weather patterns were a couple of decades ago and they did not require scientific information to plan farm activities. Another respondent in one of the focus groups suggested that local administrators meetings including *barazas* can be used to broadcast climate information from the Meteorological Department. Discussions with Agricultural extension officers on this issue revealed that trickling of weather information including early warning to farmers has not been done efficiently.

Partnerships on extension services such that expertise and awareness creation is done with the farmers, was revisited frequently during interviews and focus groups. There seemed to be

contradictory information on the efficiency of Government agricultural extension officials' services to the farmers. The extension officers firmly insisted that they offered services to the farmers while the majority of farmers claimed not to have interacted with them. However, both parties recognized the importance of partnerships that would have farmers make better agricultural decisions. Wrong audience targeting by extension services was identified as another impediment to adaptation. It was conveyed that extension officers target land owners who are mostly men leaving out the women. This therefore, leaves out women who are major contributors of labor in rural agriculture.

5.3.2 Importance of Women's Land Rights for Adaptation

This study affirmed the importance of securing women's rights to land as a resource for sustainable adaptation mainly due to the fact that rural women are majorly charged with provision of food and nutrition. Further, that their rights to land are secured within law, which supersedes culture. This was confirmed by their male counterparts during focus groups and interviews, albeit with unwavering assertion that women ownership and control of land is still a non-negotiable issue for men. The trend was surprisingly the same when it came to certain Government officials and educated women who undeniably supported restrictions on women's land rights. These prevailing assertions clearly painted a picture of a tug of war between culture and legal provisions. Seemingly, culture continues to carry the day within the study sites. Nonetheless, there seems to be slight changes, which require more study where certain men have embraced women's right to land almost entirely within their families.

During focus groups, the study realized that women are more likely to be motivated to make informed choices in response to unique situations that they confront, including those of adaptation when they have security over their land. This was true for decisions that would increase agricultural productivity and conservation of natural resources within their vicinity. One woman posed, "why would I bother myself by making any changes in land use in response to climate change when my husband keeps on marrying new wives?…He refers to me as a visitor who should be grateful that he allows me to use his land to feed my children." Similar responses painted a picture of women who wanted to be accorded secure access to land in order to meaningfully make climate-smart decisions. In certain discussions, some women in polygamous marriages also said that their insecurity stemmed from the fact that they relied on their husbands' discretion to access land: it

was common for such husbands to reallocate or reduce land apportioned to each wife at their own pleasure. When confronted with this reality, these women have no inducements to change the manner in which they practice agriculture in response to changes in the environment. As posited by Karanja (1991), land gives both men and women true identity and more so social identity. However, in patrilineal societies such as the study sites, there is a tendency to appropriate both women's labor and progeny, rendering their work and contribution to production invisible, as noted by Kandiyoti (1988).

Secure access to land is what women stressed about during the discussions if they are to invest their energy and resources towards adaptation. In terms of securing women's lad rights, Kenya can draw from experiences of women fighting for women's right in Uganda as described by Tripp (2014) in her study titled "Women's movements, customary law, and land rights in Africa: The case of Uganda". In this context women activists supported local women through various means whose land rights have been curtailed due to customary laws. One way was through the use of courts which has seen increasing numbers of women are taking their claims to magistrate's courts rather than Local Councils (LC) courts, especially in areas where land pressures are great (Tripp, 2004). Women prefer the courts because they are cheaper than the LCs. Women prefer these courts because they are often cheaper than LCs, they consider them unbiased against them, and largely due to the fact that if she takes a marital land dispute to an LC court, it is likely to be filled with male relatives and friends of her husband (Tripp, 2004 citing Khadiagala, 2001). Further, Trip (2014) citing Stewart (1996) posits that since there is often a considerable overlap between the customary and formal legal systems in Uganda, women draw on arguments from both systems in making their claims, using those arguments which best suit their purposes. Further, in customary arrangements women have found ways to claim land through a wide variety of mechanisms: through inheritance, gift, purchase, pledge, loan, lease, and share cropping, as well as through their husbands and other male relatives (Tripp, 2014 citing Feder and Noronha, 1987). In view of the Ugandan perspective, Kenyan activities can pick lessons and draw up strategies that would strengthen the resolve of rural women in demanding for the legal rights on land matters.

These realities confirm Wambui Karanja and Karanja (1991) assertions that women's security of tenure continues to be threatened by toxic practices rooted in culture. However, this "culture" needs to be questioned by revisiting pre-colonial times where women and men had their own

parcels of land with specific crops to tend to and private tenure did not exist. It seemingly appears in literature (Munala, 1995a; Bondarenko, 2014) that women had more secure land rights in the pre-colonial times. Individual titling, negative culture and environmental factors that cause degradation of land all contribute to the denial of women's land rights. The trend is that while male rights to and control over land are safeguarded and reinforced by individual tenure and male solidarity in institutions, women's rights to land ownership have been thwarted, threatened and sabotaged at every opportunity (Karanja, 1991).

Combating hunger and malnutrition within households especially in vulnerable groups, should be dealt with as a priority if Kenya is to achieve meaningful development in rural areas. Findings from this study point out that when women securely access land, secure livelihood sources and food security is a likely positive result for their households. The study is not able to draw a direct correlation on secure access to land and food security, however, there has to be an assumption in terms of giving more positive economic effect from secure access.

5.3.3 Cash crop versus food crop production

The study sites were previously majorly sugarcane planting zones, supplying sugar millers such as Mumias Sugar Company (MSC) for decades. Farmers began abandoning cultivation of the crop in the early 2000s, mainly due to dwindling returns from the sugarcane. By the time of this study a huge percentage of respondents claimed to have now embraced maize farming, for both cash crop and subsistence. Adoption of this crop has come with various challenges including poor and unpredictable pricing in the markets and Government silos, similar to the biggest reason behind their abandonment of sugarcane farming. Good returns from maize as a cash crop also requires larger sizes of land as compared to the average two to five acres of land that is the current size in the study sites. Additionally, very small parcels are dedicated to other nutritious crops such as legumes and vegetables, the latter being known to infuse nutrition in soils. It was narrated that most households find themselves relying on the purchase of vegetables, root tubers and legumes from local markets at non-competitive prices. Maize cultivation has also continued with the application of chemical fertilizers that further degrade soil quality, a practice that was done on sugarcane plantations. It was revealed by female respondents that their male counterparts who make decisions on land use, are not receptive to making changes that would ensure availability of nutritious food within the households. The men responded by stating that after abandoning

sugarcane, they essentially replicated the practices of other farmers in Western Kenya, i.e. adoption of maize as a cash crop. Further, that a local NGO has even supported them with farm inputs and expert advice on maize farming. It was also highlighted that the universal adoption of maize within the area has repeatedly led to the poor pricing in the market due to oversupply and low demand. The older female respondents were more vocal on adoption of traditional high value crops (THVCs) in addition to maize, explaining the higher nutritional value and attractive market prices for such crops. The key issue here was adaptation through crop diversification including agro-forestry.

5.3.4 The Consequences of shunning Traditional High Value Crops

Traditional high value crops (THVCs) were identified as those that were embraced before the takeover of sugarcane in the 1970s. These include sweet potatoes, bananas, millet, cassava and sorghum, Bambara nuts and local vegetables. These were identified as crops that can be cultivated alongside maize, have high nutritional value and fetch competitive prices in markets. Additionally, these crops do well in terms of value addition for both subsistence and livelihood development. Elderly respondents recounted their experiences concerning the value of cultivating and trading in these crops. One female respondent expressed disappointment in the prevailing perception that THVCs are inferior to food items such as bread. Some respondents acknowledged that the THVCs are generally drought resistant, mature faster than maize, and require organic fertilizer rather than chemical fertilizer to thrive. This finding is similar to what Mabhaudhi, Chimonyo, Hlahla, Massawe, Mayes, Nhamo, Modi (2019) address in their study on the prospects of orphan crops in climate change. THVCs are also referred to as orphaned crops and Mabhaudhi *et al.* (2019) look at the climate-socio-economic co-benefits of these crops. There is an argument to promote orphaned crops to sustainably address challenges such as increasing drought and water scarcity, food and nutrition insecurity, environmental degradation, and employment creation under climate change (Mabhaudhi *et al.*, 2019). Orphan crops require low levels of inputs such as pesticides and fertilizers, which reduces input costs for farmers (Madhubi *et al.* 2019 citing Dansi *et al.* 2012*;* Kour *et al.* 2018*).* Within communities, orphan crops can offer cross-cutting solutions to multiple constraints. For instance, sorghum, millet, bambara groundnut, lentils, and groundnuts are recommended food choices under the nutritional and water limited conditions (Mabhaudhi *et.al*. 2019). Therefore, such findings can contribute immensely in changing mindsets about the value

of the THVC on overall household nutrition and adaptation to climate change for farming-dependent communities.

The consequences of shunning the THVCs have curtailed opportunities to reduce household food insecurity and increase livelihoods development prospects. In addition, the THVCs are generally considered as women's crops as men are more interested in maize. This reality coupled with insecure women's land rights holds back the community from strategically engaging in viable adaptation farming and livelihoods activities.

5.3.5 The Status of Current Land Tenure System

This study found that the current land tenure system is majorly discriminative to women when compared to the provisions within legal frameworks. However, there is room for making changes that would positively impact the lives and livelihoods of women and by extension entire households. The laws of Kenya including the supreme law - the Constitution of Kenya, 2010 - are explicit in terms of prohibiting any form of discrimination to resources based on gender, even to those practices that are anchored in culture.

Observations made during focus groups and interviews lean towards lack of awareness on the provisions in law that would support both men and women in achieving secure land rights. Further, the prevailing system that guides land tenure issues including rights is based on culture which increases the vulnerability of women and favors men. There is also the reality of the cumbersome nature of the road to justice for aggrieved persons starting from the local administrators, land boards and to the court system. It is also an expensive process that has led to many vulnerable women such as widows to give up the struggle to obtain justice. One widow recounted her experience in seeking justice after her brother in-law encroached on her land. She said the process of seeking justice through the court system proved too cumbersome and expensive. Seeking help in locating important documents from the Ministry of Lands proved futile because required files went missing the second time she went back to do follow up. On the other hand, where families decide to secure rights of women there are impediments to that including lack of succession that should have been done before death of original owners within households. For instance, one of the cases narrated involved sons and daughters trying to get titles to land only to realize that succession

had not been done; meaning that their father also had no documentation to demonstrate succession. Their great grandparents passed on before succession was done.

5.3.6 Access to Information on Land Rights

There seemed to be challenges in terms of access to information about the rights of women and men regarding land as contained in law. The local government administrators expressed challenges in obtaining requisite material such as statutes, some of which are available on the internet. Ironically, the local administrators had smart mobile phones that are connected to the internet. When asked about what informs their decision-making, they explained that they use "fairness" as a reference point. They also quoted that the Constitution of Kenya, 2010, outlaws discrimination on gender basis and with this in mind, they try to ensure that cases are resolved mainly through mediation. It was only the judicial officers that could confidently quote the law provisions. It was during one focus group that the local chiefs and assistant chiefs agreed to use the chiefs' barazas as awareness-creation sessions for the community members. This study observed that no community member that participated in the focus groups and interviews could articulate relevant provisions in law on gender and land issues. However, they were eager to find out what the provisions are.

5.4 Patriarchy and Culture

It is seemingly common for literature to assume that all African communities are patriarchal and patrilineal while this is not the case. It is also not surprising that matriarchy is perceived as a myth by many scholars because even feminist literature is examined through patriarchal perspectives. There is evidence that Africa has matrilineal communities such as the Akans of Ghana, where property such as land is passed down through maternal lineage. As posited by Karanja (1991), the land gives both men and women true identity and more so social identity. However, in patrilineal societies, there is a tendency to portray entire communities as those that totally appropriate both women's labor and progeny and renders their work and contribution to production invisible, as noted by Kandiyoti (1988). Further, that women in such rural areas assume both their traditional roles as cultivators of land and those that were previously of men, mainly attributed to urbanization that has caused men to migrate to towns and cities (Oluoko-Odingo, 2011; Tibesigwa, B., Visser, M., Hunter, L., Collinson, M., Twine, 2015). These kinds of views of patriarchy spurred this study to explore how an ethnic community (the Luhya) of approximately 5.3 million people (2009 Kenya

national census) could have "survived" under such "negative" regime of patriarchy. Is there a possibility that households and communities can still thrive within the patriarchal system? Should we throw the baby out with the bathwater? Further research shows that women are not innocent bystanders in the propagation of negative patriarchy. The life cycle of women within the patriarchal families is enabled by older women who essentially control the younger women. Kandiyoti (1988) gives an example of classic patriarchy where older women seemingly try to hold on to the only source of power through their married sons. It is perceived that these married sons are a woman's critical resource; therefore, ensuring their life-long loyalty is important. This is the case even if it means sabotaging any perceived interest of the son's wife to access and control any form of capital of production such as land.

Dube (2017) project that investigated the ordeal of "property stripping" from widows in Binga District, Zimbabwe provides an example of how in-laws continue to suppress women's rights to land. Ndebele and Shona customs provide that property is taken either by male relatives of the husband or the eldest son in the deceased's family, more so when the husband dies interstate (Dube, 2017).

It is interesting to note that both in some cases customs prevail over legal framework in as far as women right to property such as land is concerned. Dube (2017) citing Southern Africa HIV and AIDS Information Dissemination Services (SAfAIDS), (2009) samples a case in his project, the legal case of Magaya versus Magaya in 1999 that had been appealed in court.

> *In this case Venia, who was the eldest daughter of the deceased Shonhiwa Lennon Magaya, was denied heirship because she was female. Instead, the court ordered Nakayi, who was younger than her and a second son born to the second wife, to be the heir to the estate… The judges in this case considered that the "nature of African society" demotes women to a lesser status, especially in the home,* (Dube, 2017)

Looking at the examples shared above, women in the world could be facing the same problems and therefore, we can consider finding ways in which legal frameworks and judicial systems override customs that are oppressive to women.

During the pre-colonial period, men and women in Western Kenya had clearly divided roles that ensured households were food-secure (Munala, 1995b). There was also the sense of community in the way households dealt with matters of food security which is arrantly opposite of the post-

colonial times. The spirit of collectivism of the pre-colonial era could not survive with the genesis of capitalism that came along with colonialism and post-colonialism. In fact, nowadays rural women work lands outside their farmlands for wages to support their families including providing food. They rarely help each other in their farming spaces as they used to because of individualism. The aforementioned is made clearer by Rodney (1973) when he opines that when individualism was applied to land through private ownership it came with a new understanding that individual labor should benefit the person concerned and not some wider collective, such as the clan or ethnic group. He further notes that with this new unfolding way of life, superficially, it appeared that individualism brought progress. Bondarenko (2014) asserts that Africans did not know private property in the politico-economic sense but they believed that the land belonged to their ancestors. Due to that, the Africans were sure in their specific, but not proprietary, relations with the land (Bondarenko, 2014).

Feminism as a theory (in the African context) that is used to challenge patriarchy and patrilineal ways of life, is one that is still developing. Contemporary patriarchy is emboldened by the kind of feminism that evades looking at Africa's gender issues from its specific context, time and space. Contemporary patriarchy seems to perpetuate the constraining of women not to venture beyond their seemingly traditional roles which Mama (2001) aptly describes as those pertaining "hard-working income-generating wives and mothers". It does not want to look into specific aspects of the African issues around gender, property, food security and how to address the same, according to their special nature. Lumping issues together while addressing them is escapist of the reality and does not resolve problems and move societies forward. A study done by Jacobs (2002) wonders whether land reforms are worth pursuing for rural women, because most reforms increase the burden of work for both sexes, but particularly for women. She (Jacobs, 2002) underlines that land reforms may also increase male pressure on wives to reproduce children, given the importance of family labour on generally and an urge to make a profit (or just a living) (Jacobs, 2002). This is contrary to the expected outcome of contemporary land reform projects that find living standards and food security are often improved by land reform (Jacobs 2002 citing El-Ghonemy, 1990; Ghimire, 2001). There is also the concept of Ubuntu as explained by Manyonganise (2015) who argues that despite the communitarian philosophy it has been oppressive to women and is full of whims and caprices of patriarchy. This is because most discourses on Ubuntu have been done by men who conveniently ignored the implications of Ubuntu on gender, more specifically in

Zimbabwe. Highlighting the gravity of this situation in Zimbabwe, Manyonganise (2015) cites Mangezvo (2013) on the Presidential Land Committee Report which indicated that 80% of women live in the rural areas yet over 80% ownership of prime agricultural land lies with men. This is indicative of the fact that although Zimbabwe claims to be a modern society, its land reform has largely been informed by cultural values that dictate that women can only access land through a male figure in their lives (Manyonganise, 2015). These examples show that the continent of Africa should take gender as a critical aspect that needs to be intentionally planned for and articulated in policy and practice in order to achieve any meaningful change on women's land rights.

In recognition of the importance of securing women's land rights, there were few cases where fathers went contrary to cultural expectations and bequeathed land to their daughters. However, there are two cases that stood out in these encounters. One male respondent in anticipation of conflict between his sons and daughters purchased parcels of land away from his ancestral land and bequeathed his two daughters. Another male respondent decided to sub-divide his portion of land and allocated his three children, including one daughter. This particular respondent also added that he forewarned his sons not to harass their sister and going further to threaten them with a curse should they go against his wishes. These two cases present the possibility that the status quo might change because one of the male respondents made his decisions after attending awareness creation forums by a local NGO on land rights.

5.5 Responses from Government Institutions

There were several contributions from Government and judicial officers recognizing that discriminative practices and customs that target Kenyans based on gender had been overtaken by time as laws put in place make such illegal. However, there were cases where certain respondents, both men and women, argued that they still observed what is laid down by culture. For instance, one senior Government Official in charge of resolving land issues in the study sites narrated how he would never bequeath land to his daughters because his culture prohibits the same. On the other hand, a male extension officer was emphatic that without secure land rights for women, their work within the community will suffer. He explained that his experience proved that secure land rights for women improved food production in the farmlands and overall nutrition of households. A female nutrition officer in one of the study sites narrated her experience with women and secure access to land and how this affects her work. She said that vulnerable women face challenges with

ensuring their households have nutritious foods and more to store for future use. However, she had also had to negotiate with landowners (usually men) to allow their women to make decisions regarding nutrition, while she demonstrates the benefits of women's access to land for food security.

Despite the aforementioned challenges that pit legal provisions and practice against customs, there are positive experiences that can be used to show that women's land rights can be achieved. Ikdahl, Hellum, Kaarhus, Benjaminsen, and Kameri-Mbote (2005) present the *Bhe v Magistrate, Khayelitsha and others* case in the South African Constitutional Court ruled on 15 October 2004. Here, the judge presided over the case brought before court by the Women's Legal Centre in Cape Town challenging the provision that the girls could not inherit their father's estate. In this case the Constitutional Court ruled that the two daughters were the heirs of their father's estate. Judge Pius Langa stated that customary law was subject to the Constitution (Ikdahl *et al.*, 2005). The South African context in as far as the state of women's land rights are concerned is somewhat similar to the overall Kenyan context, i.e. there are still major challenges with implementation of women's legal rights where customs are broached. The South African Constitutional ruling presented above demonstrates that upholding women's legal rights to land and property can be determined by the sole conviction of a judicial officer who decides to uphold the law.

CHAPTER SIX
CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter comprises of three main sections drawn from the study. The first section summarizes the key findings of the study and how they align with or diverge from the research questions that framed the project. The second section outlines recommendations for practitioners, policy makers and academia. The third section presents areas of possible future research informed by identified knowledge gaps.

6.2 Summary of Key Findings

This study was motivated by five research questions looking at: (1) the current gender trends on access to land in the research sites; (2) the current trends on climate change and the impact of these trends on food security; (3) ways in which rural agriculture dependent women adapt to changes brought about by climate change; (4) policies that exist to protect women's rights to access land in light of increased climate change and food insecurity episodes; and (5) the implications of the findings of this study in a wider context. Obtaining answers to these questions involved considering data from various areas including agriculture, nutrition, human rights, law, and business strategy, among others.

6.2.1 Gender trends on access to land

In response to question 1 of the research study, an assessment was done on the current gender trends on access to land in the study sites. The study found that gender is a key factor in access to land, whereby land is majorly owned and controlled by men within the study sites. This prevailing situation is not unique to the study sites but replicates itself in various parts of Sub-Saharan Africa. Gender as a key determinant of how members of a household will access the capital of production is anchored in culture. In theory, the legal framework in Kenya has - over a considerably long period of time - evolved to secure rights to land for individuals irrespective of gender. However, the reality in Kenya is that women's rights to land are still dependent on their relationship with the men in their families. This reality was compounded by the perceptions of both men and women in the study sites whose ideas on women's land rights were alike. By this I mean that there were cases where women, like majority of their male counterparts would rather chose to observe culture than own and control land. This reality is so entrenched that it transcends such factors as education and

profession indicating that in these study sites culture is still paramount. Nonetheless, there were instances where a few women spoke openly of the need to change culture and endow women with the same land rights as men. The reason behind this could be the women's fear of upsetting the status quo, especially their in-laws. Further investigation on this matter could help people understand what the women in such rural societies think and desire about their ability to own and control capital of production.

There seemed to be a tug of war between law and culture, as the community still holds on tightly to customs and practices. However, there were a few men that demonstrated having embraced the rights of women by practicing equality of land rights within their families. This is a trend that is pushing against the well-established currents where men predominantly own and control access to land. These few men detailed their experiences having bequeathed land to their daughters notwithstanding the fact that they had sons. Another trend that responds to question 1 of the study is that of women who were going against the grain to purchase their own parcels of land, including married women, albeit without the knowledge of their husbands. Such decisions had been informed by (1) the realization that law supports desire to acquire property, and (2) desire to secure property for their children's- especially daughters- when men marry more than one wife. There are other reasons that motivate women to acquire their own parcels of land, but the two above stood out in the study. Additionally, there are reasons behind the majority of men's decision to stick to culture and this study perceived it to be an issue of power relations and gender. It seemed that holding on tightly to culture made the men feel in control within their households. This is after it was severally revealed by male respondents that women who have property are "unruly" and they could easily leave their matrimonial homes because they have an alternative on account of owning land.

Nonetheless, secure access to land is paramount when considering adaptation to climate change through agriculture. For women, it increases their chances of making sustainable decisions on livelihood development and food security for their households. Linking the aforementioned to the aim of the study is important- looking at the extending to which gendered differences in land access affects efforts towards adaptation and food security. The study found that women were generally demoralized in terms of making better decisions concerning agriculture and nutrition whenever their rights to land are insecure. Imperative to note is that by land rights, the women were majorly interested in access rather than ownership. However, how can these women have secure access to

land if they cannot own it and control its usage? It is clear that women are majorly depended upon within rural households to provide food through agricultural activities on farmlands. However, there seems to be a missing link between sustainable food productions within the context of changing climate and secure access to capital of production based on the conversations carried out through the study. In reference to objective 1 of this study, one has to further investigate whether access alone is sufficient for adaptation through agriculture. There seems to be a clear distinction between secure access and access, with the former pointing towards some form of formal registration and titling. Further, this study also realized that there was evidence both in literature and primary sources that associated denial of women's rights to land with colonial times. The same evidence shows that women's land rights were more secure in the pre-colonial era. Such evidence disputes narratives that restrictions on women's rights have been anchored on culture. However, this study did not do a thorough investigation on this and even so, this would be a topic for further investigation.

Another trend on access to land involves the experiences of vulnerable women including widows. The study recognized these widows are seldom protected from threats such as evictions and dispossession from fertile to degraded lands. The perpetrators hold the view that married women are visitors in their matrimonial homes who should not claim any rights to property. Further, that these women should be grateful when they are allowed to continue living on their deceased husbands' lands. The study also showed that a woman's relationship with her in-laws could, to some degree, affect how they treat her upon the demise of her husband. It was repeated during the focus groups that if a wife was perceived negatively during her marriage, she would most likely be treated harshly by her in-laws especially if they were interested in her matrimonial property. Nonetheless, the manner in which in-laws would treat a widow cannot be foretold until after the fact. There are avenues through which widows can receive reprieve but these have been proven to be expensive and tedious but at the same time, the affected women are fearful of upsetting their in-laws.

Practice has it that as female children grow up, they are made to understand that they are "sojourners" who are expected to leave at some point, get married and own land together with their husbands. These two realities present a scenario whereby a woman has no place to call her own as truth is being minimized on both ends. This study has not delved into the intentions of such

culture that seems to toss women around all the while increasing their vulnerability. It is a reality that needs to be further investigated if any meaningful interventions are to be implemented in areas such as the study sites. These are issues that seem not to be documented, yet they are underlying concerns that are not verbalized.

6.2.2 Climate change trends and impact on food security

From the discussions above, it is clear that gendered differences in land access definitely has an impact on the way women can maximize their potential in terms of food production. Food production and its accompanying activities are immensely affected by climatic changes within the study sites. It is also not possible to delve into food security and gendered-land rights matters devoid of the reality that is climate change. Hence, the aim of the study that draws the link between insecure lands access, food insecurity and poor adaptation capacities.

The study showed that climate change is no longer a foreign issue associated with certain parts of the country. In fact, people were able to make comparisons on climatic changes up to several decades back. The variations were in terms of temperature and rainfall that can no longer be predicted by local community members, which in turn impacts on the status of households' ability to provide food. In line with this study, it was demonstrable that climate change affects the different aspects of food security including availability, accessibility, utilization and stability of food systems.

Further, the study realized that it is possible to make assumptions regarding people's understanding of being food secure. During research, there were respondents who related food security to having maize as a staple that lasts between planting and harvesting seasons. Relating food security to nutrition where a household possess the ability to access various types of food can easily be overlooked when assessing food security issues within communities. There were cases where someone would opt to sell foods such as sweet potatoes to purchase bread from local shops yet the nutritional value of sweet potatoes is superior to than found in bread. Further, that there are various food preparation practices that can turn sweet potatoes into more delicious food items.

As an adaptation strategy in line with objective 2 of the study, timely and accurate dissemination of climate information by the Meteorological Department to farmers and extension workers would have a positive impact on food availability. It is difficult for farming communities to plan agricultural activities without proper climate information. In the case of this study, the respondents

did not receive this information from relevant officials, who in turn claimed that consistent communication avenues with the farmers are not available. Perhaps it is time for the Government to fully embrace communication of such information through mobile telephony that is widely used even in rural settings. The other readily available avenue is through community meetings such as the regular chiefs *barazas*. In the case of *barazas*, there could be an impediment on the success of such initiatives because it was noted that women tend to stay away from such meetings as they claimed to use such timeslots in attending to various needs within their households.

In line with appreciating that climate change affects food security in households, it is important to identify the factors that contribute to climate change. Further, addressing those causes would move a community closer to devising ways to conserve the environment that provides the land and resources to be food secure. Indigenous ways of protecting the environment should not be overlooked as these often than not have proved to be sustainable because their efficacy resonates with locals. In line with objective 2 of the study, one of the ways to protect the environment is through mitigation which is also a form of adaptation.

6.2.3 Agriculture-dependent women's adaptation to climate change

The study affirms that despite the fact that women are greatly relied upon to provide labor in farmlands and provide food for households, their space to make decisions over land matters is mainly curtailed by culture. This reality in turn affects quality of agricultural inputs and outputs, thereby affecting levels of food security even as climate change impacts agricultural resources. Restrictions on land for women are also accompanied by the low economic standing that does impact their ability to purchase farm inputs and additional labor, adopt better post-harvest techniques, and access credit. However, there is evidence through this study that opportunities exist in terms of SHGs as avenues to among others, save and obtain credit and market farm produce. This responds to objective 2 of this study that is focused on adaptation strategies used specifically by women in response to constrained land rights with the major focus on building resilience to climate change and striving towards achieving food security. Organizing women into SHGs has always been an avenue for women to leverage their numbers and use their experiences to devise ways of survival within their communities. Research shows that as women experienced gender-based discrimination, they came together and used their numbers to influence men's decisions and actions. One of the areas that women continue to face discrimination involves access

and control of capital of production by men. As demonstrated in this study SHGs borne out of the need to empower women have provided alternative means of livelihood development and a considerable contribution to food security within households.

Adoption of traditional high value crops (THVCs)-considered as abandoned crops- by more farmers within the study sites would be a sustainable adaptation approach in reference to objective 2 of this study. Adoption of abandoned food crops that are considered has been a strategy that a few farmers within the study areas have embraced. Identified reasons behind abandonment and slow uptake of this practice are (1) ignorance of the economic and nutritional value of the crops, (2) negative perception towards THVCs- they are considered primitive, and (3) competing interests on use of available land as men prefer cash crops such as maize and sugarcane. The study identified THVCs as one of the sustainable interventions for adaptation because of their amenable nature to unfriendly climate. These crops are drought resistant, have shorter maturity timeframes, and respond well to manure that is made from locally available farm materials, such as animal waste. In addition, there is readily available indigenous knowledge on such crop management within the farming community. The problem of reduced farming spaces for women can be addressed by maximizing kitchen gardens, which are traditionally smaller pieces of land where women are allowed to plant their crops. In reference to objective 2 of this study, there were a few farmers who in a bid to maximize farming space, they had adopted the use of planting sacks for growing nutritious crops such as vegetables. This method required small amounts of spaces but holds sizeable amounts of crops. This is a method that is popularized in low-income areas within urban centers but can also be adopted in rural areas.

Seed-saving storage as a strategy for adaptation was identified by the study as an issue that the older generation of respondents were more knowledgeable on compared to the younger group. The seeds are mainly of THVCs whose availability is with a few farmers. Therefore, seed saving can be an income generating initiative that also contributes to adaptation as farmers sell to others. The saving methods are also inexpensive as materials and expertise are within the farmers themselves. For adaptation success to be achieved this seed-saving practice has to be embraced by more farmers. Nevertheless, this initiative has to be supported by the men within households because land that is controlled by them is required to practically cultivate and save seeds.

Another method that points to use of local knowledge in adaptation is the use of organic fertilizers in farmlands. This was identified by some respondents as they made comparisons with the use of alternatives such as chemical fertilizers. It seemed that majority of the farmers preferred the use of chemical fertilizers because the alternatives are labor intensive in terms of preparation. Further, that knowledge on preparation of organic fertilizers was not the preserve of all farmers. Additionally, that some of the ingredients for organic fertilizers involved the use of animal droppings were not available to all as some respondents did not own farm animals. Chemical fertilizers are known to change the nature of soil by stripping off its natural vitality and this was acknowledged by respondents. Organic fertilizer is prepared from locally available materials from farmlands and does not negatively affect the fertility of soils. Despite the perceived challenges in adoption of organic farming practices, the farmers were willing to adopt if capacity building is done.

If the decision to proactively promote climate change responsive agriculture is not made by farmers and development practitioners, no amount of resources targeted at food security will be sufficient in preparing farmers. Climate change is no longer an experience for selected areas as its effects are now acknowledged as prevalent even as places experience widespread changes in temperature and rainfall patterns. It therefore, means that farming practices have to change to reduce the vulnerability of households, which in turn will reduce the pressure on women to provide for their families in increasingly challenging times. Developing the capacities of women and men in the rural areas on adaption is to be prioritized because the general observation was that adaptation strategies are not known to all. Hungry people are usually less resilient to the stresses that come with the effects of climate change. However, the situation in western Kenya and other Sub-Saharan countries can be improved if knowledge and resources are directed towards sustainable initiatives towards adaptations. Coupled with contemporary knowledge and resources is indigenous knowledge on adaptation that was demonstrated as existent during the study. However, attitudes towards such knowledge and practices have to change and none is to be viewed as inferior to the other.

6.2.4 Legal framework on women's land rights in Kenya

The study has established that women in Kenya face challenges in accessing and owning land which would give them control over decision-making towards matters household food security

and secure livelihoods. In line with objective 3 of this study, a functional legal framework is one of the strategies that Kenya can use a means to securing women's land rights. By a functional legal framework this study refers to legislative frameworks that have the required instruments and infrastructure for implementation. Kenya has a robust legal framework on productive resources, especially land which has proven to be critical in rural areas. On the other hand, prevailing culture that curtails women's rights to land appears to be holding back communities socio-economically. The reality is that the Government seemingly appears to be underperforming in terms of implementing laws that protect women and their property in spite of the progressive legal framework. Land in the study sites is still majorly owned ancestrally which tends to disadvantage women on issues of succession and titling. The gravity of this situation leaves women out of key decision making aspects of managing land because they are not recognized as bonafide owners. The law recognizes the rights of both men and women as regards land and provides for non-discrimination on the basis of gender. Despite this, culture for example in the study sites views women living in their parents homes as sojourners who are expected to get married and leave. Those women that do not leave or return to their parents' homes are not guaranteed pleasant reception unless their fathers offer a portion of their land to them. Further, these women do not own the lands but are expected to pass them on to their sons, if any. At the same time, those women in their matrimonial homes are perceived as visitors who get to use land at the discretion of their husbands. This is despite the expectation in law that they own the said land together with their husbands; as they were brought up to understand.

The supreme law, the Kenyan Constitution of 2010 has gone to great lengths to prescribe the rights of both men and women to land. Foremost, Article 60 (f) of the Constitution calls for the elimination of any form of discrimination based on gender in law, customs, and practices related to land and property in land (Government of Kenya, 2010). The Matrimonial Property Act of 2013 (Government of Kenya, 2013) safeguards the matrimonial home from any kind of disposal without the consent of the wife and children. Article 68 of the Matrimonial Property Act 2013 further recognizes the matrimonial property including land both during and after the dissolution of marriage. Furthermore, Section 11 of the Matrimonial Property Act 2013 makes provision on how property such as land is to be dealt with during the division of matrimonial property. This Act directs that use of customary law should be in tandem with the principles of the Constitution of Kenya 2010, including that which involves ancestral land. In a bid to secure matrimonial property,

Section 79 (3) of the Land Act 2012 (Government of Kenya, 2012) provides that such property cannot be disposed of by a registered owner short of the consent or knowledge of the other spouse. The Law of Succession Act, Cap 160 safeguards the inheritance rights of women to land in the case where the death of a father or husband has occurred. The aforementioned legal frameworks paint a picture of how the country endeavors to deal with matters land and property from a gender perspective. A cursory look at the Kenyan legal framework on land would easily have anyone think that with such progressive laws, food security would be an issue of a positive review, which is not. The reality is that all matters land are still addressed through dual lenses, i.e. customary laws and contemporary law. Ideally, the statutes should take precedence but land matters- more likely than not in rural areas- seem to be addressed using customary laws and practices.

6.3 Conclusions

The study identified adaptation strategies that were used by farmers in response to land rights challenges to build resilience to climate change and achieve food security. One of the strategies involved instances where a few women spoke openly of the need to change culture and endow women with the same land rights as men. This is done in different fora including local administrators meetings where they frequently address challenges that women face as regards their land rights. There were a few men that demonstrated having embraced the rights of women by practicing equality of land rights within their families. There were other women who went against the grain to purchase their own parcels of land, including married women, albeit without the knowledge of their husbands. The adoption of SHGs has allowed women to save and obtain credit and market their farm produce. These women leveraged their numbers and used their experiences to devise ways of survival within their communities.

Adoption of abandoned food crops that are considered was a strategy that a few farmers within the study areas have embraced. The study identified THVCs as one of the sustainable interventions for adaptation because of their amenable nature to unfriendly climate. These crops are drought resistant, have shorter maturity timeframes, and respond well to manure that is made from locally available farm materials, such as animal waste. In addition, there was readily available indigenous knowledge on such crop management within the farming community. The study identified that the problem of reduced farming spaces for women can be addressed by maximizing kitchen gardens, which are traditionally smaller pieces of land where women are allowed to plant their crops. Seed-

saving storage as a strategy for adaptation was identified by the study as an issue that the older generation of respondents were more knowledgeable on compared to the younger group. The older generation farmers were willing to share this indigenous knowledge including the use of organic manure as an adaptation strategy especially for the orphaned crops.

6.4 Recommendations

This study proposes several recommendations towards achieving food security within households in rural settings by enhancing women's land rights within context of changing climate. The findings from this study suggest that adaptation efforts by development partners in developing countries will likely continue to be frustrated as long as the underlying gender and power issues are not resolved. The rights of women to capital of production cannot be overlooked if sustainability of development initiatives is to be achieved. It is also important for the development agenda in countries like Kenya to define how it will bring the country towards ending gender-based discrimination on land and property.

The following are recommendations from the study:

- This study identified lack of awareness on legal rights of men and women to land as the main fuel to injustices against women. Therefore, the study recommends that the Government of Kenya to provide legal training for its officers to sufficiently equip them with knowledge and skills on finding solutions to land rights injustices. Further, the Government should collaborate with non-state actors such as NGOs in the delivery of the awareness creation on land rights to people at the grassroots.
- Both state and non-state actors should prioritize incorporation of adaptation strategies including preventive measures such as insurance and co-operatives that will cushion the farmers from climate change negative effects. Further, adaptation centered organisations should prioritise crop diversification as an adaptation measure including drought resistant crops.
- Reduce the gap between the development of legal frameworks on women's land and their implementation. Importantly, interventions should embrace gender analysis of particular settings because communities, however similar they seem, it is in their differences that programming will get it right.

- It is unarguable that women in developing countries such as Kenya do not own capital of production but they have access to a larger degree, presenting an opportunity of interventions towards ownership that may take decades to achieve. Development interventions that guide communities towards sustainable agriculture for adaptation should take advantage of this window (access to land) rather than to put all the resources in pursuit of ownership that mostly demonizes the men; the men who in turn are triggered to hold on to their perceived source of power.
- Conversely, development initiatives need to be intentional in their design by looking out for *context, time and space* so that they target the right audience as culturally African societies (even within the same country) are not homogenous in terms of administration and management of capital of production.
- There is need to do more for women's inheritance of land in settings such as those in the study sites. One of the ways to reach out to the men is not by shoving the laws down their throats but implement programs that focus on sensitizing them on the need for women to have ownership and control of land, beside access. Thereafter, legal consequences should also be applied to those who deny women their rights as enshrined in law.
- It is imperative that agriculture related agencies conduct needs assessments of women whenever they aim to implement projects and also improve existing policy. The needs assessments should be two-pronged so that they (1) addresses the immediate needs such as accessible water points, seeds, and roads to markets (2) legal and awareness needs of women. If one looks at the segregation of needs, the first category could take a shorter time if resources are made available, as compared to the second. However, they both need to be addressed.
- The Government should to devise less costly and efficient ways to support vulnerable women who are seeking redress on matters related to land rights injustices. Such interventions will deal with the hindrances to justice caused by long durations as regards presiding over land-related cases.
- There is need for disaggregation of data by gender in aspects of agriculture, especially food security, which development bodies should embrace. This way, program interventions will be rightly informed by right data. Gender should not be overlooked and treated as an appendage in planning, monitoring and evaluation of projects.

- Both Governments and NGOs need to see the window of opportunity in actively (not as an afterthought) engaging men in empowerment of women. This means that empowerment programs that focus on changing mind-sets should probably target the men before the women, if not inclusive of both gender.
- Development agencies in the country should tune their focus onto indigenous knowledge as a strategy for climate change adaption. The starting point should be on propagating the knowledge domiciled within the older members of society in as far as farming THVCs is concerned.
- Development agencies that are focused on changing mindsets in as far as women's rights are concerned should adopt the creation of champions, specifically men. This way other men will be encouraged to venture out of culture and support the rights of women to land.
- The SHG model should be considered as a strategy for mobilizing and empowering both men and women through specified activities including table-banking that evolve to co-operatives with the right mentorship and resources. This strategy has the potential to help communities attaining capacity development additives including infrastructure and also as avenues to influence policy development in areas of agriculture and food security.

6.5 Areas of possible future research

1. Further research needs to be done concerning the true representation of the fears or adamant nature of majority of men who are opposed to women's ownership of land;

2. Further research should attempt to look into climate change adaptation and gender relations because the relationship between these two remain unseen and left uninvestigated gender inequalities will be exacerbated

3. Research needs to be done to further investigate this important question: "if patriarchy is really bad for our community especially in terms of disadvantaging women, how did communities manage to survive for many centuries being guided by patriarchy?"

4. An appraisal of current instances where institutional adaptability has succeeded in ensuring that women's land rights are protected within circumstances of environmental changes.

5 Further research should attempt to look at how societies can balance governing the land sector through contemporary legal framework and compliment this with customary governance practices. Here issues of legitimacy and objectivity of both systems should be intentionally delved into.

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8. Appendices

8.1 Appendix A: Focus Group Discussion Guide

University of the Witwatersrand

Faculty of Science

School of Geography, Archaeology and Environmental Studies

Research Topic: Exploring the Relationship between Climate Change Adaptation for Food Security and Gender-Differentiated Land Rights in Western Kenya

Objective: *To investigate the current situation regarding climate change adaptation for food security based on equitable land access in Matungu and Mumias East Sub-Counties of Western Kenya.*

INTERVIEW PROCEDURE

Open – ended questions will be utilized with additional probing questions employed to obtain clarity.

Understanding of climate change adaptation and food security

1. What is your understanding of climate change?
2. What is your understanding of food security?
3. What are the current climatic trends within your locality?
4. What is the current status of food security within your community/family?
5. What opportunities can you identify that would aid your community adapt to climatic changes?

Perceptions and Realities on women's land rights

1. What is your understanding of women land rights?
2. Do you think women land rights are important in your community? (Please explain)
3. Do you own land? (Please explain you acquired it if your response is yes and why if no)
4. How would you describe your experience as regards access to land?
5. What role has your family and community played in women's ability to access land?
6. How have families and your community supported female-headed households to access land?

7. What has been the role of institutions especially local ones in enhancing women's access to land?
8. Are you aware of the opportunities within the Kenyan Constitution regarding women's rights to land?

Capacity development

1. As a community, what role do you think you can play to ensure food security?
2. As a community, what can be done to strengthen the role of women in ensuring food security?
3. Have you had opportunities availed that have enhanced your awareness on women land rights? (state the type of organization/institution that offered the forums)
4. What do you think Capacity development institutions need to do to secure women's land rights?

8.2 Appendix B: Interview Guide for Key Informants- Government Institutions

University of the Witwatersrand

Faculty of Science

School of Geography, Archaeology and Environmental Studies

Research Topic: Exploring the Relationship between Climate Change Adaptation for Food Security and Gender-Differentiated Land Rights in Western Kenya

Objective: *To identify the institutional and policy framework within which climate change adaptation for food security can be pursued in Kenya.*

INTERVIEW PROCEDURE

Open – ended questions will be utilized with additional probing questions employed to obtain clarity.

1. **Demographic Information**

   What is your position in government?

   What is your current position in your Institution?

   How long have you worked for this Institution?

2. **Knowledge and action on climate change**

   What is your general view of climate change?

   What role has your institution played in responding to climate change in the Kenyan context?

   What is your view on the role of women in helping to tackle the effects of climate change in agriculture-dependent communities?

   What climate change adaptation interventions are being supported by your institution targeting rural female-headed households?

3. **Information and action on women's land rights**

   What is your view of women's land rights in Kenya?

   How does your institution work with female-headed households as regards land access?

   What challenges does your organization face when addressing women's land rights in Kenya?

4. Knowledge and action on climate change adaptation for food security

What type of interventions does your organization conduct as concerns climate change adaptation?

What are your views as regards the role of women in attaining food security?

How would you link access to land by women to food security in the rural areas of Kenya?

How can rural female-headed households be strengthened to achieve food security?

5. Policy interventions

What role has is your institution playing in climate change adaptation policy development in Kenya?

What role has is your institution playing towards policy development as regards women's land rights in Kenya?

The Kenya National Climate Change Response Strategy (NCCRS) recognizes women as key in dealing with climate change and achieving for food security, could you explain any targeted measures put in place to actualize government aspirations.

What are some of the challenges facing policy development and implementation interventions as regards food security in Kenya?

What are some of the challenges facing policy development and implementation as regards gendered land rights in Kenya?

What opportunities exist through policy in tackling food insecurity induced by gendered land rights in Kenya?

8.3 Appendix C: Interview Guide for Key Informants- Local Administrators

University of the Witwatersrand

Faculty of Science

School of Geography, Archaeology and Environmental Studies

Research Topic: Exploring the Relationship between Climate Change Adaptation for Food Security and Gender-Differentiated Land Rights in Western Kenya

Objective: *To identify the institutional and policy framework within which climate change adaptation for food security can be pursued in Kenya.*

INTERVIEW PROCEDURE

Open – ended questions will be utilized with additional probing questions employed to obtain clarity.

6. Demographic Information

What is your position in government?

What is your current position in your Institution?

How long have you worked for this Institution?

7. Knowledge and action on climate change

What is your general view of climate change?

What role has your institution played in responding to climate change in the Kenyan context?

What is your view on the role of women in helping to tackle the effects of climate change in agriculture-dependent communities?

What climate change adaptation interventions are being supported by your institution targeting rural female-headed households?

8. Information and action on women's land rights

What is your view of women's land rights in your area of jurisdiction?

How does your institution work with female-headed households as regards land access?

What challenges does your organization face when addressing women's land rights in Kenya?

9. Knowledge and action on climate change adaptation for food security

What type of interventions does your organization conduct as concerns climate change adaptation?

What are your views as regards the role of women in attaining food security?

How would you link access to land by women to food security in the rural areas of Kenya?

How can rural female-headed households be strengthened to achieve food security?

10. Policy interventions

What role has is your office playing in climate change adaptation policy development in Kenya?

What role has is your office playing towards policy development as regards women's land rights in Kenya?

The Kenya National Climate Change Response Strategy (NCCRS) recognizes women as key in dealing with climate change and achieving for food security, could you explain any targeted measures put in place to actualize government aspirations.

What are some of the challenges facing policy development and implementation interventions as regards food security in your area of jurisdiction?

What are some of the challenges facing policy development and implementation as regards gendered land rights in your area of jurisdiction?

What opportunities exist through policy in tackling food insecurity induced by gendered land rights in your area of jurisdiction?

8.4 Appendix D: Interview Guide for Key Informants- for Non-Governmental Organizations

University of the Witwatersrand

Faculty of Science

School of Geography, Archaeology and Environmental Studies

Research Topic: Exploring the Relationship between Climate Change Adaptation for Food Security and Gender-Differentiated Land Rights in Western Kenya

Objective: *To identify policy and practice regarding climate change adaptation for food security based on equitable land access in Kenya.*

INTERVIEW PROCEDURE

Open – ended questions will be utilized with additional probing questions employed to obtain clarity.

11. Demographic Information

What is the name of your organization?

What is your current position in your organization?

How long have you worked for this organization?

12. Knowledge and action on climate change

What is your general view of climate change in Kenya?

What role is your organization playing in responding to climate change in the Kenyan context?

What is your view on the role of women in helping to tackle the effects of climate change in agriculture-dependent communities?

What climate change adaptation interventions are being supported by your institution targeting rural female-headed households?

13. Information and action on women's land rights

What is your view of women's land rights in Kenya?

What is your organization doing to realize women's land rights in Kenya?

How does your organization work with female-headed households as regards land access?

What challenges does your organization face when addressing women's land rights in Kenya?

14. Knowledge and action on climate change adaptation for food security

What type of interventions does your organization conduct as concerns climate change adaptation?

What are your views as regards the role of women in attaining food security?

How would you link access to land by women to food security in the rural areas of Kenya?

How can rural female-headed households be strengthened to achieve food security?

15. Policy and Institutional interventions

What role has your organization played towards policy development as regards women's land rights in Kenya?

What role has your organization played towards climate change adaptation policy development in Kenya?

What are some of the challenges facing policy development and implementation as regards food security in Kenya?

What are some of the challenges facing policy development and implementation as regards gendered land rights in Kenya?

What opportunities exist through policy in tackling food insecurity induced by gendered land rights in Kenya?

8.5 Appendix E: Participant Information Sheet

Participant Information Sheet

Dear Sir/Madam,

My name is Linda Etale, a PH.D. student in the School of Geography, Archaeology and Environmental Studies at the University of Witwatersrand in Johannesburg. As part of my studies, I have to carry out a research project. The project involves exploring the relationship between climate change adaptation for food security and gender-differentiated land rights in Western Kenya. This study is aimed at investigating the nexus between adaption to climate change and access to land by women and how this affects the livelihoods of female-headed households. At the same time looking at the extent to which gendered differences in land access affects efforts towards climate change adaptation and food security in rural Kenya.

As part of this study I would like to invite you to take part in a focus group discussion. During the discussions you will be allowed to communicate in your local dialect (Luhya), Kiswahili or English as the researcher is well versed in the three languages. It is envisaged that the discussions will take place within a maximum of two hours. The focus group will be coordinated by a moderator (the researcher) who will ask questions and facilitate the discussions. The moderator will also record the discussions on a computer that is password protected. Only the moderator will have access to this computer. The deliberations will also be recorded by use of an audio-tape recorder for the purposes of ensuring that necessary information is captured together with the notes. The audio-tape recorder will be stored in a safe cabinet with access only to the researcher and destroyed once transcribing has been done.

You will not receive any direct benefits from participating in this study, and there are no disadvantages or penalties for not participating. Participation is voluntary and you are allowed to withdraw from the discussions at any point and also decline to answer questions if you do not want to. This focus group discussion is considered confidential and you are not required to give your name or any other identifying details and the information that you will provide will not be shared with anyone and will be stored securely. I will be using a fictitious name to characterize your participation, in my final research report.

This study will be written in the form of a thesis which will be available online through the university library website. In case you have any questions afterwards about this study, feel free to contact me on the details listed below. If you have any queries, concerns or complaints concerning the ethical procedures of this study, kindly contact the University Human Research Ethics Committee (non-medical), telephone + 27(0)11 717 1408, email hrec-medical.researchoffice@wits.ac.za / Shaun.Schoeman@wits.ac.za

Yours Sincerely,

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Supervisor: Professor Danny Simatele
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Danny.Simatele@wits.ac.za

8.6 Appendix F: Research Participant Consent Form

Research Participant Consent Form

Title of Project: Exploring the Relationship between Climate Change Adaptation for Food Security and Gender-Differentiated Land Rights in Western Kenya

Name of Researcher: Linda Etale

(This consent form is a voluntary agreement indicating your participation in the research. You are welcome to ask questions to fully understand the study and what your participation entails before agreeing to sign this form.)

I …….agree to part of this study. The research project has been well elaborated to me and I understand what my participation will involve. I understand that my participation is voluntary and that I reserve the right to withdraw at any stage of the discussion.

I agree that my participation will remain anonymous	YES	NO	(please circle)
I agree that the researcher may use anonymous quotes in her research report	YES	NO	
I agree that the interview may be audio recorded	YES	NO	

Kindly sign where appropriate:

Consent to participate in a focus group discussion

Name of participant ……..

Signature of participant …….....

Date ……..

Consent to participate in an individual interview

Name of participant ……..

Signature of participant …….....

Date ……..

8.7 Appendix G: Standard Questionnaire

Standard Questionnaire on Climate Change Adaptation for Food Security in the Context of Gendered- Land Rights

Instructions: Kindly fill out the form below, to the best of your knowledge by clicking boxes and providing short answers in the spaces provided. Please note that if you are unable to answer a question, leave it blank.

Section A: General Information

1. Gender Female □ Male □

2. Fill in the table below:

Age	Occupation	Sub-County	Village

3. Marital Status: [Married] [Single] [Widowed] [Divorced] [Single Parent]

4. Are you the head of your family? [Yes] [No]

Section B: Climate Change Information

1. Human Activity is responsible for Climate change
□ Strongly agree
□ Somewhat agree
□ Don't know
□ Somewhat disagree
□ Strongly disagree
□ I don't believe the global climate is changing

2. Natural variability is responsible for climate change
□ Strongly agree
□ Somewhat agree
□ Don't know
□ Somewhat disagree
□ Strongly disagree
□ I don't believe the global climate is changing

3. Are climate change awareness campaigns carried out in your community?
Yes □ No □
If Yes, Kindly continue to the next question. If No, please skip to Question 5

4. How is climate change information shared in your community?

Brochures □ Radio □ Television □ Workshops □ Others (name) □

…….

5. What would you consider as your three leading sources of climate change information? (tick 3 options appropriately)

□ Workshops
□ Television
□ Newspapers
□ Brochures
□ Radio
□ Government Officers
□ Non-Governmental Organizations officials
□ No sources of climate change information
□ Other …….

Section C: Access to land for Food security

1. Do you own land? (ownership refers to title deeds or right to succession)
   Yes □ No □
2. If your answer to question 1 is yes, what is the total acreage in acres?
   ……
3. In reference to question 2, what size of the land is used for agriculture (in acres)? .....
4. Who owns land in this community within the family level?
   Husband □ Wife □

5. In reference to question 4, is the land owned jointly with other family members such as in-laws?
   Yes □ No □
6. Are women allowed to inherit land at the family level?
   Yes □ No □

7. If you had access to the land, what would you do with the land?
   Farm □ Sell it □ Subsistence farming □ Cash crop farming □ Use as collateral for business

8. Which person(s) in your household take(s) the main decisions for land usage (e.g. cultivating land and rearing livestock)?
   □
   □
   □
9. In the past one year, what was the main use of the produce from your household's crop and livestock activities? *Tick one box*
   □ Direct sale for money
   □ Value addition before sale
   □ Household consumption

8.8 Appendix H: Ethics Clearance Certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Etale

CLEARANCE CERTIFICATE	PROTOCOL NUMBER: H17/11/13
PROJECT TITLE	Exploring the relationship between climate change adaptation for food security and gender-differentiated land rights in Western Kenya
INVESTIGATOR(S)	Miss L Etale
SCHOOL/DEPARTMENT	Geography, Archaeology and Environmental Sciences/
DATE CONSIDERED	17 November 2017
DECISION OF THE COMMITTEE	Approved
EXPIRY DATE	14 February 2021

DATE 15 February 2018 CHAIRPERSON J. Knight
(Professor J Knight)

cc: Supervisor : Professor D Simatele

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to completion of a yearly progress report.

_____ Signature

_____/_____/_____ Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES