

Living with drought: A Case study of small-scale farmers in Wankhala agricultural camp, Petauke district, Zambia



Source: Research data collection (2017)

A research project submitted to
Van Hall Larenstein University of Applied Sciences
in partial fulfilment of the requirements for
the degree of Master in Management of Development,
specialization Rural Development and food security

By
Ernest M. Mupemo
September 2017

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Abbreviations

BEO	Block Extension Officer
CA	Conservation Agriculture
CBMS	Community Based Monitoring Systems
CEO	Camp Extension Officer
CFU	Conservation Farming Unit
COMACO	Community Market for Conservation
CVA	Capacity Vulnerability Assessment
DACO	District Agricultural Coordinator
DAP	Disaster Assessment Portal
DDMC	District Disaster Management Committee
DMMU	Disaster Management and Mitigation Unit
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organisation
FEWS Net	Famine Early Warning Systems Network
FISP	Farming Input Support Program
HH	Household
IAPRI	Indaba Agriculture Policy Research Institute
IDS	Institute of Development Studies
IFCR	International Federation of Red Cross and Crescent Society
LSs	Livelihood Strategies
MoA	Ministry of Agriculture
MoCD	Ministry of Community Development
NDMC	National Drought Mitigation Centre
NGO	Non-Governmental Organisation
PEP	Poverty and Economic policy network
SSFs	Small-scale farmers
SLF	Sustainable Livelihood Framework
WHO	World Health Organisation
ZNFU	Zambia National Farmers Union

Abstract

This research helps to understand how small-scale farmers cope with frequent droughts in Wankhala agricultural camp, Petauke district, Zambia. This follows small-scale farmers' frequent failures to satisfy their food needs whole year round. This is mainly because of the reduction in productivity of their crops resulting from effects of climate change especially droughts. This research assists in understanding relationships between small-scale farmers' assets and the livelihood strategies they implore in response to drought. This is with a view to recommending to the District Disaster Management Committee ways of improving small-scale farmers' resilience in food security (availability and accessibility) in response to drought. A qualitative case study involving 3 key informants, 3 focus group discussions and 30 individual interviews with male and female farmers (15 males, 15 females), was used. Structured (for key informants) and semi-structured interviews (for individual interviews and focus group discussion) were used with help of a topic list. Purposive stratified random sampling was used to choose respondents within Wankhala agricultural camp. By nature males and females have different needs, so gender dimension was incorporated to help understand if it influences livelihood choices made in response to drought. Using Microsoft excel, data collected was grouped according to categories of responses which helped in analysing the findings. Farmers in Wankhala respond to drought differently. Differences also exist between males and females. Crop production is the major economic activity with main crops grown being maize, groundnuts, sunflower, soybeans and cotton. Males express a high affinity for cotton (cash crop) while females for sunflower and groundnuts (nutrition conscious). Vegetables (tomatoes and rape) are grown by males because of their access to irrigation facilities as opposed to females whose access to the facility is limited. Women have high level of social network in the community and this enables them access various resources including draft power which enables them to conduct economic activities for enhanced food security. Also, female farmers are more into small livestock (goats, pigs chicken) because they are easy to sell especially during drought periods. As for males, they are more into cattle. As a way of having access to food, females highly engage in piece works (on-farm and off-farm) whose payment is either money or food (maize, mealie meal). Getting credit, reduction in the amount of harvested crops sold, providing ploughing services and asking for food from others a practice highly expressed by males are other strategies used. If things go to the worst, farmers eat maize bran. To improve crop yields CA is practiced because it is resistance to drought even though the adoption rate is low. Low adoption rate is because of it being perceived as laborious farmers. Therefore, there is need for agricultural researchers to develop strategies to make it less laborious. Since both men and women use similar livelihood strategies, understanding gender differences could facilitate the development of gender sensitive policies and programs. It could also help improve sustainable and more inclusive livelihood resilience strategies. Social networks are seen to help build financial savings among women. If used by men, it would improve their financial position through savings. Therefore, it is recommended that government through the MoA and the MoCD strengthen more social networks in the community especially among men to improve their resilience in food security to droughts. This can be done through the existing cooperatives, women groups and youth groups. To sustainably address the problem of drought, more long term strategies are needed e.g. diversifying livelihoods beyond crop production. It is further recommended that extension service in small livestock production be amplified to boost production. Also, MoA extension service provision is encouraged to actively involve experts in water management to train farmers in water harvesting. The DMMU is called upon to work with MoA in improving water quality and availability as a way of building resilience in food security. This will create opportunities for crop production by farmers even off rainy-season thereby improving food availability and accessibility. Government is also called upon to be consistent in the disbursement of funds for social cash transfer for it to effectively boost peoples' ability to address shocks.

Key words: *Resilience, food, drought, assets, livelihoods.*

1.0. INTRODUCTION

This research provided an opportunity for the researcher to get an insight into the community which has been under drought stress for an extended period now. It explores small-scale farmer's livelihoods in Wankhala agricultural camp under Petauke district of Zambia. The research was conducted to help understand how small-scale farmers are coping with frequent droughts in this area. This is with a view to recommending ways of improving their resilience in food security in response to drought. For some years now, the Disaster Management and Mitigation Unit (DMMU) through the District Disaster Management Committee (DDMC) has been involved in assisting mitigating in different shocks that the district faces especially drought which has been seen to be on the increase. Realising that distribution of relief food is not giving a lasting solution to the problem, it is of interest that a sustainable approach to addressing this problem is established those whose capacities to produce their own food have been negatively affected by drought.

The outline of this report comes in six chapters. The first chapter gives an introduction and background information about the research and the location where it was conducted. In this chapter, the problem statement, research objective, research questions, and justification are given. This has been done to help other users to easily understand the information contained in it. The introductory chapter is followed by setting the scene about this research and its logical flow. Under the chapter, setting the scene, key terms, concepts and theories supporting this research work are defined. The defined concepts help to build a framework that supports conducting this research. This chapter then leads to the research design, a chapter in which the methods used in collecting data are outlined together with justifications for using such methods. This chapter also highlights on the research tools and sampling techniques implored in collecting data. The chapters on reporting the research findings and data analysis follow successively. Under research analysis, research findings are translated in relation to theories and concepts defines in chapter two. To close this report is a chapter for conclusion and recommendations the research questions outlined in chapter one are answered with the use of data analysis conducted in chapter five. Recommendations on what can be done to help build resilience in food security by small-scale farmers in response to drought are developed based on the answers given to the research questions.

1.1. Background

In the recent past, small-scale farmers of Petauke district just like other districts in Zambia, have been finding it difficult to satisfy their household food needs whole year round. This is attributed to a reduction in productivity of their crops resulting from soil loss and degradation and effects of climate change including droughts among others (FAO, 2012). Effects of climate change are reported to have impact especially in valleys where they lead to drought. As a result, there have been frequent experiences of hunger reports in such areas including and Petauke district where people largely depend on agriculture for their livelihoods, is not an exception.

Zambia is divided into different regions depending on the amount of rainfall received annually and these regions are I, II, IIa, IIb and III. Region one receives the lowest amount of rainfall(<600mm) while region III receives the highest (>1000mm). Region IIa and IIb receive 600-800mm and 800-1000mm respectively (Eroarome M.A., 2009). Of the regions given, Petauke district falls under region 2(II)a which experiences annual rainfall between 800-1000mm. However, in the recent past the district has been experiencing annual rainfall of less than the expected 800-1000mm e.g. 2015/16 recorded 527.7mm (Petauke Meteorological data, 2017). This has contributed to reduced agricultural production and productivity in the district and leading to reduced food available at household level. Because of the district having an experience of drought, this makes it a suitable site for studying and recommend means of improving livelihoods of people affected by this problem.

2.0. District development coordination structure

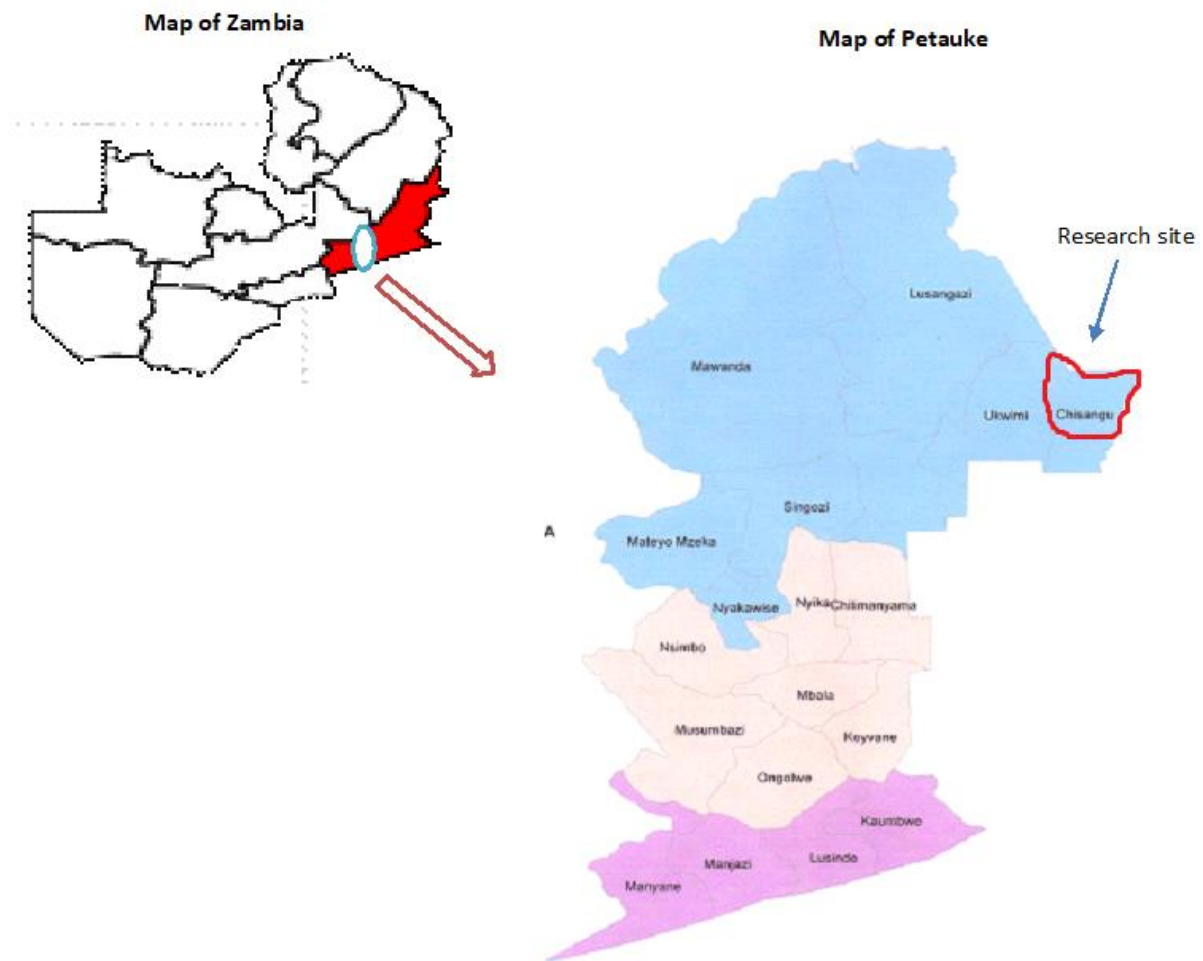
To coordinate developmental plans, the district is divided into three constituencies (Kapoche, Msanzala and Petauke central) which are further sub-divided into 18 wards. In addition, the district has five agricultural blocks with 37 agricultural camps to facilitate the implementation of agricultural related developmental programs. The agricultural blocks with their camps are **Chinika block** (camps= Mawanda, Chilongozi, Chinika, Mzumwa, Mwanika, Wankhala, Sandwe, Chikowa: **Kaumbwe block** (camps=Kasero, Manjazi, Manyane, Matonje, Mwanjawanthu 1, Mwanjawanthu 2, Nyalingu: **Nyika block** (camps= Chilimanyama, Chimtanda 1, Chimtanda 2, Kawere, Lusowe, Mtondo, South Nyamphande 1, South Nyanphande 2: **Msanzala block** (camps= Chikuse, Chipungu, Kakwiya 1, Kakwiya 2, North Nyamphande settlement scheme, Nyaphande 1, Nyamphande 2: **Ongolwe block** (camps= Lusinde, Minga, Mnyeché, Mumbi A, Mumbi B, Mondola, Mtumpha). Of the five block, Msanzala and Chinika are the ones that are partly in the valley with Chinika block having the largest part of the valley. The research site for this thesis, Wankhala agricultural camp, falls under Chinika block. The location of this site is shown in figure 1.1-1 below.

Through the stated camps, the ministry of Agriculture (MoA) and other development organisation have been working towards improving the hunger situations in the said areas. Efforts to do so have been seen through projects including Conservation agriculture scaling up (CASU) project which aimed at improving crop production and productivity (implemented from 2014 to 2016 by MoA supported by FAO). This project provided small scale-farmers with technologies of agricultural practices (minimum tillage, crop residue retention in the field, and crop rotation) believed to be effective in improving crop yields even in times of droughts compared to conventional farming practices (mono-cropping, ploughing agricultural fields and burning of plant residues). This project, CASU, was implemented in 24 camps including Wankhala where this research was conducted. The other program which government conducted with the aim of improving crop production is Farming input support program (FISP) which enhances small-scale farmers access to improved seeds and fertiliser through delivering of subsidised inputs to selected farmers.

1.1. Area of study

Wankhala agricultural camp is part of Ukwimi resettlement scheme under Chinika agricultural block (under Msanzala constituency) in the north-eastern part of Petauke district. It lies near the Luangwa valley, along Luangwa river, an area that has been experiencing low rainfall and droughts. It is endowed with natural resources including wildlife and minerals which attract residents and outsiders into small scale mining while others engage in game ranching. The area is located next to the south Luangwa national park and so some people of this community are known to be engaged in poaching for game animals from the said park. Its native inhabitants are Nsenga speaking people though the number of people from other tribes especially Chewa speaking people, is increasing. The migration by the Chewa people into this area is due to increase in population in the Chewa land making them migrate to other places looking for more land for their agricultural activities. Knowing that Wankhala is part of the resettlement scheme, it has become an attractive place for these people. This in a way is contributing to pressure exerted on natural resources in this community (e.g. more deforestation a (known contributing factor to drought) as well as competing for available land between the indigenous people and immigrants. With the increasing number of different tribes being accommodated in this area, Wankhala agriculture camp is also experiencing diversification of economic activities to some degree. The main source of livelihood for people in this area is agriculture, both crop production and livestock. These two forms of agriculture are conducted at small scale level (<5ha of land cultivated) by most people. Maize is the major crop for small-scale farmers and it is the staple food in this community just like many parts of Zambia. The second most important crop is groundnuts which farmers in this region consider to be a women's crop. Even though this being the case, both males and females grow it knowing that it is one of the marketable crops and at the same time a nutritious crop, especially for under five children.

Figure 1.1-1 Petauke district map, in Zambia indicating where the research took place



Source: Petauke district council (adapted version), (2013)

1.2. Research problem

Chabala et. al., (2015) citing Odingo, (2008) noted that at continental level Africa is more prone to effects of climate but with little if any strategies to respond to it. In this line, conservation agriculture (CA) has been promoted intensively by both government and non-governmental organisations (NGO) in the quest to address crop failure associated with changes in climate (drought). However, the adoption of CA is low. This is associated with the social, economic status of the majority of farmers which makes them fail to adopt CA technologies (Kuntashula *et al.*, 2014). As noted by Kuntashula *et al.*, (2014), there is thin literature on strategies that farmers can utilise to counteract the effects of climate change especially that they entirely depend on rainfall for their agriculture. With an increase in cases of crop failure in Petauke district, there is an associated increase in requests for food assistance by the affected communities especially in valley areas including Ukwimi settlement. In response the Disaster Management and Mitigation Unit (DMMU), through the District Disaster Management Committee (DDMC) has been providing relief food to the affected communities though the assistance provided is not adequate. With this development, DDMC realises that providing food aid is not a sustainable solution to the problem. However, the DDMC lacks knowledge on how small-scale farmers are exploiting their assets in response to effects of drought. This is in a bid to help build their resilience in food security (availability and accessibility) to effects of drought. This calls for an investigation to understand how farmers living in the affected areas can be capacitated in responding to drought that is impacting negatively on their livelihoods.

1.3. Research objective

To study the relationship between small-scale farmers' assets and their livelihood strategies in response to drought with a view to recommending to DDMC ways of enhancing small-scale farmers' capacity in responding to effects of drought (building resilience in food availability and accessibility to drought).

1.4. Main research question

What is the response to drought in the use of small-scale farmers' assets and their livelihood strategies with a view to achieving food security (availability and accessibility)?

1.4.1. Sub research questions

- i. What resources are accessible by small-scale farmers in Wankhala Agriculture camp to support their livelihoods?
- ii. What livelihood strategies do small-scale farmers in Wankhala agricultural camp undertake to provide for their needs?
- iii. What is farmers' experience of drought (the notable changes and effects)?

2.0. SETTING THE SCENE

In exploring livelihoods of small-scale farmers in Wankhala agricultural camp, a sustainable livelihood framework was adapted. This is with a view to understanding the relationship that exists between farmers assets and their livelihood strategies in their endeavours to achieve food security in the community and at household level amid drought. Food security dimensions focused on are availability and accessibility.

2.1. Livelihoods

Institute of Development Studies (IDS), (2017) considers a livelihood to be a means of people gaining a living by using their abilities and capitals. A livelihood is sustainable when it can handle stresses and shocks it is exposed to. It should also be capable of recovering from such shocks and stresses without endangering the generations to come. Shocks are events or incidences which destabilise people's undertaking of a certain type of a livelihood (Von Braun, 2009). Such shocks include drought, floods, diseases to mention but a few. These can either affect multitudes of people (covariant shocks) or just a few (idiosyncratic shocks) in a given population (PEP-CBMS, 2011). Shocks negatively affect the sustainability of livelihoods because they limit the aptitudes of people to efficiently exploit resources around them. In addition, they reduce the stocks of assets that can support people's livelihoods (Poverty and Economic Policy research network, 2011, (Marques, 2003)). In this view, livelihood diversification is what is believed to be helpful in improving resilience to such stresses, to be precise, drought.

2.1.1. Livelihood diversification

Livelihood diversification simply entails the practice of various activities in providing for their everyday needs (Frank, E., 2007). This helps in building resilience because not all livelihoods can be affected by the same shock equally. But if that happens, still different livelihoods are not equally affected, an aspect that provides increased chances of surviving the shock by the affected people. The activities can be based on different assets types which include physical, natural, social, financial as well as human capital. Activities chosen by people in using the available assets towards meeting their daily needs are referred to as livelihood strategies (Olivier, S., 2017). For rural livelihoods, they are mainly natural resource based which are either on-farm or off-farm activities. Strategies are employed with a view to producing livelihood outcomes that enhance peoples living. People in communities also choose to diversify their strategies based on the benefits coming from each strategy. The motivations for choosing what type of livelihood is taken are as either pull or push factors (Sarah, A.L., 2015). Push factors refer to undesirable issues that lead to exploring alternative means of survival and they are the common factors in rural livelihoods. These push factors include drought which is a covariate shock. Push factors lead into diversification of activities to those that are less susceptible to such shocks. As for pull factors, they are motivations which attract individuals to venture into other activities (Haggblade, S., et al., 2007). These could be more profit generated or easy means of conducting such an activity. The major difference between pull and push factors is that push factors dominate in high-risk areas to shocks/stresses while pull factors dominate in those which are less risky.

2.1.2. Assets as influencing factors in livelihoods

According to Ellis (2000), assets are stocks of capital that can be exploited directly or indirectly, to make the means of survival of the household or sustain its material well-being at differing levels of survival. These can be physical, social, natural, financial and human as well as political assets (Sung (Kyu, K. and James S., 2014). Assets are either tangible or intangible (Investopedia, 2017). Tangible assets are those resources which are physical in nature and can be quantified (natural, financial and physical assets) e.g. land, cash and livestock. These can be accessed physically to support a livelihood. Compared to intangible assets, tangible assets are easily lost through natural disasters. Intangible assets are immaterial in nature but can be described through access and or claims (social and human capitals) e.g. expertise in business and social network (IDS, 2017). These all assets complement each

other in making a livelihood sustainable. As given in the UNDP human development index (HDI) report (2014), a community or a household may not be endowed with all types of assets but only a few. The UNDP HDI report also relates low human development index (human capital indicator) for some communities to increased vulnerability to impending shocks including drought. This contributes to a household/community being less resilient to different shocks including droughts. Rural livelihoods tend to be more prone to natural disasters because they are much dependant on tangible asset and little diversification of these livelihoods is practiced.

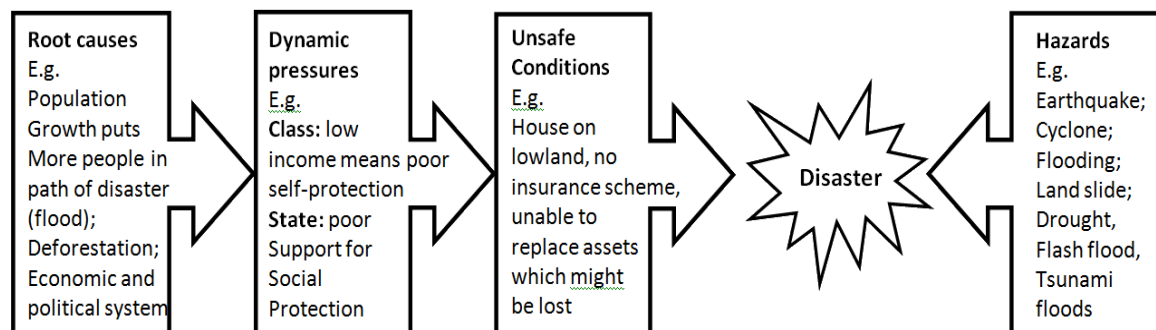
2.2. Vulnerability and resilience to shocks

Shocks and stresses are known to disrupt normal livelihood activities but shocks/stresses presence alone cannot cause such disruption unless a community of person involved in a livelihood is vulnerable to it. Therefore, vulnerability is an aspect within livelihoods that is important to pay attention to, if a community is to withstand such pressures (Awal, A.A., 2015). Vulnerability is the reduced ability of a person or a group to predict, overcome and recover from the effect of a hazard which can be man-made or natural (IFRC, 2017). As explained in the pressure and release model, a shock can only result in a crisis if the involved community or people are vulnerable to it. Reduced vulnerability leads to reduced crisis. The relationship for the existence of hazards and vulnerability that lead to crisis is as given in the equation below.

$$\text{Risk/Disaster (crisis)} = \text{Vulnerability} \times \text{Hazard}$$

This equation entails that when vulnerability to a shock is not there, then a hazard will have no effect on those exposed to it (DAP, 2017). The pressure and release model is schematically shown in figure 2.3-1 below.

Figure 2.2-1 Figure Progression of vulnerability of a person/community to hazard



Source: http://2.bp.blogspot.com/--T7H7ZuRcss/U9AF9KOWfvi/AAAAAAAAAi8/6D6_SzpH4eA/s1600/Progression+of+vulnerability.png. [Accessed: 31 August, 2017].

As noted by Von Braun, 2009, the assets owned by individuals have an influence in the degree of resilience to shocks by such individuals. In this case the shock of interest is drought. Drought is viewed as a prolonged period of rainfall leading to widespread injury to crops, and subsequently, loss of yield (NDMC, 2008). And the Disaster Management and Mitigation Unit (DMMU), (2015) defines drought as a period of unusually dry weather that continues long enough to yield a hydrologic disproportion (for example crop damage, water supply shortage, etc.). In this research, a definition by DMMU is adopted since the research is looking at a food system that is dependent on rain fed agriculture for their food security. In addition, in this definition, the aspects considered are not just crop production but also other ventures that need water for efficiency in their operations a prolonged period e.g. domestic needs. In Petauke district, the rainy seasons spans from November to March in a normal season. It is during this period that an average annual rainfall of 800-1000mm alluded to earlier is

received. However, the scenario is slowly changing. This is seen by the onset of rain, as late as 25th December coupled with early withdraw in February. This is the case with Wankhala agriculture camp, an effect that has resulted in rivers not collecting enough water to adequately supply the community in periods off rainy season (MoA, 2015). Also this has seen shallow wells drying up in the dry season, causing water scarcity among households of these communities. This in a way also influences the livelihood strategies taken by members of such affected communities.

Resilience refers to the ability of people, communities or systems that are confronted by disasters or crises to withstand damage and to recover rapidly (FAO, 2017). Different people in the same community may have different resilience to drought, just like to other shocks (floods, break-out of pests and diseases and wars), due to differences in their vulnerabilities to such shocks. Vulnerability is inversely related to resilience. The UNDP, HDI report, 2014, indicates that different factors contribute to vulnerability of people to such misfortunes. Such factors include sex which leads to social vulnerabilities. In case of Zambia, customs and norms, poor farming practices, degradation of the environment, the disintegration of social safety nets such as extended family systems and weak institutional structures to promote social welfare are among contributing factors. Other issues contributing to vulnerability are lack of access to information and knowledge, lack of access to political power and representation, lack of public awareness, and limited food diversity (DMMU, 2015).

2.3. Food security

As framed by FAO, (1996), food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. It is the ways in which food is produced and distributed. Therefore, food security is made up of four pillars that need to be satisfied for it to exist and these are availability, accessibility, utilisation and stability. These four dimensions are as given below.

Physical availability

Food availability reflects the supply of food into a food system. This is to do with food physically being there for people to access. Food availability is reflected in through the quantity of food produced or food physically stored. For governments, they strategically buy food and store for any disturbances in the food system. Therefore, keep such strategic food reserves, makes the government secure food availability. In addition the quantity of food being traded on markets is also an indicator of food availability (FAO, 2008).

Food accessibility

Food accessibility refers to the physical availability of food and also economically accessed. This entails that food has to be there and it should be within the manageable financial needs i.e. people should be able to purchase the physically available food. With increased income earned by a person so goes with an increase in food accessibility capacity and the reverse is true. Inflation rates in the economy is among factors that reflect the degree of satisfaction of this pillar (Daniel G.j., 2013).

Food utilisation

This refers to the nutritional aspect of food that is available and accessible. For this pillar to be satisfied, the food available and accessible should be able to nourish the consumer with nutrients that the body requires for it to function effectively. If the food accessed does not meet this pillar, it manifests in different forms which include anaemia in case of lack of iron nutrient or night blindness in cases of lacking vitamin A. utilisation pillar also takes into account of health in the food system. This is because a body can only use food supplied as intended if it is in healthy failure to which it malfunctions. Required nutrients can be supplied but if there are diseases in such a body then the food will be used to fight the infection and not for its intended purpose (Yadav, S.B., N.d).

Stability of the other

This pillar entails satisfaction of the other three pillars: availability, accessibility and utilisation. These are to be satisfied simultaneously over time (FAO, 2008).

2.4. Institutional participation in building resilience in food security

Various institutions and organisations are known to provide relief food assistance in times of crisis. These institutions/organisations include government, NGOs as well as community-based organisations. The strategies used by organisations and institutions in building resilience are either short-term or long term effects e.g. distribution of relief food which is an emergency response to food needs, giving social cash transfer to the vulnerable members of the communities as well as improving human capital through trainings in increased production and productivity of agricultural or non-agricultural related enterprises.

Relief food refers to an emergency provision of assistance to save people's lives in response to disaster. Other ways in which institutions help in responding to shocks include temporary provision of sanitation, health care and shelter, and the restoration of immediate personal security (DMMU, 2015). Under Petauke district, the trend has been consistent since the year 2012 (DDMC reports, 2012, 2013, 2014, 2015). In Petauke district, distribution of food allocated to affected areas by DMMU has been done through DDMC contracting NGOs including Petauke Nutrition Group and Zambia Red Cross Society, Petauke branch (Zambia Daily Mail, 2015).

Social cash transfer refers to cash assistance given to identified members of communities as a means of improving their capacity to choose and conduct activities that improve their food security (Social protection.org, 2017). This program targets groups of people whose capacity to generate and access their own food are compromised. These people include the orphans, disabled and the aged (>65 years). The amount provided might not be enough to provide for all of their needs but they are made better off than without such little support provided as long as the disbursement of the funds is consistent (Eleanor, F., et al., (2017).

In capacity building the vulnerable people in the community, trainings are conducted with a view to improving their capabilities to use their assets profitably. Some of the trainings done include entrepreneurship and conservation farming. The one training which is seen promoted in developing countries is that agrarian based knowing that land is the asset most accessed by people in rural communities. In Zambia, conservation agriculture (CA) has been promoted actively in regions where people experience droughts more than other regions (IAPRI, 2016). CA helps improve yields through its practices of ripping or pot-holing in crop field which help to harvest rain water that later on supply moisture requirements for crops in times of drought. It also improves soil fertility through the retained crop residues that decompose and act as manure to supply nutrients needed by crops. The fertilizer applied as well as manure available in the soil is also utilised efficiently by the practice of crop rotation. Crop rotation is also known to help to control weeds and pests in crop fields which increase crop yields and adding on to food availability for the producing household. This has seen adopters of CA improve crop yields even when little rain is received in their areas. By so doing, their resilience in food security with reference to drought is enhanced.

2.5. Gender and its influence in rural livelihoods

In shaping rural livelihoods, different roles are performed at household based on gender. This is pronounced especially in on-farm related activities. For instance, males are known to take more responsibilities in land preparation compared to females who are so active during planting and weeding. Gender refers to social construct aspects that characterise and distinguishes men from women (WHO, 2017). These aspects include roles that are performed by either males or females and they are not the same in all places. Duties or played according to gender are called gender roles and these can easily be interchanged from one gender to the other as opposed to sex roles which are

determined by the biological makeup of an individual. In making a choice of livelihood, gender has an influence because it determines how well a certain livelihood can be exploited basing on the availability of either males or females (Kebede, M., et al., 2014). Compared to non-agricultural based livelihoods, gender is more pronounced in agriculture based livelihoods where women are known to account for over 40% of labour needed (Ram, S., Froze, S.M. and Lala, I.P., 2013). This makes women be of significance in making contributions in shaping rural livelihoods.

3.0. METHODOLOGY

3.1. Strategy and tools

A qualitative case study was conducted using structured and semi-structured interviews with 3 key informants and 30 farmers respectively. Both the individual farmer interviews and focus group discussions (3) used topic lists which had open ended questions. Open ended questions were preferred in order to pave way for conversations that would generate more information about the topics. Group discussions were meant to get a wide range of view on assets and livelihoods of farmers in their response to drought. Also, individual interviews were conducted for a purpose of getting a deeper understanding of the topic from individual farmers' perspectives. This was especially on subjects that some individuals could not articulate themselves well in group discussions. In addition, this is to help confirm on matters raised during group discussion. This was the case with the interviewing key informants.

3.1.1. The researched community

The research focused on small-scale farmers in Wankhala agricultural camp under Ukwimi resettlement scheme, Petauke district. Selection of Wankhala agriculture camp as study site was based on it being a community of small-scale farmers whose livelihoods depend on crop and livestock production. In addition, this area is among those affected by droughts, a factor that has contributed to increased demand for relief food by the people of this community. To get research data about this subject, three group discussions with farmers were conducted; 1 for males only, 1 for females only and 1 for mixed male and females in groups of 12, 13 and 10 people respectively. In addition, 30 individual interviews were conducted. These covered 15 males and 15 females. Three groups were of interest for data collection to assist in understanding people of this community differently look at matters affecting them when they are of mixed gender.

Gender was of interest in this study to know its if it has influence in responses made to drought by people in the researched community. Group discussions were composed of farmers who were not interviewed initially. This was a way of avoiding the already interviewed individuals from influencing others who did not know much about the topic of discussion and the questions to be asked. To triangulate the data collected, three key informants who are familiar with the livelihoods of farmers in this community were also interviewed. These were the community development officer, block extension Officer (acting) for Chinika agricultural block and camp extension officer for Wankhala agricultural camp. The stated targets were arrived at following the consideration of time and financial resources available to support the data collection. Respondents were sampled from different villages within the camp so as to get an overview of the topic in a wide area of the camp.

3.1.2. Data processing and analysis

The data collected was grouped according to categories of responses which helped in analysing the findings. In doing this Microsoft excel was used. The collected data was coded where possible and frequency tables for responses recorded were generated to help make sense out the findings.

3.1.3. Sampling technique

Purposive stratified random sampling was used in choosing respondents from the villages within Wankhala agricultural camp. This was with a view to getting a broad range of activities that are of importance according to gender. Knowing that by nature males and females have different needs, gender in this case was also important to find out if it too influenced the livelihood choices made at household level.

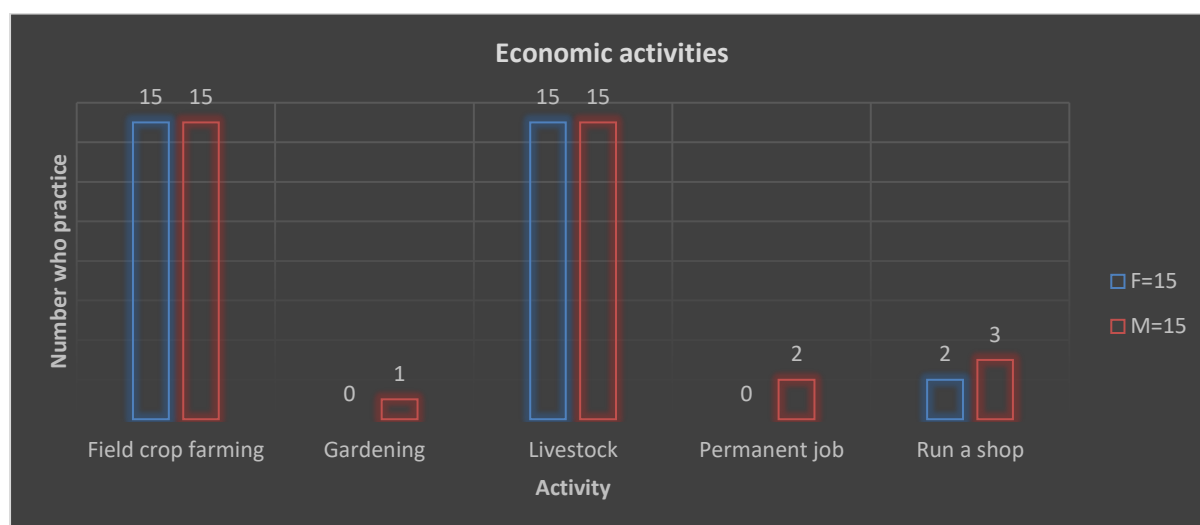
4.0. RESEARCH RESULTS

4.1. Economic activities conducted by farmers

The data collected suggest that residents of Wankhala are involved in farming as their major economic activity with crop production being the main activity followed by keeping of livestock. The main crops grown are maize, groundnuts, sunflower, soybeans, cotton and vegetables including tomatoes and rape (refer to figure 4.1-3 below). For maize, groundnuts and sunflower, they are grown for both cash and home consumption. Of the three, sunflower is the one grown primarily for home consumption. As for cotton and soybeans, they are solely grown as cash crops. Other crops grown are vegetables including rape, tomatoes, Chinese cabbage and onion which only 1 male reported to grow. These are for cash though they also supply food to the producing household. In addition, oranges are the only ones identified in this research (R=1). As for livestock, the ones kept by farmers in this area are cattle, goats, pigs, sheep, chickens, geese and doves but the main ones are cattle, goats, pigs and chickens. The degree to which crops and livestock are ventured in with reference to gender by members of this community are shown in figure 4.1-4 and 4.1-5 respectively. Livestock are kept on free range with little feed supplementation which is done for chickens and pigs.

Other income generating ventures reported are salary paid jobs, selling of groceries, selling fuel for motorbikes, moulding bricks and selling food staff bought from Petauke central business centre. Such foods include soya pieces, tomatoes and biscuits. The economic activities conducted in this community are summarised in figure 4.1-1, segregated according to gender.

Figure 4.1-1 Activities conducted segregated by gender

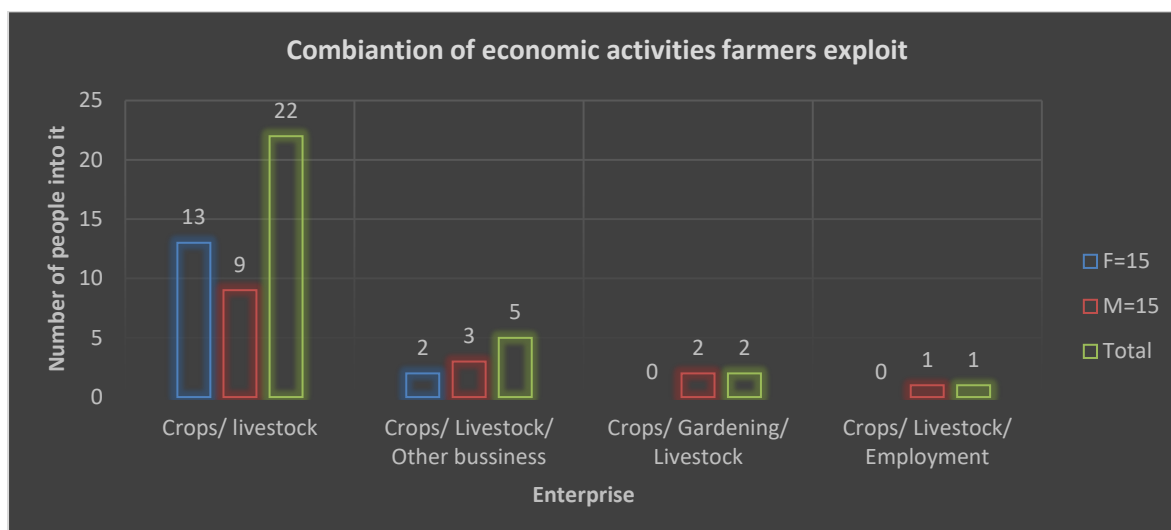


Source: Research data (2017)

Figure 4.1-1 reflect that for field crops and livestock production, both male and females are equally involved as means of generating income for their households. As for vegetables, just as earlier stated, only one male is reported to be doing gardening and this reflects the accessibility to water resource in the area. Currently, the dam supplying water for vegetable production is reported to only accommodate males. This can be a factor as to why no female respondent indicated being involved in vegetable production. With regards to permanent jobs, only two people have this opportunity as an income source. This in a way reflects the nature of the community in terms of providing employment opportunities to permanent jobs which are not based on farming. Much of the economic activities in this area are agricultural based which does not demand permanent worker knowing that the level of production is low (small-scale farming). But opportunities for other businesses like running shops are almost equally available for both males and females (3 against 2) as reflected in figure 4.1-1 above.

As reflected in figure 4.1-2, most people (R=22) venture in both crops and livestock than any other economic activity. This indicates that agriculture is the pillar for the livelihoods of people in this community with crop production being the most undertaken venture. It is further shown that a good number of females are only into agriculture and no others means of generating income compared to male counterparts.

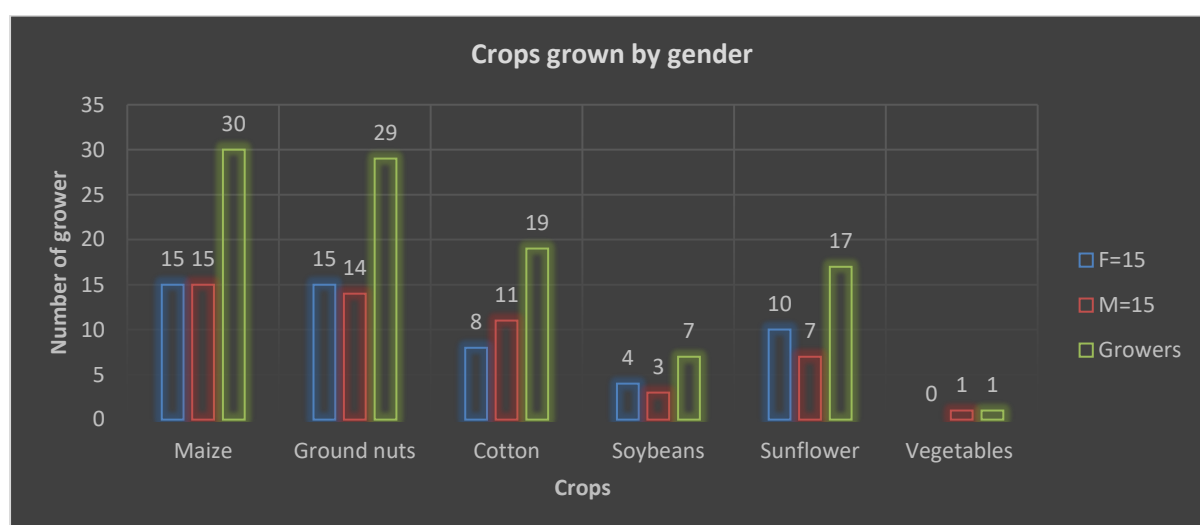
Figure 4.1-2 Combinations of economic activities with respect to gender



Source: Research data (2017)

Basing on figure 4.1-3 below, it was observed that all 30 respondents grow maize which is a true reflection of the fact that maize is the staple crop for people in this community. Concerning other supporting crops, it was observed that more men are into crops associated with cash. This is the case with cotton which was reported to be grown by 11 males against 8 females. As for soybeans, it is an emerging crop in terms of cash generation in this community and it was reported to be grown by 3 males against 4 females. Farmers also indicated their conscious about good nutrition and not just food. This was reflected in the three focus group discussions and some individual interviews conducted (refer to figure 4.1-3 below).

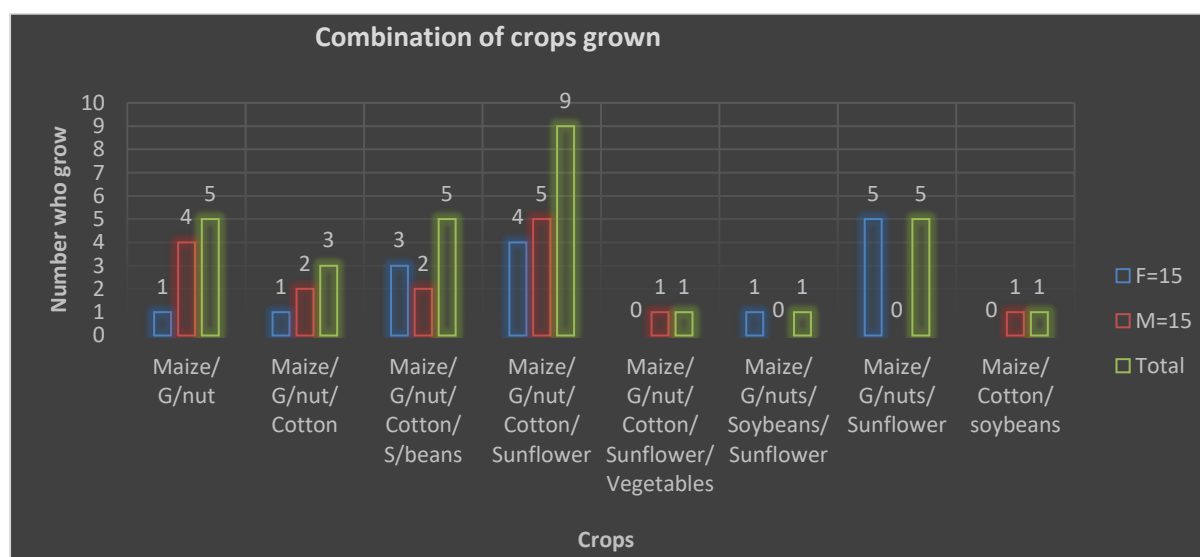
Figure 4.1-3 Crops grown by gender



Source: Research data (2017)

However, the degree of consciousness to type of crops grown and nutritional needs was not the same among males and females. Females expressed interest in crops that will not only generate income but also improve nutrition status for the household. This is reflected in the number of males (7) against females (10) who are into growing of sunflower (figure 4.1-3). This information was alluded to in all the focus group discussions that sunflower is grown by many primarily for extracting cooking oil for their home consumption. This is the case with groundnuts which are grown by 14 males against 15 female who grow it and also as given in figure 4.1-4 where the two crops are grown in combination with maize by 5 females against 0 male.

Figure 4.1-4 Combination of crops grown compared by gender



Source: Research data (2017)

As for livestock production, it was observed that more males kept cattle compared to females who have been observed to be into small livestock including goats and sheep as their major livestock. one female respondent indicated that goats are easier to sell compared to cattle in times of crisis and so she was motivated to keep goats. She further mentioned that the land owned (5ha) can support goats

better than cattle. Going by this, it can be said that this might be the motivation by other females to get more involved in small livestock compared to keeping cattle. This is reflected in figure 4.1-5

Figure 4.1-5 Livestock owned as given by respondents

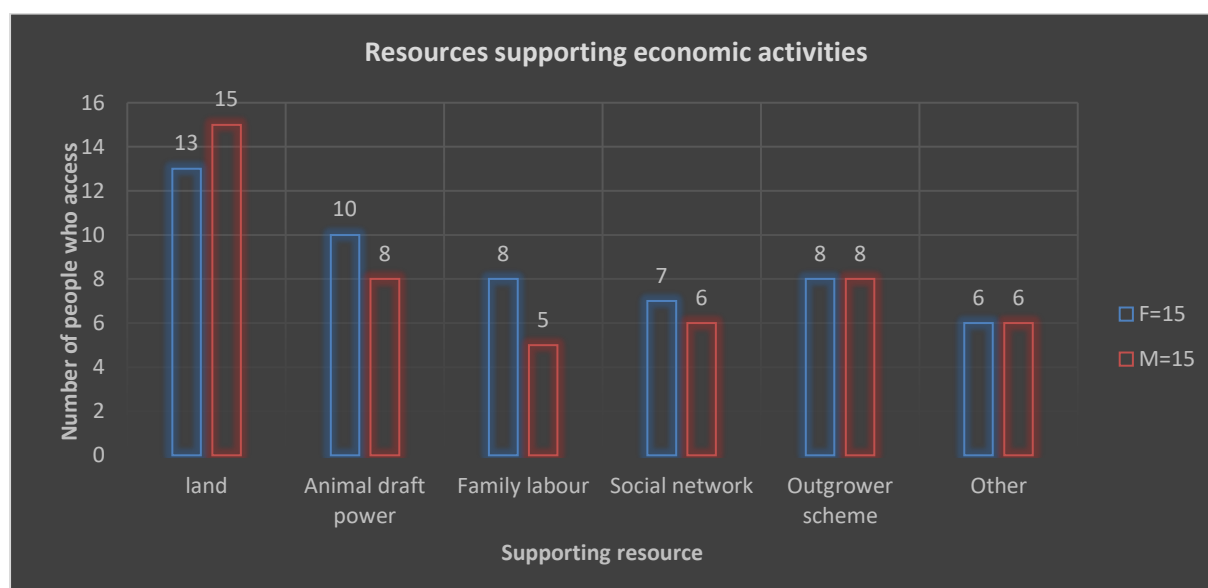


Source: research data (2017)

4.2. Resources supporting economic activities

In conducting the above mentioned economic activities, various resources are important. Of the 30 respondents, 28 (13 females and 15 males) indicated that land is the main supporting resource. As reflected in figure 4.2-1, women also consider land to be their biggest asset in supporting their livelihood. This was in line with their improved access to land through the scheme land allocation as well as through their families, in cases of married ones. On the other hand, women (R=10) had placed more economic importance in draft power than men (R=8). This relates to the women valuing social network in supporting their livelihoods. It is through these that they access much of animal draft power even for those without draft animals. Other resources of importance are as given in figure 4.2-1 below.

Figure 4.2-1 Figure 4.2 1 Resources that support economic activities in Ukwimi settlement



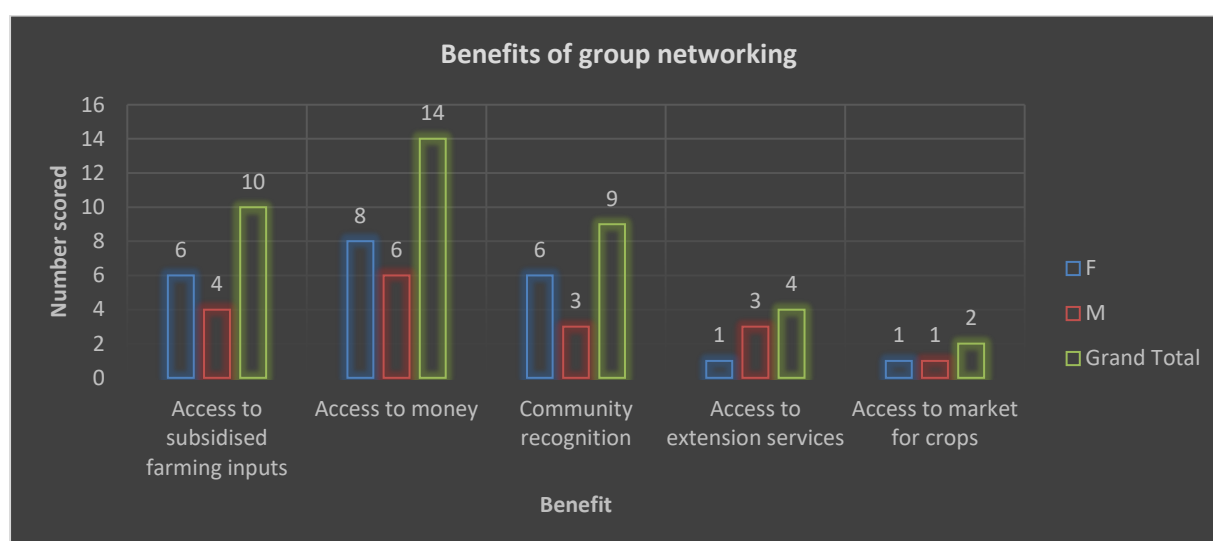
Source: research data (2017)

Of the said economic activities, 28 (15 male, 13 females) out of 30 indicated that farming is the most important activity. Even those who undertake other businesses stated that farming is their main source of livelihoods. The only respondent who considered farming as the second option was one who had a permanent paid job as the priority source of income.

Apart from access to resources highlighted above, people in this community venture in the economic activities already captured above, based on different motivations. These motivations include the proximity (50Km) of Wankhala agricultural camp to the business centre for the newly created district, Sinda, compared to Petauke business centre which is 90Km away. This is with regards to getting merchandise including fuel, vegetables and processed foods which are not locally available but marketable within this community. In addition, indigenous knowledge in farming and other businesses help them conduct such ventures. Indigenous knowledge is backed by the social network through families and other community members who support each other in their day to day activities to support their livelihoods. Social network is seen even more important in females than male respondents as a means of accessing support from extension service provision as well as from friends and families. This is reflected in the involvement of women in groups (e.g. women clubs and cooperatives) more than men. Extension service from government, NGOs and private companies also help to support and influence the economic activities in the area and they deliver their services through the above mentioned groups. For instance, cooperatives are one grouping via which government (using agricultural camp extension officers (CEO)), implements the Farming Input Support Program (FISP) to farmers. This is a program aimed at improving production and productivity of farmers crops and a farmer can only participate if he or she is a member of a cooperative. Both male and female farmers are given equal chance of benefitting and allocation of who receives is done within groups participating. Under FISP, benefitting farmers receive fertiliser and seed to support their crop farming. This further highlights the importance of social networking enhanced by groups in this Wankhala. Other benefits of groups are given in figure 4.2-2.

In addition, one respondent indicated that he does farming because there are no other means of generating income for the family and farming is cheap as it is a way of life in the village. This was linked to him having access to recycled seeds cheaply and free rains to support his farming. Another person indicated that he ventures into farming because the salary earned through formal employment is not enough to support the family.

Figure 4.2-2 Benefits of social networks as experienced by farmers in groups



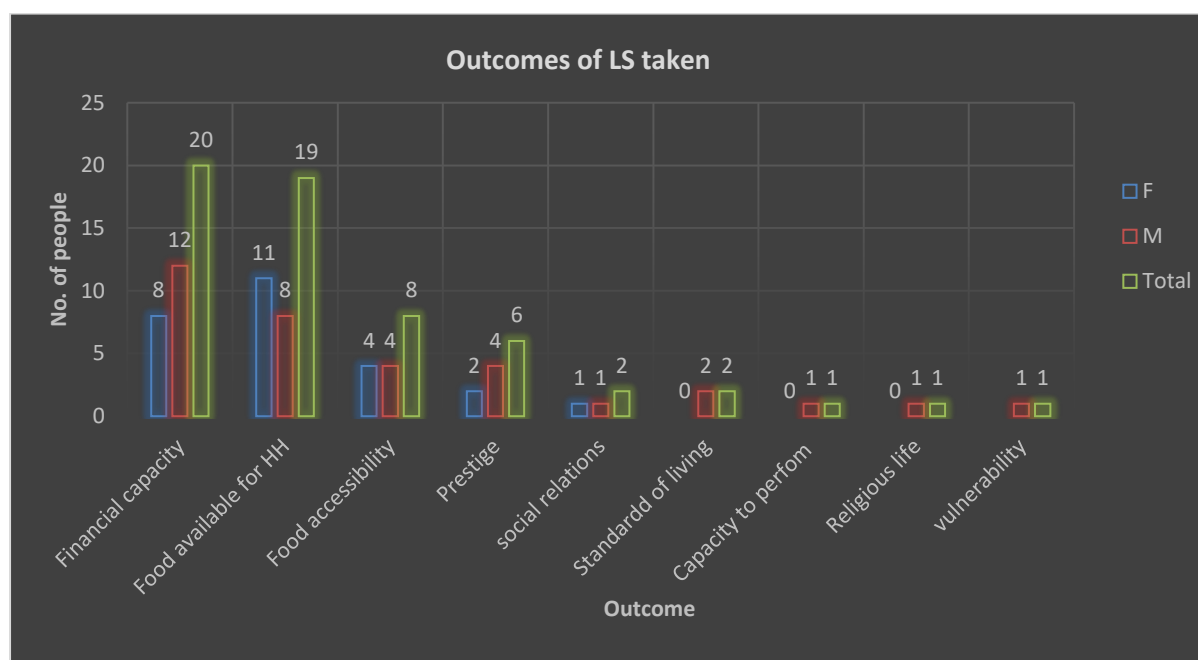
Source: research data (2017)

As captured in the figure 4.2-2 above, there is more female participation in form of groups compared to males. Females are seen to participate in two types of groupings, one where they are with men (in cooperatives) and in women groups also referred to as women clubs. However, it was observed that a few males still join women clubs and not making men clubs. It is so because they justified their membership in women clubs as a way of helping women conduct activities. Activities mentioned were those which require masculine figure like operating ploughs in their group farming fields. For such reasons, men are allowed to join such women groups through which enjoy the incentives of being members especially access to credit and subsidized farming inputs.

4.3. Livelihood outcomes in normal seasons

The various livelihood activities by people in this community lead to different outcomes but the ones which are very important in their lives are enhancement in their financial capacity ($R=20/30$) and food availability at both household and community level ($R=19/30$). Improved financial capacity is attributed to increased sales from diversified agricultural produce as well as from other non-farm undertakings. This in return enables the farmers to buy other foods perceived to be luxurious like soya pieces which are not locally produced but still locally available. Four respondents indicated that food diversity is one aspect in which food availability is being experienced by people in this community. The outcomes of LS as experienced by participants in the survey are as indicated in figure 4.3-1 below.

Figure 4.3-1 Outcomes of LS practiced in Wankhala agricultural camp



Source: Research data (2017)

Figure 4.3-1 shows that more males are concerned about their income compared to females who expressed concern for household food availability. This is also one reason why males attach more importance to prestige compared to female. One way in which prestige is observed is through the housing type someone lives in. Staying in an iron roofed house is considered to be more prestigious than staying in a grass thatched house and it is an ambition for most males to achieve following their harvest.

4.4. Living with drought

4.4.1. Perceptions about drought

Though being in the same community, farmers perceive drought differently. However, the different perceptions about drought are observed to fall in four categories and these are distribution, frequency, quantity and availability (time) of rain. Of the mentioned categories 18 respondents described drought in line with time for availability of rain in the community and this was expressed in terms of time of onset or ending of rain (R=10) and no rain at the expected time (R=8). With regards to quantity of rain received, 8 look at drought to be less rain received in the year than what is required. Also, 4 indicated that it is having little or no rain at the critical times when it is needed for crop production. Critical times highlighted were at crop germination and flowering stages. Quantity description of drought is complimented by the frequency of rain received. In this view, four (4) respondents indicated that drought is having fewer rainy days than what is needed to support crop growth to maturity in the farming season. Therefore, based on the descriptions given by respondents, drought for this community is not viewed in one dimension but in four different perspectives which are distribution, frequency, quantity and availability (time) of rain experienced during the rainy season.

In understanding causes of drought in this community, again farmers expressed divergent views. Twelve (12) respondents associated cutting trees due to increase in the population of this community to be the contributing factor. They indicated that opening new agricultural fields as well as expansion of the existing, in a bid to feed their increasing population has led to this scenario. Cutting of trees is said to leave too much open spaces that favour drifting away of rain-bringing clouds by winds, leaving

this area with reduced likelihoods of getting rain. Opposing to that, 9 respondents indicated that it is God's doing for them to be faced with drought. This considered drought to be like any other natural events which happen from time to time. One respondent expressed ignorance on the probable causes of drought due to lack of formal education he has not undergone. The remaining 18 respondents declined to associate anything to drought as they totally did not know whatever the cause could be. Effects of drought at household level.

Basing on the above responses, it can be said that the known contributing factor to causes of drought is cutting of trees that has been done in this area.

4.4.2. Farmers' experience of drought

Just as farmers have different perceptions about causes of drought, they too have different ways in which they experience drought at household level. The data collected indicate that most of the farmers experience drought in form of reduced availability of water (R=17). This was associated with drying of rivers and low water table which have both resulted from low rainfall received in this area. Drying of rivers was evident when Lusandwa river, one of the major rivers in this region was visited during data collection. At the time of visit, the river bed was as dry as a farming field in dry season (refer to figure 4.4.2-1 below). Due to low water availability, 3 respondents linked this to the cause of diarrhoeal diseases among members of their households especially children. This is because the water being accessed is dirty resulting from sharing water points with livestock in some cases. In such situations, the boreholes available are also supplying water to animals (cattle) (as depicted in the contained in figure 4.4.2-1).

Figure 4.4.2-1 Dry river bed for Lusandwa river, Ukwimi, Petauke, Zambia



Source: Research data, Zambia (2017)

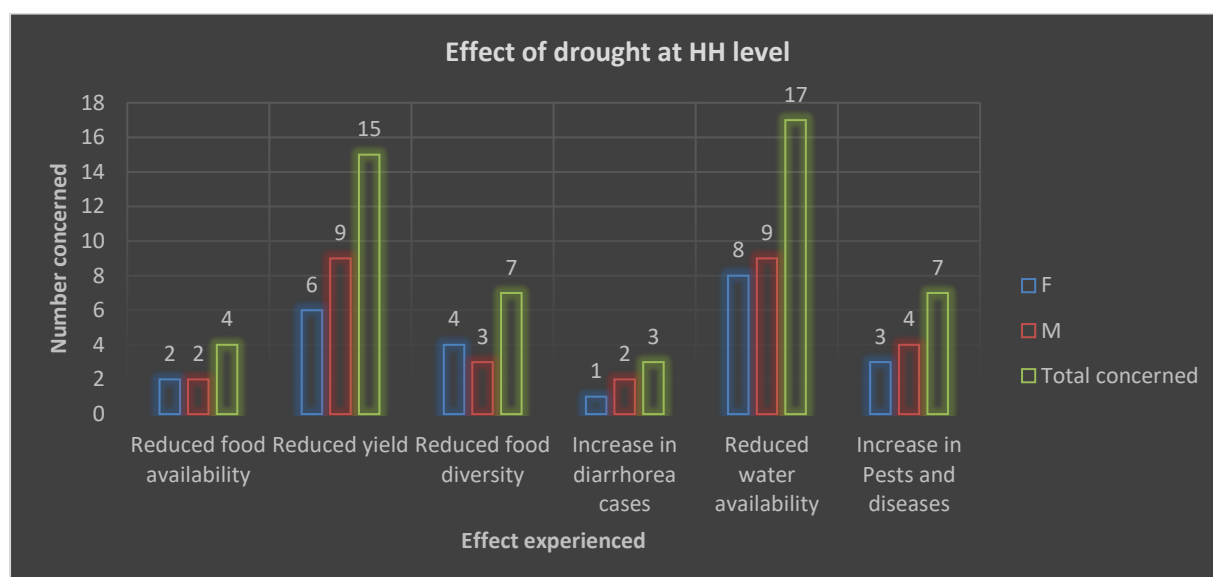
Figure 4.4.2-2 Animals and people share water points in Wankhala Agriculture camp



Source: Research data, Zambia (2017)

Respondents also echoed on the effect that drought has on their farming and for this aspect, 15 of them stated that drought leads to reduced crop yields. This is associated with factors including water stress for plants at critical growing stages. Also, 7 respondents stated that low crop yield is due to increased infestation of aphids (in cases of ground nuts fields) and witch-weed (in maize fields), both pests favoured by low rainfall. Because of reduced yields and performance of crops, 4 respondents indicated that this makes them fall into a trap of reduced food availability. On the other hand, 7 respondents linked it to reduced food diversity. Reduced food availability and accessibility are at both households and market levels. Reduced food available at the market makes food expensive. Figure 4.4.2-3 gives a summary of responses given with regards to how drought is experienced at household level.

Figure 4.4.2-3 Effect of drought as experienced by farmers at household level



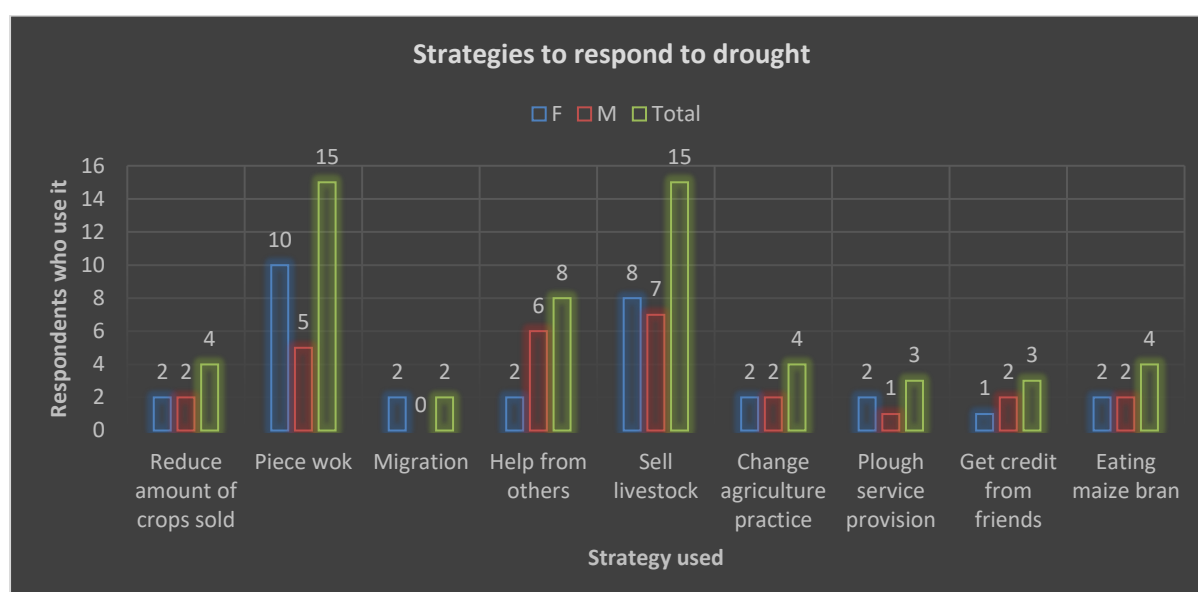
Source: Research data (2017)

Therefore, this data suggests that among farmers, drought is mostly experienced in form of reduced availability of water. This was expressed more by male respondents than females though the margin is small (M/F=9/8). This could be linked with the type of off main farming season income generating ventures that are negatively affected by lack of water in which males are involved e.g. gardening. In all the six ways that drought is experienced, females were agreeing to those views less than men except for reduced food diversity. In a way it gives a hint that women are more concerned about not only the availability but also the diversity of foods available in their households than males.

4.4.3. Livelihood strategies in response to drought

As a way of overcoming the effects of drought highlighted above, various livelihood strategies are implored by the affected households. Of the strategies, the widely used are doing piece work (R=15) for those who have food or money and also selling of livestock (R=15). In addition, 4 respondents stated that if things go to the worst, they even resort to eating maize bran which they either buy at K5 (an equivalent of 50-euro cent) per 50Kg bag or are given for free by those milling maize flour/mealie meal. These strategies and others used in this community are as given in figure 4.4.3-1 below.

Figure 4.4.3-1 livelihood strategies used in times of drought and influence assets



Source: Research data (2017)

Basing on the data indicated in figure 4.4.31, it is observed that more females get involved in piece work as a survival strategy compared to males. This can be linked to the strong social network that women share through which they know those well to do who can offer a job for food as payment. On the other hand, women are easily trusted to do piece work compared to men so they easily find jobs in such difficult times. As for the strategy of selling cattle, it is also seen more than females sell than males do to cater for their food needs. This can be linked to the fact that in this community number of livestock owned is a show of wealth and men always want to maintain their wealthy status in the community. This could be the reason why more men do not easily sell cattle as a means of getting access to food in times of need. As opposed to this, it can be said that women are not so concerned about social status associated with owning cattle but to use them for survive when need arises.

4.4.4. Influence of famers' LSs on their assets

Out of the above-stated strategies, farmers reported that these LS lead to reduced stocks financial and of physical assets (e.g. animals) owned and at the same time they get motivated to venture more into livestock production. In terms of social networking, some indicated that this helps them build strong links with others so that together they can find a solution to their common problem. This in a way promotes networking as is seen to be a reliable means of survival in such times. Networking is said to help access finances through credit through having access to savings made in a group. For cooperatives, members are required to buy at least 10 shares, each costing K50 (€5 equivalent). This is the money which members access in times of problems. For non-members of such groups, it is not easy to access such financial help. Opposing to this, others indicated that in such times of hunger, there are no good relations between those who have food and the ones who don't have. This is in fear of depleting their food stock before the next harvest. As a result, some people with food tend to cook their meals in the farming fields to avoid sharing with others. Therefore, drought is seen to affect social network among farmers in two main ways, both positive and negative.

4.4.5. Farmers' perception about coping with drought

In addressing the problems resulting from drought, farmers have different thought as to ways that can be used. Some respondents gave multiple responses with regards to means of addressing drought and its effects. This is with a view to transforming their community into one that can be resilient to this shock. Of the responses given, improving water availability in this community was the most frequent. This is said to be possible through the construction of dams and weirs since rivers easily dry due to

less rainfall experienced in the area. For this proposed intervention to be implemented, 13 respondents indicated that government has to come to their aid and offer such services. It was further indicated that government is being looked up to in solving problems through diverse ways. Some shared ways in which government is called upon to mitigate this problem include improving road network. This is in a bid to enabling farmers access to other markets with better prices for their produce and also to have access to other profitable economic ventures that will enhance diversification of means for generating income. In addition, government is called upon, through the ministry of Agriculture and Ministry of Commerce and Trade, to help in improving cotton marketing (pricing of the cotton). It is thought that if cotton prices are regulated in favour of both marketing companies and farmers, then cotton growing will be a good alternative for income generation by farmers. This is said so because cotton is a drought resistant crop and so it can thrive better than other crops like maize, in this farming community.

Government is further called upon to extend the social cash transfer and FISP programs to more beneficiaries. This is in a bid to help the people that have previously been affected by drought and now finding it difficult to stabilise in their livelihoods. Also, respondents expressed interest in growing cassava whose seed is not available in this area. And so the ministry of agriculture is called upon to provide links for farmers to other farmers who have cassava seed if it cannot provide to the interested farmers. This is because cassava, like cotton, is a drought resistance crop and so it can survive in this area and offer a solution to food shortage. When asked all group discussions, about what role they (farmers in this community) can play in addressing the problem of drought, they indicated that they are willing to support government efforts in implementing developmental projects like dam construction. The kind of support is by offering labour in doing the works required as well as giving up a piece of land to pave way for such projects.

Going by the responses given, it was coming out that community members are ready to support development but they lack motivation especially through community leadership. Therefore, building leadership capabilities among community members will help the community members initiate and implement developmental activities in line with transforming this area for the better.

4.5. Role of government and other organisations in addressing drought

As of now, government and other NGOs and private companies are involved in building resilience to drought in different ways. To start with, the disaster management and mitigation unit (DMMU), gives food relief to affected communities. The people interviewed, however, stated that the food they receive is not enough to satisfy their needs. It was highlighted that in a village of 50 households, only 7 households receive and each benefiting household receives a 50Kg bag of maize. This puts the village heads in problems and some respondents in focus group discussion expressed concern that little relief food given even leads to witch craft activities against those dividing and those who have received the food

“Instead of it bringing unity, this relief food just gives us problems. Sometimes as a leader I think that it is better government does not bring this little food because it is giving us headaches when deciding on who should receive.”

(source: respondent who is part of disaster management satellite committee).

In addition to relief food distribution, government does provide social cash transfer to elderly people (>60years old), disabled, orphans and those chronically ill. This is a program implemented by the department of social welfare. Each benefiting individual receives K75 (€7.5 equivalent) per month. This is in a bid to improve access to food by such individuals.

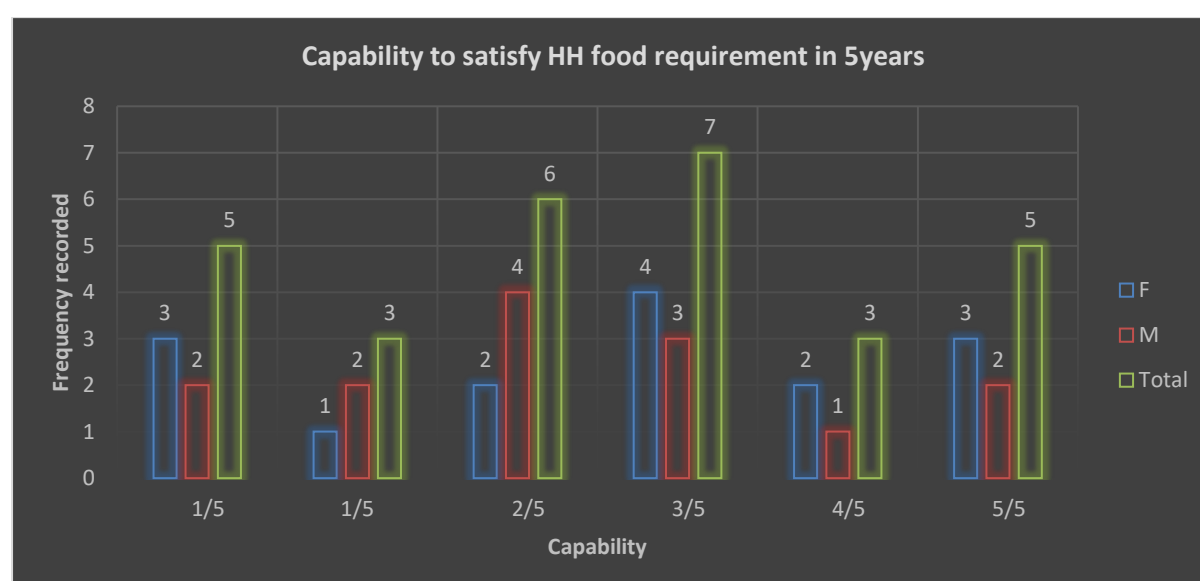
As for NGOs and private companies, they are involved in promoting farming methods that are resilient drought crops. This is conservation farming (*ulimi watso pano- local in language (Nsenga)*) which is

incorporating minimum tillage, crop rotation and agroforestry. Agroforestry is being promoted in a bid to address the deforestation that has taken place in the recent past while helping to improve soil fertility for improved crop yield. The organisations that are active are COMACO and CFU. This type of farming is also promoted by government agricultural extension officers.

4.6. Food shortage as experienced by farmers

People in this community expressed different capacities to satisfy their food requirements the whole year before the next harvest. This was expressed by ranking between 1 and 5 with 1 being the least capable to satisfy household food needs (always runs out of food) and 5 being able to satisfy the needs (does not run out of food before harvest) (refer to figure 4.6-1). It was observed that more females both always run out of food (3/5 who run out of food) and they also manage to reach the next harvesting without running out of food (2/5 of those who manage to reach the next harvest). Most males were reported to be around ranking 2/5 (4/6 respondents for this ranking).

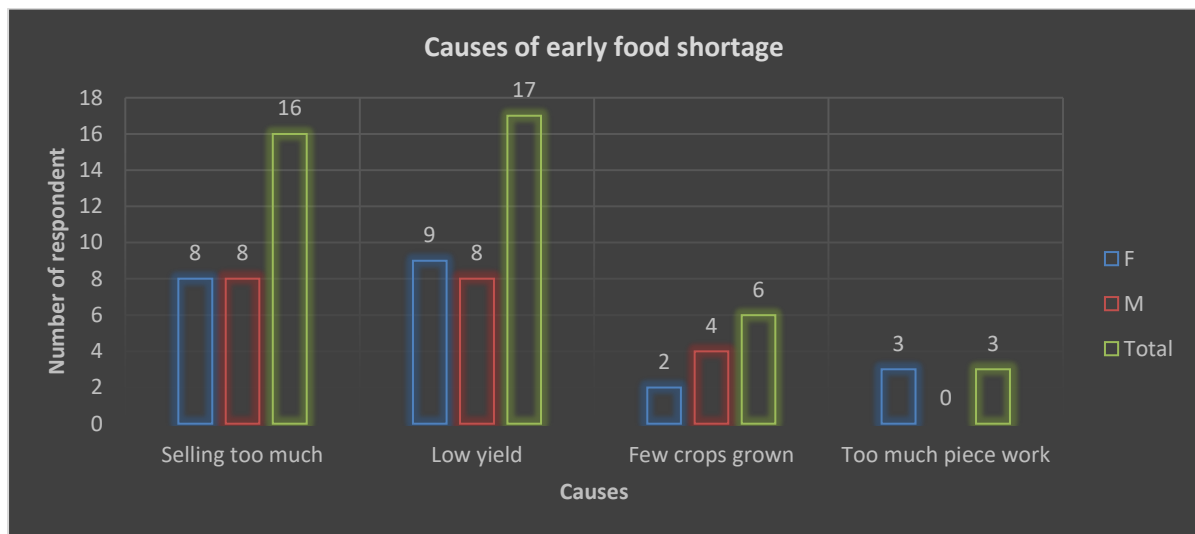
Figure 4.6-1 Capability to meet food needs in the last 5 years



Even though drought is the known major contributing factor to shortage of food in this area, there are many other factors leading to this problem. The main one given by respondent is that of selling too much food and leaving less than what can sustain a household. The respondents who agreed to this were 16 in total and this was confirmed in group discussions and during key informant interview. Too much selling of food is observed at the time of harvest when farmers feel they have more than food than what will be needed for the household in the whole year. Selling is done in both cash and butter system, mainly in exchange for meat and clothes. For some, they even sell their crop before they harvest which already put them in debt even without knowing how much harvest they will have.

In addition to selling too much of the food harvested, 3 female respondents indicated that sometimes doing piece works lead to poor low food available at home. A season can be good but because food runs out early, they cannot go and prepare their farms instead they work for food at other peoples farms and spend less time growing their food. Other factors contributing to early running out of food are as given in figure 4.6-2 below.

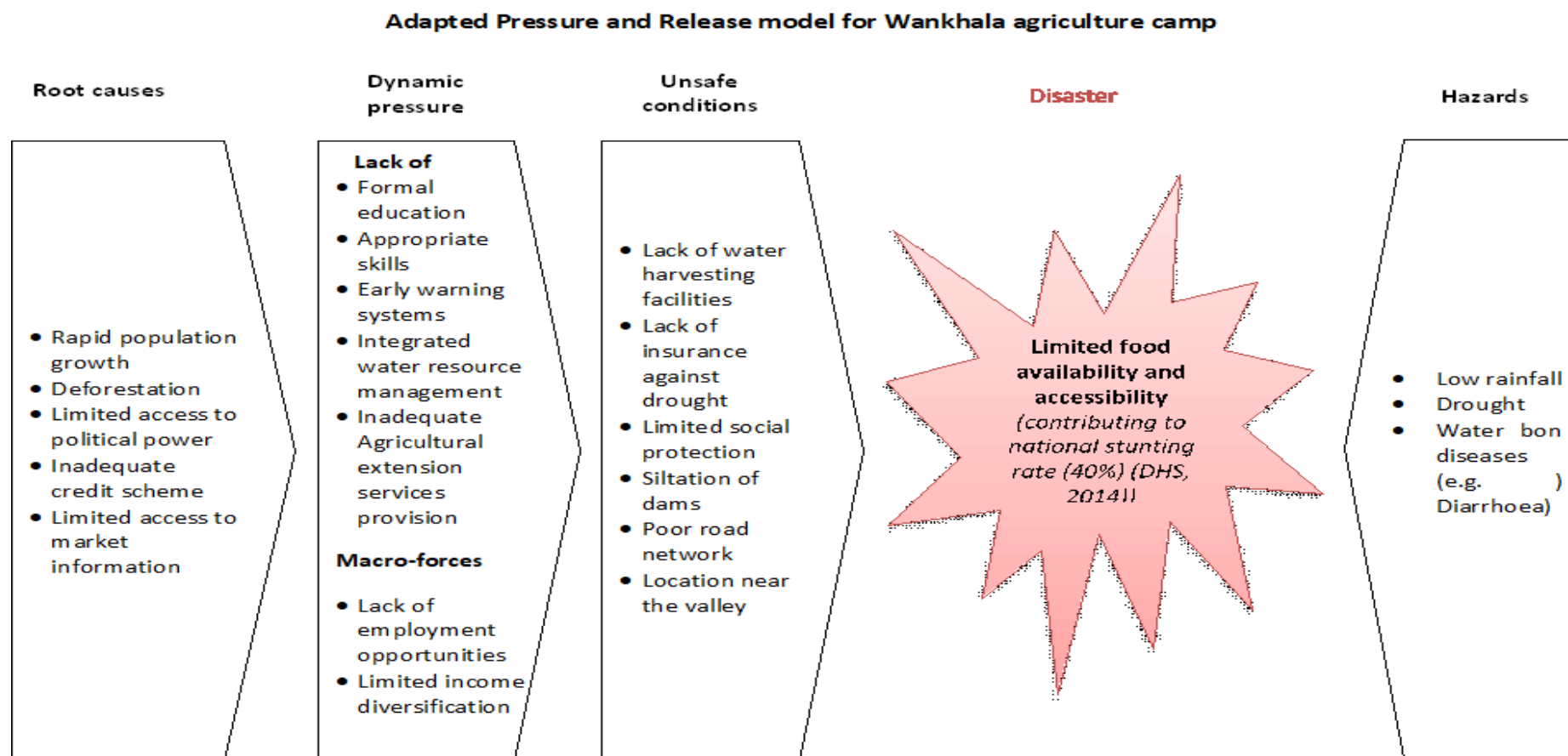
Figure 4.6-2 Contributing factors to running out of food before harvest



The data suggest that the low crop yield reported more by females could be as a result of poor management of their farms since they spend less time on them. But for males the few crops grown can be associated with their interest in growing cash crops whose income may not be kept for buying food in the later times of the year when their food harvested is depleted.

The summary of issues leading to food insecurity in this community is as given in figure 4.6-3 below which gives an illustration of pressure and released model adapted for Wankhala community.

Figure 4.6-3 Adapted pressure and release model for farmers in Wankhala agricultural camp



Source: Research data (2017)

5.0. DATA ANALYSIS AND DISCUSSION

5.1. Livelihoods in Wankhala agriculture camp

Rural livelihoods are known to be agrarian based in most developing countries and Wankhala agricultural camp is not an exception. The major resource supporting livelihoods is land, (5ha per HH) whose access by both males females is enhanced through the resettlement scheme. As indicated in the livelihood zoning of Zambia by FEWS Net, (2014), farmers of Wankhala are into crop and livestock production as drivers of the micro economy for their community. The two, crop and livestock production, are the ones that fuel the development of other businesses in this community e.g. cloth marketing. A season without good rains simply entails a year of difficulties for people of this community because both crop and livestock production rely on rainfall. If not rainfall, other misfortunes like pests and diseases affect farming activities which again lead to slowing business development in other sectors (Revision world, 2017). This is in line with the fact that natural resource based livelihoods are prone to more shocks compared to non-natural resource based livelihoods (Marshall, et al., 2010). For this reason, this has contributed to low farmer resilience to shocks since there is little diversification of income generating activities which are non-agrarian (Sarah, A.L., 2015). When female farmers' diversity of economic activities is compared to that of males, it comes out that females have diversified less which makes them more vulnerable than men to drought and other shocks that may occur. This theory is in same line with Perez, et al., (2015), who expressed concern that the resilience of females in community is lower than that of men due to limited economic activities in which they are involved.

The level of livelihood diversification exhibited in this community is related to the resources that farmers have access to, of which land is the most accessible resource supported by animal draft power. Because of availability of land resource in Wankhala, increase in population has been experienced due to increase in the number of immigrants in search of farming land). this has caused pressure on vegetation due to increased deforestation following the opening of new agricultural fields needed to feed the increased population (Elsa, M.O., Gregory, P.A., and Eric, F.L., (2017). Just as respondents in the interviews stated, deforestation due to increased agricultural fields opened up, has contributed to the open spaces in the area and eventually to drought. Open spaces have contributed to drought because they favour drifting away of rain bringing clouds, an act that reduces the amount of rain received in this area. This has negatively affected agricultural activities by reducing the quantity of crops harvested due to low rainfall that can support good crop yields. However, immigrants into this community are contributing towards enhancement of agricultural productivity through increased availability of draft power. One group of people noted for this contribution are the Chewas who are reported to own more cattle than the indigenous people. Since there exist good social network in the community among indigenous and immigrants, this has helped others who do not own draft animals to access draft power when need arises. This is in line with what Judit, J., Bruno, W. and Brent, S., (2014) observed in their work regarding the importance of social capital. The importance of social network is even more amplified when it comes to women compared to men. This is demonstrated in women coming to have an increased access to draft power through their social networks which are especially strengthened by the existence of women groups and cooperatives in which they participate more than men. Compared to women, men have been seen to be working in a solitary way, more especially when it comes to income generating ventures unlike women who complement each other's efforts. This helps them withstand pressures of drought in terms of improving food availability and accessibility just as noted by the International Cooperative Alliance, (2015). The high social network experienced among women has attracted men into women groups in the name of being trustees in such groups. Therefore it can be said that women have great influence in shaping the agricultural activities of this area even though they may not realise it.

5.2. Role of extension service in rural livelihoods

Agricultural extension service provision is key in transforming livelihoods of people in rural communities. It acts as a channel for dissemination of new technologies that are tailored towards evolving way of life for people in such areas especially farmers. This is because various programs for government (e.g. CA training, subsidized input distribution) are implemented in rural communities. In this community, it is observed that social network is one cardinal way in which farmers have acquired knowledge (indigenous knowledge passed on from one generation to the next) they are using in their day to day farming. This suggests that they are not adequately in touch with current technologies that can improve their agriculture productivity. This issue is associated with limited extension service being provided by the available service providers (MoA CEO and private companies). The limited support from MoA is said to be caused by inadequate capacity by the officer to move and reach out to farmers as required. This is because of increase in the number of farmers to be serviced by one CEO coupled with poor funding from government towards extension services. As for NGOs and private companies, they only have limited areas of interest in terms of agricultural activities (IAPRI, 2016). This has seen farmers from Wankhala camp to be lagging behind in terms of technology adoption. One technology is that of CA despite it being promoted at some point by the MoA, it still records low adoption. Despite this being the case social network has played a role in accessing extension services and those in farmer groups are known to benefit. This is because the few people serviced by extension service providers are disseminating such knowledge acquired through their network to others who are not reached. This has seen women benefiting from such networks more compared to men e.g. women get fertilizer support through cooperatives as well as women clubs as opposed to men who can only access the commodity through cooperatives. This is another factor that has seen men getting attracted to join women clubs.

Therefore, extension service delivery has been made easy through groups which have seen women taking part in other agricultural programs which were previously dominated by males where cash crops are promoted (cotton and soybeans). This is the case for out grower schemes for cotton and soybeans. As noted by Woyeni, J.P., (2016), out grower scheme is meant to boost cotton and soybeans production as well as provide links for farmers to markets with favourable prices for both farmers and buyers. However, this program seems not to be meeting farmers interests. For instance, inputs for soybeans were supplied to farmers by some scheme facilitators but it reported that they failed to purchase the produce despite farmers investing time and other supporting resources (e.g. labour) into the produce. In a way this keeps farmers from diversifying into other crops especially those that are rarely grown in the area. Therefore, as stated in a working paper by IAPRI, (2016), if extension service delivery is adequately supported by government and other stakeholders, there is a high possibility that farmers will have better access to latest technologies. This will help them diversify their activities and improve household incomes and eventually it will see them have improved capacity to survive various shocks they are faced with especially drought.

5.3. Infrastructure in supporting rural livelihoods

Within the community, the major infrastructure supporting livelihoods are water facilities which are scattered distantly in the camp though not enough to cater for the needs of the people. With increased pressure on land due to increase in population and other ethnic groups coming to this area who have more cattle, water is becoming a scarce resource. As earlier stated, rivers dry up in this community during the dry season and this contributes to water stress among farmers. The boreholes dotted in around the camp help cushion the effects of unavailability of water in such seasons. These are complimented by one dam which supplies water even for crop irrigation (as shown in figure 5.3-1 below). Due to this problem, farmers tend to be productive only in rainy season, a factor that limits their production and income generation. This is more pronounced among women who do not have access to irrigation scheme at the dam for them do gardening since it is taken up by men. On the other hand, women are reportedly spending more time on fetching water for their domestic needs (Parmeshwar, et al., 2015) since the nearby water points are dry. The effect of water availability on

agricultural production also has led to limited livestock production and productivity. However, the place was observed to have locations good enough for the construction of dams or weirs which can be done at small scale. This can be an alternative to boosting water availability in the area as well as improving underground water reserves through enhanced water seepage into the soil than allowing it all to run off to the other low land areas. This approach will be effective in helping shallow wells retain water even in dry season (Kifle, W., 2015). With enhanced extension service provision, farmers can be capacity built in construction of such facilities which can help improve water availability through water harvesting.

Figure 5.3-1 Dam for water supporting vegetable production and cattle



Source: Research data (2017)

On the other hand, poor road network and long distance to market are seen to work against farmers in terms of choosing which crops to grow as a way of diversifying their crop produce or other income generating ventures. This contributes to them falling for the proposals out grower scheme contracts despite these not favouring them in most cases. This can be demonstrated in times when cotton prices fall below the breakeven prices. But still in following years, farmers continue with the same commodity for lack of better alternatives. However, for 2016/2017 agricultural season, cotton was seen to have a good price which saw farmers rip better than in other years. Looking at last season (2015/16), soybeans was the crop with a good price (K3.5/kg) compared to cotton which was selling at K2.4/Kg (ZNFU, 2015). As from this year, the price for cotton is over K4/kg as opposed to that of soybeans which is as low as K1.5/kg. Therefore, fluctuation in prices of agricultural produce is also leading to low adoption of other crops that can assist farmers in this community in generating enough income to enable them to diversify their livelihoods for improved resilience to drought.

Despite Wankhala community having poor roads, its location is promising better opportunity. The close proximity to Sinda, a newly created district, has potential in boosting the economic activities of this community. Already some farmers in Wankhala are tapping into the opportunities by diversifying into other businesses because they can easily get other marketable goods from Sinda to this community. It is true to say proximity to district administrative centres helps improve economic activities of a certain place which is the case even in Wankhala. This in a way brings opportunities that promote diversification of income generating avenues. The way some people are taking up this opportunity to diversify their incomes by engaging in other businesses like selling fuel, is upheld. This

is because they are doing such businesses, they are also improving the lives of others within this area by bringing the goods needed to support livelihoods closer to people.

Based on above matters raised, it can be deduced that the reason that has kept farmers from diversifying their agricultural production is unreliable markets available in the community which farmers consider to be exploitative. Also the fluctuation in prices of agricultural produce is contributing to this. The interest to produce is there but availability of markets is what keeps them away from producing. On the other hand, lack of information flow regarding markets for agricultural produce is hampering growing of crops that can transform the community.

5.4. Effect of drought on livelihoods of farmers

As narrated in chapter four, drought for this community is viewed in different dimensions which are distribution, frequency, quantity and availability (time) of rain in relation to when it is needed. This falls in line with the definitions by NDMC, (2008) and DMMU, (2015) which look at drought as “a prolonged period of rainfall leading to widespread injury to crops, and subsequently, loss of yield” and “a period of unusually dry weather that continues long enough to yield a hydrologic disproportion” respectively. The definition of drought by farmers manifests in many different ways which include reduced water availability, reduced crop yields as well as increased incidences of pests and diseases. The effects experienced in this community are no different from what Stephen, M., (2009) describes to be the effect of drought in communities. Stephen, M, 2009, further noted that drought has more effects on tangible assets than intangible ones. This is the same manifestation observed in this research in which it has been realised that drought has little influence on social capital for the community. However, this community as well indicates that to some extent drought affects relationships of people those who have and those who do not have food. The have not are not accommodated by the ones who have. This is in a way for the two groups not to share hunger. On the other hand drought is seen to strengthen the relationships for the food insecure households as a strategy for them together to find means of survival in amidst of hunger. Therefore, drought can be considered to be a factor enabling people in the community to know each other better. Community members get to know those who can of assistance in times of difficulties and those who only get along with others if all things are going well for all. In addition, drought is seen to affect social relations through increased clashes among those who keep livestock, cattle and goats. Clashes result from the reduced availability of pasture for the animals. Because of this, animals cross farm boundaries into other non-owners field where they create competition for the available pasture for neighbours’ animals which creates disputes among neighbours within the communities. This is fueled by limited land allocated to each household and yet they all practice free range livestock production. Therefore, in order to maintain the social network that is enjoyed in this community there is need for coming up with other methods of keeping livestock which will not disrupt the relationships enjoyed by farmers. These are some of the dimensions in which drought tend to influence social capital.

Drought also has influence on financial capital for those households in the community that it affects. Though it does so indirectly, it has long term effects because it depletes the financial muscle for its victims. To start with, in times of drought affected people sell their animals in order to get food. If not animals, they rely on savings accrued over a period of time even if such savings were meant for other projects. By so doing drought disrupts reinvestment opportunities as the affected individuals are now into consumption and less saving. Other than this, other non-agricultural businesses in the community slow down because there is no cash available for farmers to spend. Therefore, it can be said that drought promotes more leakages in financial assets than investment since it promotes consumption. In other ways, drought motivates victims to get credit for them to survive hunger, and debts are also part of the leakages in the financial capital of households. This agrees with a study conducted by Parmeshwar, et al., (2015) in India on the effects of drought among its victims.

5.5. Effect of drought on food security

In Wankhala community, drought is felt by farmers through reduced crop yield of which more males expressed concern on this parameter. Reduction in yield simply entails reduced food availability and eventually, reduced sales from crop harvest. This negatively affects access to other foods that are not available at the affected households. Therefore reducing yield in crops has a ripple effect on both availability and accessibility dimensions of food security. These translate also into low diversity of food crops that a household can access. The low diversity of food available translates into reduced utilisation of food at household level. Food diversity is also caused by the limitation in types of crops that can be grown in the areas affected by drought. To this effect women are more concerned about diversity of food than men are. These results are affirmed by Shobha, H., Shinya, F and Hitoshi, S., (2017) in their study conducted in Nepal on household perceptions about the impacts of climate change on food security in the mountainous region of Nepal. Drought is seen to reduce water availability, a factor contributing to poor sanitation in the community. Water availability is also known to reduce livestock production especially pigs. This contributes to reduced diversification of livestock enterprises explored by farmers. The result of this effect is that it reduces availability of animal meat and products. This contributes to reduced food diversity and eventually impacting negatively on food utilisation one of the pillars of food security.

In conclusion it can be said drought has negative effects on all four pillars of food security and not just availability and accessibility but also utilisation and stability of food systems in the community. It can further be said that women are more involved in fulfilling household food security since they are concerned about food diversity than men.

5.6. Farmers' response to drought

Various activities have been observed to be practiced by both males and females in Wankhala in response to drought and the most used strategies are selling of livestock and piece works. However, the two genders exhibit differences in their choices of strategies. Women are seen to be choosing strategies which show that they are more interested in using their own resources than depending on other people for free food assistance. This is seen in them using a strategy of piece works and selling some of their livestock. Just as earlier indicated in chapter 4.4.3., females can sacrifice their time to go and work for food as compared to men who are seen to be more reliant on asking for help from others or getting credit, even though piece works are taking up females time to produce their own food. In addition, more females are willing to sell their livestock in order to cover up for food needs compared to men who seem to be hesitant in selling animals. For this reason females expressed more interest in small livestock (goats, pigs, sheep and chicken) that can be easily sold out compared to cattle. This shows that women are willing to give up on some other wealth accumulated in order to better their food security than men. Also to some extent women as compared to men, are concerned more about their dignity which is preserved through producing or earning food by working. Women use whatever resource at their disposals easily than it is for men. Men look at owning certain assets like cattle as a sign of wealth which gives them more ability to exercise authority in the affairs of the community.

Farmers also engage in getting credit to be used especially for buying food. This is facilitated by women groups that practice saving as a group and assist members who are in need. This has been seen to help build financial stability among members of the clubs, an element admired by other non-members who cannot access these funds easily. This has been seen to help improve food access by members and contributing to resilience in food security to effects of shocks. In cases where credit cannot be accessed, some members of the community get to feed low-quality foods like maize bran and wild beans, despite the two not being very palatable. As a long term response to drought, farmers change their agricultural practices from conventional farming to conservation agriculture (CA). This has seen adopters improve their crop yield leading to improved food availability. This also has seen these

farmers improve their access to other foods not produced locally e.g. soy-pieces. This is as a result of increased income realised from increased crop sale following their increased yields.

The above strategies are implored in response to shortage of food, an issue attributed to many factors including selling too much of the harvest by farmers. The frequency of running short of food before the next harvest can be used to see how resilient these households are to drought. Basing on the data from this research, it can be postulated that in Wankhala community, more females are capable of having food than males as opposed most literature that consider males to be more resilient in food security compared to females. This can be associated with females access to productive resources including land and draft animals which enhance productivity in agriculture. This is as opposed to FAO, (2014), that indicated that females lack access to productive resources which makes them more vulnerable to food prices. Therefore, it can be said that giving women enough resources at the right time, will contribute to transforming their lives and the lives of those around them. This is said so because women are seen attract men into productive groups as it was earlier reported. By so doing, food availability and accessibility in the community will be improved.

5.7. Organisational intervention in building resilience in food security

It is a fact that government and other developmental organisations play key roles in building rural peoples capacity in responding to shocks including drought. This has been seen through social programs including cash transfer which is known to improve the livelihood choices that are aimed at increasing food availability and accessibility. This is the case as presented by Eleanor, F., et al., (2017) in their study on the beneficiary perspective of cash transfer in Sub-Sahara Africa. It was established that consistent delivery of cash transfer to the intended helps them engage in other economic ventures which have added on their capacities to diversify their livelihood strategies. As seen in this community, government is taking an active role through the social welfare department to assist the most vulnerable people as identified in the community. For this research, participants in the focus group discussions affirmed cash transfer assist in reducing pressure on the few available resources at households for beneficiaries especially for the aged (65 years+ (Social protection.org, (2017)). This approach is an empowering approach in terms of building capacity for people to address their economic challenges. In addition, government through the DMMU provides food relief which helps to cushion food shortages in the affected community even though it only reaches to few individuals in the community as reported by people. Beneficiaries of relief food are households (male or female) that are seen to be worse off than others. In a way, reaching few people motivates the rest to work extra hard for them to secure food. If food relief is distributed repeatedly in large amounts, it may lead to people being reluctant to work because they would be assured of government's assistance should they run out of food.

Government through the ministry of agriculture is taking an active role in training farmers in practicing CA for improved crop performance in times of drought. However, there seem to be low adoption rates for the technology owing to the fact that the practice is laborious as expressed by farmers in group discussions. Since the technology is proven to improve crop production, exploring new ways to make it less laborious by both farmers and extension agents, are encouraged in order to increase its adoption rates.

Basing on the programs that government runs to build resilience, there are no deliberate diversified approaches that are addressing the challenge of water availability. Therefore, this area (water management) has to be incorporated into the programs by the government as well as private sector that are building resilience in food security especially to climate change related shocks in Wankhala agricultural camp.

6.0. CONCLUSION AND RECOMMENDATIONS

6.1. Response to drought in the use of resources

What is the response to drought in the use of assets by small-scale farmers of Wankhala agriculture camp with a view to achieving food security (availability and accessibility)?

In Wankhala agricultural camp, various strategies in the use of assets are practiced by farmers, both males and females, in response to drought. The most used strategies are selling of livestock and piece works. The livestock sold include cattle, pigs, goats, sheep and chickens. As for piece work, they are either on-farm and off-farm works whose payment is either money or food (maize, mealie meal). Other strategies used include getting credit, reduction in the amount of crops sold (harvested crops), help from others (asking for food assistance), providing ploughing services during land preparation for those who do not have draft animals/implements and eating maize bran if things go to the worst. In addition, farmers diversify their income sources, though the level of income diversification is low with more men practicing this strategy compared to women. Diversification of income sources helps to achieve both food availability and accessibility because it improves the level of income that can be used to buy other food. The stated strategies are meant to improve their food accessibility since they work towards generating money that is later on used to buy the food they need. As regard to food availability farmers achieve this by changing agricultural practices to the ones that are resistant to drought. The practices that are used include CA as well as planting early maturing crop varieties. In addition, food availability is enhanced by farmers keeping more food harvested and sell less as compared to the years when they never use to experience drought.

Even though the above-stated strategies are implored by both males and females, the two genders exhibit differences in their choices of these strategies. Women are seen to be choosing strategies which show that they are more interested in using their own resources than depending on other people for free food assistance. This is expressed by them doing piece works and selling some of their livestock. as explained under chapter 4.4.3., females can sacrifice their time to go and work harder for food as compared to men who are seen to be reliant on asking for help from others or getting credit, even though piece works are taking up females time to produce their own food. Additionally, more females are willing to sell their livestock and use the income to address their food needs as compared to men who seem to be hesitant in selling animals. For this reason females expressed more interest in keeping small livestock (goats, pigs, sheep and chicken) for the reason that these can be easily sold compared to cattle.

In conclusion, it can be said that farmers in Wankhala rely on rainfall as the key resource though most of them take it for granted and do not identify it as a resource supporting their livelihoods. Land is the asset that people in this community consider to be the driving resource for their livelihood activities. This is supported by animal draft power and social networks in the operations. However, the accessibility or exploitation of these resources is not the same for men and women. Based on the information gathered in this research, it is true to say male farmers have more access to physical assets like land compared to females. This is realised when their access to land, irrigation facilities and draft power are looked at even though in this research, more women than men are reported to be accessing draft power. As for women, they have stronger social networks which enable them access even other important resources including draft power and finances (credit) that support them in their livelihood activities. This gives females the capability to maneuver and do more productive economic activities even off rainy-season. This is one factor which enhances women's capacity to have food for extended periods (enhanced food availability) in a year. In addition, both males and females are seen to have low human capital in both livestock and crop farming in relation to latest agricultural technologies. This is also the case for entrepreneurial skills. This is reflected in the means that they acquired knowledge they are using in their farming and business activities. They all rely much on indigenous knowledge and less on latest the transferable knowledge that has evolved. This can be used to

conclude that the low infiltration of information from other regions is among factors making these people be vulnerable to shocks because sharing knowledge is vital to solving problems but that is low in this community.

From the above raised issues, it can be said that since social network has been seen to work in favour of women farmers, it is recommended that more social networks in the community be strengthened (especially among men) by the government through the Ministry of Agriculture and the Ministry of Community Development. These two ministries can see this achieved since they already have extension officers in the field where such networks are needed. This can be done through the existing cooperatives, women groups and youth groups. It is observed that men are seen to work more in a solitary way, a factor that contributes to reducing their capacity to effectively respond to shocks. The social networks have been seen to help build financial savings among women and so if used by men, it is likely also that this will improve the financial position for men through savings. The enhancement of social networks can be achieved by improving extension service delivery by both governmental and non-governmental extension agents. This can be facilitated via collaboration among officers involved in delivering extension services i.e. agricultural camp extension officers and community development officers (government officers) collaborating with other private companies and NGOs e.g. COMACO, ZNFU, cotton companies and CFU. This will see more areas within agriculture sector be addressed especially livestock that has little attention where extension service delivery is concerned. This is said so because private companies have just limited areas of interest but still they do use the services of CEO in some instances. Therefore, if the two can deliver their programs together, even the areas not covered by private companies and NGOs will be addressed. This is in a quest to overcome the current challenge of limited support towards extension service by the government. By so doing, this community will get opportunities and abilities to diversify their enterprises for both improving food availability and income generation for accessing other foods that are not locally produced as well as other household needs.

In addition, it is recommended that government through research and extension service sections to explore means of making CA practice less laborious in order to increase its adoption rates by farmers. This is in line with CA being effective in improving food availability through increased crop yields but it is reported to be laborious by farmers, thereby making it attract low adoption rate.

6.2. Strategies for addressing effects of drought

Concerning strategies used to address effects of drought, it can be concluded that women approach the problem collectively compared to men. This can be associated with the reason why they are reported to have a better average food security compared to men which is expressed by them accessing opportunities to piece works and this has made them use this strategy more than men. Furthermore, farmers sell their livestock and generate cash which they channel towards buying food and solving other problems faced in their households. As earlier indicated, animals are kept as a show of wealth for some people, a factor which makes most of the men be reluctant to sell livestock even when in need. However, it is the opposite for females who are known to implore this strategy more and this has seen them be more food secured than men. In other times, getting credit from other members of the community or from groups (for those who belong to groups (e.g. cooperatives, money saving groups) helps counteract the effects of drought by enabling borrowers to buy food in times of need. Access to credit is much easier for members of groups and this highlights on the importance of belonging to groups. In times when the affected individuals cannot access credit, they resort to eating maize bran. In addition, farmers resort to changing their agricultural practices though this is not helpful in the season when they are faced with drought. It is a strategy to improve their food security resilience in the years to come. The change in agriculture practice is that of adopting CA, a farming method which has seen adopters improve their food security.

Based on the above strategies that farmers implore it can be said that both male and female farmers have five strategies they use in overcoming effects of drought. Four of the five are short-term and only one is long-term. Therefore, it is recommended that more long-term strategies are developed in order to sustainably address the problem at hand. These strategies include diversifying livelihoods beyond crop production. In addition, since this community is conducive for livestock production, it is recommended that extension service in livestock (especially small livestock) production be amplified. This is to do with transferring technologies that will see farmers keep more livestock on their lands than they are currently keeping. This includes pasture harvesting and preservation as hay to be to feed animals in dry season. This will promote livestock production even among those with small pieces of land. Furthermore, this will help prevent disputes that arise from livestock trespassing in neighbouring fields. By so doing, this will enhance farmers capacities to keep more animals that can be sold in times of drought and help to buy food. Also, encouraging farmers who are not participating in money saving groups to join will improve financial savings. This will help build strong financial reserves that can be mobilised when farmers are faced with drought. This will also create capacities to diversify into other businesses instead of just relying on agriculture-based livelihood. Diversification in livelihoods will improve resilience to drought because not all livelihoods can be negatively affected by drought at the same time.

6.3. Farmers experience of drought in relation to food security

In conclusion it can be said drought has negative effects on all four pillars of food security and not just availability and accessibility but also utilisation and stability of food systems in the community. The four pillars are affected through reduced crop yield and diversification as well as low agricultural enterprise diversification. Diversification of agricultural crops can be associated with unstable crop prices and also lack of assured commitment to purchase crops by promoting agencies under the out-grower scheme. Drought has also reduced the availability and quality of water that supports the livelihoods of people which has seen increased incidences of diarrhoea among the affected.

In order to address this problem, food security can be better achieved by addressing the pillars availability and accessibility. In Wankhala this can be achieved by adoption of crops including cassava and sorghum which are resistant to drought more than the current crop, maize, which is widely grown. However, it is reported that free range keeping of livestock prevents cassava from being grown. In this case, there is need to develop bi-laws that can help control the movement of livestock in the community. This can be done through traditional leaders and political leaders as well as other government officers especially those from MoA and ministry of fisheries and livestock coming together and sensitise the community about the idea. Knowing that drought is affecting everyone in this community, people will come on board and participate in finding solutions to their own problems. Improving care for livestock in a bid to promote diversification will also see the livestock sector start developing by increased number of animals. This will also improve income generation base from livestock for those farmers who own such livestock. the idea will eventually contribute towards farmers capacity to access food even when they are in food crisis due to shocks like drought.

In a bid to improve food security, there is need to improve water availability in the community. This can be approached by the construction of dams, which requires government involved at maximum. For the community to achieve this with little assistance from the government, farmers can be trained in the construction of weirs along the streams which have now become seasonal in holding water. Wankhala has several potential sites where such weirs can be constructed but farmers lack capacities in terms of knowledge of how to do so and financial muscles to construct the structures. Therefore, it is recommended that the MoA extension service provision actively involve experts in water management in training farmers in this aspect (water harvesting). This can be strengthened if the DMMU comes on board to support such programs focusing on building capacity in water harvesting. Once this is done, it will help retain more water along the streams that dry up in seasons when there are no rains (especially from July to November). This will create opportunities for farmers to venture

into crop production even off rainy-season. This move will see improved income among participating households. This will also contribute to improving the reserves of underground water which feeds shallow wells that support HHs' domestic water needs in this community. Eventually water availability and sanitation will improve in Wankhala agriculture camp and this will contribute towards achieving food security for farmers.

Government is also called upon to improve the efficiency of the program of social cash transfer for those who are on it. This is a known fact that social cash transfer boosts peoples' ability to address shocks since it strengthens financial capacity in responding to food shortage in times of drought and other shocks. In addition, women have been seen to have strong empathy for each other even for men. Therefore, strengthening their capacity to address drought simply means strengthening the communities capacity. This is because women compared to men are known to socially work together in addressing a common problem. In this view, introducing programs which support women asset acquisition like the livestock pass-own initiatives, will help build the number of animals owned by women in this community. To facilitate for such programs, both government through the ministry of agriculture and ministry of community development are encouraged to take an active role in implementing such programs. In helping improvement of livestock asset base, goats, sheep, pigs and cattle are seen to be the livestock with more preference though small ruminants (goats and sheep) are more favourable among women.

The DMMU and other humanitarian organisations are further encouraged to get involved in building capacity for people to respond to different shocks that they might be faced with especially drought which is a known shock in this community. This is as opposed to coming to help people when their capacity is totally lost which reduces the chances of such affected individual from recovering from the effects of drought. This is the case with distributing of relief food which is almost becoming like a program for every year in this community. Instead of offering relief food, the affected families can be helped to produce more food (crops and livestock) which can see them rebuild their food store available to nourish their families.

In supporting crop diversification, the marketing companies involved in agriculture are encouraged to take a move in support for contract signing with farmers which gives assurance market for crops being promoted. In doing this the government together with ZNFU is also called upon to negotiate on behalf of farmers as well as build farmers' capacity to put up good negotiations skills in the out grower scheme programs. Other than this, farmers are encouraged to practice bulking of their low produced crops in order to attract buyers with better prices for their commodities instead of selling individually which reduces their capacity to negotiate for better prices. Furthermore, building human capital for farmers through training in agribusiness skills will increase their profit margins from their crop production. This is through practice of market research before planting and before selling their produce. This can be even more improved if value addition is implored towards their crop produce e.g. packaging of groundnut which can improve the quality of the farmers produce that is reaching customers.

In summary, it can be said that both men and women are involved in the same livelihood strategies even though they do not exploit their assets in the same way. Therefore, understanding of the gender differences in the way farmers respond to drought could help in developing programs and policies that are gender considerate. This could as well help improve sustainability and more inclusive livelihood coping strategies in response to drought and many other shocks affecting rural communities.

References

Awal, A.A., 2015. Vulnerability to Disaster: Pressure and Release Model for Climate Change Hazards in Bangladesh. Bangladesh Agricultural University, Mymensingh, Bangladesh. Available at: <<http://www.openscienceonline.com/journal/archive2?journalId=714&paperId=1663>> [Accessed: 30 August 2017].

Chabala, L.M., et. al., 2015. Assessment of Maize Yield Variations Due to Climatic Variables of Rainfall and Temperature. School of Agricultural Sciences, the University of Zambia, Zambia. Available at: <www.ccsenet.org/journal/index.php/jas/article/download/51257/28447>. [Accessed: 6 May 2017].

IDS, 2017. Sustainable Rural Livelihoods. Practical concepts for the 21st century, IDS discussion paper No. 296 Brighton, Institute of development studies. Available at: <<http://www.ids.ac.uk/publication/sustainable-rural-livelihoods-practical-concepts-for-the-21st-century>> [Accessed: 29 August, 2017].

Chikopela, J., 2014. Livelihood strategies of small-scale farmers in Nankanga camp of Kafue district, Zambia
<http://dspace.unza.zm:8080/xmlui/bitstream/handle/123456789/3703/Chikopela%20Thesis.pdf?sequence=1> [Accessed: 17 May 2017].

DMMU, 2015. National Disaster Management Policy, office of the vice-president, the government of the Republic of Zambia. Available: <http://www.preventionweb.net/files/47475_zambiadmpolicy2015.pdf> [Accessed: 25 May 2017]

DAP, 2017. Techniques used in disaster risk assessment, 2017. Available at: <<http://www.disasterassessment.org/section.asp?id=20>> [Accessed: 1 August 2017].

Disaster pressure and release model Available at: <<http://www.geo.mtu.edu/rs4hazards/links/Social-KateG/Attachments%20Used/AtRiskReview.pdf.pdf>> [Accessed: 14 May 2017].

Eleanor, F., et al., 2017. The Livelihood Impacts of Cash Transfers in Sub-Saharan Africa: Beneficiary Perspectives from Six Countries. [e-journal] volume 99, Pages 299-319. Available through: <<https://doi.org/10.1016/j.worlddev.2017.05.020>> [Accessed: 4 August 2017].

Elsa, M.O., Gregory, P.A., and Eric, F.L., 2017. Deforestation risk due to commodity crop expansion in sub-Saharan Africa., Environmental Research Letters, Volume 12, Number 4. <https://doi.org/10.1088/1748-9326/aa6509>.

EPA, 2016. Causes of climate change, climate change science. Available at: <https://19january2017snapshot.epa.gov/climate-change-science/causes-climate-change_.html> [Accessed: 20 August 2017].

Eroarome, M.A., 2009. Country Pasture/Forage Resource Profiles ZAMBIA, FAO. Available at: <<http://www.fao.org/ag/agp/agpc/doc/counprof/PDF%20files/Zambia.pdf>> [accessed 26 August 2017].

FAO, 2012. Management response to evaluation report. Expansion of the Farmer Input Support Response Initiative (FISRI) to Rising Prices of Agricultural Commodities in Zambia – GCP/ZAM/071/EC. Available at: <http://www.fao.org/fileadmin/user_upload/oed/docs/GCPZAM071EC_2012_MR.pdf> [Accessed: 17 April 2017].

FAO, 2017. FAO in emergencies. Helping to build a world without hunger. Available at: <<http://www.fao.org/emergencies/how-we-work/resilience/en/>> [Accessed: 24 May 2017].

FEWS Net, 2014. Zambia livelihood zoning. Available at:<<http://www.fews.net/southern-africa/zambia/livelihood-zone-map/july-2014>>[Accessed: 17 May 2017].

Frank, E., 2007. Household strategies and rural diversification. The journal of development studies. p.1-87. Available at:<<http://www.tandfonline.com/doi/abs/10.1080/00220389808422553?src=recsys>> [Accessed: 29 August 2017].

Daniel, G.J., 2013. Rising food costs and global food security. Key issues and relevance for India. Indian journal of medical research, India. Available at: <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3818609/>> [Accessed: 8 September 2017].

Haggblade, S., Hazell, P. B. R., & Reardon, T., 2007. Transforming the rural nonfarm economy. Opportunities and threats in the developing world (490 p). Washington, DC: International Food Policy Research Institute. Available at:<<http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/126215>>[Accessed:31 August 2017].

IAPRI, 2016. Factors influencing smallholder crop diversification in Zambia and the implications for policy. Working Paper 112 August, 2016, Lusaka, Zambia.

International Cooperative Alliance, 2015. Six benefits of cooperatives in development. Available at:<<https://coopseurope.coop/share-benefits-six-benefits-cooperatives-development>> [Accessed: 4 September, 2017].

Investopedia, 2017. What is the difference between tangible and intangible assets? Available at :<[What is the difference between tangible and intangible assets? | Investopedia http://www.investopedia.com/ask/answers/012815/what-difference-between-tangible-and-intangible-assets.asp#ixzz4rNc7gmts](http://www.investopedia.com/ask/answers/012815/what-difference-between-tangible-and-intangible-assets.asp#ixzz4rNc7gmts)> [Accessed:25 August 2017].

Judit, J., Bruno, W. and Brent, S., 2014. Role of Social Networks in Diversification of Income Sources in Rural India. University of Alberta 2014. Available at:<<http://ageconsearch.umn.edu/bitstream/170357/2/Role%20of%20Social%20Networks%20in%20Income%20Diversification%20-%20AAEA.pdf>> [Accessed: 2 August 2017]

Kifle, W., 2015. Water Harvesting and Climate Change Adaptation; The experience of Tigray region in Ethiopia., 20 April 2015. Addis Ababa, Ethiopia. Mekelle University. Available at:<<http://www.rainfoundation.org/wp-content/uploads/2015/07/Plenary-1-Kifle-Woldearegay.compressed.pdf>> [Accessed: 4 September, 2017].

Kebede, M., 2014. Livelihood diversification strategies among men and women rural households. Evidence from two watersheds of Northern Ethiopia. Mekelle University, Ethiopia. Available at:<<http://www.academeresearchjournals.org/download.php?id=630639906973216065.pdf&type=application/pdf&op=1>> [Accessed: 1 September 2017]

Kanmani, V., 2011. The vulnerability of Zambian communities living along the Zambezi river basin to floods. MSc. University of Colorado. Available at:<http://scholar.colorado.edu/cgi/viewcontent.cgi?article=1003&context=envs_gradetds> [Accessed: 31 August 2017].

Kuntashula, E., et. al., 2014. Available at: <www.ccsenet.org/journal/index.php/jsd/article/download/39121/21748>. [Accessed: 6 May 2017].

Lasse, K., 2001. The Sustainable Livelihood Approach to Poverty Reduction. Swedish International Development Cooperation Agency. Division for Policy and Socio-Economic Analysis. Available at:

<http://www.sida.se/contentassets/bd474c210163447c9a7963d77c64148a/the-sustainable-livelihood-approach-to-poverty-reduction_2656.pdf> [Accessed: 29 May 2017].

Lusaka times, 2016. Available at:<<https://www.lusakatimes.com/2016/11/06/government-starts-relief-food-distribution-in-eastern-province/>> [Accessed:19 June 2017].

<http://www.preventionweb.net/english/professional/>

Marshall, et al., 2010. A framework for social adaptation to climate change. Sustaining tropical coastal communities and industries, IUCN, Gland, Switzerland. Available at:<<https://portals.iucn.org/library/efiles/documents/2010-022.pdf>> [Accessed: 2 August 2017].

MoA, 2016. Petauke district, annual report. Ministry of Agriculture, Petauke, Zambia.

PEP-CBMS CB, 2011. Monitoring Household Coping Strategies during Complex Crises. Somerset Millennium Hotel March 21, 2011. Available at:<http://www.pep-net.org/sites/pep-net.org/files/typo3doc/pdf/CBMS_country_proj_profiles/Philippines/poverty_maps/Coping/Session_2_Shocks_Coping_To_Monitor.pdf> [Accessed: 25 August 2017].

Olivier, S., 2017. Knowledge solutions. Tools, methods and approaches to drive organisational performance. Asian Development Bank, Mandaluyong, Philippines. Available at:<https://link.springer.com/chapter/10.1007/978-981-10-0983-9_5#Sec6> [Accessed: 31 August 2017]

Parmeshwar, et al., 2015. How did the 2012 drought affect rural livelihoods in vulnerable areas? Empirical evidence from India. International Journal of Disaster Risk Reduction, Volume 13, Pages 454-469. <http://www.sciencedirect.com/science/article/pii/S2212420915300492>

Perez, et al., (2015). How resilient are farming households and communities to a changing climate in Africa? A gender-based perspective. Volume 34, Pages 95-107 Global Environmental Change. Available at:< <http://www.sciencedirect.com/science/article/pii/S0959378015000825#tbl0040>> [Accessed: 26 August 2017].

Revision world, 2017. Factors affecting farming. Available at:< <https://revisionworld.com/gcse-revision/geography/agriculture/factors-affecting-farming> > [Accessed: 25 August 2017].

Ram, S., Feroze, S.M., Lala I.P., 2013. Effects of drought on livelihoods and gender roles: a case study of Meghalaya, Central Agriculture University, India. Available at:<<http://journals.sagepub.com/doi/pdf/10.1177/0971521513495293> > [Accessed:1 September 2107].

Shobha, H., Shinya, F and Hitoshi, S., 2017. Household perceptions about the Impacts of climate change on food security in the mountainous region. Graduate School of Global Environmental Studies, Kyoto University, Nepal. Available at:< <file:///C:/Users/cash%20converters/Downloads/sustainability-09-00641-v2.pdf>> [Accessed: 4 August 2017].

Sarah, A.L., 2015. Rural livelihood diversification in Sub-Saharan Africa. A literature review, the journal of development studies. Available at:<<http://www.tandfonline.com/doi/full/10.1080/00220388.2015.1046445>> [Accessed 27 August 2017].

Stephen, M., 2009. Sustainable Livelihood Approach. A critical analysis of theory and practice. Department of Geography, University of Reading, UK. Available at:<<https://www.reading.ac.uk/web/files/geographyandenvironmentalscience/GP189.pdf>> [Accessed: 4 September 2017]

Social protection.org, 2017. Social cash transfer. Available at:<<http://socialprotection.org/programme/social-cash-transfer-programme>> [Accessed: 5 August 2017]

Sung, K.K. and James, S., 2014. Assets, asset-ness and graduation. Institute of development studies, *Graduation and social protection*. Kigali, Rwanda, 6-8 May, 2014. Available at:<<https://www.ids.ac.uk/files/dmfile/Graduationconferencepaper-KimandSumberg.pdf>>[Accessed: 28 August, 2017]

UNDP, 2014. Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience Human Development Report. Available at:<<http://www.arabstates.undp.org/content/dam/rbas/report/HDR-2014-English.pdf>> [Accessed:28 August 2017].

Von Braun, J. 2009. Food security risks must be comprehensively addressed. Annual report essay, International Food Policy Research Institute. Available at:<<http://www.ifpri.org/publication/food-security-risks-must-be-comprehensively-addressed>>[Accessed: 29 August 2017].

WFP, 1996. World food summit, Rome Italy.

Woyeni, J.P., 2016. Influence of sugar factories on improvement of cane farmers livelihood in Kenya. A case of Bungoma east sub county. University of Nairobi, Kenya. Available at:<http://erepository.uonbi.ac.ke/bitstream/handle/11295/101007/Wanyonyi_Influence%20Of%20Sugar%20Factories%20On%20Improvement%20Of%20Cane%20Farmers%20Livelihood%20In%20Kenya.%20A%20Case%20Of%20Bungoma%20East%20Sub%20County.pdf?sequence=1&isAllowed=y>[Accessed: 29 August 2017].

WHO, 2017. Gender, equity and human rights. Available at:< <http://www.who.int/gender-equity-rights/understanding/gender-definition/en/> > [Accessed: 1 August 2017]

Yadav, S.B., N.d. Basic Concepts of Food Security: Definition, Dimensions and Integrated Phase Classification. Food and environment. Available at:<<http://www.foodandenvironment.com/2013/01/basic-concept-of-food-security.html>> [Accessed: 8 September 2017].

Zambia daily mail, 2015. Msanzala constituency on the move. Available at:<<https://www.daily-mail.co.zm/msanzala-constituency-move/>> [Accessed: 5 May 2017].

Zambia Daily Mail limited, 2017. Genetically modified Bt maize alternative for combating armyworms February 20, 2017. Available at: <<https://www.daily-mail.co.zm/genetically-modified-bt-maize-alternative-for-combating-armyworms/>> [Accessed: 26 May 2017].

Zambia MeteorologicalDepartment, 2015. Rainfall pattern in Petauke district. Petauke meteorological department, Zambia.

ZNFU, 2015. Petauke Farmers Disappointed With Cotton Market Price, 9th June. Available at:<<http://www.znfu.org.zm/article/petauke-farmers-disappointed-cotton-market-price> > [Accessed: 3 September 2017].

Zambia price bulleting, 2017. http://www.fews.net/sites/default/files/documents/reports/Zambia_2017_03_PB_0.pdf [Accessed: 18 May 2017].

Appendices

Appendix 1 Reflection paper

Conducting this research did not only help me to fulfil the requirements for my master's degree program but it also offered me an opportunity to explore livelihoods of people in a community that I have long thought about in terms of transforming their capabilities to respond to challenges of drought. Being part of a district core team that presides over disaster related matters in the district, at no time did an initiative arise with a view to enquiring into solving the underlying problems of hunger in Wankhala and other areas in the same situation. But studying at Van Hall Larenstein University offered such a platform I can point at to be the initiation the process to transform the crisis in Wankhala agricultural camp, the research site. The findings and recommendations made for this study, will not just be useful for the researched community but also other places faced with similar shocks.

Myself as researcher being a tribal cousin to the ethnic group in Wankhala agricultural camp made my data collection process interesting because this community considered me like one of them. Sharing information regarding their day to day life was made easy because many members of the community looked at me as someone who could sympathies with them and help solve the problem. This made it possible for the interviewees to share even the information some looked at to be the secret regarding their utilisation of assets. However, my coming from the VHL University created attention among the community members. Some saw hope and relief in me because they felt they found someone who could help communicate their pains. To some, they saw in me someone they can share their problems with even if it means not solving such problems. While for others, they saw in me a link to financial donor. They were filled hope that eventually someday such a donor will reach out to them and solve their problems. On the other hand, others saw in me just a researcher. This is because they have given before a lot of information to many people regarding different issues researched even though no change is seen their community afterwards and I was painted to be just one of them. Through such different perceptions respondents had about me, it is possible that their responses were already biased towards what they thought of me. Some information could reflect the reality while other could be just to respond with no meaning to them.

Doing this research has helped me understand better the differences in rural households and how they make decisions regarding the use of resources. Knowing that the researched community has for some years now faced difficulties of drought, I was expectant of seeing a community that is in deep hunger. Surprisingly, I found a spectrum of households dynamics starting with very food secured to very food insecure households but all existing in one community. This helped me reflect on the participatory rural appraisal pillar number 1 which advises researchers to unlearn what they know in order to learn more about the subject. One outstanding characteristic I observed and experienced in the community that moves me until now is how thoughtful the researched community is towards visitors, the art of sharing is in them. More than 15 households I interviewed gave me at least a cup full of groundnuts, for me to taste, an expression of them welcoming me and sending me off with blessings despite some of them indicating their vulnerability to hunger. Sure no one is too poor not to give.

My research was not designed to see much of gender dimensions but after collecting data, I realized that gender had even a bigger influence in the subject I was exploring. I realised that women have bigger role in influencing the activities of a community more than what is known about Wankhala. Huge development can easily reach the rural communities through women due to their good social networking. This is opposing to the expression of men who seem to be more self-centred in their approach to rural life. If the networking shared among women is extended to men and be adopted, then rural communities will transform for the better fast. This is because men have access to most of the asset of production in rural areas where as women have the ability to transform such assets into developmental entities. Therefore, combining the two, a group of self-motivated community will arise.

Appendix 1: Individual interview topic list

Interview No.:

Gender (Male/Female):

Income sources for the households

1. What economic activities do you undertake to provide for your household needs? (*farm and non-farm*).
2. To support the mentioned activities, what resources do you have access to?
3. Of the mentioned activities, which ones do you consider to be the most important? Why? (*Ranking starting with the most important to the least*)
4. What motivates you to undertake the mentioned activities?
5. What are livelihood outcomes of the stated economic activities?

Human capital

6. How have you acquired the knowledge that supports you in your economic activities?
7. How has drought affected your household in executing the above mentioned economic activities? (e.g. health of HH members)

Social capital

8. Are there organisations/groups towards enhancing household economic activities in the community?
9. What types of groups are they? (*Governmental, non-governmental, community-based, any other*)
10. Which organisations/groups do you regard as important? Why?
11. To which of these groups do you belong?
12. What benefit do you or members get for being part of such organisations/groups?
13. How does drought affect your relationship with other members of the community?
14. In what ways are the organisations/groups found in your community participate in improving household nutrition and food security (availability and accessibility)?

Politics

15. What is the influence of politics in your economic activities?

How farmers experience drought

16. What does drought mean to you?
17. What do you think are the contributing factors to drought?
18. What has been the change in your experience of drought over the last 5 years?
 - a. In what ways has drought been affecting you and your household in the last 5 years?
19. What livelihood strategies do you take in response to effects of drought?
 - a. What is the influence of your livelihood strategies on your assets?
20. Among the assets you have access to, which ones are of importance in responding to effects of drought? And why?
 - a. Which assets do you think if owned or accessed would enable you to respond to effects of drought better than now?
21. How are government and other non-governmental organisations participating in enhancing your response to effects of drought?

Perception on how to sustainably respond to drought

22. What do you think is the way to address the problem of drought and its effects?
 - a. What is your responsibility in implementing the proposed interventions?

Relief food

23. To what extent are you satisfied with your food produce meeting your household needs before the next harvest? (scale of 1-5)
 - a. What is your experience in running out of food before the next harvest in the last 5 years?

- 24. What causes do you associate with shortages of food in such years?
- 25. Are there organisations that help provide food aid in such times? Do they satisfy your needs?
- 26. Have you in this household ever received food aid in the last 5 years?
 - a. How often have you received food aid in the last 5 years? -if yes to Q-28

Outcomes

- 27. What is the effect of your strategies on food availability and accessibility for your household?

