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Vulnerability of livelihood and adaptive capacity to climate change: A case of Chikupi Rural Women, Zambia

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Abstract

Zambia has not been spared from the adverse effects of climate change that have affected the poorest in society. Most Zambians reside in rural areas and depend on small-scale agriculture for their livelihoods. The only way out of climate change effects is adaptation. Climate change adaptation requires communities to have adequate income and assets/capital for improved livelihoods/wellbeing. This paper aims to explore Chikupi women's access, use of assets/capital, and constraints they face in adapting livelihood to climate change. The study uses Chikupi Rural in Kafue District as it is located along the banks of the Kafue River, and it is a flat plain that is often affected by floods and drought. This study responds to the questions: who is regarded as vulnerable and poor in Chikupi and why? How do women use assets to adapt their livelihoods to climate change in Chikupi? What constraints do different groups of women face in adapting their livelihoods to climate change, and why? The Sustainable Livelihood Approach, intersectionality, and feminist economic theories are used for the study. The study uses qualitative interviews and focus group discussions for data collection. Study results reveal that single women, the aged, and differently-abled people are vulnerable and poor. In addition, vulnerability and poverty are also characteristic of households with added roles and responsibilities such as food provision and care of families. Piecework, trading, and farming were major livelihoods that served as adaptive measures in times of climate change impacts in Chikupi. Major assets owned and used are small livestock and land by single women. Most married women do not own assets of their own but as couples. The study revealed that some women have access to government grants and subsidized farming inputs. The study also found that some women have trouble adapting to climate change because they are vulnerable in marriage due to cultural barriers, husband restrictions, and the fact that they do not own many valuable assets. Results also revealed that some women do not participate in development activities and do not have the power to make decisions about household spending.

Key words: vulnerability, poverty, adaptation, assets, adaptation strategies

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List of abbreviations

AEC	Agro-Ecological Zone
AIDS	Acquired Immunodeficiency Syndrome
CFU	Conservation Farmers Union
CSO	Central Statistical Office
CWAC	Community Welfare Assistance Committee
DFID	Department for International Development
DPO	District Planning Officer
FAO	Food Agriculture Organization
FGD	Focus Group Discussion
FISP	Farmer Input Support Programme
FSP	Food security Pack Programme
GBV	Gender Based Violence
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
IGA	Income Generating Activities
IPCC	Intergovernmental Panel on Climate Change
ITCZ	Inter Tropical Convergence Zone
LCMSR	Living Conditions and Monitoring Survey Report
MCDMCH	Ministry of Community Development Mother and Child Health
MDG	Millennium Development Goals
MFND	Ministry of Finance and National Development

MOCTA Ministry of Chiefs and Traditional Affairs

MNDP Ministry of National Development and Planning

NAPCC Indian Government's National Action Plan on Climate Change

NGO Non-Governmental Organization

OECD Organization for Economic Co-operation and Development

OVC Orphans and Vulnerable Children

SLF Sustainable Livelihood Framework

SLA Sustainable Livelihood Approach

UN United Nations

UNDP United Nations Development Programme

WHO World Health Organization

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1.0 Introduction

Negative impacts from climate change have continued to affect all sectors and levels of society (Lim *et al.,* 2005). These impacts will continue as a vicious phenomenon globally with an increase in risks to livelihood (He *et al.,* 2020). Those likely to have more effects are the vulnerable groups of the poor in Sub-Saharan Africa (SSA) (Clark *et al.,* 1998), where there are elevated levels of poverty, inadequate social safety nets, and access to health care and education. Their livelihoods depend on agricultural activities (World Bank, 2001). In addition, studies have shown that subsistence farmers are more vulnerable to risks due to their inadequacy in accessing assets and resources (Baffoe and Matsuda, 2018). This makes them fall into a long-term vicious circle of vulnerability and poverty (Van Den Berg, 2010). Without policies and institutions to protect subsistence farmers, they are weak, uncertain, and open to shocks, risks, and stress (Chambers, 1989 and Adger 1999).

Zambia has been facing the impacts of climate change that result in severe weather conditions, such as rising temperatures, droughts, and unpredictable rainfall patterns. The 2020 University of Notre Dame Global Adaptation Initiative index positioned Zambia as the 41st most vulnerable country to the effects of climate change out of 182 countries (Ministry of Finance and National Development, 2022). The incidence and severity of climate events is likely to increase in the future, with a negative effect on the economy and consequently on people's livelihoods (Central Statistical Office, 2016). Statistics show that droughts and floods have already cost Zambia more than $13.8 billion in disaster losses over the past three decades, which corresponds to a 0.4 per cent loss in annual economic growth (Ministry of National Development Planning, 2017). Without any action, it is projected that rainfall variability alone will lead to losses of 0.9% of Gross Domestic Product (GDP) growth in the next decade, with many citizens plunging below the poverty line (CSO, 2016).

The above Zambia's climatic challenges necessitated the study in Rural Chikupi of Zambia to look at the vulnerability, adaptive capacity in relation to assets owned and how they are utilized and constraints of women in adapting livelihoods to climate change. And also to establish how the Local Government can make use of these findings to alleviate poverty in the area and Zambia as a whole. As a development practitioner and change agent, I am particularly interested in the

issue of climate change because it is a new phenomenon that has dire effects on most populations especially those who live in rural areas and depend on agriculture for their livelihood. For example, one would want to ignore climate change but looking at the 2015 Zambia's Living Conditions Monitoring Survey Report, 58.2 per cent of the Zambian population live in rural areas and face floods and drought that affect their agricultural products (CSO, 2016). My interest in climate change has grown in wanting to see communities free of poverty. Currently, Zambia ranks 141 out of 165 countries globally with a 53.4 Sustainable Development Goal Index (SDGI). The SDG Index helps assess a country's overall performance based on the Seventeen (17) Sustainable Development Goals (SDGs) that give equal weight to each goal (ibid). Zambia's score (of 53.4) indicates its position of about 53% of the target outcome of one hundred (100). In addition, even if Zambia is on course to achieve the SDG goals, it still has challenges in reducing hunger (SDG1) (Sachs *et al.,* 2021). Therefore, since most Zambians live in rural areas and are dependent on agriculture, which in turn is greatly affected by floods and droughts, then as a change agent, I find it imperative to help rural communities evade poverty and want to carry out a research on climate change.

1.2 Research problem

In terms of climate change adaptation, some scholars claim that the only solution for Sub Saharan Africa (SSA) is to adapt to climate change. Adaptation is said to consist of changing farming methods, putting in place methods that reduce risks, managing resources, and caring for people's health (Füssel, 2007). Adaptation is people's ability to manage climate change impacts (Dodman and Mitlin, 2013). Because climate risks cannot be eliminated, adaptation reduces people's exposure so that they are not vulnerable to the impacts of climate change (Field *et al.,* 2012). The adaptive capacity of people is dependent on how among others, people use and control their space, time, and power (Jabeen, 2014).

In climate change adaptation, household access to income and assets play a crucial role. This is because income and assets help alleviate poverty and improve the well-being of people (CSO, 2016). Since households depend on income to meet their day-to-day needs, ownership and control of income and assets enable people to access food, clothing, housing, and health. In this way, income and assets are used as a measure of well-being because the consumption of goods

and services is dependent on the availability of income for a household (ibid). For rural communities, asset ownership is an alternative for consumption capability and ownership of production assets, such as farming implements, which can be a determinant of a household's ability to generate other income (CSO, 2016). However, adaptation might be challenging for rural communities because of inadequate income compared to urban communities.

The 2015 Living Condition Monitoring Survey Report results indicate that urban households earn three times more than rural households (CSO, 2016). Further, income inequalities are also visible between male-headed households and female-headed households within rural areas. Further, study results indicate that the monthly income for male-headed households was 1,928 Zambian Kwacha, while the monthly income for female-headed households was 1,378 Zambian Kwacha (ibid). In addition, rural households do not only have challenges with income, but they also rely on subsistence agriculture and use traditional agricultural methods that make them more vulnerable to the impacts of climate change (CSO, 2016). Continued deprivation has led majority of rural populations into poverty (CSO, 2016). Although lack of education for example, affects both rural and urban areas and both men and women, it is more challenging for those in rural areas due to other social and economic challenges. Education and skills development are essential in the socioeconomic development of any country as they provide opportunities for employment, poverty reduction, productivity, and personal growth (Ministry of Gender and Child Development, 2014). Therefore, promoting gender equity and equality in education leads to equitable access to quality education and skills development, leading to improved human capital for sustainable national development (ibid).

In terms of agriculture, the Zambian government has set agriculture as a priority sector to foster sustainable economic growth and poverty reduction (MGCD, 2014). Unfortunately, the agricultural sector is hampered by increased incidences of floods and drought due to climate change that has affected food crops for rural households leading to hunger and poverty. One would ask, how does Zambia sustain food production amid climate change impacts? It is against this background that led me conduct a research to explore adaptive capacity of women to climate change in rural Chikupi in Zambia. The reasons for choosing women is that first, in terms of climate change, the effects have been said not to be gender-neutral because of differences

between men and women regarding access to assets/capital, information, and agricultural inputs (Food Agriculture Organization, 2015). Secondly, in climate change policy, gender (especially women) is seldom addressed (Hemmati & Röhr, 2009). The third reason is from the evidence from previous studies indicating that only 3 out of 87 articles dwelt on women, and children (Berrang-Ford, Ford, & Paterson, 2011).

The fourth reason is that from a gender lens, there has been narrow studies focusing on rural women of Sub-Saharan Africa on climate change as well as adaptation (Meyiwa *et al*., 2014). The inclusion and analysis of women in climate change adaptation is cardinal as they possess precious local knowledge necessary when taking decisions on adaptation (Figueiredo and Perkins, 2013). With such studies on gender discerned climate change effects (Djoudi and Brockhaus, 2011), it justifies this study as a gendered approach to adaptation as a necessity so as not to overlook gender inequality regarding climate change (Vincent *et al*., 2010). The reason for using assets is what has been elaborated in the previous paragraph stating that assets play a crucial role in climate change adaptation. This is because the ownership and control of assets help in alleviating poverty and also the improvement of people's wellbeing (CSO, 2016). The choice of Chikupi as a case study as has been stated in chapter four (4) has been due to its rural in nature and that the area is negatively impacted by climate change in terms of floods and at times drought.

1.3 Significance of the study

Study results will not only help me as a researcher conduct an academic research, but would also help the Local Government find a way of helping rural farmers improve their wellbeing through agricultural production by identifying opportunities available for access and use of assets, important assets for adaptation, and constraints women face to adapt to livelihoods in times of climate change. It will also give policy direction to development planners to focus on the budget implementation on members of the community especially women for effective poverty alleviation programmes as they strive to improve other sectors of the economy. Further, not much is known about asset ownership and control among women in Chikupi, their utilization and constraints and yet the area is often hit with floods that affect farmers in terms of agricultural yields.

In addition, the study is significant because there is no known research particulary on assets among women that has been conducted in Chikupi. For those in Research and Development, study results will help redesign priority areas on climate change intervensions so as to focus more on the marginalized (in this case women). Further, it will guide them suggest adaptive strategies that are sustainable and cost effective.

1.4 Research objective

To explore Chikupi women's access, use of assets/capital, and constraints they face in adapting livelihood to climate change.

1.5 Research questions

1. Who is regarded as vulnerable and poor in Chikupi, and why?
2. How do women use assets to adapt livelihoods to climate change in Chikupi?
3. What constraints do different groups of women in Chikupi face in adapting livelihoods to climate change, and why?

1.6 Thesis Outline

This thesis has six chapters. The first chapter gave an introduction and research problem. The second chapter reveals literature on past relevant research conducted in line with the study. The third chapter summarizes the theoretical frameworks used in the thesis: the frameworks of sustainable livelihoods, intersectionality, and feminist economic theory that were used in the analysis of the topic of women's adaptive capacity to climate change. The methodology is described in chapter four. The presentation of findings and discussions is in chapter five. Finally, chapter six concludes with a summary of the findings of the thesis.

2 Literature Review

2.1. Introduction

This chapter will look at reviewed literature for this study in line with women's adaptive capacity in Chikupi, assets, ownership and control, and livelihood strategies for their positive improved wellbeing. This will be through a critical analysis of what other researchers have cultivated on the vulnerability and poverty levels among female farmers. What assets, capital, and livelihood strategies are available for women to adapt to climate change? And how do asset/capital ownership and control influence women's ability to adapt to climate change? The study literature will be presented from a global perspective focusing on Sub-Saharan Africa and Zambia.

2.2. General information/Concepts

Vulnerability is multidimensional and affects people through several factors at different scales, be it at a global or local level (Bohle *et al.*, 1994). The vulnerability has been associated with exposure, sensitivity, and adaptive capability (Engle, 2011). Most countries in SSA are affected by climate change impacts as their economies are fragile (Kasperson & Kasperson, 2001). In addition, these countries have a limited ability to use natural and human resources, which influences their vulnerability further (Ribot & Peluso, 2003).

In climate change adaptation, resources can be in the form of private (financial) and public assets (road infrastructure), social affiliation (groups), and systems that warn of impending disasters (Cinner *et al*., 2018). However, for most countries in SSA, the availability of such resources, as Sen (1984) put it, does not mean that people have access to them; it reduces their vulnerability. This is because access to resources involves social relations that are not available, and even when available, poor people fail to make use of them (Watts, 1983). Therefore, poor people's inability to access resources and adapt to climate change impacts is because they cannot control their day-to-day lives (Gaillard, 2010) due to the places where they live and how they source their livelihoods (Blaikie, 1985). Linked to this is the gender aspect that influences people's vulnerability to climate-related impacts (Thomas *et al.,* 2019). Other influences on vulnerability relate to the absence of control of resources and privileges that affect mostly women to cope with the impacts of climate change (Denton, 2002; Sultana, 2014).

2.3 Exposure, poverty, and climate change

a) Vulnerability

A study from Coastal Bangladesh examined the effects of cyclone Aila in 2009. It revealed that women worked the fields in high heat, fetching water from contaminated wells and repairing infrastructure damaged by flooding (Al Nahian, Islam, & Bala, 2013). These situations amplified hardships in their daily income acquisition tasks, increasing hunger. Another study by Mirza of the Char dwellers of Bangladesh revealed that most women were reliant on agriculture and livestock-related activities for their livelihood. Because these activities are vulnerable to floods and droughts and do not have ways to make money, they are more at risk (Alam, 2017).

Another study in Mexico found that smallholder Milipa farmers had no formal education. They relied mostly on rain-fed agriculture, with inadequate adaptation strategies to climate change and faced increasing poverty (Campos *et al.,* 2014). The same study shows that most small-holder farmers were females with the lowest income levels. They played a secondary role in most productive activities, yet they were responsible for the community's long-term stability (ibid). Another study from Zambia's Masaiti and Chirundu revealed that the socio-economic profiles of smallholder farmers in the two districts were low due to low levels of income and diversified sources of income. This made smallholder farmers fail to cover extra household needs after satisfying basic ones and worsened their situation (Dumenu and Takam Tiamgne, 2020).

b) Poverty

Poverty is associated with vulnerability as poor people in SSA countries suffer from losses in agricultural production due to climate-related impacts (Roberts & Parks, 2006). Poverty mostly affects people's access to assets and makes them more vulnerable, especially to climate change (Blaikie *et al.,* 1994). Therefore, since vulnerability is also determined by, among others, political and institutional capacities (Bohle *et al.,* 1994), it is difficult for poor people to be resilient in times of climate change impacts due to a lack of knowledge of access to assets (Mileti, 1999).

The study done in Bangladesh by MacMahon (2017) in the villages known as Baintola, Fakirhat, Hurka, and Chitolmari, shows that poor people were marginalized politically and socially. Since

they depended on small-scale agriculture for their livelihoods, it affected their adaptive capacity to climate change impacts. This had a bigger effect on women than on men, making it harder for poor women to access agricultural resources (MacMahon, 2017). In the same study by MacMahon (2017), it was revealed that poverty contributed to women's failure to access credit that was essential for their adaptation to climate-related impacts. This shows that it is hard for poor people to get credit because of their situation (Amin *et al.,* 2003).

A study conducted in Sesheke, Western Province of Zambia, revealed that even if most people viewed agriculture as the major pathway out of poverty for women, because of their limited access to important productive resources such as labour, fertile land, and inputs, their role in agriculture restricted them only to subsistence food crops with limited potential to earn a living (Lwando, 2013). In addition, the same study revealed that seasonal migration outside agriculture was not possible due to social and cultural norms. Further, they spent much of their income on food to improve household food security in times of climate change impacts (Lwando, 2013).

2.4 Climate change adaptation: assets/capital and livelihood strategies

An increasing body of literature presents the prominence of assets to the alleviation of poverty together with increased welfare and empowerment. However, there is a recognition by some scholars, such as Quisumbing and Maluccio (2003), of the challenges to women's ownership of capital and assets and the impact as well as the prominence of assets in agricultural development interventions that are focused on gender (cited in Andersson Djurfeldt *et al*., 2018). It shows further that as assets help raise incomes, the accumulation of assets over time also indicates enhancements in livelihoods (Andersson Djurfeldt *et al*., 2018).

There are further arguments by different scholars that the way households respond to risks and effects of climate change depends on their adaptive capacity. They argue that adaptive capacity, in turn, depends on the amount and diversity of assets and capitals, social networks, institutions, and entitlements that impel the distribution and utilization of assets and capitals (Blaikie *et al.,* 1994). This means that the assets that households have and how easy it is for them to get to them are key factors in how vulnerable rural communities are to climate change (McDowell *et al.,* 2010).

On the issue of livelihood strategies, a study done in Chikupi, Mungu and Kabweza in Zambia revealed that vegetable cultivation was a popular livelihood strategy for women. They contended that it was more profitable than being employed, and it also allowed for more freedom in choosing how to spend time and effort in their daily work (Borsboom, 2012). In the same study, women who belonged to the government and Non Governmental Organization (NGO)-initiated clubs engaged in various income-generating activities such as gardening, crafts, and livestock. This was because of the perception that women were good handlers and spenders of money, and these activities helped supplement rain-fed agriculture, farming, and gardening (Borsboom, 2012).

a) Natural assets/capital

Natural assets refer to natural resources and services that individuals depend on for their existence and development (Pandey *et al.,* 2017). Most farmers' significant natural assets are land, which is vital to rural family livelihoods. However, when it comes to natural assets, there are gender gaps. For example, there is a gender gap in access to land among smallholders with land rights based on community land allocations (Andersson Djurfeldt *et al*., 2018). In most African communities, women access land through marriages, with female land rights being secondary as their husbands hold the right to use it (Andersson Djurfeldt *et al*., 2018).

In most parts of Sub-Saharan Africa, Communal land rights follow patrilineal structures where land allocation does not include women. This is a widespread practice in Africa, where separation of property is biased towards husbands, and when marriages end, it goes back to the deceased family (Andersson Djurfeldt *et al*., 2018). A study conducted in Kenya (GoK, 2008), revealed that only a few women had title deeds for their pieces of land. This positioned them at the periphery regarding crop production and decisions (Skinner, 2011). Uneven rights to land limit women's capacity to access credit and confine their decisions on land use, which is essential to adapting to climate change.

b) Physical capital

Physical assets are basic facilities and infrastructure that offer ease to farmers' production and lives (Pandey *et al*., 2017). The cost of the farmers' agricultural equipment and tools echoes the

input that farmers have made for agricultural production and helps enhance the effectiveness of agricultural production (Garca De Jalon *et al*., 2018). However, access to farm equipment is beyond the reach of most smallholder farmers in Zambia as it is expensive (GART, 2009). The study done in Zambia revealed that less than half the farmers interviewed had access to draught power (CFU, 2006). Therefore, most smallholder farmers only depend on the contractor providers, such as tractors and animal-drawn power, from the few that own them (Moonga and Moonga, 2016).

The failure to acquire such equipment is the inadequacy of money by smallholder farmers. A study conducted in Chikupi, Kabweza, and Mungu, Zambia, shows that smallholder farmers such as women could only spend money on family and household expenses rather than on productive assets (Borsboom, 2012). Therefore, the study implied less space for women to accumulate the money required to pay back loans and interest. In this way, only men could invest in things like irrigation technologies (ibid).

c) Financial assets/capital

Financial assets mirror the total amount of money accessible to people, including access to credit (Garca De Jalon *et al.*, 2018). The amount of difficulty for farmers when getting financial support mirrors their chances of resisting livelihood risks and adopting adaptation strategies (ibid). For example, financial capital facilitates access to other assets such as land, investment in physical capital, as seen in the access of fishing gears for those in fishing industries, and savings (Mayoux, 2001). A study in Cameroon among women who got credit from a saving group shows that it helped them buy land for farming (Mayoux, 2001).

Another case study in Nigeria shows a relationship between micro-lending, increased household savings, and reduced poverty. It revealed that low access to financial capital and savings, as observed across the sites, prevented households from building other capital and attaining significant assets to improve their livelihood portfolios and production activities, thus increasing vulnerability to climate change impacts (Nkpoyen and Eteng, 2012).

On the other side, even when, for example, women have access to financial capital, they do not always get it due to gender-related challenges. A study in Zambia's Mungu, Kabweza and

Chikupi shows that most female farmers who wished to obtain loans for investments, for example, in a new irrigation technology but did not know where to access them from. But even when these women could afford to find and pay for the loans, the final say was from their husbands considered as bosses in their households (Borsboom, 2012). A similar study from Zanzibar on livelihood assets in the two east coast communities of Kiuyu Mbuyuni and Matemwe. It revealed that most households across the sites had no access to any type of grant or/pension.

In addition, most people in Kiuyu Mbuyuni and Matemwe had no savings at all (Makame *et al.,* 2018). The findings linked the reasons for the low returns of the community's livelihood activities to the small-scale nature of their activities. Further, their low savings are attributed to their low participation in cooperatives and saving groups (ibid). Interestingly, related study results have shown that farmers with poor financial assets find it difficult to face livelihood risks. These results are consistent with Ochieng *et al.* (2017) and Shah and Wang (2018), who reveal that the scarcity of financial assets exposes farmers to risks, leading to livelihood vulnerabilities.

d) Social capital/assets

There has been a realization of late by most researchers also to consider social networks and institutions in agricultural adaptation (Wheeler and von Braun, 2013; Lipper *et al.,* 2014). Social capital is a way people and organizations form connections that bring about cooperation through working together to resist the impacts of climate change (Dietz *et al.,* 2003). Studies from selected African countries such as Kenya (Mukuenia and Nyandu) and Uganda (Rukia and Huima) show that households consist of members that have different and important networks that lead to collaborations with organizations or linkage to community-level social capital (Niles *et al.,* 2021).

In addition, the study revealed a positive relationship between credit group membership and food security (Niles *et al.,* 2021). The findings are based on the importance of access to resources such as credit for food security and improved climate change adaptation (Bryan *et al.,* 2009). This is so because members' access to credit enables them to use the money to buy food and other household necessities in times of floods and drought.

Another study to show the success of social capital in Bika, Zimbabwe, revealed that farmers use social community networks to converge and help each other in an activity called nhimbe (collective fieldwork). This is an activity hosted by one farmer where community members help in weeding, harvesting, or cultivation. The benefits included strengthening the community's social nets against climate impacts, skill-sharing, and idea-sharing on how to address climate impacts (Nyahunda and Tirivangasi, 2021). In the same study, farmers did not get rid of their cattle when there was a drought. Instead, they used their networks and connections to give their cattle to friends and family who lived in other places with better grazing land (Nyahunda and Tirivangasi, 2021).

e) Human capital

Human capital/assets are related to personal knowledge, skills, health, and labour potential (Baffoe and Matsuda, 2018). Education is commonly an essential element for farmers to successfully manage different livelihood strategies (Jezeer *et al.,* 2019). A study conducted in San Salvador and Rio found that education influenced people's understanding of reducing climate change risks. It revealed that formal education made people aware of existing risks, access information on risk reduction, and learn coping methods (Wamsler *et al.,* 2012).

Further, a study from Nigeria revealed that healthy women with higher education participated positively in the labour force (Osundina, 2020). In addition, other findings reveal that women with secondary and college education were more likely to have regular paying jobs than those with only primary school education (Cazes and Verick, 2013). ILO (2017) and the World Bank (2014) also echoed that their employment chances also increase when women improve their education.

In terms of climate change, education is an essential tool that enables adaptation to climate change impacts (IPCC, 2014). People with higher education have a higher participation rate for good wages (Euwals *et al.,* 2011). Good wages result in improved well-being, especially in times of climate change impacts. In addition, education and better jobs enable people to cope with disasters such as floods and drought (Adger *et al.,* 2004). Therefore, increasing the number of women with a good education would lead to good-paying jobs and improved well-being,

reducing vulnerability and poverty. Reduced vulnerability and poverty make rural women adapt to climate change impacts due to the availability of adaptive strategies emanating from adequate financial and social resources from employment networks.

2.5 Gender differences in asset control and ownership

Studies have shown that women have limited ownership and control over land and property rights in sub-Saharan Africa. For example, a study in Kenya found that women only had access to land through their spouses, especially under customary tenure (Farnworth *et al.,* 2013). This situation positions women at the periphery of the production of crops and decision-making (Skinner, 2011). This has a ripple effect as it limits them from accessing credit facilities and impedes their adaptation to climate change. In Gwembe, Zambia, a similar study revealed that customary provisions determined land ownership. It showed that husbands only allocated small pieces of land for farming to their wives (Khoza *et al.,* 2019), and a woman could only own land if single and with children. Only then could her father or brother apportion a piece so she could farm on it (ibid).

Another study in Sesheke, Zambia, revealed that most women in the area were of low economic status, had insufficient education, and lacked access to assets, information, and skills as compared to males, leaving women more vulnerable to the effects of climate variability (Lwando, 2013). On the same topic of gender disparities in decision-making, a study in Zambia's Chikupi, Kabweza and Mungu revealed that financial decisions on the proceeds from any income, such as gardening in most households, were made by men. This left women in a submissive and vulnerable situation, especially in matters of self-sustenance (Borsboom, 2012).

This was similar even with livestock. For example, a study in Kenya showed that gender inequality persists in livestock ownership and control of earnings, where men control earnings from large livestock. At the same time, women only own small livestock such as goats, sheep, and poultry (Njuki & Sanginga 2013). The lack of ownership and control robs them of collateral for credit, a safeguard against shocks, and the possibility of storing value (Deere, 2010).

2.6 Conclusion

The literature reviewed confirms disparities regarding vulnerability and poverty that have put women, especially at the edge with limited assets, be it natural in the form of land, physical in the form of livestock, or human skills and education. Social capital has benefited most people, especially through networks and connections towards climate change impacts. Lack of natural assets such as land and physical assets such as livestock makes it impossible to access credit from financial institutions, leaving them with limited livelihood strategies, especially in these times of harsh climate impacts of floods, drought and increased heat that have continued to affect agriculture production, which is their main source of food.

3 Theoretical Frameworks

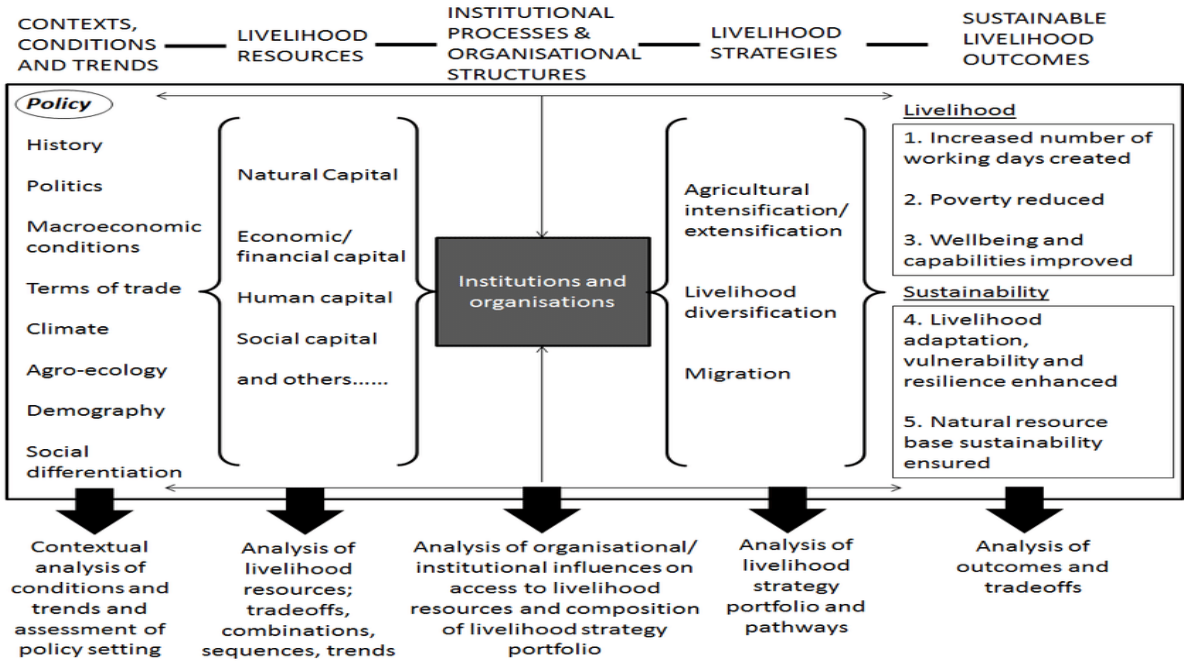
3.1 Introduction

This chapter presents the three (3) adopted theoretical approaches of the Sustainable Livelihood Framework, Intersectionality, and Feminist Economic Theory to explain and narrow down the research on rural women's livelihood and adaptive capacity. The Sustainable Livelihood Framework (SLF) will be used as an analysis to assess available assets and capitals and how they make use of them for livelihood strategies. The intersectionality approach will be useful during the analysis to understand that the impacts of climate change differ according to gender, class, age, race, and caste. This will further help understand that women possess different skills, networks, resources, and abilities that can help solve problems. Finally, the feminist economic theory has also been incorporated to aid in analysing power relations regarding the ownership, bargaining power, and expenditure of important resources and how power can aid in the adaptation process of women.

3.2 Sustainable Livelihood Approach

The Sustainable Livelihood Framework by Scoones (1998) has been adopted for this research to analyze how people may achieve or fail in their livelihoods. The framework will not be used to uncover all aspects of sustainable livelihoods as presented in the framework (Figure 1). Still, it will be used as an analysis in terms of women's vulnerability, available assets, how they use them, and strategies available that can be employed to better their livelihoods in the wake of climate change impacts. The SLF is also helpful at the time of data collection. It permits a combination of methods and mostly supports participatory nature, such as focus group discussion, as discussed in the methodology chapter of this research (Scoones, 1998). Specific to this research, the framework will be applied to individual households and, to some extent, village level.

Figure 1: Sustainable Livelihood Framework



Source: Scoones (1998 p.4)

3.2.1 What are Sustainable Livelihoods?

Chambers and Conway (1992) define sustainable livelihoods as,

> *'A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain, or enhance its capabilities and assets, while not undermining the natural resource base.'*

Some key elements by Chambers and Conway (1992) that have emerged from the above definition, livelihood adaptation and vulnerability, will be useful for analyzing and discussing the findings of this research. Livelihood adaptation and vulnerability will be used to analyse women's different abilities and assets and how they use them to adjust to the impacts of climate change for improved livelihoods.

3.2.2 Livelihood assets/capitals

Assets and capitals such as social, tangible, and intangible assets of a community play an imperative role in people's livelihood strategies. This means that a community needs to have a strong capital set from their different livelihoods. For example, when women have adequate income, land, knowledge and skills, and the capacity to use their capital, they will have a positive livelihood (Scoones, 1998). There are four (4) assets and capitals proposed by Scoones (1998), and they are natural, financial, human, and social. The assets are explained in the literature review chapter.

The success of using capital draws upon the combination of one or two capitals people own and control for a livelihood strategy as Chambers and Conway (1992) suggest examples of groupings of assets in the form of personal capabilities, tangible assets (in the form of material resources), and intangible assets such as access to capital. Access to capital, trends (e.g., assets accumulated), sequencing (one asset connecting people to other assets), and clustering (linking one asset to another).

3.2.3 Livelihood strategies

Livelihood strategies can be at individual, household, and village levels (Chambers and Conway, 1992). People make choices and different livelihoods consciously or unconsciously in different seasons and scales. For example, an individual farmer may decide to have a small garden during the dry season to supplement income and food in times of floods. Further, an individual or household may combine different livelihood strategies depending on their health, the urgency of finances and food, and when that livelihood is suitable (Chambers and Conway, 1992). For example, a household may engage in informal labour (piecework), gardening, and food crop production (such as maize, beans, and groundnuts). Rural livelihoods have been reliant on natural resources such as soil and water. For this reason, their livelihoods are at risk as the natural resource is usually affected by impacts, for example, floods and drought (IDS, 1996).

3.2.4 Transforming structures and processes

For assets and livelihood strategies to materialize, there must be institutions. Institutions are behaviours in a certain order and have rules and norms. They may be formal or informal, depending on the actors managing them. In summary, Davies (1997) defines institutions as:

> *"The social cement which links stakeholders to access to capital of various kinds to the means of exercising power and so define the gateways through which they pass on the route to positive or negative [livelihood] adaptation"*

3.3 Intersectionality

Intersectionality as a theoretical paradigm has its roots in critical feminist thought intended to examine different marginalizations both at an individual and societal level (Crenshaw, 1999). From an intersectionality position, marginalized people are hardly homogenous. For example, in a particular community, women may have degrading cultural representations related to their race, and others may be victims of gender-related domestic and sexual violence (Crenshaw, 1991). In this case, intersectionality (Crocket *et al.,* 2011) suggests several ways to find similarities and differences between and within marginalised groups in several ways.

An intersectionality is an approach adopted for this research to understand the difference and existence of multiple kinds of identity that govern an individual's relationship to power (Crenshaw, 1991). In addition, intersectionality has helped explain and understand that a community possesses people with different skills, different personal linkages and incomes, and social and economic variables, leading to the ability of different clusters to solve different problems (Hoernig, n.d). Intersectionality has helped researchers address issues ignored by other disciplines. Relationships such as gender and other categories such as class (Valentine, 2007) continue to side-line women and other marginal groups, which are pertinent to this research (Dias and Blecha, 2007).

Intersectionality as an approach does not only consider the presence of dominance but illuminates how they relate to one another (Osborne, 2015).

Therefore, intersectionality makes it possible to identify how women with different identities and positions, such as class, gender, and age, interact in the community (Frye *et al.,* 2008). In addition, this helps posit relationships between groups, such as the single or married (Valentine, 2007), to understand their relationships as a vibrant process rather than as separate groups (Watson and Ratna, 2011).

In addition, the use of intersectional analysis has helped to identify audible voices and those that are ignored (Osborne, 2015) or regarded as invisible (Couch, 2011). This is an example that even among the most marginalized people in a community, there is a heterogeneity of experience and treatment in practice and in the study. Understanding such differences is imperative for the successful intervention of such groups of people (Osborne, 2015). Related directly to this research, intersectionality shows yielding cardinal insights as far as disaster management research is concerned.

For example, in Bangladesh, after a flood experience, it revealed that although gender matters in the context of natural disasters, women were not necessarily a homogenous group because intersectionality with religion, class, caste, and age, among others, affected resources, responsibilities, and rights that any woman had (Sultana, 2010). Similarly, while men may seem central in mainly patriarchal societies, they are categorized by class, education status, and religion (ibid).

Further, intersectionality has helped to analyse that vulnerability to natural disasters is gendered, and on the other hand, vulnerability is moulded by other factors, together with race and class (Osborne, 2015). It also helps to explain that although a natural event triggers a disaster, its impact on society is embedded in the social system where it takes place. Regarding assets, intersectionality helps us understand that because of power relations and systems of privilege, people may each inherit a different combination of assets, problems, and hurdles dependent on how they start in life (Healey, 2006).

3.4 Feminist economic theory

The feminist economic theory, as alluded to by Quisumbing, shows that asset ownership has a strong association to a person's position in a particular household. As much as households are characteristic of family unity, individual members who own and control assets have authority over other family members (cited in Andersson Djurfeldt, 2018). In the case of marginalized groups such as women, Quisumbing and Maluccio contend that possession of assets would make women capable of influencing decision making in their households and at the community level. This may contribute to the improvement of their livelihood opportunities (cited in Andersson Djurfeldt, 2018). In addition, Deere and Doss claim that even if women's possession of assets can help alleviate poverty, literature shows that men own more valuable assets than women. This situation causes gender biases in the way assets are distributed and shared at household and community levels (cited in Andersson Djurfeldt, 2018).

3.4 Conclusion

The three theoretical approaches presented above complement each other for this research on rural women's livelihood and adaptive capacity. This is because the community faces different risks, mainly in the rainy season of floods and drought, as they are dependent on agriculture for their livelihoods. Therefore, analysing their sources of capital or assets and how they use them is crucial as it relates to strategies they employ and related institutions working in the area that would impede or help them attain positive outcomes. In addition, the analysis considers differences between individuals and groups among women that should not be generalized. These are in terms of vulnerability, opportunities, gender, and age. These considerations entail conducting research with the knowledge that there are vulnerable people to climate impacts within the same group as women, while others are not. Adaptive capacities will therefore not be the same.

4 Methodology

4.1 Study Context – Zambia

4.1.1 Economic Demographic trends

According to the 2015 Living Conditions Monitoring Survey (LCMS), Zambia's population was 15.5 million people (CSO, 2016). Rural areas accounted for 58.2 per cent of this population. Agricultural activities were the major economic activity (CSO, 2016).

4.1.2 Climate and climate change in Zambia

Zambia has three seasons, with the first being the warm wet season that lasts from November to April, with temperatures varying between low and mid-20 degrees Celsius and during which the country receives its annual precipitation. The second is the cool, dry season from May to August, with maximum temperatures ranging from about 10 degrees Celsius to 20 degrees Celsius (www.britanicca.com). The third is the hot, dry season, from September to October, with maximum temperatures ranging from about 20 degrees Celsius to about 30 degrees Celsius.

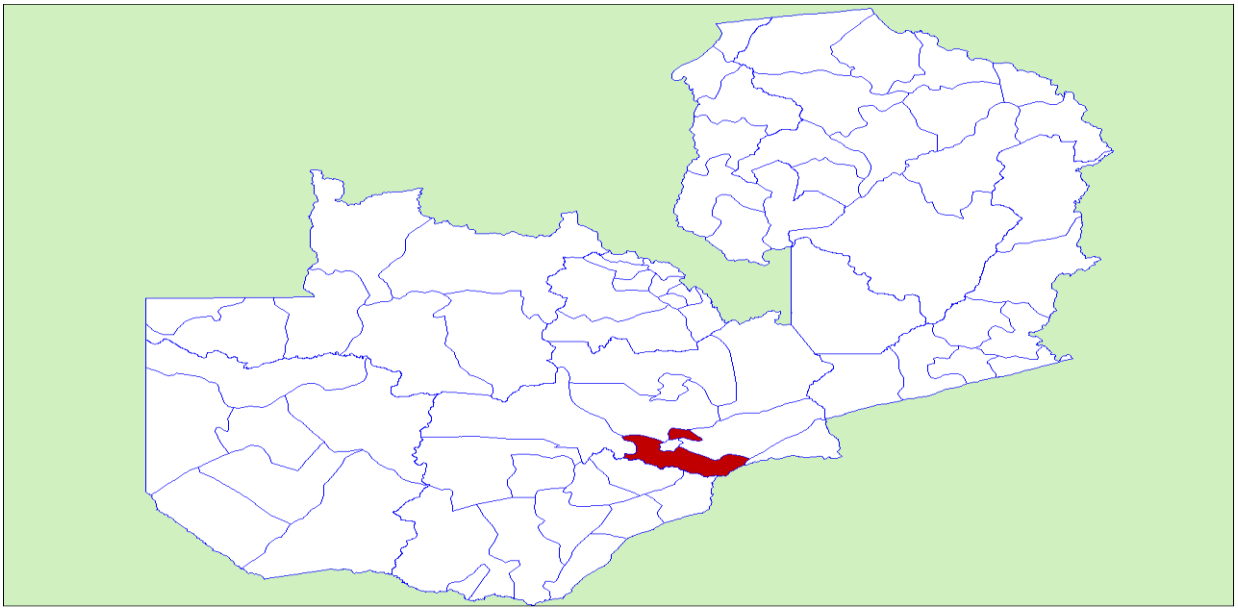
As a development and cross-cutting issue, climate change is very precarious in Zambia. Unsustainable use of natural resources such as trees and poor management of the environment has contributed to rising cases of impacts of climate change such as droughts, floods, and elevated temperatures (MNDP, 2017). In addition, Zambia's natural environment threatens its ecosystem because of poor management of environmental practices such as water and land pollution, air pollution, sanitation, and waste management (MNDP, 2017).

4.2 District profile of Kafue

Kafue District is in the Lusaka Province of Zambia and lies on the north bank of the Kafue River, where it derives its name from. It is located to the south of Lusaka's capital city (See Figure 1 below). It has an estimated 242,275 people based on the 2010 National Population Census data (CSO, 2010). About 69% of people live in rural areas with agriculture, livestock rearing, and general trading as their main economic activities (ibid). Major crops grown include maize, sugar cane, sunflower, groundnuts, cotton, and beans (CSO, 2010). The city has five mainland-based ecological services, namely agriculture production, forestry, fresh-water use,

wetlands, and hydro-power generation, which contribute to the livelihood of indigenous and external communities in the district (ibid).

Figure 1: Map of Zambia showing the location of Kafue District



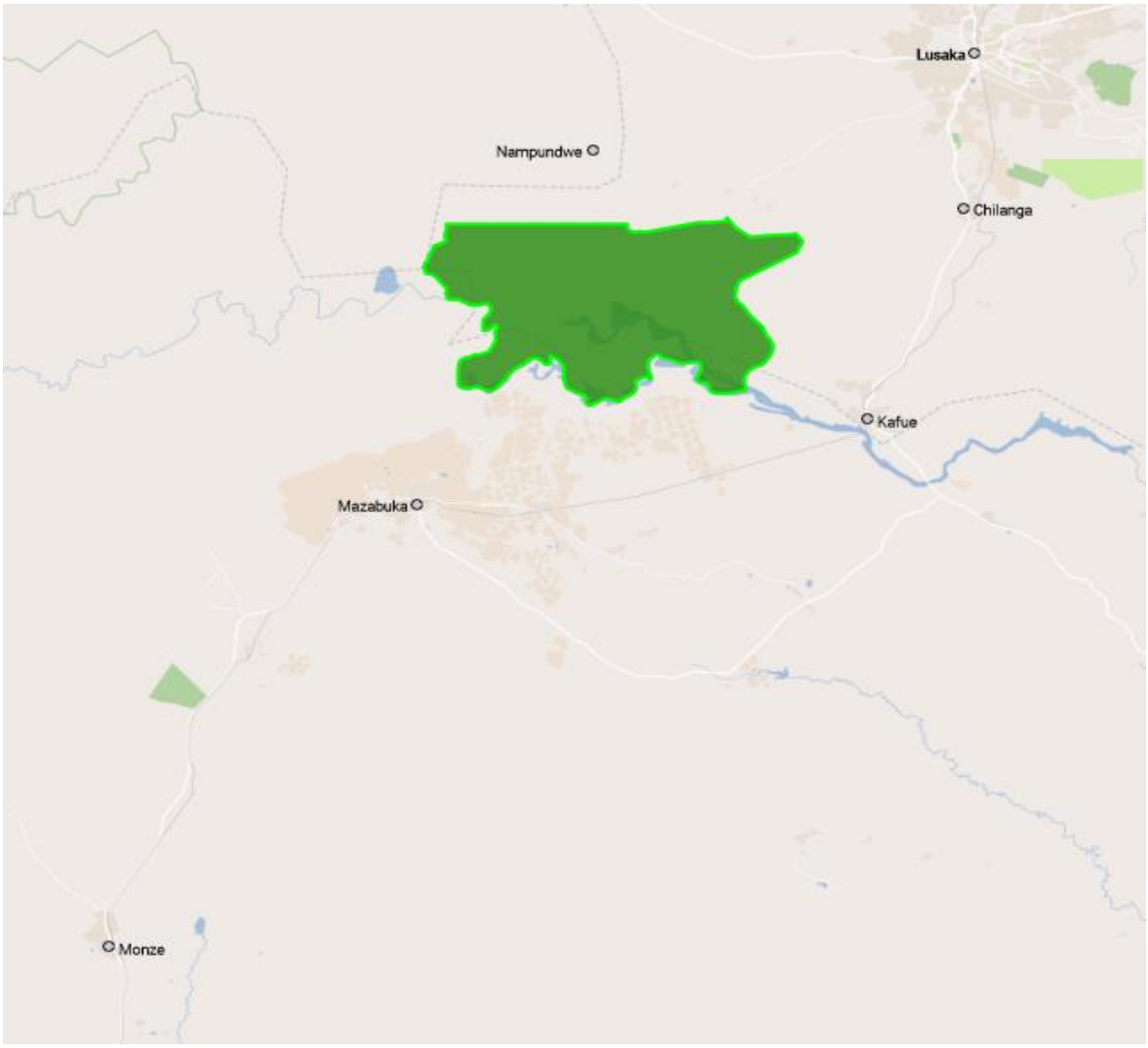
Source: https://www.lsk.gov.zm/ Retrieved on 10/04/2022

Since 2000, the intensity and frequency of floods and droughts and the number of people affected have also changed, with more floods and droughts over a longer period (CSO, 2010). This has culminated in the loss of crops and reduced nutrition and income for most households, especially the small farmers dependent on agriculture for survival.

4.2.3 Site selection and site description

The study was conducted in a village within Chikupi. The The name of the village (study site) has been kept anonymous to protect my informants. The study site is twenty kilometres west of Kafue town (Figure 2). It has an estimated population of about 1,036, according to the 2010 census (CSO, 2010). The study site was specifically selected as it is one of the areas along the Kafue Sub-Basin affected by floods and drought (Zambia Pilot Programme for Climate Resilience, 2014).

Figure 2: Location of Chikupi



Source: Thomas Brinkhoff

Further, Chikupi is a flat plain, making it susceptible to floods during the rainy season (Moonga and Moonga, 2016). As a result, many houses collapse during the rainy season, and crops are submerged in water (as seen in figures 3 and 4 below), making households vulnerable to food shortages, diseases, and hunger.

Figure 3

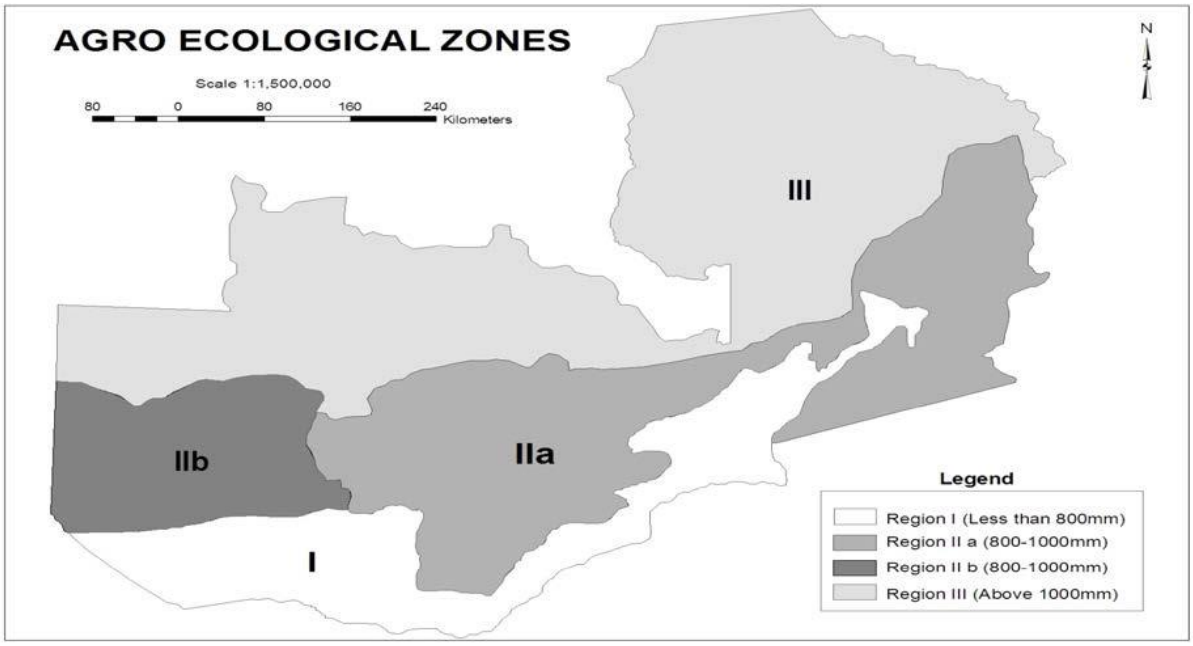
Figure 4:

Source, Kafue Disaster Management and Mitigation Unite Office (DMMU).

Since Chikupi is resettlement under the customary land tenure system, residents have no title deeds or any form of legal documentation as the legal authority of residence is through the Village Headman. Zambia has a duo land tenure system between the customary (traditional land) and the statutory (state land). With traditional land, all fields become communal grazing areas after harvest (ibid). Farmers are not allowed to fence off their fields as this would be a cost and would be challenged by other community members (Umar *et al.*, 2011). The community of Chikupi consists mainly of subsistence farmers involved in agriculture (ibid).

Chikupi, as seen in figure 5 below, lies in Zambia's Agro-Ecological Zone (AEC) II, which is mainly the major productive agricultural land in the country and receives between 800 and 1000 mm of rainfall every year and covers approximately 42 per cent of the country. The AEC II is further segmented into AEC IIa and AEC IIb. Chikupi is in the AEC IIa and covers the fertile plateaus of Lusaka, Central, Eastern Provinces and Southern, while AEC II b covers the sandy areas of the Western Province. AEC IIa promotes the production of various main food and cash crops like maize, sunflower, groundnuts, and tobacco. In contrast, AEC IIb promotes the cultivation of other crops like millet, rice, cashew nuts, timber, and vegetables.

Figure 5: Map of Zambia showing the Agro-Ecological Zones.



Source: www.fao.org.

4.3 Entry into the study area

The entry into the community (study area) was characterized by an initial meeting with the Agricultural Block Officer. I explained to him my mission to conduct a study on climate change targeting women farmers. Due to his busy schedule, I was later assigned a Community Welfare Assistance Committee Member (CWAC) who is also a well-positioned gatekeeper with vested knowledge of the community. I explained the simplicity of the work I was to undertake and helped me make appointments with the traditional leaders and key informants.

4.4 Research approach

The study used a qualitative approach to cultivate successful research as all responses represented individual women farmers who participated in interviews, focus group discussions, and key informants in adaptive capacity (Merriam, 2002). This comes from the idea that reality is not from a single perspective and agreed upon that someone can measure (ibid), but a

collection of different ideas and reflections (Merriam, 2002). Qualitative research helps make sense of the phenomena from the participant's standpoint (Merriam, 2002).

The study took a constructionist view of knowledge of the world based on people's understanding of it from their reflections (Ormston *et al.,* 2014). This is because reality is made visible by women who experience climate change impacts (Gergen, 1999). Therefore, since women are the ones who experience the harsh impacts of climate change, they provided a more valuable contribution to the study (Seymour, 2013) of adaptive capacity in Chikupi, rural Zambia. This was in their historical, structural, political, and socio-cultural settings and they pursued their interpretations from their perspectives and understandings (Bryman, 2016). This has helped them build their day-to-day experiences with assets, ownership/control, and adaptable strategies for their livelihood outcomes.

Qualitative interviewing was due to my ontological position suggesting that women farmers and key informants' knowledge and experiences are meaningful properties of reality (Mason, 2017). Since women farmers perceive and experience challenges differently, qualitative interviews illuminated their different ontological positions regarding assets and capital and their different livelihood strategies (ibid.). As a researcher, I had an epistemological position that allowed a meaningful way to generate data on ontological properties through interacting, questioning, and witnessing their world (Mason, 2017). In addition, Atkinson and Silverman contend that talking and dialogue have inherent appeal due to their understanding of everyday life (Padgett, 2016).

The generation of data for the study used a collection of qualitative methods, including interviews and focus group discussions. Using two methods made it possible to understand research issues from different participants' points of view and get more complex data during the study (Mason, 2018). In short, since interviews were more of one-to-one interaction, the addition of focus groups, which are more interactive as they involve more members, added views that were beneficial for the study. It was also to identify fundamental concepts between them (Hyde, 2000), thus allowing me to generate the required data as a researcher.

4.7 Sampling Strategies

The gatekeeper (a CWAC) facilitated the participant recruitment and, most importantly, as a way of obtaining informed consent from respondents (Flowerdew and Martine, 2005). A purposive sampling method was employed for the fifteen (15) female farmers that took part in the face-to-face interviews as they were the ones who faced the hash impacts of climate change, and their responses to the study were valued. Panton claims that the logic and power of purposeful sampling lies in selecting information-rich cases for in-depth study to learn matters of central significance to the research (In Palinkas *et al.,* 2015). The fifteen (15) individual female farmers represented various categories such as marital status (married and single), age (ranging from 21 to 58) and income status.

The two focus groups were conveniently selected and composed of seven (7) and six (6) members. These were different members from those that took part in the interviews. They represented distinct categories: age (ranging from 21 to 56), marital status (married and single), and income status. This was to get divergent views from different age groups, marital statuses, and income statuses as they were affected differently and dealt with climate change impacts differently. Therefore, their divergent views were cardinal to the research. This was only possible through interactions and interviews on their different experiences on climate change impacts, assets, family size, sources of income, and general wellbeing in climate change matters.

Further, five (5) key informants were purposefully selected as stakeholders in Chikupi due to their different developmental roles. The key informants consisted of two (2) Agricultural officers brought in due to their roles in the farming community of Chikupi, and their responses were important for the study; one (1) Chiefs and Traditional Affairs Officer as a chief overseer of traditional matters in the area; one (1) Headman as a traditional leader responsible for village related matters; and one (1) Social Welfare Officer as an implementer of all social-related programmes in the community. Each key informant has been coded for anonymity in the analysis section, and the adopted code *'KI'* denote *'key informant.'* And each key informant has been given a number, for example, *KI 1,* denoting *Key Informant 1*.

4.8 Qualitative Interviews

Interviewing is a thorough, semi-structured or loosely structured method (Mason, 2017). It involves face-to-face (co-present) interviews with either one person or a small group (ibid). Interviews are one of the most recognized forms of qualitative research methods. Interviews conducted in women's home settings enabled their comfort and accorded me time to interact with them as a researcher freely. Open-ended and non-structured interview guides were used. This was for them to explain their situations in their own words and from their points of view (DeCarlo, 2018). Such an interaction was not possible with other methods (ibid). The same method was used for key informants.

A total of 5 key informants were targeted, as elaborated in the sampling strategy above. Unfortunately, at the time, only the village headman was physically available for a face-to-face interview. For the other four, it was difficult to interview them face-to-face due to their busy schedules. However, two (2) (a Chiefs and Traditional Affairs Officer and a Social Welfare Officer) were interviewed online, and the other two (2) (an Agricultural Block Officer and an Agricultural Camp Officer) filled in a simplified guide with spaces provided. This was because time was against me, and I had to return to Sweden to finalize my thesis.

4.9 Focus Group Discussion

Although focus groups are used in other fields of study, for example, market research, they have proved useful in the social sciences (Mason, 2002). Powel *et al.* contend that a group consists of people that a researcher brings together so they can talk about their own experiences on a certain topic (Flowerdew and Martine, 2005). In this study, focus groups helped bring women farmers of Chikupi together, unlike in a one-on-one interview to get views and opinions through the stimulation of discussion on climate change impacts, available assets, use, ownership, and their application for livelihood adaptation (ibid). Therefore, group interactions are a key mechanism for generating data. In this case, focus group discussions helped to complement interviews during data generation. This enabled the researcher to gain insight into the range of views individuals hold on climate change and their interaction during dialogue (Flowerdew and Martine, 2005).

Two focus groups consisted of women farmers according to age, marital status, and income status. Focus group A discussion took place in the morning, while a focus group B discussion in the afternoon, and the duration was one hour for each. The researcher was the moderator, and discussions were recorded using a phone to allow a free flow of discussions without disruptions from notetaking.

4.10 Data analysis

Analysis of the data was done manually. All recorded data was carefully listened to and transcribed. It was a time-consuming process, and to make matters worse, I was unfamiliar with any software used to transcribe data as a researcher. In addition, transcription is very time-consuming compared to the actual time taken when collecting data (Cohen *et al.,* 2012). Recordings were played back and forth to ensure that nothing was missed. Analysis was necessary for my thesis as it worked as a reduction process for the data that I generated to make sense of it (Robin and McCartan, 2016). Transcribed data was put into themes manually. For example, all data related to research question one (1) were grouped together, this was also done for research question 2 and 3. This helped to explain and discuss findings that were related and helped answering all the research questions. Data analysis involves organizing data, accounting for, and explaining the data collected (Cohen *et al.,* 2012). Data processing was easy for me as the data generated from filled-in interview guides was already in the form of text.

4.11 Study limitations

Even though the study sounds so smooth in data generation, there were a few limitations. The duration of the study was short as there was supposed to be enough time for me to contact the gatekeeper, who would find me a suitable site for my data collection. The Agricultural Block Officer, my initial gatekeeper, had commitments that delayed my introduction to the community leaders. By the time I was allocated another gatekeeper, two to three weeks had passed, which made the intended initial meetings cancelled and community entry not properly done.

The other limitation was the purposive sampling to select participants for the study. This process is not perfect as participants may not represent all the views of a wider majority. Coupled with delays in starting the data collection, the sample was difficult to fulfil as time was not adequate.

Although the consolation was that all categories of planned individuals were interviewed, a wider selection would have been ideal.

The other limitation was on interviewing key informants. At the time of data collection, most intended interviewees were present but committed. For a respectable number of times, meetings where cancelled. This prompted the change of interviewing some respondents from face-to-face to online interviews and filling in interview guides as time was against me as I had to return to Sweden.

The other limitation was the busy schedules of women in focus group discussions. A suitable number of women do trade as a supplement to their income. To bring them together for a group discussion meant taking them away from their sources of livelihood. Group discussions were close to their business, which caused interruptions during discussions such as moving motor vehicles, customers who were buying their merchandise and passers-by, making the process more like group interviews, thereby challenging the validity of the findings as they were not of an interaction nature.

4.12 Validity and reliability

Validity refers to the integrity and applicability of the methods used in any research and the accuracy of findings concerning the data collected. Reliability describes the consistency of procedures in analysing data (Long and Johnson, 2000). Evaluating the quality of any research is critical to ensuring that the findings used are in practice and integrated into the system of inquiry (Noble and Smith, 2015). Qualitative research is criticized because it lacks scientific rigour and does not explain the used methods. It is also criticized because the analysis process is unclear, and the results are just a collection of personal reflections favouring the researcher (Rolfe, 2006).

As a researcher, I may have found myself with individual experiences and viewpoints that may have resulted in bias in my methods. Still, the data collected from the women in Chikupi was from their own experiences and perspectives (Noble and Smith, 2015). Furthermore, the qualitative interview methods employed were due to my ontological position suggesting that women farmers of Chikupi and key informants' knowledge and experiences were meaningful

properties of reality (Mason, 2017). So, my job was to get information from people who had seen the effects of climate change by asking them questions.

4.13 Ethical Considerations

During the study, as a male interviewer, I ensured that ethical issues were given prominence to circumvent fears and culturally related discomforts by women (Mason, 2018). To this effect, my qualitative study considered all associated ethical issues and helped in the entire process of data collection (Weiss, 1998). In terms of the vulnerability and sensitivity of women in the study, as a researcher, I ensured that every participant was comfortable and that all cultural norms between a male researcher and a female interviewee were adhered to (Mason, 2018; Bryman, 2016).

The qualitative method employed in this study through interviews put me in a position that would influence the outcome of the results since I was the one collecting data. Usually, this affects the validity of the data collected (Merriam, 2002). However, as a researcher, I maintained professionalism and collected data devoid of any biases.

For focus group discussions, even if the selection and bringing together of women as they trade at the market seemed problematic, as a researcher, I had no challenges as their knowledge and familiarity with each other helped in the discussions as it helped break barriers among them thereby making discussions open and mutual (Morgan, 1988). In addition, although I had challenges with disturbances by people who were passing and those that wanted to buy participants' merchandise during focus groups since the meetings were near the market, I facilitated discussions beyond the reproduction of not only established consensus stories (Morgan, 1988). It further created a platform for every participant to air out their views without fear and allowed a free flow of ideas on every topic (Morgan, 1988). As an ethical point, I used letters and numbers for identification so that my respondents could not be traced.

4.14 Positionality and reflexivity

a) Positionality

As researchers, it is imperative to explain and make known our positionality. Positionality describes how I, as a researcher, saw the world and how my identity may have influenced the research and its overall outlook (Foote & Bartell 2011). This means that during my study on the women's adaptive capacity of Chikupi, my values and beliefs may have been shaped by my gender, social class, or my status, thus creating biases in the results (Sikes, 2004). In this case, positionality reflects my position as a researcher that may have had an influence on how the study was conducted, its outcomes, and results (Colghlan and Brydon-Miller, 2014). But I was very aware, especially when it came to things like my gender as a man who went to interview the other gender, which is a culturally fixed position.

I must admit, it was difficult for me to get up close and interview women. In an African setting, people of the opposite gender when not intimate, it is difficult to get close and interact. My explanation of my mission about their challenges to climate change and what assets they owned and were important made our relationships clearer and helped me gain confidence to reach out to many.

b) Reflexivity

In this research, I also considered the aspect of reflexivity. I was very aware of my views and position and how they could affect how the study was designed, carried out, and how the results were interpreted (May & Perry, 2017). In as much as I tried to detach myself from such thoughts, positionality reminded me that my social-political location would still influence my orientation. No matter how much I try, I cannot separate myself from the social process of the study as I am the one to interview women and key informants in Chikupi (Hammersley & Atkinson, 1995; Malterud, 2001). In short, it is not possible to separate myself from the world where the study is being undertaken. However, given that no modern researcher should participate in unethical studies (BERA, 2018), reflexivity and clarification of one's positionality may, therefore, be seen as crucial aspects of the study process.

c) Insider – Outsider perspectives

For the insider and outsider debate in research relates to an individual who has no relationship or knowledge about the community where the research is conducted (Griffith, 1998, cited in Mercer, 2007). In research, those who belong to the outsider notion argue that it is impossible for an insider researcher to detach himself/herself from the community where the research is conducted and be able to avoid being biased (Kusow, 2003). However, for this study, it was difficult for me as a researcher to detach myself since I was the one doing interviews because it gave me easy access to the culture of respondents (Sanghera & Bjokert 2008) and helped produce a more truthful, reliable description of results (Geertz, 1973). This was because being an insider helped me with the languages spoken, which made it easier to interact with women of different age groups and marital status as I gathered data (ibid). Of course, I was conscious of what comes out of being an insider, such as unknowingly becoming biased, or being overly sympathetic, and failing to ask provocative questions (Geertz, 1973). For this, I was careful and stuck to my interview guide to ensure that all pertinent issues were brought out for a better study.

5 Analysis of Study Results and Discussion

This chapter consists of findings and a detailed analysis of the research. The analysis of findings will respond to the research questions which are, who is regarded as vulnerable and poor in Chikupi and why? How do women use assets to adapt livelihoods to climate change in Chikupi? What constraints do different groups of women face in adapting livelihoods to climate change and why? The first part will show findings related to question one (1), then the next part to question two (2) and the last part to question three (3).

5.1 Perception of vulnerability and poverty in relation to climate change impacts

5.1.2 Vulnerability

The physical aspect of vulnerability is related to the way communities are exposed to natural impacts (Watts and Bohle, 1993). This is characteristic of Chikupi that is located on the flat plain on the banks of the Kafue River that exposes people to floods during the rainy season (Moonga and Moonga, 2016). Study results reveal that during the rainy season some "*houses collapse"* (*Interviewee 10*) due to increase in rain and some houses have "*roofs blown off"* (*interviewee 12*) due to strong winds. From an intersectional point of view, in as much as impacts of climate change are a result of natural events, the impact is felt on the people in that locality (Fisher, 2010).

When asked about the most vulnerable in Chikupi, *interviewee 15* said, "*Female headed households are vulnerable because they take care of a lot of orphans and vulnerable children, and it is difficult to provide for them. Whenever they want to cultivate, they are affected by floods and fail to survive."* In addition, a *key informant* responsible for agricultural related activities stated that vulnerability was also from additional roles played by women, he felt that *"Women are vulnerable because in most cases they are the ones who look for food to feed the families" (KI 2).*

The above corresponds to the Seventh National Development Plan assessment that vulnerability in Zambia is mostly linked to chronic poverty resulting from being an orphan, widowed or loosing livelihoods (MNDP, 2017). Responses also show that in one community such as

Chikupi, one group of women can be vulnerable to climate change impacts due to added responsibilities of taking care of Orphans and Vulnerable Children (OVCs), while another group of women can be vulnerable because of added responsibilities of being breadwinners that take care of food, health, and education of children in their households (Crenshaw, 1991). This problem was also recognized by the Inter-Governmental Panel on Climate Change (IPCC) that adaptation to climate change was shaped by gender roles, especially the vulnerable women who were the majority in agricultural related activities and had also multiple household responsibilities (Terry, 2009).

5.1.3 Perception of vulnerability in relation to family size

Family size was also linked to increased vulnerability about sustenance of families, financially, and socially. The study shows two schools of thought regarding family size when it comes to benefits and constraints. For example, one *key informant* in charge of agricultural related activities, in support of the notion on advantages of having a larger family said that *'The bigger the family the more the family can have diversity in terms of production' (KI 3).* This response was supported by one focus group participant who said that,

> *"It is easier to live when you have a lot of children. For example, in my case, we are 18 at our home, others are my own children and others are nieces and nephews, we live happily together. The reason I say it is easier, when we go in the field to cultivate, if I say today, we need to finish about 20 yards, we will make sure we finish that portion" (FG 1).*

Other respondents disagreed to the above and stated that in as much as having a large family seem important in terms of diversity, production, as well as in accomplishing of tasks, there are economic implications attached to that as well, and makes larger families vulnerable, a *key informant* responsible for traditional related matters at the village level said *"It is difficult to raise a large family when you do not have an income, but for those with adequate income, it is ok" (KI 1).* The financial aspect attached to support large families with limited money was also echoed by another *key informant* responsible for social welfare activities who said that,

> *"…for instance, you and I have the same job and salary, but at the end of the day if you have ten children, the little salary that you are getting will be shared among the ten children, let us say in terms of school requirements. So, it means much of your income will go to servicing your children's needs and you might have little saving that might go to mitigate those effects of climate change as compared to someone, maybe with just one child, whose part of that money only goes to that one child and the rest of the money, maybe, he will save that money to meet the needs that might come as a result of climate change" (KI 5).*

In a different response from the one given by respondents *KI 1* and *KI 5,* one participant from *FG 1* said, "*Children require a lot of things, school, clothes and medication."* This statement is true bearing in mind that economic growth in Zambia is very unequal as incomes for the poor has not increased enough to propel them out of poverty (MPND, 2017). In addition, geographically, urban areas in Zambia have benefited more from economic growth than rural areas (MPND, 2017), thus subjecting rural areas especially those with larger families failing to support family members especially with additional challenges of climate change impacts.

From the narration given by women supporting large families, to some extent, a family has also been seen to be a social capital consisting of individual members who among themselves may possess other capitals for example human capital (e.g., skills and knowledge), put together can help a family respond favourably in times of climate change impacts (Scoones, 1998). This could be the more reason study results from the 2015 Living Condition Monitoring Survey Report indicate that in as much as overall results for Zambia show that incidence of poverty increase as the size at household level increases, in rural areas, incidence of poverty go down as household size gets larger than eight (8) members (CSO, 2016). This further shows the power of social capital because families for example in rural areas use networks, affiliations, social relations, and associations to accomplish different livelihoods and access other capitals such as human and financial as they work together (Scoones, 1998).

5.1.4 Perception of poverty

This study has shown that there is a general perception about poverty in relation to age, and people living with disabilities. Even if the target for this study were women, much of what was mentioned about the poor, were the aged and disabled. Of course, from a gender perspective, the aged can be either male or female. Since females also fall into the category of the aged and possibly disabled, the two groups could mean the same. The 2015 Living Condition Monitoring Survey Report revealed that people considered living in poverty were those vulnerable due to their inability to work and earn income (CSO, 2016). In response to the question about who is poor in Chikupi, one participant from a focus group said, *"A person regarded as poor is a person who is aged and has no support from anyone" (FG A).*

In a similar shared view, another participant from the *FG B* said, *"Poor people are those individuals without any form of help such as the disabled and the aged."* This study result confirms findings by the Zambia Government that poor people are those disadvantaged such as women, the aged, and the differently abled (MNDP, 2017). The report just shows that the poor are not only affected by climate change impacts that make them fail to sustain their livelihoods but are also affected by their status such as age, disability, and gender (Smith and Lenhart, 1996).

5.2 Perception on sources and use of assets/capital and livelihood strategies

This study has also unearthed that some women in Chikupi have access to livelihood assets such as financial, social, human, natural and physical. Women have also been found to have access to Government Assets (grants) such as Social Cash Transfer and Agricultural farming inputs (fertilizers and seeds). Therefore, the first part will analyze how women access and use livelihood assets in times of climate change impacts and the second part how they use Government assets towards climate change impacts.

5.2.1 Access and use of livelihood assets in times of climate change impacts

5.2.2 Access and use of natural capital

Natural capitals such as soil, trees, and water are essential for most people's livelihoods as they depend on them (Scoones, 1989). However, natural capital such as land is not readily available to most poor in the SSA (Scoones, 1998, IPCC, 2001, Adger, 2003). This became apparent among interviewees especially among the married women. *Interviewee 12* stated that, *"I do not have anything of my own as we own everything as a couple and many things are for my husband."*

Owning a special commodity such as land is a challenge for most women. In many African countries, women are only able to have access to land through their marriages, although their land rights are restricted as husbands claim ownership (Andersson Djurfeldt *et al.*, 2018). Land right in Africa is through patrilineal, leaving women without an essential natural capital. For the single women, although not all of them, some indicated having ownership of natural assets such as '*land' (Interviewees 6, and 10)* that they use to grow different crops for their families.

From the above narrations from interviewees, it shows how vulnerable most women are as it would be difficult in case they wanted to transform land (natural capital) to other capitals such as money (financial capital). Entitlements such as land are important in one's life as it gives opportunities and alternatives that an individual can utilize to solve problems (Sen, 1984). Therefore, land is a legal right and not a moral or human right. Unfortunately, this is mostly denied to most women and leaves them with inadequate housing, inadequate education, basic financial security, and makes them fail to acquire goods and services (Devereux, 2001).

5.2.3 Access and use of financial assets/capital

Regardless of vulnerability and poverty levels, households must find ways and means to survive. When asked about the common sources of income, most women indicated trade, gardening, and informal labour such as cultivating in a field in exchange for money (piece work). Even though the area is known for farming, many people have found alternative livelihood activities. *Interviewee 10* on the livelihood activities stated that, *"We do piece works mainly off the rain season on large farms owned by big farmers."* A participant in *FG A* added that, *"We buy and*

sell vegetables, and other merchandise such as fish, that we preserve for sale in the market stands." The study result is indicative of diversified household activities in terms of income generation. However, when asked if their income is sufficient, most respondents especially from the focus groups said, *"we are selling but it is not easy."* These study results show initiatives of women in times of need by the women of chikupi.

The study results are consistent with a study done by Borsboom (2012) in the nearby villages of Mungu and Kabweza revealing that most farmers deploy different livelihood strategies such as irrigated agriculture to earn them money throughout the year, and others worked in commercial farms that surround their villages, others were in fish trading. Although these results do not represent a direct adaptation to climate change per say, they represent a general way of livelihoods by respondents in times of difficulty. Interviewees were unable to differentiate between a livelihood for adapting to climate change or a general one.

For example, when asked if they had altered their livelihood in the wake of floods that mostly impact them, *interviewee 8 said* that *"since the weather has changed with more rain especially during the rainy season, our plans are to start gardening of onion."* Another *interviewee* said, *"I started gardening in the dry season to supplement rain dependent crops such as maize" (Interviewee 13).* The respondents were not giving responses as a direct adaptation to impacts of floods in the area. Responses were a mixture of plans and activities to supplement rain fed crops such as maize which is a staple food in Zambia. Therefore, livelihoods such as piece work, trade, and gardening are a general livelihood people of Chikupi have adopted either knowingly or unknowingly to the impacts of climate change. All these livelihood activities in some way make them raise money to buy food, take children to school, maintain health and other household needs.

Although in some parts of Zambia as seen from the study in Chankumba Agricultural community that is impacted by floods and drought and that the majority of the men and women were engaged in gardening, piecework, brickmaking, and livestock (Siulemba and Moodley, 2014), from this study, it became apparent that majority just found a way of getting-by, whenever they needed an income to support their families, although others had plans to adapt since they were affected by floods.

When asked about which asset/capital they consider important and why? Almost all *interviewees* mentioned money (financial asset). *Interviewee 12* said that *"Money is everything. When I have money, I can rent a field, buy fertilizers and be able to have a good harvest. So, the most important thing for me is to have money."* Another *interviewee* pointed out that *"Money helps someone to do whatever he/she wants, for example, starting a garden" (Interviewee 6).* This preference is a sign that for women to have a decent life, financial capital should be number one as they strive to get other capitals. However, the only challenge the study found is access to different clusters of capitals to enable them to diversify their livelihoods. Majority of women wished to have access to more money to enable them to expand their business or buy assets that could be sold to buy food in times of drought and floods when crops are destroyed. Therefore, having different businesses is an adaptive measure for the women.

Women's access to certain capitals is dependent on individual or group power, and availability of institutions in the area (Scoones, 1998). On their challenge of limited capital for diversification in times of financial scarcity especially when faced with floods and drought, interviewees were asked if credit was easily accessed in Chikupi. In response, *interviewee 12* said that "*There are no challenges, but just the fear of paying back. I may get a loan for a business but if the business fails, and when the owners demand for it, I will have nothing to give them."*

Another *interviewee* added that, "*There are no challenges of getting loans, but one requires a business that brings returns within a short period of time to enable her to pay back within the agreed time" (Interviewee 8).* So, the challenge for the women was not their inability to get credit, but lack of financial institutions that offer collateral free loans. Institutions in women's lives create opportunities for sustainable livelihoods by facilitating access to livelihood capitals such as credit (Scoones, 1998).

The failure to access credit due to lack of paying capacity is not the only challenge for women of Chikupi. For those in marriages, even if credit was to be made available, they still needed to get consent from their husbands. In some cases, some women when they access loans, they give their husbands since them can pay back. One *interviewee* narrated that "*... I got a loan for my husband so he can buy goods in our grocery" (Interviewee 4).* A similar result from the study done in

Zambia's Mungu, Kabweza and Chikupi revealed that even when women could find money and pay off their credit, their husbands had a final say (Borsboom, 2012). Therefore, difficulties women face in accessing financial capital make them vulnerable and exposed them to impacts of climate change (Shah and Wang, 2018).

This is because women need a combination of one or two capitals for them to manage their livelihoods. The success of using capitals draws upon the combination of one or two capitals people own and control for a livelihood strategy. As Chambers and Conway (1992) suggest, combinations can be in the form of personal abilities, material resources, and access.

5.2.4 Access and use of social capital

Literature has shown that social capital is important for sustaining livelihoods. This is accessed by community members through affiliation in groups and networks (Kasanga *et al,* 2020). Almost all respondents had not utilized social networks in times of floods/drought for their livelihoods. *Interviewee 11* shared her reason for the failure: *"I do things as an individual because it is difficult to work with others as they would change their minds later in life and leave me alone."* A similar response was given by *Interviewee 8* that, "*We do things on our own since problems affect us only and so that we do not die of hunger."*

Since social capital hinges on networks, social relations and affiliations as people search for livelihood strategies (Scoones, 1998), it is difficult for the women of Chikupi to manage impacts of climate change. Drawing on lessons from Vhembe women in South Africa, the bond created among community members helped them overcome climate change impacts. Through their social bond, community members shared precious resources such as water, and they organized themselves in such a way that in case of a disaster, members would be there to help each other especially in times of climate change impacts (Nyahunda and Tirivagasi, 2022). The narrations above give testimony of the importance of social capital as an adaptation strategy to climate change to a rural community such as Chikupi. Adaptation has many factors in any given society, among them are human and social capital, personal security, and education (Yohe and Tol, 2002).

5.2.5 Access and use of physical capital

Successful engagement in productivity entails people having physical assets such as infrastructure, livestock (e.g., cattle, goats, sheep, and chickens), savings and machinery (Scoones 1998, Regmi and Adhikari 2007). People with limited or no access to physical assets are at risk as their livelihoods would be affected negatively. The study revealed that almost all single women owned physical assets such as houses, cattle, goats, chickens, and household property. However, study results show a different scenario for married women. In explaining physical assets owned, *interviewee 1* indicated that, *"I only own beddings and clothes that is all."* This response was consistent with the majority that indicated owning only *cooking utensils, chickens, and goats.* Many married women stated that assets were owned by their husbands. One married *interviewee* had this to say,

> *'I only own money from Social Cash Transfer (SCT), otherwise I don't have any assets of my own. My husband has never thought of me to give me assets. For now, what I own are plates and pots that I buy as my own' (Interviewee 15).*

The above response is a sign that most married women are also vulnerable and are female household heads. The lack of ownership of a combination of assets such as physical and productive assets such as cattle and goats make them fail to access other assets/capital such as credit necessary for their livelihoods (Scoones, 1989). This makes women dependent on their husbands and constantly vulnerable to financial shocks and climatic trends.

5.2.6 Access and use of human capital

Human capitals are people's levels of education and skills production. It is considered important to society through its enhancement to the capacities of people. It is also generally accepted that farmers require education as a necessary component to successfully manage a variety of livelihood methods (Jezeer *et al.,* 2019). The responses from most women show that human capital is inadequate as women do not have skills and secondary education. Study results show that *out of 15 women interviewed and 13 from focus groups, only 5 had reached secondary and 1 tertiary level*. Low levels of education have contributed to low income and poverty rural communities.

Empirical evidence in households in Sub-Saharan Africa show that those with access to education have higher labour and income diversification while those without access to education have low income and labour diversification (Asman, 2011). As shown from the preceding statement, education, which is a human capital, it may not only enable an individual access financial capital, but such an individual may also increase networks (Social capital) that would improve opportunities for employment for improved livelihoods (Lanzi, 2007; Dinda, 2008) especially in times of climate related impacts when most households have inadequate food and are in need of other social necessities like education and health.

Although study results show low levels of education in Chikupi among respondents. A consolation is that many have skills and knowledge of different livelihoods such as businesses and gardening, essential for survival in times of climatic hardships. This is consistent with findings from the study done in Kabweza, Mungu, and Chikupi that many villagers were now engaged in vegetable production from skills learned from different sources. Others from agricultural school, experience from work in commercial farms, others from their parents as they were growing up (Borsboom, 2012). With such skills, farmers were able to diversify into garden production through irrigation technologies. Therefore, this suggested that farmers with a variety of income generating activities, that were able to diversify their livelihoods, would in turn invest and multiply their vegetable production into profitable businesses (Borsboom, 2012).

5.3 Access and use of Government assets/capital in times of climate change impacts

5.3.1 Access and use of Social Cash Transfer (SCT)

Access to Government assets (grants) has proved to help vulnerable groups such as the aged, female headed, differently abled, chronically ill, and child headed to reduce hunger and poverty. Study results revealed that *out of 15 women interviewed, and 13 participants in focus groups only 11 are beneficiaries of Social Cash Transfer (SCT).* In explaining the SCT programme and its benefits, the *key informant* responsible for social welfare programmes that target the poor and vulnerable in the area, said that,

> *"The SCT programme is one of the deliberate programmes under the Ministry of Community development and Social services that assists vulnerable women, the aged, chronically ill, and those with disabilities. When you look at it, the money that they are given, helps them a lot in mitigating the effects of climate change. This is the money they get, and we do not dictate to them how to use it" (KI 5).*

In addition to the statement made by *KI 5*, Social cash transfer programme is a Zambian Government Programme implemented by the Ministry of Community Development and Social Services aimed at assisting the poorest households in society for them to meet social needs such as health, food, education, and shelter. Those who qualify to be on the programme are; female headed households with 3 children or more; house headed by a child aged 18 years and below; households with person (s) who are chronically ill; households with a person (s) with severe disability; households with an elderly member aged 65. The beneficiaries receive 180 Zambian Kwacha and are paid bimonthly which amounts to 360 Zambian Kwacha for every payment. Persons with disabilities receive double transfers than other vulnerable persons receive (300 Zambian Kwacha and for 2 months it adds to 600 Zambian Kwacha) (Mwamba, 2022).

From the above statement by *KI 5* and description of the SCT programme from the preceding paragraph, it shows that those benefiting would have improved livelihoods. One participant from a focus group who is a recipient of SCT shared her experience regarding benefits,

> *"The SCT grant has been helpful to this day, you find that at times I have no food at home, I manage to buy mealie- meal, bathing and washing soap and it is helping me and the children I take care of. At times it helps me buy schoolbooks, lotion/Vaseline and at times school uniforms for my children" (Focus Group A).* A similar response was also given by *Interviewees 3*.

In as much as the SCT is helping as testified by the recipient in *FG A*, only a few are on the programme indicative of many women that require Government grants such as SCT. As seen from the number, *11 out of 28* women who took part in the study, shows how many women are vulnerable to financial capital. Even if the qualifying criteria disqualifies others, numbers for

women who are not on the programme are high. Even though the Zambian Government reported an increase in protection services such as SCT between 2006 and 2021, there were challenges in effective implementation of the social cash transfer interventions, especially targeting the extremely poor and vulnerable (MFNDP, 2022). Challenges comprised poor targeting of beneficiaries, and erratic release of funds to cash transfer beneficiaries (ibid).

5.3.2 Access and use of Farmer Input Support Programme (FISP)

The other Government Programme through the Ministry of Agriculture and Corporative that target poor households is the Farmer Input Support Programme (FISP) through cooperatives. The study revealed that women in Chikupi have affiliations to cooperatives and have been able to access subsidized farming inputs. As explained by the *key informant* responsible for Agricultural activities in the area*, "female farmers are allowed to access Farmer Input Support Programme from the Government. Women and men are advised to form cooperatives where they do many activities and one of the benefits is access to subsidized farming inputs" (KI 2).*

In addition to the statement by *KI 2,* the Zambian Government through the Ministry of Agriculture and Corporative implements the Farmer Input Support Programme (FISP). Camp Agricultural Committees (CAC) are responsible for identifying and selecting FISP beneficiaries (farmers) at camp level and helps form cooperatives. During this process, the Camp Extension Officer (CEO) serve as secretariat. The selected farmers are approved by District Agricultural Committee and approved names submitted to Ministry Head Office. Successful beneficiaries pay 400 Zambian Kwacha and receive one 10 kilogram bag of maize seed, three bags of Compound D fertilizer and three bags of Urea fertilizer (Phiri, 2022).

The FISP as narrated by some beneficiaries has proved to be helping women access subsidized inputs especially that income has reduced due to reduced yields from impacts of climate change thereby affecting their income. Women pointed out that ordinary prices of farm inputs were very high and the Government's policy to subsidize inputs had benefited a lot of households. *Interviewee 8* had this to say on the benefits of being in a cooperative,

> *"You cannot manage to buy fertilizer on your own from a shop, it is very expensive, but we observed that this one from the cooperative is cheaper, for example if you pay K400 you are given 6 bags of fertilizer and 1 bags of maize seed, it is better than getting from the shop"*

The above testimony shows how important getting one of the most important commodities for rural farmers, which is farming inputs at a subsidized amount. This has enabled poor women who get grants from the SCT programme, manage farming activities as testified by one beneficiary, "*yes, since fertilizer is expensive, and I only manage to buy inputs from the money I get from SCT" (Interviewee 1).* Even other women that do not benefit from any grant shared their joy of the FISP programme. FISP was not only about the subsidy part but was more of increased yield due to access to an increased number of farming inputs such as fertilizers.

One *interviewee* said that "*there are benefits because buying subsidized inputs enables me to increase my yield and sell products to buy whatever I want and also pay for the next season" (Interviewee 7).* Therefore, as the study has revealed, many women who have benefited from subsidized inputs, have somehow found a way to adapt to climate change impacts as the little they get from different sources such as piecework, trade, and even from Government grants such as SCT, enable them in times of loss of crops access inputs for the other seasons since the cost of inputs is not the same as in retail shops.

This also somehow allows them to plough back the remaining amount into other livelihoods for the survival of their families. However, out of 28 women who took part in interviews and focus group discussions, only 12 women were in cooperatives and benefiting subsidized inputs while the rest were not. These disparities somehow shows that majority of women have challenges to adapt to climate change impacts as little financial resources they earn go to inputs that are also very expensive. This makes them fail to save or channel the money to other livelihoods such as gardening.

5.4 Perception of constraints by women to adapting livelihoods

5.4.1 Perceptions on who should own assets/capital

Women's access and control over assets is cardinal to reduce their vulnerability and poverty and more so for people of Chikupi to reduce climate change impacts such as floods and drought. Literature, however, shows that ownership and control of major assets especially those of high value is by men (Deere and Doss, 2006). The study shows that single women own and control assets/capital and no one hinders their use for their general livelihoods. For married women, most of the women interviewed complained of lack of distribution, ownership, and control of assets/capital in their homes. They too claim they need assets just like the male counterparts. One *interviewee* had this to say,

> *"At times us women are the ones who face challenges, when a man leaves or divorces you, we are the ones that remain taking care of children and therefore it is not ok for assets to be in the hands of men only, but even women too need these assets" (Interviewee 11).*

A similar response was shared by a *key informant* responsible for Agricultural activities in the area, who in addition to the above pointed out that: *"Women need to be in possession of assets and not only men because normally women put to good use the assets/capital they have for the benefit of the whole family" (KI 2).* This shows the existence of socio-economic differences of people in Chikupi. The differences have negative effects for women to organize adequate livelihoods required to adapt to climate change impacts. This has been seen to what they own in relation to their marriage, social status, and affiliations (Scoones, 1989). All these have a bearing on how women respond to climate change effects that have affected their food security (ibid).

Women's views represent the idea that even women need to own assets for them to improve their livelihoods. Ownership and control of certain assets leads to the acquisition of other assets necessary for survival. For example, an asset in the form of cattle (physical asset), can be used as animal drawn power during agricultural food production. In addition, it can be sold to get financial assets to buy land and farming inputs (Scoones, 1998). All these sets of assets when achieved can assist vulnerable women recover from floods and drought.

5.4.2 Constraints to relocate during climate change impacts

Resilience to climatic shocks is seen from possession of a set of assets such as financial capital, affiliations to access social capital, good education to access formal and good paying jobs, and flood free land as natural capital for agricultural production. However, when someone fails to resist to impacts of climate change such as floods and droughts, there is need to relocate which is also an adaptation measure. Failure to relocate is a constraint to adaptation. The ability to relocate due to impacts of climate change has a strong correlation to vulnerability in households. The study revealed that constraints of relocation in Chikupi for some women is due to limited financial assets. One *interviewee* made this statement below,

> "*Shifting brings problems as it needs money. We came from Kalomo and relocating would be very expensive, it would mean going back where we came from. We must save enough money to travel and be able to build another house, it is expensive" (Interviewee 12).*

Further, some interviewees in the study have indicated that the failure to relocate is not just about inadequate finances, but other cultural factors that compound their lives. For those that are married, challenges are to do with cultural norms and traditions. One *interviewee* had this to say over other challenge for not relocating despite climate change impacts in the area: *"I am just a wife brought in to join my husband, and even if the idea was to be mine, I would not leave my husband as Chikupi is his home village" (Interviewee 15)*. This situation is also similar as seen from the study in Sesheke, Zambia, where women had challenges to grow their income and failed to relocate because of social and cultural related barriers (Lwando, 2013).

This shows that women's challenges are dynamic, they can be financial, social, cultural, and moral. It is therefore difficult to just assume one challenge for every woman. Vulnerability and constraints of women should not be viewed from the financial aspect only, but also from the cultural aspect as well (Osborne, 2015).

5.4.3 Constraints of livelihood adaptation due to vulnerability in marriage

Many people hold the view that when a woman gets married then her needs and that of the household is taken care of. The other view is also from an understanding that when two people

put their resources and heads together, then such a household will be food secure, and is likely to evade poverty. In his contribution, a *key informant* responsible for social welfare programmes that target the poor and vulnerable in the area supported the idea of increased income that accrues when both a husband and wife are in gainful employment,

> *"For instance, as in your case, you are married, you work and your wife works, you have an income and your wife has an income, so your earnings put together, they are enough to fight a challenge that comes with climate change" (KI 5).*

Another *key informant* responsible for agricultural related activities added that, *"When one is married, they have more resources to adapt to climate change than when one is single " (KI 2).* Contributing to the same, in one focus group, one participant said, *"For me as a married person, it is easier because whenever I want to do something, for example a business, we sit down with my husband, and he supports me" (FG B).* The responses were indicative that there were no vulnerable married women as most women benefited from marriages in terms of increased income and resilience to climate change impacts regarding financial accumulation and partner support, however, this study also revealed that some married women were also vulnerable in Chikupi.

Some participants in the focus groups shared different views that in fact married women are the ones failing to adapt to climate change due to restrictions from their husbands and any livelihood strategy required their husband's permission. Some participants felt that married women could not just wake up in the morning to go for any livelihood activities without the consent of their husbands. Even a business proposal must be approved by their husband and if their husbands were not comfortable with it, it was often rejected. This made it difficult in their personal capacity to contribute income for their households especially in the wake of climate change impacts where a diversified income was necessary to cater for food and other needs in a household. One participant from one focus group said,

> *"It is not every married woman who is comfortable, others are not. For example, as a married woman, at times when I make a programme that I want to do this and that, my husband refuses me. Or on such a day I want to go and do this and that, he will refuse. The*

way I see it myself, for a married woman, things are tough at times, if you live alone as a single person and decide that today I want to go to this or that place, all you do is start off and leave. So, there are hurdles even in marriages" (*FG A*).

When asked further about their views regarding single women, it became apparent that single women regardless of age and whether widowed or divorced they enjoyed certain privileges such as freedom to do things when and how they saw it fit. Of course, for those slightly older, say above 50 years since their livelihoods were more dependent on agriculture, they did not do much in terms of businesses or piecework. On the benefits of single women, one participant from *Focus Group B* said, "*For single women, just to be honest, they are free because there is no need to get permission as she is at liberty to decide what to do at different times, if it is taking care of children's needs, she knows it is her responsibilities as long as it will help her household."*

When it comes to climate change impacts, it is generally acknowledged that impacts affect single women (divorced, widowed, never been married) more than those that are married. Mzimela and Ahmed (2018) claim that changes in climate factors were shown to have the greatest influence on land under cultivation due to increased crop pests and weeds, insufficient rainfall (decreased soil moisture and storage capacity), and crop burn due to high temperatures. Due to their greater reliance on agriculture, single women are particularly affected. Married women are less exposed to direct risk since they are involved in agriculture with their spouses or have more diverse asset base.

From the intersectional standpoint, the study results show that vulnerability to effects of natural impacts should not only be looked at from the gender aspect, but a consideration should be made on what people are able to do, the type of family, their cultural beliefs, understanding, as well as their economic and marital status (Neumayer and Plümper, 2007). Therefore, taking only female headed households, aged, and those living with disabilities as the only vulnerable and poor, according to intersectionality, ignores married women as they too are affected for example individually, by money earned, relationships with their husbands, abilities, and age (ibid).

5.4.4 Women's participation in community activities

In terms of development, women's involvement has been recognized as critical to sustainable development. Nevertheless, women in society are not well represented at all levels (CSO, 2016). When asked if women take part in community meetings or any other engagements, a response was given that, *"Some few months ago there were community meetings convened concerning the same issue of floods in our area, but I was not invited" (Interviewee 12).* It follows that not being invited is one thing but not knowing why someone was not invited is another. When asked why they are not invited to community meetings, *interviewee 7* said, *"I have never been invited and I do not know why?"*

This is a challenge marginalized people face especially on the failure to inform them on matters that also affect them in the community. It relates to inequalities experienced by women in development matters be it at national or community level. From the intersectional perspective, this has shown that some women have not been considered in matters of development and it clearly shows that they are an ignored group that are not only left out in meetings, but the majority are not even aware of happenings in their community (Valentine, 2007). *Out of 15 women interviewed only 3 acknowledged being invited to community meetings and out of 3, only one attended the meeting and the others gave excuses due to different commitments*. This anomaly is despite the environmental policies at different levels that have given guidance on the recognition of gender, the youth, and children in matters of economic, environmental and social development (Lwando, 2013).

5.4.5 Decision making on household expenditures

Decision making on household expenditure is one of the prerequisites to wellbeing and in terms of climate change, it enables people especially women to manage climatic impacts through diversification. This study has revealed that almost all single women made independent decisions about household expenditure for as long as expenditures conformed to household needs such as food, agricultural inputs, and school fees/uniform, then their children would support them. This was also revealed in a study in rural Ethiopia that many single women found that being single

gave them more control over their lives, including the ability to decide whether to attempt anything new (Badstue *et al,* 2020).

For this study, challenges were on the part of married women who stated that their husbands were the ones who made almost all decisions. *Interviewee 4* had this to say, "*I would really want to decide how the money should be spent, but men always want to do what they want with every money earned."* A similar response was given by another *interviewee* that said, "*My husband makes decisions because he is the one who works and brings money home. If I was earning any income also, I would have a voice" (Interviewee 12).* This study result is consistent with a study done in Rural Ethiopia by Badstue *et al.,* (2020) that revealed that in general, married women made independent decisions on some issues but needed to consult with their husbands on others. Further, women were said to be free to sell little amounts of for example vegetables in local markets and run minor businesses anywhere while husbands often handled overall home finances and huge expenditure decisions.

This study has shown that from an intersectional position, marginalized people are hardly homogenous. The results are indicative that single women are deprived of partner support and other benefits that are associated with marriage life such as class, and that married women are deprived of ownership and control of assets/capital necessary for improved livelihood (Crenshaw 1991). On the importance of ownership, control, and power, Quisumbing contend that the ability of women to own assets is therefore associated to their ability to influence the decision-making process within their households and to enhance their potential both inside and outside of the home. Women's ability to influence decision-making is directly correlated to their ability to own assets (cited in Andersson Djurfeldt, 2018). In support of the preceding point, one *key informant* responsible for Chiefs and Traditional affairs had this to say,

> *'Ownership is very important, when you own something, meaning you have power to drive change. When you have less ownership, you have less power to drive change. When people have assets, meaning they will take those assets to drive and adapt to climate change and their voice will be highly heard unlike those without assets, as their voice will not be heard because they have nothing to use as a tool for them to make change and control what can be called climate change impacts' (KI 4).*

Quisumbing assert that increasing women's access to and control over assets has the potential to significantly reduce poverty, as some scholars have stated; nevertheless, males generally possess more assets overall than women do. Increasing women's access to and control over assets has the potential to significantly reduce poverty (cited in Andersson Djurfeldt, 2018). The more marginalized people are denied ownership and control of assets, the more it perpetuates them to vulnerability and poverty especially in times of climate variability where improved livelihoods are cardinal. The intersectional perspective has helped to identify the most marginalized people in Chikupi, and that there is a heterogeneity of experience and treatment, and that the understanding of such differences is very imperative for successful intervention of such groups of people in future (Osborne, 2015).

6 Summary of Findings

To explore Chikupi women's adaptive capacity to climate change impacts and their livelihood strategies, this thesis aimed to respond to three research questions. The first question was, who is regarded as vulnerable and poor in Chikupi and why? The question was more closely related to climate change, and the findings assisted in understanding the community's perception of vulnerable and poor people. Findings revealed that female-headed households were vulnerable and that their vulnerability was more from responsibilities of extra care of orphans and vulnerable children (OVCs), and that vulnerability was also related to struggles of women in terms of fending for food as they were the main providers and household caregivers. The study also revealed that there are a lot of people regarded as poor, and among them were the aged and differently abled. The above findings gives me an impression of the difficult it is for women of Chikupi to fully adapt to climate change impacts of floods. Since adaptation is about people's ability to manage climate change impacts by reducing exposure so that they are not vulnerable to impacts, this may prove to be difficult for single women, the aged and the disabled due to their vulnerability and high levels of poverty. This shows that their adaptive capacity is low due to inadequate capitals leading to limited or low livelihood strategies due to their vulnerability and poverty.

For research question two, it was assessing women's use of assets to adapt livelihoods to climate change in Chikupi. Findings reveal that most women access livelihoods through piecework during the rainy season, trade in different merchandise, and others have small gardens that help them with income when faced with social challenges that need income. From this, it shows that unknowingly, women have adapted to climate change through diversified sources of income, which has become beneficial in times of floods and drought. However, in as much as it shows that women have diversified their income in times of climate change impacts, their strategies have low income returns to fully adapt to climate change impacts of floods. Sustainable income base require them to have livelihoods that enable them easily acquire other assets/capital so that they can easily use one asset to get other assets when income demands are high. For example, ownership of say land would enable them produce food crops, and sell surplus for money, the money can be used to buy livestock as a stock value, which can in turn be sold to buy food in times of drought/floods or send children to school.

Study results also indicate that single women own and control some assets such as land and livestock, while many married women do not, and that makes them vulnerable as lack of assets denies them other income like financial assets to adapt to climate change. However, some women have access to government grants such as social cash transfer from the department of social welfare and subsidized farming inputs under the Ministry of agriculture that help them with improved yields, thereby increasing food and enable them buy inputs for the other farming seasons.

The third question was to investigate what constraints diverse groups of women face in adapting their livelihoods to climate change and why? The study revealed that there were constraints in ownership and control as most important assets where owned and controlled by men, leaving women vulnerable to adapting to climate change. Many households had challenges in relocating even when their fields and houses were affected by floods due to a lack of financial capital. Although marriage is supposed to improve one's welfare, the study revealed that some married women were also vulnerable due to a lack of independent decision power and cultural factors. Women's advancement and contribution to development, particularly in the fight against the effects of climate change, where hampered by a lack of community participation. Other

constraints according to study results were a lack of decision-making power in household expenditure, which is a man's job, leaving women with limited options, especially in diversifying livelihoods in the face of climate change impacts such as floods.

As indicated in the preceding paragraphs, ownership and control of assets is key to adaptation due to increased income base in times of climate change impacts. Although vulnerability is much visible among single women, this thesis has unearthed a different standpoint that married women are also a vulnerable group due to their inability to own and control assets. Of course since they are married, and assets are perceived to belong to them as well, but since they do not have their own, it makes them vulnerable. Just like single women, ownership and control of assets gives power to use and sell to acquire other assets to improve livelihoods. This in turn may add income for their households as a supplement to what their husbands possess.

6.1 Conclusion

From the thesis results presented, it clearly shows that women of Chikupi do not have the much needed adaptive capacity to withstand climate change impacts. Adaptation has been said to consist of activities such as changing farming methods, putting in place methods that reduce risks, and management of resources (Füssel, 2007). Chikupi being a rural area and most people heavily reliant on agricultural activities that demand natural assets such as land, financial and physical assets such as farming equipment, it is worrying to find that majority of women do not own and control these assets. How then would they change farming methods to adapt to climate change impacts? How do they reduce risks? It is indeed not possible as majority of women's common source of income in Chikupi are the provision of labour in exchange for a wage called piece works. Even if finances where to be made available through credits, as revealed in the study, many women cannot manage to pay back due to lack of collateral. In addition, for a few that do gardening off rain season to cushion income and food from rain fed agriculture, the benefits are far less as yields cannot fully cushion what is lost to floods to fully feed households. Further, majority of women experience barriers such as lack of community participation, limited decision making opportunities, and failure to relocate due to financial constraints.

As clearly elaborated by the Sustainable Livelihood Framework (SLF), assets and capitals such as tangible and intangible assets play a key role in people's livelihood strategies. In the case of

women of Chikupi, possession and control of adequate income, land, knowledge and skills, and the capacity to use their capital, would have been ideal for their positive livelihood in times of floods. Further, the success of utilizing capital is dependent on the combination of one or two capitals for a livelihood strategy that is not available for women of Chikupi and renders them vulnerable to climate change impacts leading to hunger. As Chambers and Conway (1992) suggested, groupings of assets such as material resources, access to capital, assets accumulated, having one asset connecting people to other assets, and linking one asset to another would help women adapt to climate change impacts.

From the study results, it shows that even if the Zambian Government would want to improve its economy and alleviate poverty through agricultural productivity, this would not be achieved because agriculture is reliant on natural resources such as soil and water which are impacted negatively by floods and droughts. This is what is practically happening in rural Chikupi. Further, since adaptation is the ability of people to manage climate change impacts, this is not possible for rural Chikupi women due to their vulnerability, limited access to assets such as finances, land, livestock, farming equipment, social capital, and different barriers/constraints. Of course climate risks cannot be eliminated completely, as adaptation just reduces people's exposure so that they are not vulnerable to impacts of climate change (Field *et al.,* 2012). However, for Chikupi rural women, as revealed from the study, they do not have the capacity to reduce the exposure due to many reasons already alluded to. This calls for the Local Government to put in place measures that will help different categories of women especially in rural parts of Zambia as recommended in the proceeding section if poverty and hunger are to be alleviated amid climate change impacts.

6.2 Recommendations

The study has revealed challenges faced by women regarding access to income (financial capital), lack of participation in decision-making meetings, limited natural assets among married women, and limited access to protection services such as SCT and inadequate livelihood strategies for both single and married women. In view of these study findings, the following recommendations are made,

- The Zambian Government, through the Ministry of Community Development and Social Services, should scale up targeting of beneficiaries and include married women as a special category as well.

- The Zambian Government and stakeholders should take advantage of floods and introduce other crops such as rice growing, since plains are viable areas for rice production.

- The Zambian Government and stakeholders should mainstream income generating activities (IGAs) in all development activities as a diversification measure to allow women to increase their income base for other capital especially in these times of increased floods, heat that has destroyed crop, pests, and diseases.

- The Zambian Government and stakeholders should introduce collateral-free loans for vulnerable groups.

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APPENDIX 1: Consent Form

GRADUATE SCHOOL - FACULTY OF SOCIAL SCIENCE

CONSENT FORM

Participant No. …….

My name is Douglas Mbokoma, a Masters student at Lund University in Sweden carrying out a research on Vulnerability and adaptive capacity of agricultural women to climate change in Chikupi of Kafue District. The responses will help me know women's vulnerability to climate change regarding assets/capital and determine how assets influence their livelihood strategies for positive livelihood outcomes. Therefore, your participation will contribute positively to this body of knowledge in finding women's vulnerability and assets/capital important to improve livelihoods amid climate change variabilities.

I am collecting data for my academic purpose only. All data will be kept confidential and will not be made available to anyone who is not connected with my study, not even other participants. Further, your name will not be indicated, instead, you will be identified using an interview code. You are free to refuse participation in this study if you do not feel like. In case you agree to take part in the interview, you are also free not to answer questions that are not to your liking. You are also at liberty to end the interview at any time of your choice. The interview will not take more than I hour.

Name: ……

Date: …….....

Signature: …….....

APENDIX 2: Interview guide for female households

1. Tell me about yourself.
2. Who lives in your house?
3. How old are you?
4. How do you make a living?
5. Do you have children? If yes, how many?
6. How far did you go in education?
   a) Primary b) Secondary c) College/University d) never been to school
7. Who makes decisions about household expenditure?
8. Who makes decisions about household food consumption?
9. Are you a farmer?
   a) Yes
   b) No

10. Is there any change/s in relation to climate change? A) Yes b) No

11. If yes, have you altered your farming?
    a) Yes
    b) No

12. What changes have you made?
    a) New crops
    b) Move to new location
    c) Others specify

13. Did you manage it as an individual or as a community and why?

14. What do you think is a determinant of crop yields (answers can be multiple)
    a) Weather b) soil conditions c) my farming practices d) availability of money e) other specify

15. What was the worst natural disaster you have ever experienced? When? And how were you affected?
    a) What?
    b) When?

c) How?

16. Do you think there will be solutions to floods/storms/drought in the future?
    a) Yes
    b) No
    c) Don't know

17. If yes, from whom?
    a) Government b) Local leadership c) other specify

18. Have you ever thought about relocating to another place to avoid climate change disasters?
    a) Yes
    b) No

19. If yes to where?

20. If no, why have you not relocated?

21. Have you been engaged in any other activity to adapt to natural disasters? a) Yes b) No

    a) If yes which activities

    b) If not, why?

22. Apart from climatic conditions of floods and drought alluded,
    a) Are there particular seasons when you face challenges regarding your wellbeing?
    b) And what are those challenges?
23. Do you own any kind of asset/capital? If yes, what assets do you own?
24. If you own any asset/capital, do you have control over it/them?
25. If not, why?
26. Do you think ownership and control of assets/capital has any bearing of whether one is female or male?
27. What is you view on Gender Based Violence? Do you think it contributes to challenges women face to cope in times of floods/drought?

28. Do you think tradition/culture has a bearing on who owns assets/property? If the answer is yes, how?
29. In the last one year, have you received any form of grant (money, farming inputs, etc.) from any organization? If yes,
    a) What form of grant? And
    b) From which organization?
30. Do you belong to any organisation/club? If yes,
    a) Which one?
    b) Are there benefits of being a member?
    c) If not, why?
31. Have you in the recent past gotten any loan?
    a) Yes
    b) No
32. If the answer to the above question is yes? What was the loan for?
33. Are there challenges in women accessing loans in your area?
    a) Yes
    b) No
34. If Yes, why?
35. Looking at the trend of shocks in your area, what asset/capital do you think is/are essential for your survival?
36. Are you involved in any local government decision making, e.g. constructing canals to mitigate flooding?
    a) If yes how?
    b) And if no, why?

APPENDIX 3: Interview guide for Focus groups

1. How do majority of households earn a living in this community?
2. Who is regarded as a poor person?
3. Who are the vulnerable?
4. As members of the community, what do you have in common?

5. What would you tell me about what assets you own as women/wives in your households?
6. Do you have freedom to use those assets you own as you wish?
    a) If yes, how?
    b) If not why?
7. Among the married, single, widowed, and divorced, in this community, who has more chances of improved livelihood outcomes and why?
8. Is having a large number of children in a household a hindrance or advantage to improved livelihood and why?
9. In terms of climate change, how do people/community react to climatic hazards (floods/drought) in this community?
10. What other surviving strategies are available in the community?
11. Does asset ownership influencing household decision making in households among women?
    a) Yes
    b) No
12. If the answer to question 11 is yes, how?
13. If not, why?
14. Does asset ownership enhance opportunities in households among women?

a) Yes
b) No

15. If the answer to question 12 is yes, how?
16. If not, why?
17. Does increase in control of assets by women help to improve livelihoods in households?
    a) Yes
    b) No
18. If the answer to question 15 is yes, how?
19. If not, why?

APPENDIX 4: Interview guide for Key informants

1. How are women farmers responding to climate hazards of floods and drought?
2. In terms of climate change risks, who are the most vulnerable to climate change?
3. In relation to question 3, why do you think this is so?
4. Do you have a deliberate policy/programmes/activities for female farmers in relation to climate change adaptation?
5. If yes what programmes?
6. If not, how do you help them adapt to climate change since their area is prone to floods/drought and affect their livelihoods?
7. Is marriage as a status a factor in climate change adaptation?
   a) If yes, how?
   b) And if not why?
8. Does the size of the family/number of children have any bearing on livelihood strategies in households?
   a) If yes, how?
   b) And if not how do they make a living?
9. Do you think assets/capital (human, social, financial, physical and natural) play an important role in adaptation to climate change?
   a) If yes, how?
   b) And if not why?
10. Which assets/capital (human, social, financial, physical and natural) do you think are important and why?
11. How does asset/capital ownership help household to adapt to climate change?
12. Is the increased female control over assets important?
    a) If yes, how?
    b) And if not why?
13. Do women take part in decision making in their households?
    a) If yes how?
    b) And if not, what obstacles are there?

APENDIX 5: List of interviewees

No.	Organization	Gender
1	Local farmer	F
2	Local farmer	F
3	Local farmer	F
4	Local farmer	F
5	Local farmer	F
6	Local farmer	F
7	Local farmer	F
8	Local farmer	F
9	Local farmer	F
10	Local farmer	F
11	Local farmer	F
12	Local farmer	F
13	Local farmer	F
14	Local farmer	F
15	Local farmer	F
16	Village Headman	M
17	Agricultural Block Officer	M
18	Agricultural Extension Officer	F
19	Assistant Social Welfare Officer	M
20	District Chiefs and Traditional Affairs Officer	M

List of focus group participants: Focus Group A

No.	Organization	Gender
1	Local farmer	F
2	Local farmer	F
3	Local farmer	F
4	Local farmer	F
5	Local farmer	F
6	Local farmer	F
7	Local farmer	F

Focus Group B

No.	Organization	Gender
1	Local farmer	F
2	Local farmer	F
3	Local farmer	F
4	Local farmer	F
5	Local farmer	F
6	Local farmer	F