COMPARATIVE ANALYSIS OF HOUSEHOLD VULNERABILITY DERIVED THROUGH APPLYING WEIGHTS FROM LITERATURE AND CONSULTATION WITH COMMUNITIES OF PLACE

By

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DECLARATION

I, Sheila Kanhukamwe-Mlambo, hereby declare that this thesis for the Doctor of Philosophyin Rural Development (PHDRDV) Degree submitted to the Institute for Rural Development at the University of Venda has not been submitted previously for any degree at this or another university. It is original in design and in execution, and all reference material contained therein has been duly acknowledged.

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ABSTRACT

Considerably large numbers of people in many parts of developing countries are vulnerable to hazards such as floods, wildfires and droughts. Quite often, the people fail to withstand the effects of the hostile environments they are faced with. Vulnerability is multidimensional and must be reliably estimated because it helps develop appropriate strategies to counter the associated causes and effects,in particular at household level.Conventional aggregate analyses of household vulnerability rely on weight-based indices calculated using information derived from literature. Rarely are grassroots communities engaged to assign the weights. Various scholars argue that use of various targeting approaches results in inclusion of undeserving households in developmentprogrammes and also exclusion of those in dire need of assistance. Therefore, there is need to develop appropriate approaches that might address this challenge.

In this study conducted in Rushinga District of Zimbabwe,Maputseng in Lesotho, Mpolonjeni in Swaziland community members were engaged to assign weights to financial, human, natural, physical and social capitals as determinants of rural household vulnerability. The weights were compared to those obtained from literature and used in a household vulnerability index (HVI) that the Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN) developed. The effect of including weights obtained through engaging youth, women, men and community leaders in rural communities on HVI and classification of households was subsequently investigated. The modified 10 seed technique was used to assign weights to the indicators of vulnerability in focus group discussions.

A household survey was conducted to collect data on livelihoods to use to compute HVIs and 400 households were sampled. Qualitative data were processed using the modified Cresswell (2011) Thematic Content Analysis technique. With respect to quantitative data, descriptive statistics were computed using MS Access. Hypothesis testing for proportions (t-test) was used to test for significant differences among the weights. Chi-square and analysis of variance was undertaken using the Statistical Package for Social Sciences ver 21.0. Seasonal variations in household vulnerability in Rushinga District were determined. Using data from the Maphutseng (Lesotho), Mpolonjeni (Swaziland) and Rushinga (Zimbabwe), comparisons in the magnitudes of weights of capitals and household vulnerabilities were made to establish if there were any differences in perceptions among these communities of place. The effect of incorporating the community-assigned weights of capitals on the magnitude of HVIs was assessed.

Men, youth and women revealed that the communities in Rushinga District had limited but diverse livelihood strategies that sustained households during difficult times. Women and community leaders assigned most weight to human capital in determining the livelihoods to be 30.3 % and 30.6% respectively. Youth assigned greater weight to physical capital (32 %) while men regarded natural capital as important (30.6 %). This highlights the importance of engaging diverse interest groups in making decisions regarding targeting of relief support.

Significant differences in the HVI standard weights and those assigned by community members were observed ($P < 0.05$). However, there were no significant differences in results of indices between the use of the HVI derived through literature and the community determined weighting. Although there were no differences, community engagement led to the identification of capitals contributing to high vulnerabilities and these differed from HVI standard.When comparing the average weights for each capital across interest groups, households were found to be more vulnerable to shocks introduced to physical (28.6 %), human (28.3 %) and natural capitals (23.3 %). The respective weights derived using the FANRPAN HVI were 25, 25 and 10 %. Furthermore, the community weighted HVI : FANRPAN HVI estimates were 12.6 % : 25 % for financial capital, with the corresponding results for social capital being 7.2 % : 15 %. Significant differences in estimates were observed for financial and natural capital weights that the community assigned when compared with the standard HVI weights ($P < 0.05$). Although there were no significant differences ($P > 0.05$) in the overall HVIs obtained after adjusting with the community weights, the results provided useful insights into the capitals worth taking into account.

It was clear that household vulnerability should be addressed through adopting programming approaches that consider spatial differences. Inter-community differences in assigned weights were also confirmed to occur, highlighting the need for not relying exclusively on standard weights. Therefore, it can be concluded that standard weights might not realistically reflect the dynamics obtaining at household level. For effective development relief programming to be achieved it is advisable to incorporate community-based mechanisms that continuously update information. Community participation would help guarantee ownership of the process, in line with the adage, “nothing for us without us.”

Furthers studies are required to improve on the FANRPAN HVI. It is important that the costs and benefits associated with the use of the HVI are compared to other methods for more informed decisions to be made. The dynamics of community weights need also to be investigated.

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ABBREVIATIONS

ADP	Area Development Programme
AIDS	Acquired Immunedeficiency Syndrome
CARE	Cooperative for Assistance and Relief Everywhere
CRS	Catholic Relief Services
C-SAFE	Consortium for Southern Africa Food Emergency
CSO	Central Statistics Office
CVI	Community Vulnerability Index
CW	Community Weight
DFID	Department for International Development
ESCAP	Economic Commission for the Asia and the Pacific
EVI	Environmental Vulnerability Index
FANRPAN	Food and Natural Resources Policy Analysis Network
FANTA	The Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organisation
FAOIWG	Food and Agriculture Organisation Informal Working Group
FFA	Food for Assets
FFSS	Food for Social Services
FGD	Focus Group Discussion
FGT	Foster Greer and Thorbecke (measures of poverty)
FOSENET	Food Security Network
FPMG	Food Programming Management Group
HBC	Home Based Care
HIV	Human Immunodeficiency Virus
HVI	Household Vulnerability Index
IWG	Informal Working Group
MDG	Millennium Development Goals
PRA	Participatory Rural Appraisal
PRR	Productivity Requirement Ratio
SADC	Southern Africa Development Community
SOPAC	South Pacific Applied Geoscience Commission
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNESCAP	United Nations Economic Commission for the Asia and the Pacific
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WVZ	World Vision Zimbabwe
ZIMVAC	Zimbabwe Vulnerability Assessment Committee

CHAPTER 1 INTRODUCTION

1.0 Background

Development entails enhancing the overall wellbeing of people and bringing positive changes in their lives. It is an intentional effort designed to make a long-lasting impact at the level of individuals and societies (Ireland, Sibanda, Mupetesi and Mhlanga, 2004). When this takes place at the community level it is structured and gives local people greater control over finding solutions to the conditions that affect their lives (Chesley, 2007). The range of groups and organisations representing people in a locality constitutes thecommunity sector. Community development demands active involvement of people in dealing with the issues which affect their lives and is a process based on the sharing of power, skills, knowledge and experience (Chesley, 2007). Community development seeks to empower local people to achieve self-driven improvement in the quality of their lives.

Interventions have been developed to ensure that development is brought to different communities in the world. The Millenium Development Goals (MDG) adoptedin September 2000seek to ensure that social change takes place globally through universally accepted indicators. Over the years, the framework has inspired development efforts, helped set global and national priorities (United Nations, 2011) and focus subsequent actions. The 2011 MDG report states that increased funding from many sources has translated into the expansion of programmes to deliver services and resources to those most in need. However, despite the progress in development, it still remains difficult to reach the most vulnerable people. This is why development agencies continue to grapple with how best to identify the most vulnerable people who should be assisted. Slater and Farrington (2010) distinguish between whom an intervention is designed to reach (eligible beneficiaries which are the most vulnerable) and those whom it actually reaches when implemented (inclusion and exclusion errors). This suggests that there is need to develop appropriate approaches that can help address this challenge.

Many targeting method have been developed to address the challenges of reaching the most vulnerable in the communities. Designing a targeting approach involves finding answers relating to who would be reached and why, and relies either on assessment of poverty or categorising society (Slater and Farrington, 2010). Implementation of a targeting approach answers questions regardinghow beneficiaries are identified and reached.Self-targeting, means-testing, proxy means testing and community-based selection are some of the approaches in use (Hoddinott, 1999). According to Lavellee, Olivier, Pasquier-Doumer and Robilliard (2010), targeting makes it possible to appropriately direct resources to the poor. All this is done to ensure that there is efficient use of resources through meeting the real needs of the poor. Hoddinott (1999) defines targeting as restricting the coverage of an intervention to those who are perceived to be most at risk or vulnerable.

Many targeting methods endeavour to reach the most vulnerable. The MDGs state that the most vulnerable people are to be reached. However, there is varied understanding of vulnerability. According to Makoka and Marcus (2005), vulnerability is a multi-dimensional concept which can be related to several hazards. It exists at varying levels, ranging from one household, community or country to any kind of event that may be harmful once it occurs such as droughts, diseases, floods. Effective household targeting in either development or food assistance interventions hinges on appropriate determination of the most vulnerable. This means that proper measurement of vulnerability would help improve the ability to clarify the state of the household. Such knowledge would in turn isolate the source of vulnerability thereby ensuring that there is proper targeting. However, there is no common measure of vulnerability that development agents use. A common measure would assist in measuring and tracking vulnerability levels in the communities. Taking this problem into account, the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) developed and proposed the adoption of the Household Vulnerability Index (HVI) as a proxy measure (Sibanda and Kureya, 2007) of measuring and classifying vulnerability.

1.1 Background to World Vision Development Agency

World Vision is a worldwide community development organization that provides short-term and long-term assistance to 100 million people worldwide (including 2.4 million children). It operates nearly 100 countries (www.worldvision.org) For six decades, World Vision has been engaging people to work towards eliminating poverty and its causes. World Vision is committed to helping the poor. This is done through emergency relief, long-term development projects and advocacy.

In an effort to improve targeting in its interventions, World Vision International (WVI) through the Food Programming Management Group (FPMG) partnered with FANRPAN in piloting the HVI as a proxy measure of vulnerability (Sibanda and Kureya, 2007) in Zimbabwe, Lesotho and Swaziland. Due to global recession, resources have declined over the past few years, yet the number of people in need has been increasing due to a combination of factors such as climate change, HIV and AIDS and poor government policies. The limited resources against the great need requirethat proper identification of the most vulnerable households (Slater and Farrington, 2010) is done. Important on the list of WV engagement with communities, is defining who benefits, how they will be selected and by who. WV' approach to targeting has been contextual in order to accommodate governments and communities. However, with the growing call for accountability and need to demonstrate impact, WV found it necessary to revisit the way it targets in order to be sure that when evaluating its programs it is assured that it was working with the deserving/ appropriate target group.

The tool that was piloted was the FANRPAN HVI which is a composite statistical index designed to quantify household vulnerability through assessing human, physical, natural, social and financial assets available to each household. It categorizes households based on their varying degrees of vulnerability, aiming to ensure better planning and targeting of interventions.It is worth noting that World Vision Zimbabwe uses various targeting methods in its relief and development interventions (WVZ, 2007). The most commonly used method is community-based selection. Criteria for community-based selection are also used in transformational development projects (referring to those lasting 10-15 years in an area) within World Vision. The aim of using such an approach is to ensure that the communities involved are empowered. Thisapproach deliberately facilitates processes that seek to ensure the intended beneficiaries lead their own development throughout the project cycle, including selection of beneficiaries in all the interventions introduced in an area (WVZ, 1999).

Community-based targeting assumes that local people can classify families as rich or poor, based on locally agreed notions of deprivation or need (Haddad and Zeller, 1996; Gwatkin, 2000). This implies that community targeting provides a means of taking advantage of the local knowledge of households' needs and capabilities that are difficult to capture when measurable indicators are used. For instance, communities are likely to know who in their midst are very poor and those who might be suffering a crisis or have the least income-earning potential. However, community-based methodologies have inherent weaknesses, which have made targeting remain a problem in the selection of households (Coady, Grosh and Hoddinott, 2004).

Grosh (1994) identifies and explains the different types of household-focused targeting approaches that can be used. Community-based identification is one of these. It is simple and inexpensive although it may lead to inconsistencies with respect to interventions. This emanates from the fact that the community and households tend to overstate their vulnerabilities (Coadyet *al.*, 2004). This weakness has also frequently been observed in vulnerability analyses in World Vision Zimbabwe (WVZ) programming, a situation which demands viable solutions. As a result, frontline staff and their partners often accuse each other of lacking objectivity when selecting vulnerable households, which at times precipitates conflicts (WVZ, 2007). Although this is the case, the major weakness has been that the same households identified as vulnerable at the inception of a project continue to benefit from all the interventions introduced into an area every year. There is evidence of some programmes being implemented in an area for at least 10 years with the same households benefiting. According to WVZ (2004), some of these households are not showing an improvement despite the support they receive.

As already highlighted above, there are many problems that necessitated FANRPAN to pilot the HVI as a programming tool. Even though this the case, the HVI has never been evaluated to establish how it compares with the community-based method used in World Vision (WV) programming. It has also not been evaluated to establish how it has been calculated compared to communities' understanding of vulnerability. Nevertheless, participatory methods have been widely used in World Vision programming. Use of participatory approaches demonstrates WV's respect for local knowledge about life circumstances and coping strategies, which Chambers (1995) values highly. Also, participation changes the role of the researcher from one of an 'expert' to a listener and provides a 'view from below' (Mies, 1996). Therefore, this study sought to assess how the inclusion of the community voice in defining vulnerability variables affected the FANRPAN-developed HVI.

1.2 Statement of the Research Problem

The measurement and classification of vulnerability is associated with high uncertainty since it is a multidimensional concept (Eakin, and Tapia, 2007).Classification of the households in a communityis critical for targeting groups of people and understanding their sources of vulnerability (Sibanda and Kureya, 2007). This classification is enabled by the calculation of an index.Various methods of developing a vulnerability index have been proposed (Chaudhuri, Jalan, Suryahadi, 2002). Many vulnerability indices are based on the assumption that the indicators of vulnerability are of equal importance.

Eakin and Tapia (2007) observe that vulnerability indicators have different weights. However, studies on household vulnerability have relied on weights calculated using availableliterature and models. They have never systematically engaged the communities in assigning weights to the indicators. Against this backdrop, this study proposes infusing community engagement in the weighting process and compares the resultswiththe weights developed from literature using a household vulnerability index (HVI). The HVI was developed by Food Agriculture and Natural Resources Policy Analysis Network (FANRPAN). The theoretical foundations of the FANRPAN HVI involved assigning predetermined weighting on the dimensions of household vulnerability. Its major weakness is that the weights used in the HVI were derived from existing literature. In this study, the effect of including weightings derived through engaging various interest groups at grassroots community level on HVI and classification of households was investigated.

The study also explored the seasonality of household vulnerability using longitudinal panel data. Apart from this, the feasibility of using the classification of household vulnerability as a targeting tool compared to the community-based approach was explored. In general, community-based targeting is acceptable to most beneficiaries. This made it worthwhile to investigate how the HVI beneficiary selection compared with community-based targeting.

The FANRPAN HVI relies on collecting information about household variables. Methods that rely on collecting data are beset with information-related problems (Adato and Haddad, 2002). The informational challenges arise because most targeting techniques are designed assumingthat there is agreement on the definition of poverty or vulnerability, and consensus on the measure of standard of living (Johnson and Start 2001, Besely and Kanbur, 1999). For almost all the targeting techniques to operate on the basis of these assumptions there is need for accurate documentation of individuals' assets and incomes. This study sought to understand what vulnerability meant to different interest groups in communities as they assigned weights. The HVI, for example, attempts to comprehensively collect information about a household so as to accurately place it in a relevant vulnerability category after assessing all the livelihoods.

Apart from the informational constraints already raised, inclusion and exclusion errors arise in most conventional targeting techniques (Hoddinott, 1999). The errors have a serious impact on the potential success of targeting. Errors of inclusion occur when an intervention benefits inappropriate individuals and households. In contrast, errors of exclusion arise when an intervention leaves out the intended beneficiaries. The errors are respectively denoted as leakage and under-coverage. A targeting intervention would be regarded as fairly efficient if it substantially minimizes leakage (inclusion errors) and achieves the lowest possible under-coverage (exclusion errors). There is need to investigate how to address the problems articulated above. In the current study, how the HVI reduced exclusion and exclusion errors when compared with community-based targetingwas explored. This was premised on the view that if the HVI was to become the preferred method in programming for development it must be better than the conventional approach.

Figure 1.1 illustrates the dynamics of household vulnerability. Seasonality and community contextualised vulnerability affect the classification of households. The classification depends on the method used and the variables under consideration. This study interrogates the weighting of the capitals and its effects on the classification of households. Of particular importance is the analysis ofcommunity perceptions in order to determineits effect on the magnitude of vulnerability indices.

1.3 Research Objectives

This study sought to compare the statistical and community-based targeting tools for development relief work in RushingaDistrict in Mashonaland Central Province of Zimbabwe. In this research, the HVI was compared with community-based selection criteria in order to objectively identify the most vulnerable people. The advantages and disadvantages of each toolin gathering information for classification of specific target groups in relief and development work were unravelled. Critical analyses of how each tool targeted households in the same community and the related cost-effectiveness were assessed. Another feature of the study was an investigation into how incorporating the community voice in the definition of vulnerability and in assigning weights influenced the calculation of the indices. Aspects that might have to be modified in order to improve its applicability were also studied. Analyses were conducted to establish how the targeting methods used in Rushinga ADP programming would classify beneficiaries. Lastly, the extent to which inclusion and exclusion errors differed among the methods in the same community was studied. All this was done in order to help shape World Vision programming of development relief.

Considering the explanations presented above, the main objective of the current study was to suggest improvement areas of the HVI through carrying out comparative analyses of the statistical and community-based targeting tools for development and relief work in RushingaDistrict of Mashonaland Central Province in north-eastern Zimbabwe. In order to address this main objective, the specific sub objectives used were :

(a) To determine how various social groups in the community assigned weights of vulnerability to the capitals at their disposal compared to those of the FANRPAN HVI;
(b) To assess how the community weightings of vulnerability affected the magnitude of HVI indices in different communities;
(c) To assess the seasonality of vulnerability and its effect on the HVI;
(d) To compare theHVI standard, community weightings and community-based selection as classification approaches; and
(e) To suggest improvement areas for the HVI based on empirical evidence.

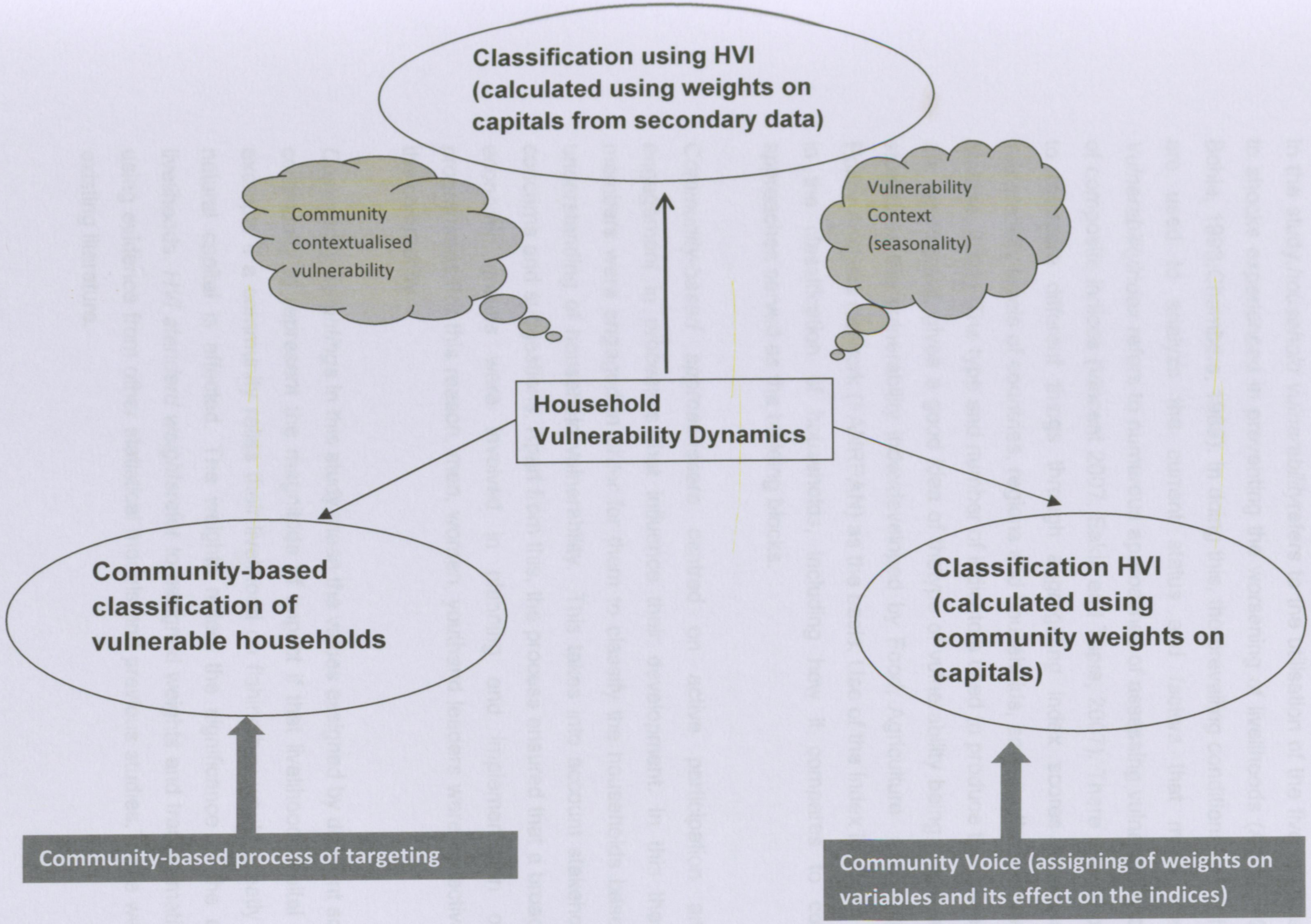
1.4 Research Hypotheses

In this study, the following hypotheses were tested:

(a) Community weighting of vulnerability does not significantly alter the overall HVI magnitude of indices;
(b) There are no differences in assigned weights of vulnerability across communities in different countries in Southern Africa (Zimbabwe, Lesotho and Swaziland);
(c) Household vulnerability is the same across seasons; and
(d) Use of community-defined weights does not result in significant classification change inthe standard HVI.

1.5 Definitions of Key Terms and Concepts

This study contributes to an understanding of household vulnerability to poverty in Zimbabwe with particular emphasis on RushingaDistrict. Household vulnerability, vulnerability index, community weightings, HVI standard weights and community-based approaches are fundamental terms and concepts that underpin this study. In this study, the livelihood framework thatDepartment for International Development (DFID, 1999) developedwas the basis of analysis of household vulnerability. The framework spells out the factors that are critical in the survival of people. Chambers and Conway (1992)reveal that livelihoods comprise assets and activities needed for a living. Human, social, natural, physical and financial capitals are the main components of the sustainable livelihood framework.



gure 1.1 Conceptual Framework of the study on comparative analysis of statistical and community-based targeting tools for development relief in
ashinga

In the study,*household vulnerability*refers to the utilisation of the five capitals in responding to shocks experienced in preventing the worsening of livelihoods (Adger, 1999; Watts and Bohle, 1993;Chambers, 1989). In doing this, the prevailing conditions at the household level are used to analyze the current status and factors that make them vulnerable. *Vulnerabilityindex* refers to numerous approaches of assessing vulnerability through the use of composite indices (Vincent 2007, Eakin and Tapia, 2007). There are variousindices used to measure different things through aggregating index scores intended to rank the vulnerability levels of countries, regions and households, among others (Moss, Brenkert and Malone, 2001). The type and number of indicators used to produce theindices and how they are aggregated, gives a good idea of thetype of vulnerability being measured. The current studyuses the vulnerability indexdeveloped by Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) as the basis. Use of the index in space and application in the classification of households, including how it compares to community-based approaches served as the building blocks.

*Community-based approaches*are centred on active participation and stakeholder engagement in processes that influence their development. In this thesis, community members were engaged in order for them to classify the households based on their own understanding of household vulnerability. This takes into account stakeholders' opinions, concerns and suggestions. Apart from this, the process ensured that a broad range ofsocio-economic groups were involved in planning and implementation of development programmes.For this reason, men, women, youthand leaders were collectively regarded as the community.

Community weightings in this study mean the values assigned by different social groups in a community to represent the magnitude of impact if that livelihood capital is affected. For example if a community relies their livelihood on fishingthey would greatly affected if their natural capital is affected. The weights reflect the significance of the capitals to their livelihoods. *HVI standard weights*refer to assigned weights and transformations to variables using evidence from other statistical models and previous studies.These were derived from existing literature.

1.6 Organisation of the Thesis

Chapter 1 has presentedthe background to the thesis, statement of the problem, objectives and hypotheses of the research. In Chapter 2,theliterature is reviewed in order to build an understanding of vulnerability, poverty and variousapproaches to classificationof households. The methodology of empirically testingeach hypothesis is presented in its relevant chapter. Chapter 3 is devoted to acomparison ofhow the community weighting process of weights on five capitals differs from the ones suggested in the FANRPAN framework. Analysis is also done on how different social groups assigned weights and the significance of that in development.

Chapter 4 analyses the spatial differences of household vulnerabilities and the importance of contextualising vulnerability indices. Chapter 5 presents findings on the seasonality of vulnerability bringing out the importance of taking cognisance of the importance of seasonality in tracking vulnerability especially when the indices are used as a monitoring tool. Chapter 6 compares that classification of households using the indices calculated on weights from literature, indices calculated from weights from community groups and the general classification by the community. This provides insights on how households can be classified in the different vulnerability classes depending on the weights of the capitals. Chapter 7 presents discussion, recommendations, and conclusion.

CHAPTER 2 REVIEW OF LITERATURE

2.1 Introduction

This chapter reviewed literature on the vulnerability, community participation and targeting methods. Operational definitions of vulnerability and community participation were discussed in view of their meaning in different disciplines. A summary of the literature review was provided at the end of this chapter.

A common objective of vulnerability assessment is to differentiate populations in terms of their vulnerability and the type of shock that the households are vulnerable to. According to Adger (1998) and Cardona (2004), determination of vulnerability is hazard-specific. In developing countries there are large sections of society that may be classified as vulnerable, and in sub-Saharan Africa, in particular, HIV/AIDS infected and affected households are accounting for a significant proportion of vulnerable groups. According to UNAIDS (2010), the HIV/AIDS prevalence rate in the sub-Saharan Africa for adults 15-49 years is 5% and the affected households are more susceptible to becoming poor in the presence of a shock – whether it is an economic shock, such as rising prices, or a natural disaster such as a flood or drought. The situation is exacerbated by the unavailability of means to cope with the shock when it occurs. The Household Vulnerability Index hinges on this fact and analyzes how the different sources of livelihoods are affected in the face of HIV/AIDS shock for example how a household would use their land if there is a sick member.

The assumption is that the HVI is able to classify a population in order to understand who may be more or less vulnerable and in what ways they are vulnerable. It is, however, important to note that vulnerability is a difficult concept to measure and describe (Eakin and Luers, 2006). This is mainly because it is multidimensional and thus multivariate concept so every different indicator of vulnerability is likely to have a different degree of influence thus requires a different weight. Other targeting methodologies are also discussed with a focus on their shortcomings and how the HVI is expected to fill the identified gaps.

2.2 Vulnerability to Poverty

It is very critical to understand vulnerability so as to adequately measure it. Vulnerability is described as a dimension of disadvantage, which relates to exposure to shocks. It is differentiated from poverty, which focuses attention on presentconditions, vulnerability is a forward-looking concept. The idea of vulnerability relates to the way in which events impact on a certain system, and specifically on the likelihood of experiencing loss or negative outcomes in the future because of particular events or actions (Hoddinott and Quisumbing 2003; Alwang, Siegel, Jorgensen, 2001).

Individuals, households, communities, or regions – exposed to certain risks, can be helped in managing and reducing risk, to become more resilient, adaptable and able to cope with changes (Alwang*et al.*, 2001). These households that become resilient are described as being able to cope in the HVI developed by FANRPAN. The literature on household vulnerability has been generated primarily as an extension of the analysis of poverty (Cuna 2004; Hoddinott and Quisumbing 2003;Alwang*et al.* 2001). One of the key insights of this literature is the conceptual distinction between the current conditions of a household such as income status and the likelihood that this given household will experience a deterioration of its condition in the future. Hence, vulnerability is not a measure of the current condition of the household, but a measure of the likelihood that these conditions (outcomes) will worsen in the future due to adverse events such as HIV/AIDS, droughts and floods. However, it is important to note that the current conditions are used to predict the possible outcome in the future.

Household vulnerability has been defined by Heitzman*et al.* (2002) as a "risk chain" comprising (a) uncertain events which are described in some literature as shocks which are either internal or external (b) the options for managing risks or risk responses which are also referred to as resilience of a household to cope in the presence of a shock and (c) the outcome in terms of welfare loss.

Thus a household is said to be vulnerable to the outcome of an uncertain event, if it does not have sufficient resources to adequately contend with the outcome of the event.

Literature reveal that the development community has settled on the appropriate indices to measure poverty [namely the Foster Greer, Thorbecke (1984) (FGT) indices], no consensus has yet emerged about the appropriate way to measure vulnerability. There are several approaches that emerge in literature, which consider vulnerability. According to Christiaensen and Boisvert, (2000),Chaudhuri, *et al.*(2002), vulnerability is associated with high expected poverty. They considered the possibility of a household falling below the poverty threshold looking at the consumption levels. Ligon and Schechter, 2003 associated vulnerability with low expected utility where they looked at information about individual risk preferences. Given that individuals are often uncertain about their preferences it is difficult to relate these to future problems since vulnerability is futuristic.

A Participatory Poverty Assessment that was done in Tanzania (Morris, Butterworth,Lamboll,Lazaro, Maganga and Marsland, 2009) comprehensively did a qualitative assessment of households' risk environment, their coping strategies, and the resulting household vulnerability. The study concluded that vulnerability is the result of the number and intensity of the shocks households face against the number and effectiveness of their coping strategies. It identified environmental and macroeconomic conditions, governance, ill health, lifecycle conditions and cultural beliefs and practices as important shocks causing households to be more vulnerable. As coping strategies the assessment found that households make use of assets (including human, social, political, natural, physical and financial assets). Thus poverty itself limits people's capacity to improve and safeguard their well-being. The assessment also found out that there are some disadvantaged social groups in the country that due to their low access to assets are particularly vulnerable. Although the study touches on different dimensions and that vulnerability (in the future) is linked to household's poverty (current situation), the focus was mainly on qualitative description. The study does not quantify how the different shocks affect vulnerability, which is very important in identifying the causes of household's vulnerability so as to address the problem.

Vulnerability and development was analysed by Cardona (2004) as vulnerability to signify a lack or a deficit of development due to socially constructed shocks. Therefore, the author also focuses on the intrinsic susceptibility of a community suggesting that vulnerability originates in physical and socio-economic shocks and a lack of resilience by taking a look at these parameters. He tried to get to a holistic view of vulnerability, which covers both physical factors as well as socio-economic aspects. It gives a forward-looking perspective on what might happen, if a certain hazard takes place. A definition of vulnerability to poverty is given by Chaudhuri*et al.* (2002) as the ex-ante risk that a household will, if currently non-poor, fall below the poverty line, or if currently poor, will remain in poverty. These approaches are mostly restricted to income vulnerability and they try to find a common metric for all indicators. Thus they are mostly restricted to measuring money (consumption) and tend to disregard other indicators that are more difficult to be translated into monetary terms (Alwang*et al.* 2001).

2.3 Measuring Vulnerability

Most vulnerability measures have just been recently developed and some of them have not been widely adopted (Makoka and Marcus, 2005). It is important to note that different disciplines measure vulnerability in different ways. This section presents important measures of vulnerability from the economics and the environmental science perspectives.

In the economics discipline, vulnerability to poverty is measured as the probability that a household (or an individual), whether currently poor or not, would find itself poor in the future (Chaudhuri, 2011) Usually, the concept of vulnerability is understood in the income space to express the probability that a household will become consumption poor in the future in the sense that household members will not be able to purchase due to income vulnerability. In this case, vulnerability is measured with respect to the consumption poverty line (Chaudhuri, 2011).

Different organizations working on environmental sustainability have developed different measures of vulnerability in order to advance their course. Among them is the Commonwealth Vulnerability Index (CVI), developed in 2000 (Commonwealth Secretariat, 2000). The CVI was developed based on three years of intensive research carried out by Commonwealth of Nations with the mandate of the Commonwealth finance ministers and endorsed by the heads of government (Commonwealth Secretariat, 2000). The index was based on two principles: first, the impact of external shocks over which the country affected has little or no control; and secondly the resilience of a country to withstand and recover from such shocks. In this framework, therefore, vulnerability means exposure to exogenous shocks over which the affected country has little or no control, and relatively low resilience to withstand and recover from such shocks. The CVI is a country-level index, which ranks developing countries according to measurable components of exposure and resilience to external shocks. The development of the index is based on the observation that income growth volatility is the most apparent manifestation of vulnerability (Commonwealth Secretariat, 2000).

Besides the CVI, another measure of vulnerability that has been developed is the Environmental Vulnerability Index (EVI). It was developed by the South Pacific Applied Geoscience Commission (SOPAC) and the United Nations Environmental Programme in 2005 (Makoka and Marcus, 2005). It was developed through consultations with governments, institutions and leading experts throughout the world. According to UNEP and

SOPAC (2005), the EVI has been developed to provide a rapid and standardized method for characterizing vulnerability in an overall sense, and identifying issues that may need to be addressed within each of the three pillars of sustainability, namely environmental, economic and social aspects of a country's development. The main aim for the creation of the EVI is to promote sustainable development across the world and cooperation on issues relating to the world's natural life support ecosystems (Makoka and Marcus, 2005). The EVI is based on indicators for estimating the vulnerability of the environment of a country to future shocks. These include indicators on weather and climate, geology, geography, ecosystem resources and services, and ecological processes and human interactions (Makoka and Marcus, 2005). The next section will look at how attempts have been made to narrow down the index from a national level down to household level.

2.3.1 Measuring Vulnerability at household level

There is a variation in the measurement of vulnerability from practitioners in different disciplines even from differentperspectives within the same disciplines. There is use of different meanings and concepts ofvulnerability, which, in turn, have led to diverse methods of measuring vulnerability(Alwang et al, 2001).One such indicator based measurement is the Financial Vulnerability Index (FVI) developed by (Anderloni, Bacchiocchi, Vandone, 2012).The index measured financial vulnerability of a household as it relates to expenditure, income, savings, and loans for Italian households. The limitation of this study is that it deals with one aspect of the capitals available to a household which does not reflect the total household vulnerability.

Household Social Vulnerability Index (HSVI) was developed by Vincent and Cull(2010). The study assessed the social vulnerability of a household to climate change. The study is based on the multiple dimensions of vulnerability identified in the livelihood framework. It recognises the importance how a household interacts with different capitals at its disposal and the significance of putting weights in the calculation of an index. However the study is limited in that it uses uniform weights, assuming that a household uses the capital assets uniformly if which this is not the case.Vincent (2007) creates a household level index for adaptaive capacity to change (HACI). He develops it based on theoretically determined composite indices. The development of the indices is based on limited indicators, economic wellbeing, demographic structure, interconnectivity, quality of housing and dependence on natural resources. The other limitation is that the index is based on equally weighted sub-indices.

Another household vulnerability index was developed by Eakin and Tapia (2007). The study combined the livelihoods framework with the multicriteria decision analysis approach to weight household attributes according to their relative importance. The study recognises the need for different weights in the calculation of the indices however it is based on literature and expert judgement. This poses challenges in excluding community voice in the process where theie participation is limited to proving information about their households. This study proposes active community engagement in the coming up with weights that can be used in the calculation of an index.

2.3.2 Background to the FANRPAN Household Vulnerability Index

The HVI was developed in 2004 by FANRPAN, in its endeavour to quantify the impact of HIV/AIDS on a household, when it embarked on a study on the *Impact of HIV and AIDS on Rural Livelihoods and Food Security* (Sibanda and Kureya, 2007). Although the concept of vulnerability has been applied in a variety of disciplines and contexts, the bulk of the literature on vulnerability focused on household vulnerability to poverty and vulnerability of geographic areas to environmental adversities or natural disasters (Cuna, 2004). The HVI developed by FANRPAN concentrated on quantifying the vulnerability of households to the adverse effects of HIV/AIDS. FANRPAN and was formed in 1994 as SADC needed a network that deals with food and natural resources (Sibanda and Kureya. 2007). It is comprised of governments as the key stakeholders, farmer organizations, farmers and Non-Governmental Organisations. It is a regional network focusing on research, policy and networking around food, agriculture and natural resources in the Southern Africa Development Community.

From a study conducted in 7 SADC countries, FANRPAN identified the need to put a quantitative measure to household vulnerability as pivotal intervention in the HIV and AIDS crisis. A household that has a strong livelihood base should be better equipped to cope with HIV and AIDS, yet the level of copying depends on the quantity and quality of the livelihoods. The HVI was developed by FANRPAN in 2004 by means of investigating the different dimensions through which households are likely to be affected when exposed to shocks such as HIV/AIDS. Appropriate weights and scales were applied to each of the impact areas and an HVI calculated for each household (Food Security Network, 2007).

The HVI framework employs the sustainable livelihoods approach as the basis of its foundation (Sibanda and Kureya, 2007). A livelihood is considered to be sustainable when a household can cope with and recover from stresses and shocks through either maintaining or enhancing its capabilities and assets. During the process it should not deplete its resource base. Thus the more assets a household has, the lesser its vulnerability (Sibanda and Kureya, 2007). The HVI uses the five capitals to analyze the impact of HIV and AIDS as follows:

Human capital- HIV and AIDS impacts on household demographic structure i.e., size and composition, and the mobility of household members. *Natural capital*- Household vulnerability increases environmental degradation and affects access to natural capital. *Physical capital*- This includes changes in household physical assets, access to extension services and changes in optimal farm household production. *Financial capital*- HIV and AIDS evoke changes in household financial assets, investment choices, household income and expenditure and market access. *Social capital*- The pandemic affects social networks in terms of support, and inter and intra-relationships from government, community and other relatives. There are different kinds of shocks that can be experienced at a household level varying from climate change (droughts, floods) and HIV/AIDS. In this particular study conducted by FANRPAN All these capitals were linked to the HIV and AIDS pandemic through how it affects household agriculture and food security (Sibanda and Kureya, 2007). The HVI categorises households into three levels of vulnerability, i.e., coping, acute and emergency and then based on these levels, development response packages are designed to assist the most vulnerable households fight their external and internal vulnerability (Sibanda and Kureya, 2007).

The HVI is also expected to be used in monitoring assisted households' graduation or deterioration from one level of vulnerability to another. By focusing on the livelihood framework the sources of vulnerability are expected to be identified hence correctly identifying interventions required to move households from one level of vulnerability to another (Sibanda and Kureya, 2007).

2.3.3 Household vulnerability index approach in relation to capitals

Literature on vulnerabilities has linkages with the asset-based approach and sustainable livelihood literature (Alwang*et al.*, 2001). Livelihoods comprise of different on and off farm activities for generating income that is used for procurement of various assets. It also implies communities' access to income and resources to meet basic needs sustainably (Chambers and Conway, 1992). The sustainable livelihoods approach is used to analyse the different activities and strategies that are used by households to acquire income using various resources at their disposal. Resources may comprise of different assets such as human, social, financial, economic, physical, natural and political (Chambers and Conway, 1992).

Assets that are defined as natural/biological include land, water, common-property resources, flora and fauna. Social assets examples are community, family and social networks. Examples of political assets are empowerment - sometimes included in the 'social' assets. Human assets are education, labour, health and nutrition. Physical assets are such as roads, clinics, markets, schools and bridges. Economic assets are jobs, savings and credit, among others (Chambers and Conway, 1992).

Sustainable livelihoods are those activities that are able to cope with and recover from shocks and stresses (such as drought, civil war, policy failure, HIV/AIDS) through adaptive and coping strategies. Communities with sustainable livelihoods should ensure that their activities do not irreversibly degrade natural resources within a given ecosystem. Livelihoods are said to be sustainable if they are socially equitable, which suggests that promotion of livelihood opportunities for one group should not limit options for other groups, either now or in the future (Chambers and Conway, 1992). The activities should promote intergenerational equity.

The extent of household access to assets is strongly influenced by their vulnerability context, which takes account of trends (for example, economic, political and technological), shocks (for example, epidemics, natural disasters, civil strife) and seasonality (for example, prices, production, employment opportunities). It is crucial to measure this vulnerability so that the state of the household and the source of the vulnerability can be identified. Figure 2.1 below summaries the relationship between livelihood capitals and how HIV/AIDS impacts on them.

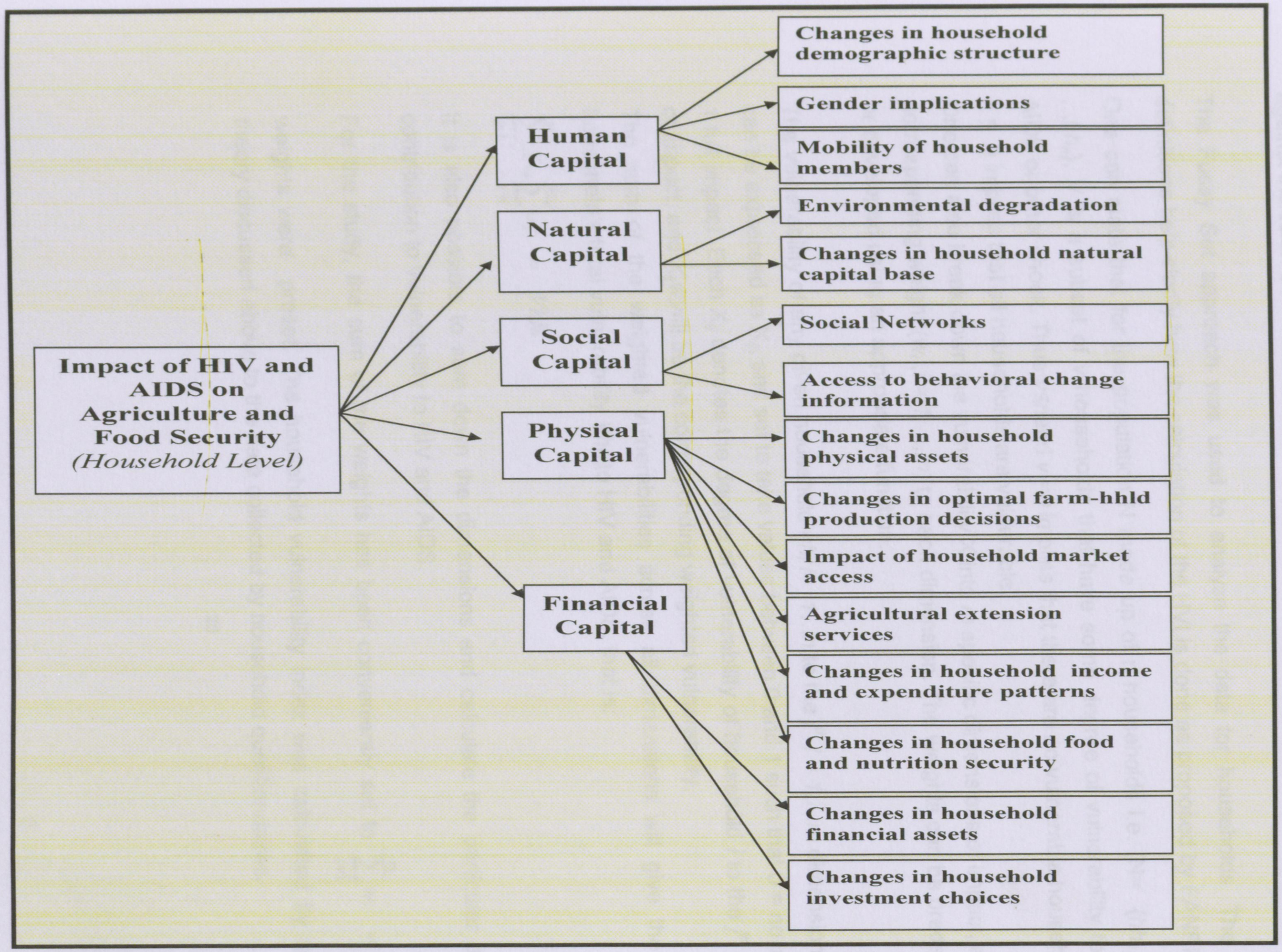


Figure 2.1. Relationship between HIV/AIDS and the household livelihood capital

Source: Food Security Network, 2007

2.3.4 Theoretical Foundation of the Household Vulnerability Index

According to Sibanda and Kureya (2007) the theoretical foundation of the HVI was based on the work originally proposed by Costa (2002) known as the fussy set approach to multidimensional analysis of poverty given composite indicators. The aim of the HVI, as was the case in the work by Costa, is to quantify the multi-dimension aspects of the impacts of HIV/AIDS problem on a household. The HVI tool would be perfect for targeting because of its capacity to assess the holistic access of a household to different capitals, FANRPAN (2007). It is, therefore, in this light that the tool would be tested for its capacity to target against inclusion and exclusion errors and cost effectiveness of the tool in implementation.

The Fussy Set approach was used to analyse the data for households. The following definitions help clarify how the calculation of the HVI is done as proposed by FANRPAN:

One can state that for the population N made up of n households i.e. (N= $\{hh_1, hh_2, hh_3 \ldots hh_n\}$, V is a subset of v households that have some degree of vulnerability to HIV and AIDS or other shock. Thus $v \leq n$and $v = 0$ implies that there are no vulnerable households, and $v = n$ implies that all households are vulnerable.
One can also break down the vulnerability X into m specific dimensions of impact, and give a corresponding weight (w_i ,$i = 1,\ldots,m$) to each dimension. The weights can be predetermined, or developed using an appropriate function.

The vulnerability of any given household hh_i $i= 1\ldots n$ to the j^{th} $j = 1,\ldots m$ dimension of impact can be expressed as X_{ij}, and set to take values between 0 and 1 such that 0 = no impact and 1 full impact. Each X_{ij} denotes the degree of vulnerability of household i to the j^{th} dimension of impact, and $X_{ij}w_i$will be the corresponding weighted vulnerability.
The sum of the weighted vulnerabilities across all dimensions will give the particular household's total vulnerability $Vhh_i$to HIV and AIDS, that is:

$$\sum_{j=1}^{m} X_{wj} \sum_{j=1}^{m} w_j = Vhh_i$$

It is also possible to sum down the dimensions and calculate the particular dimension's contribution to vulnerability to HIV and AIDS.

For the study, the sum of the weights has been conveniently set to $\sum_{j=1}^{m} w_j = 100$. The weights were preset. The household vulnerability index was calculated by applying the theory discussed above to the data collected by household questionnaires.

This study proposes the inclusion of community voice and participation into the formula such that the corresponding weighted vulnerability for a household was expressed as XijCWi instead of XijWi:

Xij denoting the degree of vulnerability of a household I to the j^{th} dimension of impact and

CW denoting community weight

The sum of all weighted community vulnerability will be denoted as:

$$Vhh = \sum_{j=1}^{mm} X_{CWj} \sum_{j=1} CW_j$$

2.3.5Categories of Household Vulnerability Index

Three levels of vulnerability were used in the survey. Household could either fall into vulnerability level one, two or three. Specific definitions for these categories are given below:

- Low Vulnerability Levels – a household in a vulnerable situation but still able to cope.
- Moderate Vulnerability Levels – a household that has been hit so hard that it needs urgent but temporary assistance for it to recover. This entails assisting households recover from a shock (recovery and rehabilitation of that household).
- High Vulnerability Levels – a household is an emergency situation but could be resuscitated only with the best possible programming to address the area of need. The emergency level is thus defined as a household where saving lives of that household is number one priority before one can introduce that household to long term developmental projects. These are the households that would require emergency interventions to save lives and these could have been into the situation due to different shocks.

The above cut-off points were derived through a simulation process. The study simulated a coping level household by assigning upper limits of coping level values to the different indicators and then calculating the HVI.

2.3.6 Limitations of the HVI

Despite the fact that the HVI derivation was largely informed by a rich literature around HIV and AIDS in the world, the index is not immune to challenges that bedevil indices. An element of subjectivity especially in the assigning of weights to the different livelihood assets remains one of the major challenges. Though this process is supposed to be informed by a careful analysis of literature on the study communities, there are bound to be limitations if this literature scan is not conducted properly.

2.4 Approaches to Household Classification: Targeting

There are different approaches to targeting that are identified in literature. Table 2.1 provides a summary of all the approaches discussed in detail in this section

2.4.1 Geographic Targeting

Various developmental organisations use different targeting methodologies. One example is geographical targeting, which entails selecting an area because of its peculiar characteristics. Either all the community members participate or certain households can be selected (Hoddinott, 2001). Geographic locations differ ranging from size to the inclusion and exclusion errors. If the geographical location is large such as a District, many programmes may not have enough resources to target everyone so targeting methodologies may have to be employed to target individual households. But at a village level it may be possible that a programme may benefit all the residents of the area. Lavelle *et al.* (2010) states that geographic level such as the village and/or households generally share the same climatic, geographic conditions, productive activities, infrastructure, access and so inequalitiesamoung households tend to be smaller.

Ravallion and Wodon (1997) show that in Bangladesh geographic location is of great importance as a predictor of poverty than other household characteristics and the conclusion was that differences in returns to household characteristics such as labour force for their human capital depended on geographic area affecting their livelihoods. Efficiency of geographic targeting depends on the level of concentration of the most vulnerable in the area. In most cases households are heterogeneous and resources are limiting which may affect the inclusion and exclusion errors when this type of targeting is conducted.

Table 2.1 Summary of key features of commonly used techniques for household targeting for development and relief

Techniques (plus source)	Description of the Approach	Strengths	Weaknesses/Gaps
1. Geographic targeting (Hoddinott, 2001)	Entails selecting an area because of its peculiar characteristics and everyone benefits by virtue of being in that area	It has low administrative costs as everyone is targeted, works better in small geographic area	It assumes households are homogenous but in reality they are heterogeneous, and resources are limiting which may affect the inclusion and exclusion errors when this type of targeting is conducted.
2. Community-based targeting (Grosh, 1994; Bailey, 2008)	Community members select themselves. Communities choose the households that they know to be vulnerable and these tend to bring conflicts and are subject to corruption.	It is simple and inexpensive; approach depends on good facilitation skills, done in order to maximize the benefits of the intervention while minimizing the costs at the same time.	May lead to inconsistencies in terms of interventions that may be implemented in the community and may also overstate vulnerabilities.
3. Proxy-means testing targeting (HallieEaking and Bojorquesz-Tapia, 2006).	Entails calculating a synthetic score on the basis of easily collected indicators of vulnerability using weighted algorithm.	Ensures uniformity across a selected community but may differ among different communities. Vulnerability can be calculated to a single digit that makes ranking households easy.	It is based on previous analytical work and periodic updates to establish proxy variables and weights which might make it expensive if not properly planned and managed.

2.4.2 Community-based Targeting

Grosh (1994) describes different types of household targeting that can be used such as community-based identification, which is simple and inexpensive. However, it may lead to inconsistencies in terms of interventions that may be implemented in the community and may also overstate vulnerabilities. This method demands that skilled staff carry out Participatory Rural Appraisals (PRAs). Effectiveness of this approach depends on good facilitation skills, which are paramount for clearly communicating issues to members of the community in question. This is done in order to maximize the benefits of the intervention while minimizing the costs at the same time. Communities choose the households that they know to be vulnerable and these tend to bring conflicts and are subject to corruption (Bailey, 2008).

The strength of the community selection process is that it enables community members to participate fully and actively. However, WV tries to verify and triangulate targeting information from the community. The challenge is that the community ranking usually bring tension between the beneficiaries and the non-beneficiaries. In development work of Rushinga this methodology has resulted in the same beneficiaries participating in almost all interventions that come in an area during the lifetime of a programme that lasts 10-15 years. The PRR and HVI endeavours to ensure community participation in creating a database where all possible areas of livelihoods are identified and the true vulnerability showed for each household.

2.4.3 Proxy-means testing

Inconsistencies that result from the community-based targeting can be addressed using a proxy measure of vulnerability. This entails calculating a synthetic score on the basis of easily collected indicators of vulnerability. The weighted algorithm that is used ensures uniformity across a selected community but may differ among different communities (HallieEaking and Bojorquesz-Tapia, 2006). If there is no evidence of community participation, the result may be regarded as arbitrary, especially if communities and households fail to understand it. Therefore, it is critical that communities participate and have a clear understanding of the methodology applied. A weakness of the weighted algorithm is that it is based on previous analytical work and periodic updates to establish proxy variables and weights which might make it expensive if not properly planned and managed.

2.4.4 Productivity Requirement Ratio

The consortium of World Vision Zimbabwe, Catholic Relief Services (CRS) and CARE International in Zimbabwe had a variety of food security interventions. Traditionally, vulnerable beneficiaries were selected based on what communities perceived to be vulnerability (through facilitation process conducted by the implementing agencies). Before the introduction of the productivity requirement ratio (PRR), beneficiary selection procedure used a set of vulnerability criteria and households were ranked in a participatory process. The beneficiary list would be determined during the participatory process. However, the PRR beneficiary targeting process is based on the participatory household vulnerability ranking through community-based selection and also the calculation done on the potential of the household to meet its cereal requirements. Potential agricultural productivity (human capacity and productive assets) on the household's land and value of livestock it can sell during the year is compared to its cereal requirement in a ratio called Productivity/Requirement ratio (PRR), (USAID, 2007).

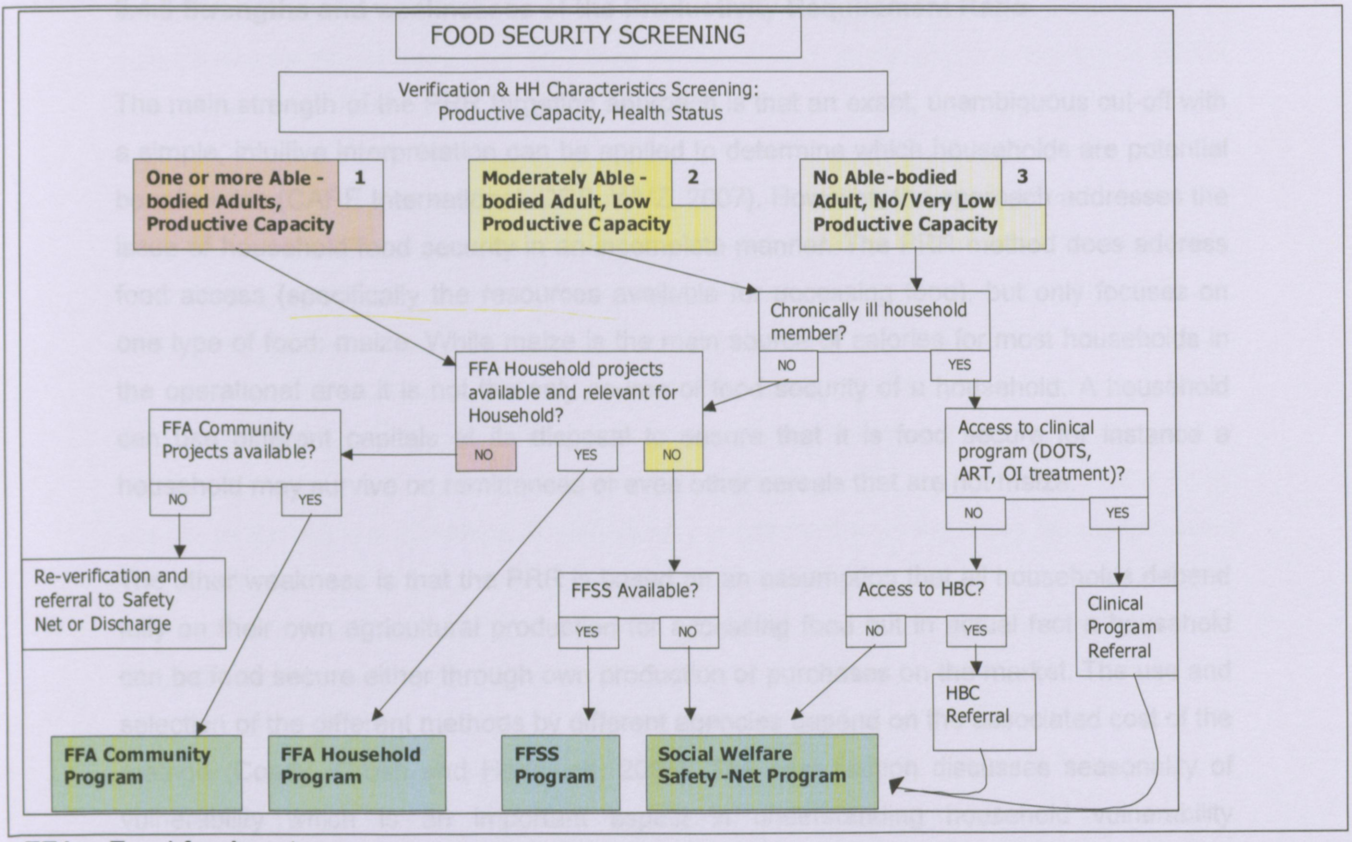
Summary of how the PRR was being used to select beneficiaries for different programmes is presented in Figure 2.2 where programmes such as Food for Assets, Food for Social Services and the Safety Net programs in relief work were done.

The PRR is intended to be a comparison between a) the amounts of cereals a household has access to through its agricultural production; and b) its cereal requirement. The household's access to cereals is assumed to be determined by five factors:

1) current stocks;
2) human capacity, a function of age, health status and disability status;
3) ownership of productive assets, including draft power and implements;
4) yield potential of land; and
5) ownership of livestock that can potentially be converted to cereals through sale.

A mathematical equation relating these five elements produces a single value of kilograms of cereals a household can access, which is then the numerator of the ratio. The denominator is the households' cereal requirement, based on household size and the health and disability status of its members. If this PRR ratio is greater than "1" then the household can meet its cereal requirements; if it is less than one then it cannot (CARE International, CRS, WVZ, 2007).

Community rankings and a follow-up verification survey complement the PRR in the final selection of beneficiary households.



FFA – Food for Assets

FFSS – Food for Social Services

HH – Households

ART – Anti Retroviral Treatment

DOTS – Stop TB Strategy

Figure 2.2 : Productivity Requirement Ratio determination of appropriate intervention for each household

Source: CARE International, CRS, WVZ, 2007.

2.4.5 Strengths and weaknesses of the Productivity Requirement Ratio

The main strength of the PRR targeting approach is that an exact, unambiguous cut-off with a simple, intuitive interpretation can be applied to determine which households are potential beneficiaries (CARE International, CRS, WVZ, 2007). However, the approach addresses the issue of household food security in an incomplete manner. The PRR method does address food access (specifically the resources available for accessing food), but only focuses on one type of food: maize. While maize is the main source of calories for most households in the operational area it is not the only source of food security of a household. A household can use different capitals at its disposal to ensure that it is food secure for instance a household may survive on remittances or even other cereals that are not maize.

The other weakness is that the PRR is based on an assumption that all households depend fully on their own agricultural production for accessing food but in actual fact a household can be food secure either through own production or purchases on the market. The use and selection of the different methods by different agencies depend on the associated cost of the method (Coady, Grosh and Hoddinott, 2004). The next section discusses seasonality of vulnerability which is an important aspect in understanding household vulnerability dynamics.

2.5 The use of Indices in Vulnerability assessments

Approaches to vulnerability differ according to disciplines and the use of composite indices varies (Vincent, 2007; Brooks, Adger and Kelly, 2005; Cutter, Boruff and Shirley, 2003; Moss *et al.*, 2001). Indicator-based analyses are critical in identifying, ranking or distinguishing among units of analysis for the purpose of informing resource allocation, or targeting support programs or other interventions (Eakin and Tapia, 2007). The indicator-based approaches to vulnerability that have been undertaken at the national scale have permitted the ranking of geographical places (Moss *et al.*, 2001; Brooks *et al.*, 2005) through the use of indices such as the Environmental Vulnerability Index and the Commonwelth Vulnerability Index as has already been highlighted.

The use of indices has allowed spatial comparisons through the use of existing data sets mapped to theoretical concepts associated with vulnerability (Eakin and Tapia, 2007). Moss *et al.* (2001) notes that one substantial drawback of national-level indicators is the variability at distinct scales of analysis depending on the variables under consideration. Despite the variability of the indices, they are critical in gaining insights into the sources and cause of vulnerability for households that may face similar shocks in the same environment (Eakin and Luers, 2006; Brooks *et al.*, 2005; Yohe and Tol, 2001)

The vulnerability indices can thus be used to assess a household's degree of membership to different classes of vulnerability in order to analyze different sets of specific household characteristics in this case being the five capitals and the variable descriptions that are associated with vulnerability. There are however challenges that are faced in the creation of an index such as the heavy reliance on data. This has led to the use of secondary census data that is not frequently collected hence can mask the frequent dynamics of vulnerability due to lack of frequently collected data (Vincent, 2007; Alwang*et al.*, 2001). Hence this study sought to assess the dynamics of vulnerability in different seasons since household- level vulnerability can be very dynamic. Household can move in and out of vulnerable states in relatively short periods of time (Alwang*et al.*, 2001) hence this has a bearing on the classification of households.

The calculation of different indices uses different approaches. This study is however based on the livelihood approach. This approach has been suggested at a local scale to group households according to their associated assets and activities through the use of qualitative and quantitative means (Ellis, 2000; Scoones, 1998). The classification provides insights into the varying implications of socioeconomic and environmental shocks for households pursuing particular types of strategies for the household's survival. (Eakin, 2005; Eriksen and Brown, 2005).

2. 6 Summary of Review of Literature

Although literature and several studies have brought out the importance of vulnerability index as a way of classifying vulnerable units either for nations or households, no emphasis really has been made so assess how these compare to the other conventional methods of selection or classification such as the community-based approaches. Literature has revealed that most of the studies on vulnerability approaches do not look at the household in a holistic manner, assessing all the capitals that a household is able to tape from for its survival hence indicating its coping capabilities.

These indices are developed as a way of addressing problems of vulnerability classification in the face of limited resources such that a household that is vulnerable can easily be identified and prioritized.

The FANRPAN HVI does look at the household coping mechanism using the livelihood approach. It poses that it is not sufficient for a household to be selected in programming intervention without assessing how the household utilizes its capitals. Relatively limited research has applied the concept of vulnerability to the analysis of socio-economic conditions of households. The study builds on this to assess the spatial differences of vulnerability using the index, the seasonality in the classification and the comparison of the HVI classification and community-based classification.

CHAPTER 3DETERMINANTS OF HOUSEHOLD VULNERABILITY AND LIVELIHOOD STRATEGIES

3.1 Introduction

The Food and Agriculture Organisation Informal Working Group on Participatory Approaches and Methods (FAOIWG) defines participation in development as a process of equitable and active involvement of all stakeholders in the formulation of development policies in all the stages. This allows for a more equitable development process, disadvantaged stakeholders need to be empowered to increase their level of knowledge, influence and control over their own livelihoods, including development initiatives affecting them (FAO, 2007).

Participatory research is to be included in any project as it is indispensable for the collection and analysis of the necessary information on the action areas and the disadvantaged people (Heck, 2003). In recent years, participatory methods have increasingly been used in national poverty assessments, initially for enabling the poor to express and analyse their priorities and realities (Pimbert, 2004). Participatory Poverty Assessments (PPAs) are promoted for instance by the World Bank, with the stated aim of helping the perspectives and priorities of the poor influence development cooperation and national policies (Norton and Moser, 2001).

United Nations Economic Commission for the Asia and the Pacific,describes dimensions that keep the poor trapped as a lack of income and productive assets. They also identified a lack of access to essential economic and social services as well as a lack of power, participation and respect as also contributing to the poor being trapped in their situation. Participatory approaches are complemented by the use of a *sustainable livelihoods framework*, which considers that a livelihood comprises the capabilities, assets and activities required for a means of living (UNESCAP, 2008). This study adopted the view expressed by UNESCAP of engaging community to actively participate in assessing their own vulnerabilities using the livelihood framework. The communities defined capitals in their context and gave weights to each capital depending on the significance of that asset in their livelihood as a community.

This chapter assesses the importance of community participation in the identification and definition of variables that communities consider when ranking household vulnerability and assigning weights to livelihoods strategies. It also covers methodology, results and the summary of the discussion.

3.2 Description of the Study Area

RushingaDistrict is located 215 km to the north-east of Harare, the capital city of Zimbabwe. The RushingaDistrict is located within Mashonaland Central Province. It is found along the northern Zimbabwe-Mozambique border. The southern part borders with Mashonaland East Province with Mazowe River serving as the demarcation area. There are 26 wards in RushingaDistrict. The Area Development Programme (ADP) was introduced by World Vision in Rushinga in 2004 after realising the needs of the people in that community. However, the ADP covers only nine wards namely Ward 1: (Mukosa), 2: (Chapinduka), 3: (Chitange), 4: (Bopoma), 5:(Makuni), 19: (Nyamanyanya), 21: (Nyanhewe), 20: (Kasika)and 22: (Nyatsato) (figure 3.1).

Rushinga is poverty stricken mainly due to its historical legacy and geographical location (WVZ, 2007). The area was adversely affected by the war of independence that was fought in Zimbabwe (1960s and 70s) and the subsequent civil strife in Mozambique. The civil war in Mozambique spread into the areas bordering Zimbabwe and Mozambique resulting in considerable human displacement and loss of lives. Because of this, Rushinga lags behind in terms of development.

The studywas covering the ADP area which is the nine wards. The area is mountainous, which reduces the land area suitable for farming. It falls in the agro-ecological region four (Vincent and Thomas, 1961) which is characterised by low rainfall of about 465mm/year and high average temperatures that reach 38°C. The rainfall is poorly distributed annually and seasonally. This result in intermittent seasonal rivers, only Mazowe River flows throughout the year

Due to the low rainfall received in the area, cotton and other drought tolerant crops such as millet and sorghum are successfully grown. The vegetation is characterised by Baobab trees that can thrive in hot and dry areas (World Vision Zimbabwe, 2004).

Rushinga ADP has been implementing both relief and development work since 2004. The area has been chosen for this particular study because different approaches have been used in targeting beneficiaries for the interventions that are brought into the area.

3.3 Research Methodology

The research design, population and sampling procedures that are described in this chapter are to empirically test the objective which sought to determine how social groups in the community assigned weights of vulnerability to the capitals at their disposal and these were compared to those of the FANRPAN HVI. The hypothesis which states that community weightings of vulnerability do not significantly alter the HVI indices within communities inRushingaDistrict, was empirically tested.

3.3.1 Research Design

A case study was done in which selected social groups were investigated in great detail concerning their assets and capabilities for their livelihoods. Exploratory design was also used as community's defined vulnerability and its variables in their context. Qualitative approach was adopted to empirically answer this objective. This study utilised both primary data and secondary data. Primary data was collected using both qualitative and quantitative methods. Secondary data was drawn from FANRPAN values that had been collected using literature review. The primary data collected was then compared to the secondary data available.

3.3.2 Population, sampling frame and procedures

In the research presented here, modified ten seed tool was used to assign weights to indicators and the household survey was done to collect information used to compute the vulnerability indices. When assigning of weights, different social groups (men, women, youth and local leaders) were sampled (4 groups in each ward for all the nine wards). Community leadership was engaged to mobilize people according to the above mentioned social groups. People who were willing to participate were mobilized but were limited to a maximum number of 15 for each group for effective participation (Cornwall and Guijt, 2004).

The community interest groups that were engaged were women aged thirty-six to sixty years as well as men aged thirty six to sixty years. The youth comprised of male and female within the age categories of 18-35 as described by the country of Zimbabwe (Central Statistics Office, 2000). Community leaders comprised traditional leaders, development committees, and support group leaders. The support groups comprise of members of the community that unite to provide services as caring for the people living with HIV/AIDS as well as those that care for orphans.

The Focus Group Discussions, enlightened the research to assess how the weightings or views on vulnerability differed by each group. It was also of great importance to assess how the community leaders' views differed from the rest of the community. In many development programmes local leadership is called to represent the perception of the rest of the community, the data provided insight into the development strategy of calling local leadership. A total of thirty-six focus group discussions were conducted.

A household survey was conducted for all the households in the area. At household level information on the five capitals and capabilities were collected.

The diverse types of data that was collected that describe household characteristics for example continuous, nominal and ordinal were calculated using fuzzy logic based on the theory of fuzzy subsets for the construction of an index including the different dimensions (attributes) of vulnerability (Dagum 2002). In this approach, the vulnerability of a person is identified by its degree of belonging to the fuzzy sets, and this respectively to each of the attributes of vulnerability (Costa 2002). The degree of belonging is determined by the degree of possession of the attribute, which may take the value one or zero interval [0, 1] (see Appendix 1, Fuzzy sets developed by FANRPAN). Using the weights from focus group discussions and data from household survey the data was aggregated into a single index to allow for classification.

3.3.3 Data Collection

A total of thirty six focus groups discussions were conducted in assigning of weights on the different livelihoods strategies. During the discussions communities were engaged to get perceived definition of vulnerability. The ten seed tool is a rapid participatory learning tool that is useful in gathering qualitative information on various issues (Jayakaran, 2002). The modified ten seed stimulates discussion and ranks different issues according to their importance.

Unlike the ten seed tool, this study engaged the community using hundred stones in allocating weights to the different capitals depending on how significant it was to their lives. The members allocated the stones according to what they believed to be critical factors, the most important determinant of vulnerability to poverty getting the most stones, followed by the next important one and so on until the least important capital. As a group each focus group discussed the allocation and redistributed the stones accordingly until what the whole group believed to be the true situation in their area was reflected. The number of stones allocated per each capital were recorded. The groups went on to redistribute the stone allocated to each capital among variable descriptors under each capital using the same process of assigning weights and ranking.

Enumerators were hired from local students and were later trained on facilitation skills. As part of the training, pre-test were done to ensure that students had understood the process of engaging the community. Each focus group discussion had a facilitator, two note takers and an observer. The lead researcher participated in the exercise by ensuring data quality through being part of the FGD discussion of all the groups during the process. The FGD were conducted in a manner that enabled active involvement and participation by all members managing both the quiet (so that they actively participate) and the dominant members managed to give a chance for others to contribute. Each FGD wrote its perceptions on the flipchart and discussed until consensus was reached in both defining and giving weights to the five capitals. Each FGD would then present in plenary to the rest of the groups on what they would have come up with. Each ward was covered in a day and a total of four focus group discussions were done per day. All the flipcharts were labelled to reflect the group composition, the ward for processing and data entry. Daily reflections of the process was done and feedback was given to the enumerators by the lead researcher. The lead researcher supervised the data collection and ensured that the questionnaires had been adequately completed.

Views from the community were gathered through brainstorming and open discussion. One hundred stones were used because they help reduce the error of calculating to percentages as in the case when fewer or more stones are used. This also reduces the rounding off error, so the exact mathematical values were derived from the discussions.

3.3.4 Variables for secondary data collection

Fifteen impact areas that fall within different livelihood assets or dimensions were used as identified through the 2004 FANRPAN study (Sibanda and Kureya, 2007).The following are the key assumptions of the index:

a) It assesses five capitals (natural, human, physical, financial and social) and assumes that the bulk of households in that community have similar characteristics ie mostly subsistence farmers,
b) Households have mixed livelihood options, and draw some form of livelihood from each of the capitals.

c) The minimal set of questions each household was asked was necessary and sufficient for comparing through principal component analysis done for the variables by FANRPAN

3.3.5 Data capturing, cleaning and analysis

The results from the focus groups discussions were organised according to the different thematic areas based on the livelihood framework. The capitals were the financial capital, human capital, natural capital, social capital and physical capital. The themes were consolidated according to the perceptions of youth, women, men and leadership. The consolidation of perceptions was done according to the FGD guide such that the data was presented according to the themes that emerged during discussions.

The data that was collected from the social groups weighting process of the livelihood capitals was entered in excel. The data was entered according to the perceptions on the weights of the youth, men, women and leaders. Average weights were consolidated based on the social groups. The weights were then compared to the average weights of FARNPAN. Level of significance was calculated values using hypothesis test for proportions. The hypothesis test was done since the purpose was to assess the differences between sub populations' means with different sample sizes (Poate and Daplyn, 1993). The hypothesis test for proportions were done using the t-tests for small proportions since thirty-six focus groups discussions were done. A 95% and 90% significant levels was done to determine the range within which the null hypothesis values will be expected to lie (Poate and Daplyn, 1993). Online calculators for hypothesis test for proportions were done on www.wessa.net/rwasp_hypothesispro2.wasp.

Table 3.1 Impact areas and variables that were used to measure household vulnerability by FANRPAN

Impact areas	Indicators
1. Optimal farm-household production decisions	Nitrogen fertilizer use for staple crop Staple cereal output per capita
2. Changes in household demographic structure and labour availability	Proportion of sick members Who is regularly sick Dependency ratio
3. Changes in household productive physical capitals	Ownership of plough or ox-drawn cart Productive livestock index Livestock sales index
4. Sustainability of household food and nutrition security *(food accessibility and utilization)*	Number of meals per day Regular source of financial resources Household nutrition diversity
5. Impact on household Market Access	Use of revenue from crop sales
6. Agricultural extension services	Access to extension services
7. Changes in household income and expenditure patterns	Expenditure patterns Expenditure of additional resources
8. Changes in household productive financial capitals	Reliance on bank savings Amount of credits received Presence of unpaid debt
9. Impact on household investment choices	Farm equipment purchases and sales Livestock purchases and sales
10. Access to behavioral change information	Sources and quality of information on HIV and AIDS Sources and quality of information on agriculture
11. Changes in household productive natural capitals	Loss of land % land utilization
12. Mobility of household members	Household disintegration due to HIV and AIDS
13. Gender implications	Age and gender of household head
14. Support networks	Two types of support from government, NGOs and local community Areas in which support completely met household requirements Number of social networks
15. Environmental degradation	% field fertilized by natural means Management and use of forest products

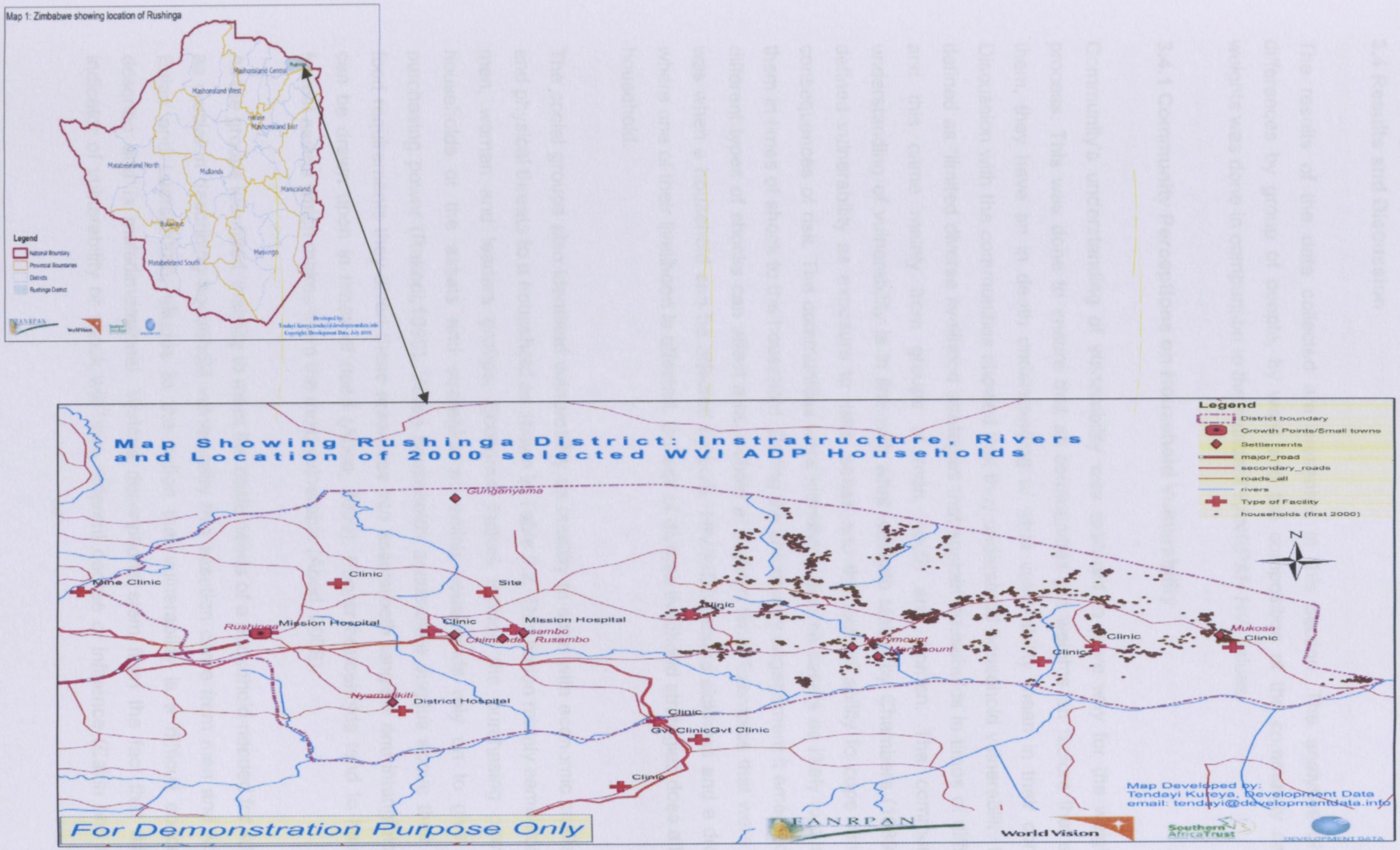


Figure 3.1RushingaDistrict Map showing the coverage of the ADP in which World Vision Operates thus being the area of the study

3.4 Results and Discussion

The results of the data collected are presented in this section. The analyses of the differences by group of people, by ward and the composition of the community capital weights was done in comparison to the standard FANRPAN HVI values.

3.4.1 Community Perceptions on Household Vulnerability

Community's understanding of vulnerability was explored to pave way for the weighting process. This was done to ensure that as communities put weights on factors that affect them, they have an in depth understanding of what vulnerability mean in their context. Discussion with the communities showed that they understood household vulnerability to be defined as "limited diverse livelihood strategies that sustain households in times of difficulty and this came mainly from groups of men, youth and women. The communities understanding of vulnerability is in line with what wasaslo stated by Chambers (1989)who defined vulnerability as exposure to risks, stress and the lack of ability to cope with the consequences of risk. The communities were identifying diverse assets as likely to cushion them in times of shock to the household. During the community engagement it emerged that different types of shocks can affect a household at a given time. Examples that were cited was when a household can be affected by both HIV/AIDS related sickness and a drought where one of their livelihood is affected. So lack of diverse livelihood strategies does affect a household.

The social groups also identified vulnerability as inability to cope with economic challenges and physical threats to a household as shown in Table 3.2. This notion mainly came from the men, women and leaders groups. Economic factors include the purchasing power of households or the assets and strategies on which households rely on to give them purchasing power (Rakodi,1999). When households accumulate surplus above their basic food requirements they divert these resources into assets(both tangible and intangible) that can be drawn upon in times of need (Abed, 2009). Poorer households tend to have the fewest assets which makes them the most vulnerable (Abed, 2009).

All the groups identified 'inability to meet the basic needs of a household needed for survival' as crucial in describing household vulnerability this assetion came from men and women. Eakin and Luers(2006), alludes to the notion that vulnerability is a difficult concept to describe and is multidimensional. Various descriptions stem from the fact that different indicator of vulnerability or shock will have different degree of influence (Eakin and Luers, 2006). Inability to meet basic needs is related to the deterioration of primary livelihood system for the household leading to increased impoverishment as they fail to meet basic needs (Chambers, 1989).

The community also explained household vulnerability as lack of productive assets at home. It emerged during discussions that the loss or lack of productive assets affect the household's means of survival hence makes them vulnerable. Dilley and Boudreau (2001) make a distinction between vulnerability to hazards (which may or may not lead to disasters depending on how the risk is handled) and vulnerability to negative outcomes such as starvation, loss of productive assets. A negative outcome of lack of productive assets results in vulnerability according to the community's perception.

The compounding effect of lack of livelihood strategies and lack of productive assets results in the household's inability to meet the basic needs required for survival (Slatter and Farrington, 2010). The linkages between livelihoods and vulnerability can be clearly identified and analysed using the livelihoods framework approach (DFID, 2000). The sustainable livelihood approach grew from the recognition that the improvement in the lives of the poor is not just about income but that there are different assets and capabilities that a household can utilise for survival (DFID, 2000).As the communities were defining vulnerability they were touching on different aspects of the livelihood approach.

An analysis of exploring ten detailed exploratory studies on the livelihoods oriented interventions in Tanzania, South Africa, Uganda and Lesotho revealed that it is people centred and listens to what the poor people themselves have to say (Franks, Toner, Goldman,Howlett, Kamuzora, Muhumuza, Tamasane, 2004). The approach understands that poverty is multidimensional and therefore analyses vulnerability that affects people's lives (Franks et. al, 2004). The study went on to engage people to understand the variables that are under each of the five capitals.

3.4.2 Comparisons within and between each capital

The determinants of each capital were done to assess how the composition of community and HVI standard differed and the key issues that the communities consider in defining vulnerability to the assets at their disposal. Approaches to assessing vulnerability and adaptive capacity through the use of composite indices have been proposed in recent years which are indicator based analyses (Vincent 2007, Brooks *et al.*, 2005).

Table 3.2 Household Vulnerability definition from community perceptions

Dimensions household vulnerability	Men (n_m = 108)	Women n_w=135	Youth n_y = 101	Leaders n_l= 108	Total n_t= 452
1. Limited diverse livelihood strategies that sustain households in times of difficult times	IIIII IIII	IIIII	IIIII II	IIII	25
2. Unable to cope with economic challenges and physical threats to a household	IIIIII	IIIII	II	IIIII	18
3. Lack of productive assets at home	III	III	II	III	11
4. Inability to meet the basic needs of a household needed for survival	IIII	III	II	II	11
5. Household that have potential for loss in hard times	I	II		1	4
6. Inability to deal with loss at a household level	I	I	I		3

Smit and Wandel, (2006) argue that the determinants of vulnerability are necessarily dynamic depending on the stimulus under consideration. However engaging communities on indicators under each livelihood capital can be used to gain insights into the causes of vulnerability. Using a livelihood approach, (Scoones, 1998) the survey collected data on household assets and capitals (financial, human, physical, natural and social). The results of the comparison per each capital is discussed below.

3.4.2.1 Natural Capitals

Under natural capital, the following variables were considered: soil fertility in relation to fertiliser use, environmental management and land use in food production. During the discussions it emerged that under natural capital, vulnerability increases as soil fertility declines when application of natural fertilisers reduces. Vulnerable households rely more on the environment for free products such as wild fruits and these households do not fully utilize their existing land. They also face barriers of access to land for agriculture (Odenya, 2003).

Different studies have identified different indicators under the human capital, for instance a study done by CARE international (2002), for the KanalNargar community in the Mongria region of Bangladesh showed that under natural capital the community prioritised the forest, land type, soil fertility, flooding as important vulnerability factors. This shows how each community can interact with a capital asset depending on the shocks they experience, in this case it implies that flooding was an important descriptor.
The community put more weight on environmental management, limited labour and land use than the weight for FANRPAN HVI standard as an indicator for the vulnerability level of the Rushinga community. The weighting of fertiliser use as an indicator of vulnerability was the same for the community and HVI standard. Rushinga community rely on agricultural production (WVZ, 2004) hence a household that does not have access to the natural capital is vulnerable.

Odenya (2003) analyzed the effects of HIV/AIDS on the livelihood activities at the household. He states that weeding and other inter-cultivation measures may be neglected as a result of labour and input shortages. Some families may abandon traditional practices such as mulching which replenish the soil, or may sell livestock which would otherwise provide manure, thus reducing soil fertility.

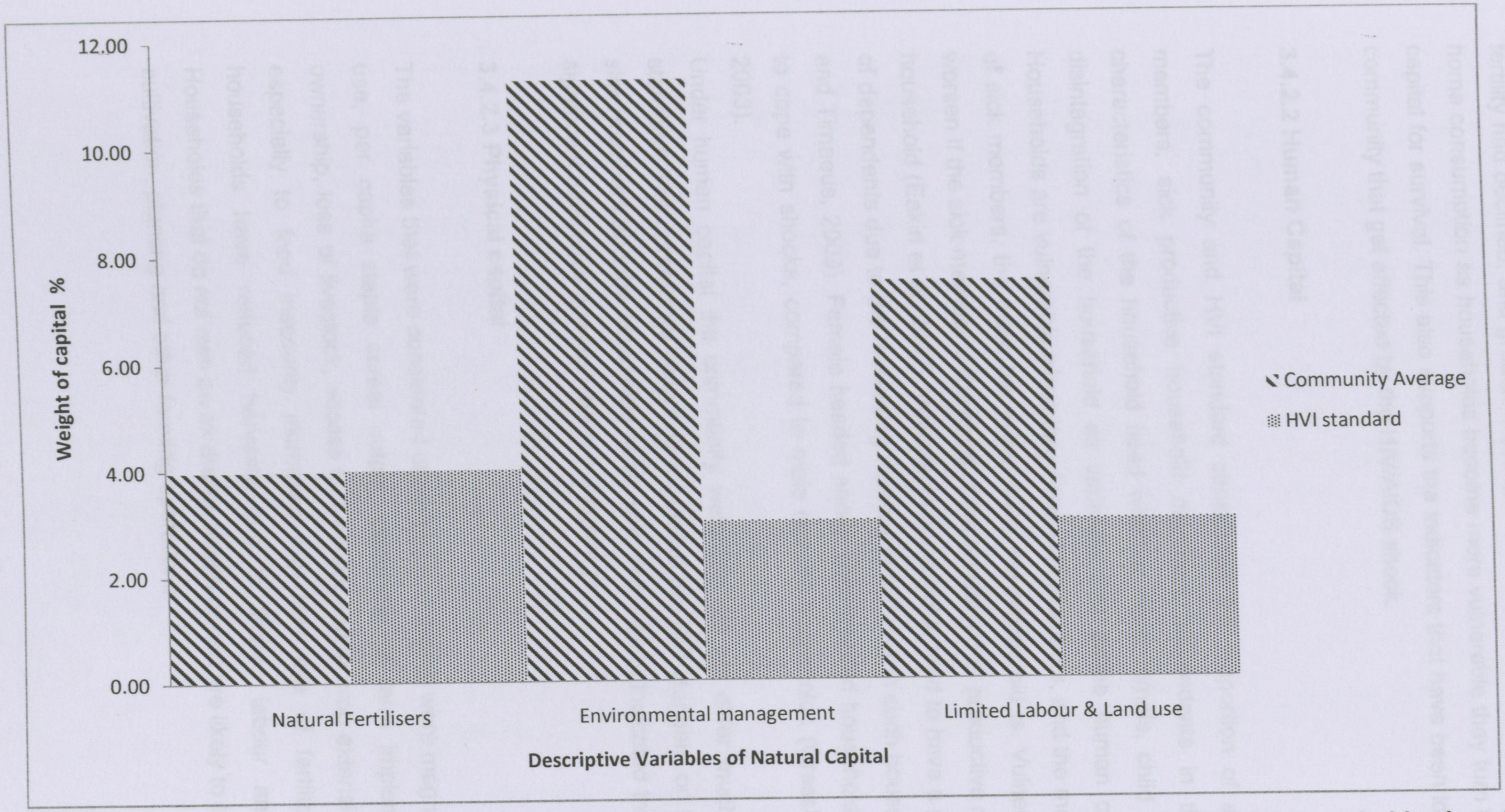


Figure 3.2 Descriptors of weights for natural capitals from Rushinga Community perspective and FANRPAN household vulnerability index

In a study done by Odenya (2003), about 60 % of the respondents indicated that soil fertility had declined, and greater exploitation of fuel wood for sale and wild foods for home consumption as households become more vulnerable they turn to their natural capital for survival. This also supports the indicators that have been identified by the community that get affected by the HIV/AIDS shock.

3.4.2.2 Human Capital

The community and HVI standard considered the proportion of sick household members, sick productive household members, dependants in the household, characteristics of the household head whether male, female, child or elderly and disintegration of the household as variables that define human capital Fig 3.3. Households are vulnerable when they have sick members, and the more the number of sick members, the more the vulnerability the household is. Vulnerabilty tends to worsen if the sick member is the head of the household or productive members of the household (Eakin et al, 2007). Vulnerable households tend to have a greater number of dependents due to the increasing number of orphans in such households (Grassly and Timaeus, 2003). Female headed and/or child headed households are less able to cope with shocks, compared to male headed households (Grasslyand Timaeus, 2003).

Under human capital the community weighting did not differ much from the HVI standard. The community weighting exceeded the HVI standard on the variables of sick members and the household head sick. The T-tests indicated that there was no significant difference between the two weightings.

3.4.2.3 Physical capital

The variables that were considered under physical capital were magnitude of fertiliser use, per capita staple cereal output, ownership of farm implements, livestock ownership, loss of livestock, access to livestock and/or crop extension. Vulnerability especially to food insecurity increases with less use of fertilizers. Vulnerable households have reduced harvests due to limited labour and draft power. Households that do not own an ox drawn plough or cart are likely to face difficulties in cultivation, planting and other farming operations.

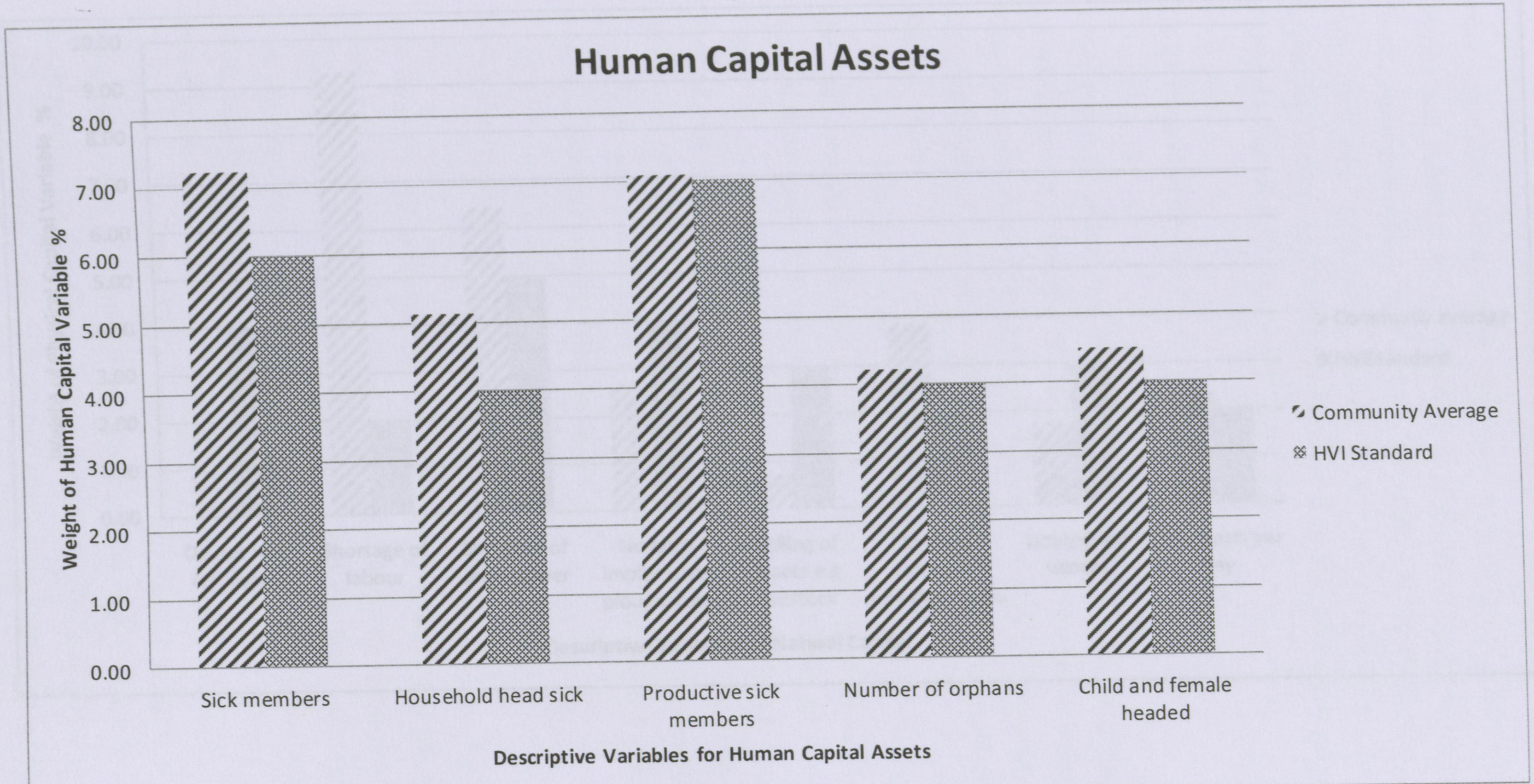


Figure 3.3 Descriptors of weights for human capital from Rushinga perspective and FANRPAN household vulnerability index

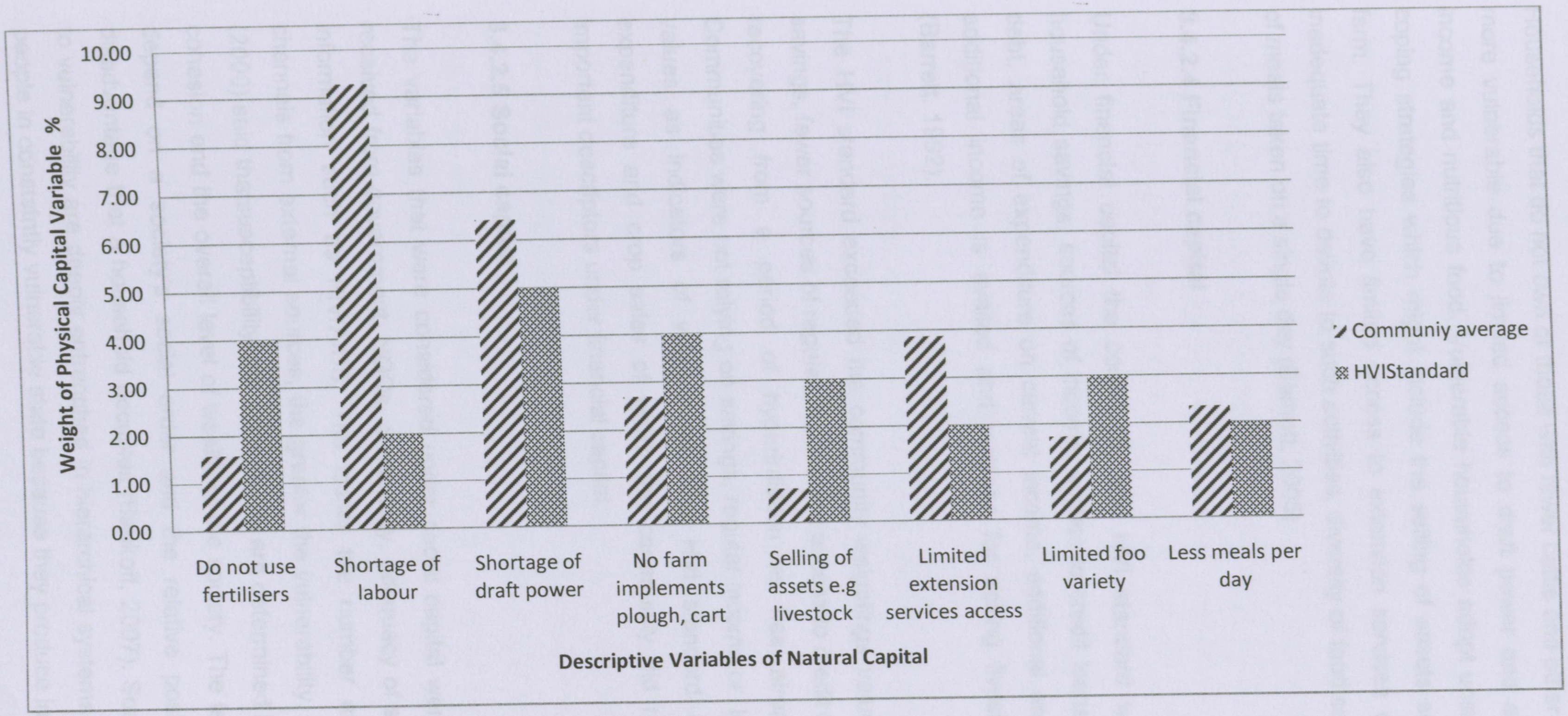


Figure 3.4 Descriptors of weights for physical capitals from Rushinga community perspective and FANRPAN household vulnerability index

Households that do not own or those with fewer cattle and other livestock species are more vulnerable due to limited access to draft power and alternative sources of income and nutritious food. Vulnerable households adopt unsustainable short term coping strategies which might include the selling of assets such as livestock and farm. They also have limited access to extension services due to ill health and inadequate time to devote to such activities, diversity of food consumed and number of meals taken on a single day (Barnett, 2005)

3.4.2.4 Financial capital

Under financial capital the community and HVI standard weightings considered household savings, sources of income, access to credit loans, presence of unpaid debt, areas of expenditure on current income, additional areas of expenditure if additional income is availed and purpose for selling livestock/ harvested crop (Barrett. 1992).

The HVI standard exceeded the community weightings value on the variables of savings, fewer sources of regular income and access to credit or loans. Zimbabwe is recovering from a period of hyperinflation as has already been explained. Communities were not relying on savings, regular income or loansso they put lower values as indicators of vulnerability. The HVI standard considered additional expenditure and crop sales of which the community did not consider them as important descriptors under financial capital.

3.4.2.5 Social capital

The variables that were considered under social capital were the type of support received from government, NGOs, community, adequacy of support, and access to information such as HIV/AIDS. The lesser the number and quality of support channels from external sources, the greater the vulnerability. Barnett and Whiteside (2000) said thatsusceptibility and vulnerability are determined by the degree of social cohesion and the overall level of wealth of the society. The level of vulnerability will depend on a society's social order and the relative position of advantage or disadvantage that a household occupies (Bankoff, 2007). Social factors contributing to vulnerability are deeply entrenched in hierarchical systems as these can maintain people in conststntly vulnerable state because they produce inequality, exclusion and exploitation (Bailey, 2008).The community weighting did not consider access to information as a variable that describes the social capital. The HVI standard had more weight under external support than the community weighting (Figure 3.6).

3.4.3 Comparison of average community-defined and Household Vulnerability Index weights

The study showed that the weightings of the capitals namely human, financial, physical, natural and social differed between the HVI standards developed by FANRPAN and the community weightings of Rushinga community. According to the Rushinga community a household would be more vulnerable to a shock introduced to human capital which was given a weight of (28.3 %) and physical capital (28.6 %) then followed by natural capital (23.3 %) and these had been pegged at 25, 25 and 10 % , respectively in the standard HVI (Table 3.3). The community weighted financial capital at 12.6 % and social capital at 7.2 % of which these had been pegged at 25 and 15 % , respectively by the FANRPAN HVI (Table 3.3).

To test for significant differences, hypothesis tests for proportions were conducted (Table 3.3). The analysis indicated that there was significant difference between financial weights of the community ($P < 0.05$) and the standard HVI weights. The standard had put the values at 25 % but the community of Rushinga weighted financial capital at 12.6 % indicating that the absence of financial capital does not contribute significantly to vulnerability of the community. This is because Zimbabwe as a nation was recovering from a period of hyperinflation (World Vision Zimbabwe Strategy, 2009) and communities were relying on barter trading. Studies done also support this finding indicating that in most rural communities assets have more value compared to cash (Bankoff. 2007). The FANRPAN HVI had put more value on financial assets which was not supported by the perception of Rushinga community.

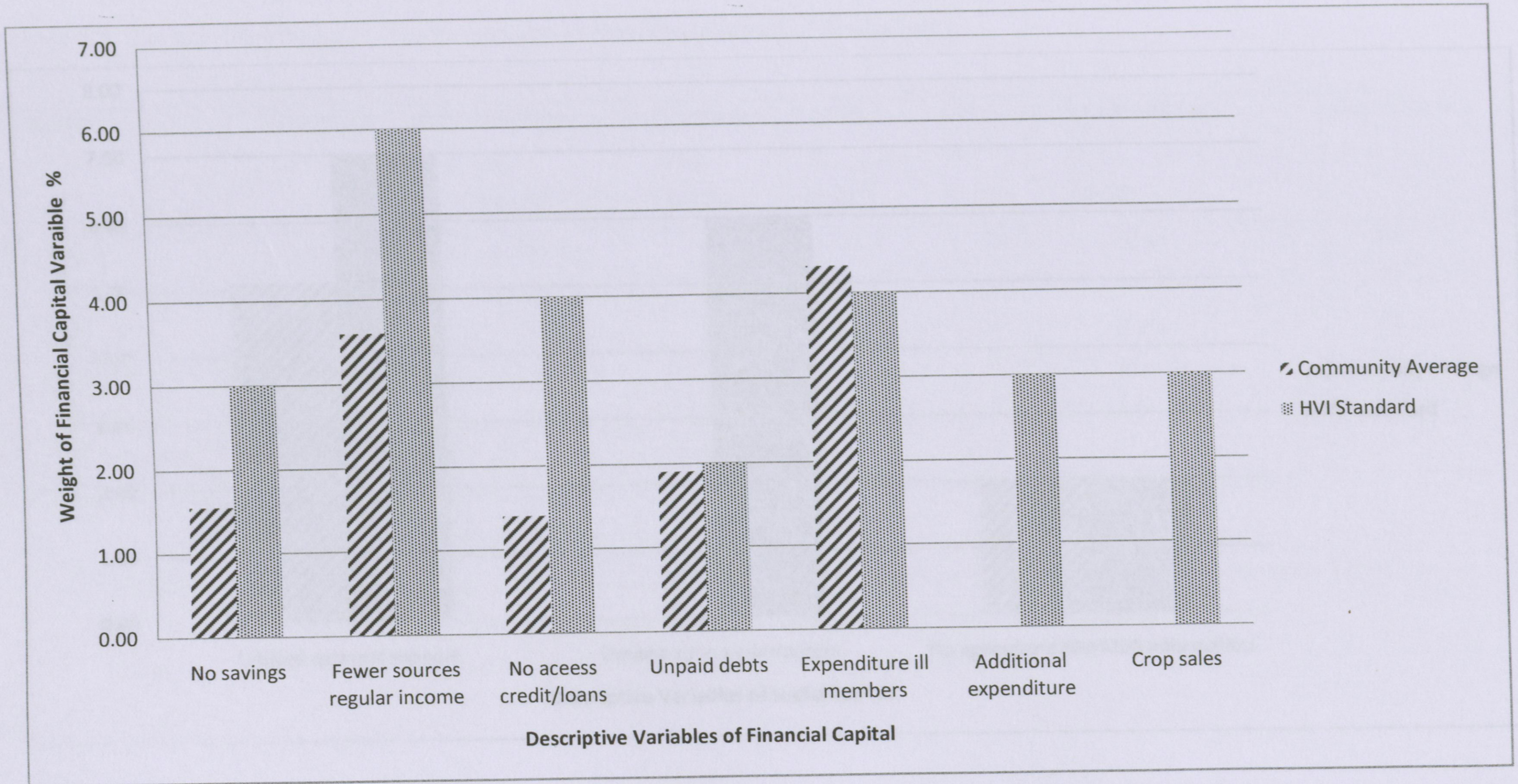


Figure 3.5Descriptors ofweights of financial capitals from Rushingacommunity perspective and FANRPAN household vulnerability index

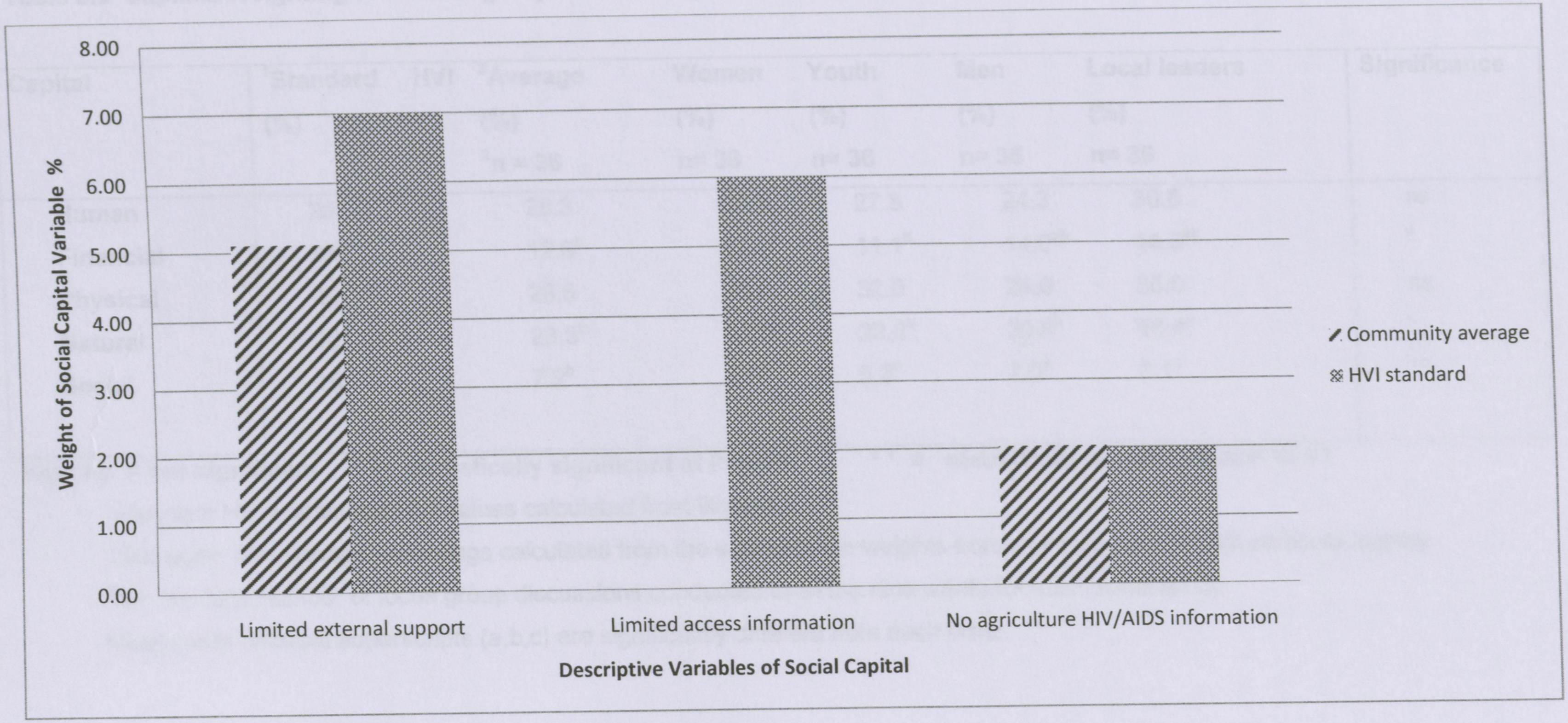


Figure 3.6 Descriptive Variables for Social Capital from Rushinga Community Perspective and FANRPAN Household Vulnerability Index

Table 3.3 Capitals Weighting of interest groups in RushingaDistrict of Zimbabwe

Capital	[1]Standard HVI (%)	[2]Average (%) [3]n = 36	Women (%) n= 36	Youth (%) n= 36	Men (%) n= 36	Local leaders (%) n= 36	Significance
Human	25	28.3	30.3	27.8	24.3	30.6	ns
Financial	25^a	12.6^b	11.2^b	11.1^b	14.0^{ab}	14.3^{ab}	*
Physical	25	28.6	28.5	32.0	24.0	30.0	ns
Natural	10^a	23.3^b	23.0^b	22.3^b	30.6^b	16.4^a	*
Social	15^a	7.2^b	7.0^b	6.8^b	7.0^b	8.1^b	**

Key: ns = not significant * = statistically significant at P<0.05 ** = statistically significant at P <0.01

[1]Standard HVI= standard HVI values calculated from literature

[2]Average= the average weightings calculated from the values of the weights from all the groups for that particular capital

[3]N= the total number of focus group discussions conducted in all the nine wards for each social group

Means with different superscripts (a,b,c) are significantly different from each other

There was also a significant difference betweenstandard HVI and community HVI for natural capital at ($P<0.05$). The standard HVI had put the value at 10 but the community put the value at 23.3 %. This is because Rushinga community practices agricultural production despite it being a dry area and experiencing recurrent droughts. The community indicated this in a participatory rural appraisal that was done by World Vision in 1994 that it is their major livelihood (WVZ PRA, 2004) such that a shock that affect their natural capital increases the vulnerability of that community. The community has been receiving food aid since 2002 after a Zimbabwe Vulnerability Assessment was done and categorised them as requiring food aid after recurrent droughts that were a shock to their natural capital (ZIMVAC, 2009). Analyses of the social capital showed that there was significance difference. The FANRPAN HVI had put a weight of 15 % whereas the community average was 7.2% of which further analysis indicated that there were significant differences at $P<0.01$. Discussions showed that the social capita was valued low because of the food aid programme which had just ended and was creating conflict in the area due to exclusion errors during beneficiary selection. Comparisons of the human and physical capital showed that there was no significant difference as well between community and standard household vulnerability weights.

3.4.4 Comparisons of community and standard weights by group

The results indicate that there was no significant difference for all the groups (Table 3.3) from the standard HVI weight under human capital. There was also no significant difference between the groups for all the capitals. The standard HVI weight can be used in the calculation of HVI indices for Rushinga community as the community weighting did not significantly differ from the standard weight.

Physical capital analysis also indicated that there was no significant difference between the community weights for men, women, youth and local leaders and that of the standard weight (Table 3.3). Although there was significant difference between standard weight and the average community weight for natural capital at $P<0.05$ not all groups differed significantly from the standard. The analysis indicated that women significantly differed at $P< 0.05$ and youth at $P<0.05$ for natural capital. The natural capital for men and local leaders did not differ significantly from the standard weight. The social community weight for men, women, youth and local leaders showed that they did not differ significantly from the standard weight ($P>0.05$).

3.4.5 Comparisons of group weights within each capital

An analysis of variance within and between the groups indicated that there was no significant differencesamong the groups of men, women, youth and local leaders within each capital (P>0.05). The weights assigned by the different groups represent a common shared understanding of the effects of shock to that particularcapital that would be a source of their livelihood. The mean values of the capitals weights reflect how the community of Rushinga utilise the five capitals at their disposal in the presence of a shock. There was no group that differed significantly from another group for all the capitals (P>0.05). In some capitals the difference for the groups was on how they differed from the standard weights but not among the groups themselves.

3.4.6 Comparisons of capital weights by wards

Comparisons of the community weights by ward were done to assess if there are any geographical differences on how the capitals affect the vulnerability of the households. Comparisons were done between the ward averages and the standard HVI weights (Table 3.4). There was significant differences between ward 19 (P<0.05) and the standard HVI weight for human capital and it was the only ward that showed significant difference. The ward had an average weight of 36 % against the HVI standard weight of 25. Discussion from the focus groups indicated that most people in this community are employed and the ward is nearer to the growth point compared to other wards.The financial capital was significantly different for ward 1, 2, 3, 19, 21 and 22 (P<0.05). All the wards were lower than the HVI standard weight.

Ward 22 was the only ward that was significantly different from the standard HVI weight at (P<0.05) for the physical capital. It had an average of 45 compared to the standard of 25. Analysis for natural capital showed that there was significant difference between the average for the (ward 5 and 19) and the standard weight at P<0.05. Social capital differed significantly between the averages for ward 1, 2, 3 and 20 and that of the standard HVI weight at P<0.05.

Table 3.4 Average community capital weights by ward

Type of capital	Standard HVI weights ased on literature (%)	Average Weighting % Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 19	Ward 20	Ward 21	Ward 22	Significance
Human capital	25^{a}	24.8^{a}	25.0^{a}	28.8^{a}	35.5^{a}	17.0^{a}	36.0^{b}	27.5^{a}	30.0^{a}	30.0^{a}	*
Financial capital	25^{a}	9.7^{b}	9.7^{b}	10.7^{b}	18.8^{a}	16.3^{a}	13.2^{b}	16.3^{a}	10.0^{b}	7.0^{b}	*
Physical capital	25^{a}	29.3^{a}	28.3^{a}	28.3^{a}	26.0^{a}	26.0^{a}	24.4^{a}	25.8^{a}	30.0^{a}	45.0^{b}	*
Natural capital	10^{a}	31.2^{b}	33.3^{b}	18.0^{a}	15.0^{a}	35.3^{b}	19.2^{a}	25.3^{b}	10.0^{a}	8.7^{a}	*
Social capital	15^{a}	5.0^{b}	3.7^{b}	14.2^{b}	4.8^{b}	5.5^{b}	7.2^{a}	5.3^{b}	15.0^{a}	6.7^{a}	*

Key: * = significantly different at $P<0.05$

3.4.7 Household Vulnerability Index: Household head implication

The analysis was done based on the household head type (child headed, elderly headed, female headed and male headed as in (Table 3.5). The values of the capitals changed based on whether the community weighting had differed positively or negatively from the standard HVI weighting. Where the community weighting had been given more value than the standard the indices of the capitals increased and where the values had been less the capitals values decreased.

The analysis of the overall HVI value, the inclusion of the community voice into the construction of the HVI calculation increased the indices. The average of the child headed HVI was 55.2 % before inclusion of the community voice but later moved to 57.2% after inclusion of the community voice and participation. The elderly headed household moved from 54.8 to 56.2% , female headed changed from 54.1 to 55.7 % and for the male headed household it moved from 50.1 to 52.2 % .

3.5 Conclusion

T-tests were conducted to assess if the indices were significantly different from each other. The inclusion of the community voice significantly changed the HVI for the social, financial and natural capital assets. These are the same capital assets that had community-based weights significantly different from the standard weights. For both the community and standard HVI weight the capital the community is most vulnerable to is the physical capital as these are the ones that had the highest values. Analysis of the overall HVI indices for the different categories of households indicated that there were no significant differences between indices calculated from community-based weights and standard weights.However although the overall indices did not differ the inclusion of the community voice provided insights on the capital assets valued

Table 3.5 Descriptive statistics of computed households vulnerability index (HVI) in RushingaDistrict of Zimbabwe

Type of capital	Category of household	Vulnerability assessment tool		
		Standard HVI %	Community-based weighting %	Significance
Human capital	Child-headed	7.1	11.3	ns
	Elderly headed	6.9	11.0	ns
	Female-headed	6.7	10.8	ns
	Male-headed	5.9	10.0	ns
Social capital	Child-headed	5.2	12.1	**
	Elderly headed	5.2	12.1	**
	Female-headed	5.2	12.1	**
	Male-headed	5.0	11.9	**
Physical capital	Child-headed	18.3	20.6	ns
	Elderly headed	17.7	19.9	ns
	Female-headed	18.3	20.6	ns
	Male-headed	16	18.3	ns
Financial capital	Child-headed	11.3	6.3	*
	Elderly headed	11.4	6.2	*
	Female-headed	11.4	6.2	*
	Male-headed	11.5	6.4	*
Natural capital	Child-headed	13.2	6.9	*
	Elderly headed	13.6	7.0	*
	Female-headed	12.5	6.0	*
	Male-headed	11.7	5.6	*
Household Vulnerability Indices Total	Child-headed	55.2	57.2	ns
	Elderly headed	54.8	56.2	ns
	Female-headed	54.1	55.7	ns
	Male-headed	50.1	52.2	ns

Key: ns = not significant * = $P < 0.05$ ** = $P < 0.01$

CHAPTER 4EFFECTS OF INCORPORATING COMMUNITY-DEFINED WEIGHTS OF CAPITALS ON MAGNITUDE OF HOUSEHOLD VULNERABILITY

4.1 Introduction

Approaches to vulnerability are conceptualized as dynamic (Alasia, Bollnan, Parkins, Reimer, 2008) and require the definition of a time dimension as well as consideration for the temporal imperatives of change. A common objective of social vulnerability assessment is to differentiate populations in terms of the composition of their vulnerability (Eakin and Tapia, 2007). It is important to understand who may be more or less vulnerable in a community (Eakin and Tapia, 2007) but also in what ways they are vulnerable. Vulnerability is a difficult concept to measure and describe (Eakin and Luers, 2006) since it is multidimensional and different indicators of vulnerability can have a different degree of influence on the overall index.

Smit and Wandel(2006), argue that the determinants of vulnerability are dynamic, vary according to the stimulus in consideration and are location specific. It is therefore crucial that the weights that are put for the different indicators of vulnerability reflect the community's ability to cope or areas of vulnerability (Alasia*et al.*, 2008). There are concerns that creating a vulnerability index at the household level is associated with several challenges. Data from existing censuswhich are normally used can mask important local variability and subtlety in assets and entitlements (Vincent, 2007; Alwang, Siegel, 2001) this is why it is important to engage the communities in providing information on how they interact with the capitals. This ensures that the indices calculated from weights derived from community engagement, represents the priorities and dynamics in the communities.

The study adopted the livelihood approach in engaging the communities in assigning weights to the capitals in their communities. The study also sought to assess variability of these capitals in the different communities Swaziland and Lesotho. Data for three different communities was analysed for this study.

4.2 Description of the Study areas

The study used data from three different sites that had been engaged namely Rushinga in Zimbabwe (results are already presented in chapter 3 of this thesis), Maputseng in Lesotho and Mplolongeni and Swaziland. The sites were selected because World Vision International is operational in those areas doing developmental work that last between 10-15 years depending on the needs of the community. World Vision piloted the use of the FANRPAN HVI in these three areas.

4.2.1 Background to MaputsengADP in Lesotho

Maphutseng is located in the Mohales' HoekDistrict, 140km south of Maseru, the capital city of Lesotho. Geographically, the ADP is divided into three parts. The first is the mountain zone, falling at an attitude of 1800m above sea level. Although most of the ADP area is in the mountain zone, it is least populated. The second part is the foothills zone and the third the lowland zone. Most of the people live in the lowland zone. The Mokhele mountain range marks the south-eastern boundary of the ADP whilst the Mekaling mountain range marks the north-western boundary (Maphutseng ADP Design Report, 2008)

The District is generally semi-arid and land degradation is a common feature in the area due to heavy run-offs and poor land management practices. According to the Local Government Statistics, the population is estimated at 22,000 and the majority live in the valley and foothills. The area consists of one ethnic group of people, the Basotho people(Maphutseng ADP Design Report, 2008).

Low levels of food production, low-income levels, high HIVandAIDS prevalence rates, and poor road infrastructure characterize the area (MaphutsengADP Design Report, 2008). The area is also prone to environmental degradation due to heavy rainfall and poor land use. Maphutseng has experienced several years of drought and this has contributed to the reduction in the production of food crops. The people in Maphutseng area grow a variety of crops including maize, sorghum, wheat, beans and peas. Since the area tends to be drought prone, promotion of drought resistant crops has been critical in World Vision programming (Maphutseng ADP Design Report, 2008). In addition, there are farmers who raise sheep and goats for wool and mohair. The highlands part of the area produces fruits.

4.2.2 Background to Mpolonjeni ADP in Swaziland

Swaziland has four main administrative regions; Hhohho, Manzini, Shiselweni and Lubombo regions. Swaziland covers 17,364 square kilometres, while the Lubombo Region accounts for 5, 945 square kilometres of this area. This is the largest of the four regions which accounts for 34.24% of the country's size. Lubombo region is further divided into four major physiographical zones according to climatic conditions and land reform. These are Lower Middleveld, Western Lowveld, Eastern Lowveld and Lubombo Range. Western and Eastern Lowveld are basically plains with an altitude of 200 – 500 metres above sea level. Generally, Swaziland has a sub- tropical climate with hot summers and cool winters. Mpolonjeni ADP falls under the Lowveld zone covering 37% of the country, has high summer temperatures with mean temperature ranging between 17 and 27°C. On average 600 – 750mm of rainfall are received annually. Other characteristics of the Lowveld include winter frosts and most fertile soils in the country. The drought situation which has struck the country for about fifteen years has maintained a hot and dry climate. (Mpolonjeni Assessment Report, 2004)

Mpolonjeni Area Development Program (ADP) is located in the central east of Swaziland in the Lubombo Region. The ADP is about 105 kilometres from the Mbabane which is the capital and largest city of Swaziland. The program covers ten communities in the lowveldzone which are Ngcina, Mpolonjeni, Shoba and Ndzangu, Langa, Maphatsinduku, Mncitsini, Ekupheleni, Matsetsa and Nyetane. These communities have 3211 households.The population for Mpolonjeni ADP was estimated at 24, 000. There are an estimated 3,230 households in the ADP of which 33.7% are headed by women (Mpolonjeni Assessment Report, 2004).

4.3 Research Methodology

This section sought to compare the community weights derived from Lesotho and Swaziland where the FANRPAN HVI was piloted. The objective was to assess how the community weightings of vulnearbility affect the sizes of household vulnearbility indices in different communities.

4.3.1 Research Design

The study design adopted was the case study which was also exploratory as was the case with the Zimbabwe (Rushinga ADP). A case study is defined by Bromley, 1990, as a systematic investigation into an event that could be related in an endeavour to describe and explain the phenomenon of interest and in this particular interest exploring how different communities value livelihood capitals at their disposal. Multi-perspective analysis was done in which the research focused on views of different social groups in the community. A qualitative and quantitative approach was also adopted. The qualitative data was collected in the communities of the different sites, on the value people in these communities associate with the five capitals. The quantitative information was collected at household level focusing on the descriptive variables of the capitals mainly to assess how a household would interact with the five capitals.

4.3.2 Population and sampling procedure

The population that was used for this study comprised the communities for Maphutseng in Lesotho and Mpolonjeni in Swaziland. The results from these two sites were later compared to the results of Rushinga Zimbabwe already presented in the previous chapter. In Maphutseng a total of eighteen focus group discussion were done. The ADP is divided into three sites and has a total of 2665 households .Four groups of men, four groups of female youth were done in all the sites and five groups of women and five groups of male youth were also done in all the sites. Each focus group discussion comprised between eight to fifteen members. For Mpolonjeni ADP the total number of households is 3211. A total of thirty focus group discussions were done. Each of the social groups children, youth, men, women, elderly and leaders had a total of five focus groups conducted. Each focus group discussion had a total number of eight to fifteen. For qualitative data collection social groups were engaged.

The study used the social groups that were of importance to that community such that Zimbabwe had men, women, youth and local leaders. Lesotho had adult male, adult female, youth male and youth female. Swaziland had children, youth, men, women, elderly and leaders. Since the weighting of the capitals is supposed to be context specific the social groups were selected based on what best suits the community.

The interest groups had the following general age categories children below 18 years, women aged thirty-six to sixty years as well as men aged thirty six to sixty years. The youth comprised of male and female within the age categories of eighteen to thirty five. In engaging the community a common tool was used across countries (Appendix3). The data collection was conducted in a participatory manner. Views from the community were gathered through brainstorming and open discussion.

4.3.3 Data Collection

Communities were engaged to get perceived definition of vulnerability as has been discussed already in chapter 3. They defined vulnerability in their context and how shocks affect their livelihood assets.

The data was collected uniformly across the three sites. A household questionnaire was developed and used for collecting information on the five capitals variables. The minimum set of variables to be used in the calculation of the HVI was collected uniformly across countries (Appendix 3).

4.3.4 Data capturing, cleaning and analysis

The HVI calculations were done using the standard weights and community weightings to comparatively analyze how these varied. The weights or scores for each of the five livelihoods dimensions (physical, financial, human, natural and social assets) were used for both the standard that has been predetermined by FANRPAN and the community weighting to calculate the HVI. The indices were calculated to fall between 1 and 100 %. Households having high %ages meant that their vulnerability was higher but those with lower meant that they could cope due to their interaction with the capitals and capabilities. The weights were pre-set after taking into consideration the importance of each livelihood asset in the lives of the target community that is the ADP.

The data that was collected from the social groups weighting process of the livelihood capitals was entered in excel for all the sites. The data was entered according to the perceptions on the weights of the different social groups.The weights were then compared to the average weights of FARNPAN calculated values using hypothesis test for proportions. The hypothesis test was done since the purpose was to assess the differences between sub populations' means with different sample sizes (Poate and Daplyn, 1993). The hypothesis test for proportions wasdone using the t-test for small proportions. A ninety five and ninety per cent significant levels was done to determine the range within which the null hypothesis values will be expected to lie (Poate and Daplyn, 1993). In analysing for variance a hypothesis test for proportion were done in comparing the community averages and the FANRPAN weights to the same capitals. Online calculators for hypothesis test for proportions were done on www.wessa.net/rwasp_hypothesispro2.wasp.

4.4 Results and Discussion

The results of the study are presented in this section. Hypothesis test for proportions was done in assessing whether the differences between the community weightings and HVI weights were significant assess how vulnerability differs across communities. The values of the weights were also used in calculating the HVI to assess whether the incorporation of context specific weights would alter the HVI for selected households.

4.4.1 Lesotho Comparisons of Community and the Standard Household Vulnerability Index Weighting Capitals Averages

The community weighting results indicate that Maputseng community values financial capital most (Table 4.1). Focus group discussions indicated that this was because the majority of males in the community work in the neighboring South Africa for their livelihoods. Remittances from the working spouses are an important capital in Lesotho (Maphutseng Assessment Report,2005). Some household heads cross the border every day to work in the neighboring province of South Africa (Maphutseng Assessment Report,2005). According to World Bank(2007), rural finance reducesvulnerability through savings and access to credit which help rural households manage seasonal liquidity shortages.This helps them meet planned life events such as marriage, childbirth, unplanned life events such as a health emergency and death. By putting more weights on the financial capital the community indicated that any shock that affect that capitals would put most households in a vulnerable state.

Maphutseng community indicated that remittances from spouses assist them in meeting the households' needs. Since most families indicated that they rely on the money being sent therefore well-functioning rural financial systems can also help poor families receive remittances reliably and at low cost (World Bank, 2007).

Male adults put more weight on financial capital followed by male youth than the other female groups. Income is important in rural communities in building assets and reducing their vulnerability to the crises that are a major part of their daily lives (Littlefields, Murduch and Hashemi, 2003). Men tend to be the providers of their families hence the importance of that capital in their livelihoods. Financial capital is also supported by other studies to be integral in lowering vulnerability. A study done in Bangladesh showed that a greater proportion households that indicated that they have credit (60 %) faced low level of vulnerability as compared to 'without credit' respondents (36 %) who faced high vulnerability (Ahmed, Sewar, NorAini, Idris, Mia, 2011). The same study also showed that a lower proportion (30 %) of the borrower women are moderately vulnerable than the non-borrower women (42%). Analysis of the Maphutseng community average and the social groups weightings indicated that they were all significantly different P<0.05 from the FANRPAN standard for the financial capital.

The community average for human capital was significantly different at P<0.05 from the standard HVI weight (Table 4.4.1). Male and female youth did not put any weight on human capital.It would have been expected that the human capital would play an important role in a community that relies more on financial capital coming from remittances. The community however indicated that shocks to the financial capital affect them more as they rely more on exporting their labour to the neighbouring country. The female adults differed significantly from the standard HVI weights at P<0.05.

Maputseng community weight for physical capitals was compared to the predetermined FANRPAN HVI weights to assess how they differ. The analysis indicated that there were no significant differences between the two. However analysis of the social groups showed that female youth put more weight on physical capital than the male adults who did not put any weight under the capital. The physical assets variables were mainly ownership of cattle, farm implements. The low values allocated to this capital are in line with the livelihoods of this community. The main livelihood falls under the financial capital as most household heads work in South Africa so they mainly rely on remittances.

The recurrent droughts affected crop production such that communities did not prioritize physical capital. However women prioritized this capital and the reason was that they are the ones normally left at home as their husbands work in neighbouring country and till the land. The hypothesis test for proportions done indicated that there is significant difference between the community and the standard weighting (P<0.05). The community average for natural capital was significantly different from the standard HVI weights (P < 0.01). The male adults prioritized this capital but the male youth did not prioritize this capital. The analysis also showed that under social capital only the male adults prioritized it but the other groups did not assign ant weights. The social community average weighting differed significantly from the standard HVI weighting (P<0.05).

Table 4.1 Capitals Weighting of interest groups in Lesotho Maputseng Area

	% Weights						
Capitals	**Standard1**	**Average2** [3]**N = 30**	**Male Adults** **N = 30**	**Male Youth** **N = 30**	**Female Adults** **N = 30**	**Female Youth** **N = 30**	**Significance**
Human	25^{a}	7^{b}	0	20^{a}	6^{b}	0	*
Financial	25^{a}	50^{b}	60^{b}	54^{b}	42^{b}	42^{b}	*
Physical	25^{a}	22^{a}	0	26^{a}	22^{a}	38^{b**}	**
Natural	10^{a}	18^{b**}	22^{b*}	0	30^{b*}	20^{b**}	s
Social	15^{a}	5^{b*}	18	0	0	0	s

Source: Lesotho (Jama, 2011)

Key: ns = not significant * = statistically significant at $P<0.05$ ** = statistically significant at $P < 0.01$

[1]Standard HVI= standard HVI values calculated from literature

[2]Average = the average weightings calculated from the values of the weights from all the groups for that particular capital

[3]N = the total number of focus group discussions conducted for each social group

Means with different superscripts (a,b,c) are significantly different from each other

4.4.2 Lesotho Household Vulnerability Index: Standard vs Community Weighting

The household vulnerability indices were calculated for the households in Lesotho Maputseng area using both the standard and the community weighting (Table 4.2). The indices were calculated by the type of household heads of the community. They were disaggregated by the type of asset/capability to identify the type of capital that households are most vulnerable to. The less the index the more a household is able to cope to shocks introduced to it and the more the index the less a household is able to cope to shocks. The communities gave weights to a capital indicating how much a household will be affected in the absence of that capital meaning that the capital will be very critical to the livelihood of that household. The analysis showed that all the household types were vulnerable to financial capital, followed by physical, natural, social capital and then human capital for both the standard HVI and the community weighting.

The HVI calculations that were done using the community weighting increased where the community weighting was more than the standard HVI weighting and decreased where the community weighting was less that the HVI standard. The community weights increased the total HVI values. T-tests for significant differences between the totals for HVI standard and community indicated that all the P-values are not significant. Thus the community values mainly assists in identifying the sources of vulnerability and not the overall HVI value for a household.

4.4.3 Swaziland Comparisons of Community and the Standard HVI Weighting Capitals Averages

The Swaziland Mpolonjeni community gave weights to capital weights according to how these influence their livelihoods and have a bearing on their vulnerability. The community prioritized physical and financial capital. The main livelihood for the community is crop and livestock production (Mpolonjeni, Assessment Report, 2004). Due to the recurrent droughts in the area the households have prioritized drought resistant crops in an endeavor to improve their yields in cereal production. The community also prioritized financial capital and they highlighted the use of savings groups to improve on their income levels.

Table 4.2 Lesotho Average Descriptive Statistics for computed Household Vulnerability Index

Type of capital	Category of household	Vulnerability assessment tool: Standard HVI %	Community-based weighting %	Level of significance
Financial capital	Child-headed	11.7[a]	23.6[b]	*
	Elderly headed	11.8[a]	24.1[b]	*
	Female-headed	11.9[a]	24.2[b]	*
	Male-headed	11.8[a]	24.1[b]	*
Human capital	Child-headed	4.7[a]	1.6[b]	*
	Elderly headed	6.3[a]	2.4[b]	*
	Female-headed	6.4[a]	2.5[b]	*
	Male-headed	7.9[a]	4.1[b]	*
Natural capital	Child-headed	7.4[a]	13.5[b]	*
	Elderly headed	7.3[a]	13.4[b]	*
	Female-headed	7.4[a]	13.6[b]	*
	Male-headed	6.9[a]	12.9[b]	*
Physical capital	Child-headed	20.1	17.9	ns
	Elderly headed	20.6	18.5	ns
	Female-headed	21.5	19.6	ns
	Male-headed	19.6	17.6	ns
Social capital	Child-headed	18.9[a]	6.8[b]	*
	Elderly headed	18.8[a]	6.9[b]	*
	Female-headed	18.3[a]	6.2[b]	*
	Male-headed	19.3[a]	7.6[b]	*
Household Vulnerability Indices Total	Child-headed	62.8	63.4	ns
	Elderly headed	64.7	65.3	ns
	Female-headed	65.6	66.1	ns
	Male-headed	65.5	66.3	ns

Source: Own computation

* = statistically significant at $P < 0.05$

Key: ns = not significant

Including the community voice in the weighting process showed that for Mpolonjeni community average human capital weight (15 %) was less than that for the HVI standard (25 %). The children, youth and women gave more weight (20 %) to human capital than the men and the elderly (10 %). Financial capital weighting was given more value by children, men, and elderly at 30 % and the groups of youth, women and leaders gave it 20 %. Physical capital was given more value by the groups of youth, men, women and the leaders.

The average natural capital HVI standard (10%) was less than the community weighting 17 % (Table 4.3). Groups for men, women, elderly and leaders put more weight on natural capital 20% than the groups of children and youth (10%).The average social capital was 15 % and that for the Mpolonjeni community was 17 % . The individual group ratings indicated that the elderly, the leaders, youth and children weighted the social capital at 20 % and the groups for men and women at 10% .

Hypothesis test for proportions was done at 95 % confidence interval to assess how the community weighting differed from the standard FANRPAN values. The average human capital values did not significantly differ from each other ($P>0.05$). Analysis of the group weightings indicated that the groups of men, elderly and leaders differed significantly from the HVI FANRPAN values ($P<0.05$)(Table 4.3). The other capitals namely the financial, physical, natural and social did not differ significantly from the FANRPAN values. Analysis of the groups of children, youth, men, women, elderly and the leaders for the financial, physical, natural and social assets did not differ from the standard values ($P>0.05$).

4.4.4 Swaziland Household Vulnerability Index: Standard vs Community Weighting

The household vulnerability indices were calculated for the sampled households of Mpolonjeni community (Table 4.4)The households were classified according to the type of household head and average indices calculated. For all the household types the households indicated that the capital that the community is most vulnerable to is the physical capital followed by social, financial, natural and lastly human capital. The overall HVI calculation using the community weighting and standard HVI calculations did not differ significantly for all the groups.

4.4.5 Capitals that had High Indices across sites

The total HVI calculations done for all the households had different capitals contributing differently to the total values. Table 4.5 analyses the capitals that the highest values in contributing to the overall HVI value across the different types of household heads summarised for the different countries. Thus the inclusion of community voice in the HVI calculations assisted in contextualising the index so that the source of vulnerability can be appropriately identified for that community. It is important to note that for Maphutseng area, all the different households types that were analysed showed that they were vulnerable to the capitals that they had put more weight in the ranking. This is because the calculations done at household level in coming up with the household vulnerability index had a bearing on the value weight put for each capital. The weights were critical in identifying the contribution of each capital to the overall livelihoods of households in that community.

4.5 Community Inclusion Modified HVI

The analysis done for the inclusion of community voice indicated that although the indices do not significantly change, it assist in identifying the most critical capitals for that community. These capitals are of great importance in identifying the sources of vulnerability. Under literature review

the study proposes the inclusion of community voice and participation into the formula such that the corresponding weighted vulnerability for a household be expressed as XijCWi instead of XijWi:

Xij denoting the degree of vulnerability of a household i to the j^{th} dimension of impact and

CW denoting community weight

The sum of all weighted community vulnerability will be denoted as:

$$V_{hh} = \sum_{j=1}^{m} X_{CWj} \sum_{j=1}^{m} CW_j$$

Although FANRPAN HVI had recommended the inclusion of community weighting in the process it is critical that the formula is explicit in inclusion of community voice. One should not just take the FANRPAN weighting but this should be contextualised to communities' understanding of vulnerability and should be clear as in the formula suggested above.

Table 4.3 Capitals Weighting of interest groups in Swaziland Mpolonjeni Area

	% Weights								
Capital	Standard1	Average2	Children	Youth	Men	Women	Elderly	Leaders	Significance
		n = 18	n = 18	n = 18	n = 18	n = 18	n = 18	n = 18	
Human	25a	15	20	20	10^b	20	10^b	10^b	*
Financial	25	25	30	20	30	20	30	20	ns
Physical	25	27	20	30	30	30	20	30	ns
Natural	10^a	17	10	10	10	20^b	20^b	20^b	**
Social	15	17	20	20	10	10	20	20	ns

Source: Swaziland (Nxumalo, 2011)

Key: ns = not significant *** = statistically significant at P<0.05** **** = statistically significant at P < 0.01**

[1]Standard HVI= standard HVI values calculated from literature

[2]Average= the average weightings calculated from the values of the weights from all the groups for that particular capital

[3]N= the total number of focus group discussions conducted for each social group

Means with different superscripts (a,b,c) are significantly different from each other

Table 4.4 Swaziland Descriptive Statistics for computed Household Vulnerability Index

Type of capital	Category of household	Vulnerability assessment tool		Significance
		Standard HVI %	Community-based weighting %	
Human capital	Child-headed	5.5	4.0	ns
	Elderly headed	7.6	6.1	ns
	Female-headed	6.2	5.0	ns
	Male-headed	5.5	4.0	ns
Natural capital	Child-headed	6.5	7.7	ns
	Elderly headed	6.2	7.4	ns
	Female-headed	6.4	7.6	ns
	Male-headed	6.2	7.4	ns
Physical capital	Child-headed	21.7	23.2	ns
	Elderly headed	20.6	22.2	ns
	Female-headed	21.3	22.9	ns
	Male-headed	20.9	22.5	ns
Financial capital	Child-headed	11.2	11.2	ns
	Elderly headed	12.4	12.4	ns
	Female-headed	12.2	12.2	ns
	Male-headed	11.8	11.8	ns
Social capital	Child-headed	15.3	17.4	ns
	Elderly headed	14.7	16.6	ns
	Female-headed	14.0	16.0	ns
	Male-headed	15.0	17.0	ns
Household Vulnerability Indices Total	Child-headed	60.1	63.5	ns
	Elderly headed	61.4	64.7	ns
	Female-headed	60.1	63.7	ns
	Male-headed	59.3	62.7	ns

Source: Own computations

Key: ns = not significantly different

Table 4.5 Summary of the major perceived capitals determining household vulnerability across countries in Southern Africa

Type of capital		Rank of capital in								
		Maphutseng, Lesotho			Mpolonjeni, Swaziland			Rushinga, Zimbabwe		
		1	2	3	1	2	3	1	2	3
Natural	Standard HVI									
	Community			✓					✓	
Physical	Standard HVI	✓			✓			✓		
	Community		✓		✓			✓		✓
Financial	Standard HVI			✓			✓			
	Community	✓					✓			
Human	Standard HVI									
	Community									✓
Social	Standard HVI		✓			✓			✓	
	Community					✓				

Source: Swaziland (Nxumalo, 2011 and Jama, 2011)

Key: ✓= rank of respective capital by different communities

4.6 Conclusion

The analysis of the chapter was to empirically test the hypothesis which states that there are no differences in assigned weights of vulnerability across communities of households due to geographical location in some countries in Southern Africa. The evidence provided in this section indicate that there are differences in assigned weights that reflects the communities livelihoods. However the hypothesis test for proportions done showed that the inclusion of the community voice into the weighting process does not change significantly the overall HVI values for a particular household. It is important to note that the inclusion of community voice assisted in identifying the capitals that are making the community vulnerable. The capitals that had the highest values showed that vulnerability was inclined towards the capitals that had the highest values. The analysis showed that the inclusion of community voice either affirmed the HVI standard or identified the capital that is most critical to that community. The analysis done for the computed HVI for the different types of household heads across countries showed that the source of vulnerability differed (Table 4.5).

CHAPTER 5 SEASONAL VARIATION INHOUSEHOLD VULNERABILITY WITHIN COMMUNITIES

5.1 Introduction

Vulnerability context as defined in the DFID framework (1999), assesses the external environment in which people exist. People's livelihoods are affected by trends, shocks and seasonality which they have limited or no control over. The external environment has direct impact on people's assets and capabilities' status (DFID, 1999). Changes in the environment can either be positive or negative depending on the impact on the assets of people.

Literature on vulnerability to poverty or food insecurity has shown that households can move in and out of vulnerability status in relatively short periods (Alwang*et al.*, 2001). Smit and Wandel (2006) argue that the determinants of vulnerability are dynamic according to the stimulus in consideration. Environmental risks play an important role in household vulnerability, for example the heavy dependency on rain-fed agriculture renders the majority of the Zimbabweans vulnerable in the face of erratic and unpredictable rainfall (Zimbabwe Vulnerability Assessment Report, 2011). It is therefore important to assess how the vulnerability of a household changes within different seasons so as to understand the dynamics of household vulnerability.

Some of the studies on environmental risks have focused on identifying the different shocks that affect households such as the one done by Hoddinott and Kinsey (2001); and Alderman (2004) that show that rainfall shocks are causally related to reduced human capital formation and that the magnitudes of these effects are meaningful. Dercon and Krishnan (2000) reported that rainfall shocks, crop damage and livestock diseases are among the leading shocks that make households vulnerable to poverty in rural Ethiopia.

Chiwaula and Waibel (2011) showed that there is seasonal bias in household vulnerability to poverty estimates. They mainly focused on the seasonality of consumption data collected for poverty estimates and reported that seasonality should be considered in vulnerability to poverty estimates. However there has been a gap in assessing seasonality in vulnerability using the livelihood approach in tracking the changes for the assets and capabilities in a household using the five capitals developed by DFID (1999). The livelihood approach assesses all the resources that are at the disposal of a household so as to identify sources of vulnerability.

This study, therefore, aims at filling this gap in knowledge. In particular, the study focused on analysing how the vulnerability index changes for a household using panel data collected for different seasons in a year. The vulnerability index used for this study is based on the one developed by FANRPAN.

5.2 Description of the Study Area

The study was conducted in RushingaDistrict which is located 215km in the northeastern direction from Harare, the capital city of Zimbabwe. The ADP is in the Mashonaland Central Province and is along the Zimbabwe-Mozambique border. It shares the northern border with Mozambique. The southern part borders with Mashonaland East. The District has a total of 26 wards but the study area covers nine of them namely Ward 1 Mukosa, Ward 2:Chapinduka, Ward 3:Chitange, Ward 4:Bopoma, Ward 5:Makuni and Ward 19:Nyamanyanya, Ward 21 Nyanhewe, Ward 20 Kasika and Ward 22 Nyatsato as these are World Vision Operational areas as described in section 3.2 of this thesis.

5.3 Research Methodology

The research design, population and sampling procedures that are described in this chapter are to empirically test the objective which sought to assess the seasonality of vulnerability and its effect on the household vulnerability index. The analysis tested the hypothesis which states that seasonality of vulnerability do not significantly alter the targeting indices within communities in RushingaDistrict.

5.3.1 Research Design

A longitudinal study was used as the research design for this study. The study involved interviewing the same households at two time points.The study allowed the analysis of the differences or changes in the variables from one period to another, that is, the description of patterns of change over time. Primary data was collected using quantitative methods and the community weights already established in chapter 3 of this thesis were used for the analysis of the household vulnerability indices.

5.3.2 Population and sampling procedure

The data required to estimate the seasonality of household vulnerability requires panel data of sufficient length. However for the area under study that data was not available. For the purposes of this study a sample of four hundred households was obtained from the nine wards of RushingaDistrict which is World Vision operational area. The aim was to follow them up and applying the same questionnaire to obtain a two-period panel data for the same variables. The sampling procedure for the four hundred households involved the identification from the nine wards. Clustered sampling was done to get a representation across all the wards. In each ward households were randomly selected from the list of households. The household numbers that were randomly picked were interviewed at two different times. The first interviews are done in May as the households would be harvesting and the second interviews were done in November as households were cultivating for the next season. In these two periods the study sought to assess the major changes that happen in peoples' livelihoods as these mark the major events in the farming community of Rushinga

5.3.3 Data Collection

A household survey was conducted for all the households in the area. At household level information on the five capitals and capabilities were collected as these form the basis for the livelihood approach used for this study. Enumerators for household survey were trained for them to understand the tool (Appendix 3). A pretest was done to ensure that the enumerators had understood the questionnaire and could administer in vernacular. The lead researcher supervised the data collection and ensured that the questionnaires had been adequately completed. To improve on quality daily reflection were done by the teams.

5.3.4 Data capturing cleaning and analysis

In analyzing the household data, information was captured in Statistical Package for Social Scientist (SPSS) as well as Microsoft access to calculate the household vulnerability indices. In analyzing the information on the capitals the study employed the Household Vulnerability Index developed by Food, Agriculture and Natural Resources Policy Analysis Framework, in 2004. The Household Vulnerability Index measures vulnerability of households and communities to shocks such as diseases and poverty. TheHVI achieves this by comparing wealth or assets that are available to a household, and classifies the households according to three levels of vulnerability. As indicated by Thomas (2003), to be able to address vulnerability effectively it needs to be measured so that areas of highest priority can be identified. The HVI approach conceptualizes vulnerability as the presence of factors that place households at risk of not being able to cope (see formula and calculation in section2.3.3 of the thesis).The calculation were done and households classified as highly vulnerable, moderately vulnerable or lowly vulnerable. The following descriptions of cutoff points were done for the three scenarios. The vulnerabilities were described based on the livelihoods assets. Table 5.1 describes how households in the different categories relate to the five capitals.

Table 5.1 Cut-off points for Low/Moderate level and Moderate/High Vulnerability households

Capital	Minimum for Low vulnerability level households	Minimum for high vulnerability level households
1. **Human**	a) Household is headed by an economically active household member b) Dependency ratio is low, less sick household members and no orphans. c) At least two economically active household members.	a) Household is headed by an economically in active, elderly or child b) Dependency ratio is high, more orphans and sick household members. c) Economically active household members are few.
2. **Natural**	a) Household use both inorganic and organic fertilizers b) Medium agriculture activity c) Utilize much land for subsistence farming d) They can fairly manage the environment	a) Organic fertilizers are the main sources of fertilizers b) Low agriculture productivity c) Utilize less land for subsistence farming d) They cannot manage the environment well
3. **Social**	a) May receive some means of support from NGO's and government b) More knowledgeable on agriculture and HIV/AIDS, and issues are discussed regularly at homes	a) Receive support from NGO's and government b) Most of the support goes to food and health
4. **Financial**	a) Have a diversified income source b) Household income is used on a balance of needs (farming inputs, education, health, recreation etc)	a) Have no basic source of income b) Most of the household income is used on food and medicines
5. **Physical**	a) Own important livestock for example. cattle, in sustainable numbers b) Have labour for farm and off farm work c) Receive some agricultural extension services d) At least three meals per day	a) May have no or few livestock No labour for farm and of farm work b) Do not own farm implements c) Do not regularly eat three times a day

5.4 Results and Discussion

The chapter assesses the seasonality of household vulnerability by analysing the variables under each capital and capability of the households namely human, natural, physical, financial and social capital. The data that was collected in the two panel datasets was compared.

5.4.1 Seasonality of Human Capital

Descriptive analysis was done to assess the differences in the panel data sets using variables that were used to calculate human capital at household level. The analysis indicated that there are certain variables that did not change for the overall data sets. The type of household head did not change over the period. 66.6 % of the household heads were males, 21.2% were females, 7.9 % were elderly and 4.3 % were child headed (Table 5.4.1). A study conducted by Baiyegunhi and Fraser (2010) for pane data showed that in the first and second survey rounds, there was higher incidence of poverty among household heads aged 60 years and above. Household became more vulnerable to poverty with an increase in the age of household head. The FANRPAN HVI model considered that female headed and/or child headed households are less able to cope with shocks, compared to male headed households. A study conducted by Baiyegunhi and Fraser (2010) showed that female headed households were more vulnerable to poverty compared to the male headed households.

There was a slight increase in the number of orphans from 12% to 14 % . There was also a change in the health status of the household for the productive sick members, sick household head, and other sick family members from 16% , 19 % , 8 % to 12 % , 21 % , 9 % respectively. A study by Holzmann and Jorgensen (1999), showed that a high %age of households move into poverty due to temporary shocks (such as illness or loss of employment) that are reversed just one or two years later. T-tests were done to check if the results were significantly different between the seasons. The variable on productive sick members showed that there was significant difference between the seasons at $P<0.5$ (Table 5.4.1). The difference of the %age of households with household head sick was significantly different at $P<0.01$.

5.4.2 Seasonality of Natural Capital

Changes to the natural capital were noted that during the harvesting period 71 % of households indicated that soil fertility for their land had declined as application of natural fertilizers declined. For the data collected during farming season 69 % of the household indicated a decline in soil fertility. Environmental management deteriorates with increasing vulnerability. Households revert to the environment for "free" products such as wood when vulnerable. The other variable that was considered was limited land use causing vulnerability as households do not fully utilize the potential land sizes at their disposal. Limited use of land increased from 25-29% indicating that more households had not fully utilized their land during the two farming seasons. Analysis for significance showed that the use of land by the households in the two seasons were significantly different from each other at $P<0.5$.

The analysis showed that there is a correlation between sickness and natural capital assets. Sickness of household members has implications on other capitals of a household such as land use under natural assets.Arable land that can be cultivated by a household with productive sick members changes when there are sick people in the house. Correlation analysis was done on the relationship between sick members of a household and area cultivated and the results showed that there was strong negative relationship ($r = -0.157$, $P < 0.05$) for farming period dataset and ($r = -0.144$, $P < 0.05$) for harvesting period dataset. An increase in the number of sick members in the household resulted in less area that was cultivated.

5.4.3 Seasonality of Physical Capital

Variables under physical capital were assessed on how they would change over the two seasons. Draught power did not change over the two seasons it remained the same at 68 % of the households indicating shortage of draught power for cultivation (Table 5.2). In general, livestock are a major asset for improving rural livelihoods.Households that do not own or own fewer cattle and other livestock are more vulnerable due to limited access to draft power and alternative sources of income and nutritious food (Barret, 2005).

Further analysis was done on draught power to assess the relationship between cattle and the size of land cultivated. The analysis indicated that there was a relationship between the number of cattle owned and the size of land planted with crops. A weak positive correlation was observed between cattle ownership and cultivated land ($r = 0.002$; $P< 0.05$), ($r = 0.005$; $P < 0.05$) for harvesting season and farming season respectively. Owning large herds of cattle did not necessarily translate to ownership and cultivation of large tracts of land. Furthermore, community members reported that they hire draught power from others and the recurrent drought have negatively affected the land sizes that are cultivated.

On average, each household owned two cattle. The relationship between cattle ownership and state of household food security throughout the whole year (how many months household food stocks would last) was investigated. It was observed that there existed a relationship between cattle ownership and household food stocks ($X^2 = 1.109$; $P < 0.05$) during harvesting period. There was a positive correlation between the number of cattle owned and the months the food stocks of a household lasted ($r = 0.142$, $P < 0.05$) during farming period. This meant that the more livestock a household had the greater the chances it had of becoming more food secure.

There was a decrease in the %age of households who indicated that they had no farming implements such as ploughs from 60 % in the harvesting period to 55 % in the farming season. Further analysis indicated that there was significant differences between the season at $P<0.5$. The decrease was mainly because some households managed to purchase some farm implements during the period. The selling of assets also decreased from 4.8 % of the households to 3.2 % who indicated that they had sold assets as a coping mechanism for the shortages in the household. Households that indicated that they had limited food variety and limited meals increased from 24.6 % and 37.4 % (harvesting period) to 28 % and 54.6 % (farming season) respectively. There was significant difference between the seasons at $P<0.5$ (Table 5.4.1). These are indicators of vulnerability at household level and they were considered under physical capital as food result from past productive activity.

Table 5.2 Descriptive statistics for variables used in assessing seasonal vulnerability in RushingaDistrict

Type of household asset or capability	Vulnerability Variable	Harvesting season % of households	Std. Dev.	Farming Season % of households	Std. Deviation	Significance
Human capital	Productive members sick	16.0[a]	3.2	12.0[b]	4.1	*
	Household head sick	19.0[a]	5.7	21.0[b]	6.1	**
	Other household members sick	8.0	3.3	9.0	4.1	ns
	Number of orphans	12.0	3.7	13.0	3.9	ns
	Child headed	4.3	0.6	4.3	0.6	ns
	Female headed	21.2	9.6	21.2	9.6	ns
	Male headed	66.6	40.1	66.6	40.1	ns
	Elderly headed	7.9	4.1	7.9	4.1	ns
Natural capital	Decline in soil fertility	71.0	38.8	69.0	38.0	ns
	Practising environmental management	65.1	43.2	64.0	42.9	ns
	Limited land use	25.0[a]	7.7	29.0[b]	7.9	*
Physical capital	Don't use fertilisers	25.0	6.6	20.0	6.1	ns
	Low harvest	21.5	6.2	19.0	5.8	ns
	Shortage of draft power	68.0	35.1	68.0	35.1	ns
	No farming implements	60.0[a]	28.6	55.0[b]	25.7	*
	Selling of assets	4.8	0.6	3.2	0.5	ns
	Limited farming extension services	37.8	15.1	40.0	16.8	ns
	Limited food variety	24.6[a]	6.3	28.0[b]	7.3	*
	Two or less meals per day	37.4[a]	15.0	54.6[b]	21.7	*

Type of household asset or capability	Vulnerability Variable	Harvesting season % of households	Std. Dev.	Farming Season % of households	Std. Deviation	Significance
Financial capital	No savings	97.9	83.7	96.0	81.7	ns
	No regular source of income	56.4[a]	22.1	52.0[b]	20.0	**
	No access to credit/loans	99.4	101.2	99.2	99.7	ns
	Unpaid debts	19.1	5.3	20.0	5.8	ns
	Expenditure on ill members	2.9	0.6	3.2	0.7	ns
	Additional income spend on food	42.7	20.0	45.0	21.6	ns
	Crop sales money spend on health	25.5[a]	6.5	28.0[b]	6.9	**
Social capital	Limited external support	61.8[a]	39.7	55.0[b]	25.7	*
	Limited access to HIV/AIDS information	2.1	0.3	2.0	0.3	ns
	No agricultural information	23.3[a]	5.2	30.0[b]	7.0	*

Key: ns = not significant * = statistically significant at $P < 0.05$

** = statistically significant at $P < 0.01$

5.4.4 Seasonality of financial and natural capitals

Financial capital did not change much in the two periods. The %age of households that indicate that they had no savings changed from 97.4 % during the harvesting period to 96% during the farming season. Increased expenditure on health care due to the presence of more ill members in the household (Barnett, 2012) increases vulnerability, analysis of the panel data indicated that there was an increase from 2.9 % of household to 3.2 %. Limited access to credit loans due to increased risks and lack of collateral associated with households in the rural community poses as a vulnerability factor. Other studies have shown that an increase in access to credit market enhances household welfare through the provision of investment credit to boost household income (Adugna and Heidhues, 2000). The analysis of the data set indicated that access to credit/loans did not improve with the majority of the households indicating that they do not have access to loans.

Social capital was defined within the sustainable livelihoods framework to mean the social resources that people make use of in pursuits of their means of survival and this includes networks, connectedness, membership of more formalised groups, relationships of trust, reciprocity and exchanges (DFID, 1999). There was a decrease in the %age of households that indicated that they were receiving limited external support for the needs that they have from 61.8% to 55 % . Receiving agricultural information is critical at household level as it influences some of the decisions at the household level that relate to livelihood.

5.4.3 Seasonality of Household Vulnerability Index

The variable information collected for the five capitals was used to calculate household vulnerability index using the formula presented in section 2.3.3. The community weights derived in chapter 3 were used in deriving the index. All the discreet variables were transformed using the formulas presented in Appendix 1 for all the five capitals. The overall household vulnerability index was compared for the two periods. High vulnerability increased in the farming season compared to the harvesting period from 2.3-3.1% of the households (Figure 5.1). Seasons are very critical in assessing household vulnerability as there a lot of factors that affect household's livelihoods. More households were classified as vulnerable during the farming season that the harvesting period. Further analysis of the capital's contribution to the overall HVI indicated that physical capital contributed more to the HVI values. There was however a decrease in the classification for moderate and low vulnerability from 89.9 % and 7.8 % to 89.7 and 7.2 %, respectively. There is a movement during the farming season of households from those that had low vulnerability to moderate vulnerability. The movement is there also for those in moderate vulnerability to high vulnerability. The analysis for significant levels established that the classification for high vulnerability is significantly different at P<0.01. There was also significant differences at P<0.01 for the low vulnerability classification. There was however no significant differences for moderate vulnerability classification. A study conducted by Chiwaula and Waibel (2011) indicated that seasonality is very critical and should be considered in poverty and vulnerability assessment as it affects values for these. Seasonality of vulnerability mainly affected the low vulnerability and high vulnerability classification with households who were in the moderate vulnerability category moving classes with change in seasons.

5.5. Conclusion

The study has established that vulnerability is dynamic and different seasons in a year can have different classification of vulnerability of people. The HVI frameworks factors in different aspects that may affect vulnerability at household level such as sickness which has an impact on human capital and drought which affect the physical capital when issues like food stocks, land sizes were considered. The study bring out the need for regular updates for household vulnerability tracking when its used in monitoring progress. It is therefore encouraged that seasonality be considered when assessing for household vulnerability.

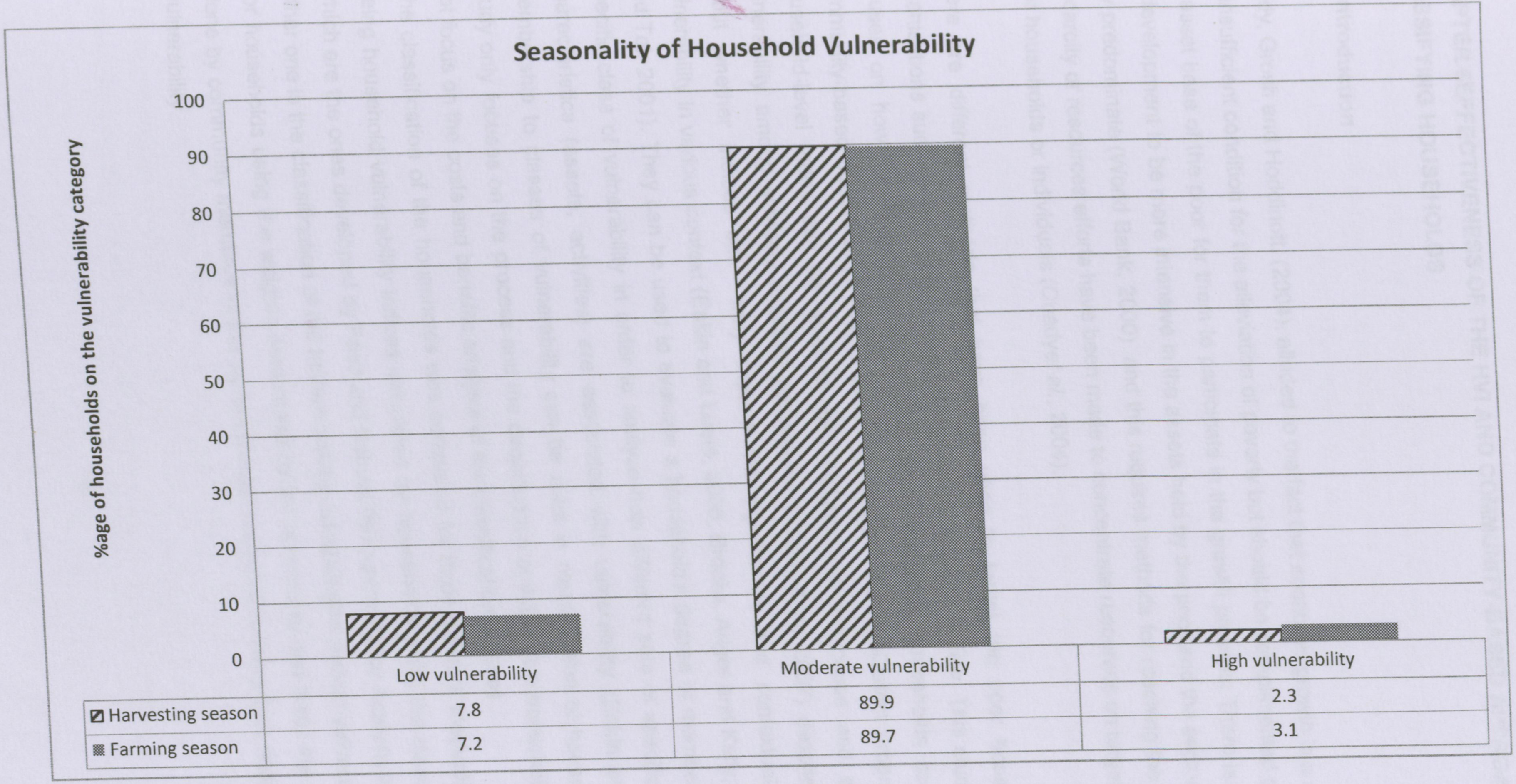


Figure 5.1 Seasonal variability in household vulnerability for RushingaDistrict

CHAPTER 6EFFECTIVENESS OF THE HVI AND COMMUNITY-BASED APPROACHESIN CLASSIFYING HOUSEHOLDS

6.1 Introduction

Coady, Grosh and Hoddinott, (2004), alluded to the fact that economic growth is a necessary but insufficient condition for the alleviation of poverty but should be complimented by building the asset base of the poor for them to participate in the growth process. There is also need for development to be more intensive in the assets held by the poor and the sectors in which they predominate (World Bank, 2000) and this requires methods for reaching the poor. Due to scarcity of resources efforts have been made to concentrate resources on target groups of poor households or individuals (Coady*et al.*, 2004).

There are different methods that have been used to target the poor households by organisations such as has already been discussed in literature review. This study however focuses on how the household vulnerability index classifies households compared to community-based classification that is normally used in RushingaDistrict programming. A household-level index can be used to gain insights into the cause and structure of vulnerability among similarly exposed populations (Eakin et al, 2007) despite questions about whether indices can truly capture the significance and contextual nature of vulnerability in various context (Eakin and Luers, 2006, Brooks, Adger and Kelly, 2005,Yohe and Tol, 2001). They can be used to evaluate a household's degree of membership with a specific class of vulnerability in order to analyze how different sets of specific household characteristics (assets, activities) are associated with vulnerability (Eakin et al, 2007). Membership to classes of vulnerability can be used in classification of households. This study only focuses on the process and the classification of vulnerable households but does not focus on the costs and benefits analysis of the classification process.

The classification of the households was compared for three different methods one of the being household vulnerability indices calculated for households using the standard weights which are the ones developed by Food and Natural Resources Policy Analysis Network. The other one is the classification of the households by calculatinghousehold vulnerability indices for households using the weights determined by the community and lastly the classification done by community members of the same sampled households using their understanding of vulnerability.

6.2 Description of the Study Area

RushingaDistrict is in natural region four and five which is drier and hugely affected by droughts. The communities of Rushinga practise mixed farming of crop and livestock production. Rushinga is poverty stricken mainly due to its historical legacy and geographical location. Development work has been done in Rushinga to mitigate against the effects of recurrent droughts and the low annual rainfall received in the area as shown in figure 1. Development is defined as enhancing the overall wellbeing of people and bringing positive changes to the society. It is an intentional effort to make a long-lasting impact at the level of individuals and societies (Ireland *et al.*, 2004). Development in World Vision operational areas entails assisting the communities to be food secure, have access to education, income generating projects and improved access to health services. During development it is also endeavoured that households that require assistance are reached.

6.3 Research Methodology

This section describes the design that was used for the study, population, sampling methods, data collection and analysis for the specific objective of comparing the classification of the HVI standard, HVI community and community-based method.

6.3.1 Research Design

The study used a case study of Rushinga, using both quantitative and qualitative methods in exploring the classification of households using different methods. The qualitative methods were used during community consultations on the community weights of the capitals and classification of vulnerable households. Quantitative methods were used in gathering household data on the capitals variables.

6.3.2 Population and sampling procedure

A sample of hundred and fifty household was used for this study. These were taken from the four hundred used in chapter 5 where cross longitudinal data for households was collected over two different seasons of harvesting and farming. To allow for comparison of the three methods namely HVI calculated using standard weights, HVI calculated using community weights and the community based classification, household data collected during the farming season was used to calculate the household vulnerability indices used for classification since the community based classification was done during the farming season. The standard weights and community weights were used in indices calculation for the sampled households. The sampled one hundred and fifty households were also used in the community-based classification to allow for comparisons.

6.3.3 Data Collection

The sampled households were taken from a household survey that was done for the analysis in chapter 5. The process involved:

a) Data collected on households during the farming season to allow for comparison of the community-based consultations done during the same period. The data was collected using questionnaires (developed to capture livelihoods capitals variables) Appendix 3
b) Entering the data into a Household Vulnerability Index database developed by FANRPAN (with varying degrees of verification and consistency checks of the questions as they were being entered into the system)
c) Calculating the HVI indices using the database and weights developed by FANRPAN from literature
d) Classification of the households according to the indices,
e) Calculation of the HVI indices using value of weights on the five capitals from community engagement in chapter 3.
f) Classification of the households by the community leadership for all the one hundred and fifty households according to the cut off points determined by the communities input on description of household variables in the various categories as described in table 5.1.

6.3.4 Data capturing, cleaning and analysis

To compare the classification, the HVI indices calculations were done using the standard weights as well as with community weightings of the capitals and a comparative analysis done on how these were varying. These were compared to the community-based classification. The community based analyses and classification was done for each household with the group of selected community members analyzing each household using community knowledge on how the household relates to the five capitals being financial, physical, natural, social and human. Using the threshold agreed by the community (Appendix 2) classification was done for the households using the HVI calculations which were done for both community and standard weights. To test for significance level t-tests were done between the HVI indices from standard weights and community weights.

6.4 Results and Discussion

The analyses focused on the classification of households to empirically answer the hypothesis that the use of the HVI standard weights in households classification do not significantly differ from the community-based techniques and HVI modified with the community voice.

6.4.1 Classification of households

The variables that were used in the HVI quantitative data collection were the ones that were considered in the setting of the community thresholds for the classification into the three vulnerability classes namely highly, moderately and lowly vulnerable. The variables that were collected in the household survey were essential as these provided the information at household level that was used in the calculation of the indices for HVI Standard and HVI community. The community based classification had 10.7% of the households as highly vulnerable, moderate vulnerability had 88.7 % households and low vulnerability had 1.3 % households using the criteria presented in Appendix 2. According to the criteria set by the community the highly vulnerable households require emergency interventions for their survival as there are different factors in the five capitals working against them such as low yields compared to the high dependency ratios, lack of regular sources of income. All these factors affect their vulnerability to poverty. The HVI using community weights classified 7.3% of the households as highly vulnerable, 90.7 % as moderately vulnerable and low vulnerability had 2.5 % of the households. The classification using the standard weights from literature has 2.7% as highly vulnerable, 93.3 % as moderately vulnerable and 4 % as lowly vulnerable.

The highly vulnerable classification of households using the HVI standard was significantly different from HVI community and community-based classification at $P<0.05$. The cut off points for the HVI standard and HVI community indices were based on the variable description on Table 5.1. The HVI community provided a balance between the use of proxy means of classifying vulnerability and community input on capitals critical for their livelihood. The community-based classification made use of the community knowledge about the household. There were no significant differences between HVI community and community-based classification because the calculation of the indices had taken into account people's opinions.

Issues of fairness and transparency are important elements for political supportability of any classification method (Pritchett, 2005). The acceptability of a classification method by community members and stakeholders is critical for not all the success of a program but to allow ownership at the onset (Grosh, Del Ninno, 2008). Hence the need for stakeholder involvement in the process of classifying households and this has been addressed in the HVI with community weights. Increased transparency in criteria is an important factor in that it can help in acceptability of classification methods. An advantage with community-based methods is that they involve communities in the classification process, thus promoting transparency and ownership of the process. However, there is the danger of political or elite manipulation by local actors (Coady eat al, 2004). However the HVI community weights classification eliminates the elite manipulation that may be found in classification of household by community members as there is a mix of methods in using data collected through the survey and use of community weights of the five capital assets.

During field visits community leaders and community members were asked to brainstorm on characteristics they thought were associated with vulnerable households. These were similar to those variables selected in the FANRPAN HVI calculations (Appendix 2). This can suggest that a method where similar indicators are used is likely to gain acceptance in the communities. To enhance community ownership, the final classification of households can be shared with the community for verification and correcting exclusion errors resulting in HVI community classification. This may also help in addressing differences that may arise in classification as shown in Table 6.1

For a policymaker devising a programme to assist vulnerable households(those with high probabilities of becoming poor in the future) constitute the targetbeneficiaries and these are the ones classified as highly vulnerable. Misclassifying vulnerable households as low vulnerability carries a high exclusion cost. These households would not be prioritized despite the fact that they would require assistance. This type of misclassification can be labelled as exclusion error,corresponding to the proportion of currently highly households, which were classified moderately vulnerable or low vulnerability. The second type of misclassification implieslabellinglowly vulnerable households as either moderately or high vulnerable. This misclassification is inclusion error.

Sinha and Lipton(1999) suggest that these categories of classification offer a potential window from which to design specificand effective programmes. Similarities in vulnerability of households might be due to variousfactors. The livelihood capitals helps unpack the source of vulnerability for each household instead of treating households as homogeneous. Classification helps in prioritizing where organisationscan prioritize householdsthat have a weak particular capital among the highly vulnerable households and designinterventions to address the class of vulnerability.

The results of these validation exercises using different methods indicate that vulnerability indices estimates havea relatively high degree of misclassification, especially among the poor. However,it should be noted that the classification is based on average of the values calculated for each capital. Analysis of the values allocated to each capital enhanceheterogeneities of each household. For instance,vulnerability profiles should help to distinguish the sources of vulnerability for each household as has already been discussed in chapter 3 and 4.

Table 6.1 Classification of household in vulnerability categories using HVI and community-based method

Level of Vulnerability	% of households HVI standard weights[1] [3]n = 150	HVI community weights[2] n = 150	Community-based classification n = 150
High	2.7[a]	7.3[b]*	10.7[b]*
Moderate	93.3	90.7	88
Low	4	2	1.3

Key: ns = not significant * = statistically significant at P<0.05

[1]Standard weights – weight value derived from literature by FANRPAN

[2]Community weights – weight values from community engagement process.

[3]N = the total number of households selected for the household classification process

Figures with different superscripts (a,b,c) are significantly different from each other

CHAPTER 7 GENERAL DISCUSSION AND CONCLUSIONS

7.1 Introduction

In the recent past, international humanitarian and development community has highlighted the need for more effective provision of aid (Emmi, Ozlem, Maja, Ilan, Florian, 2011). The donor community continues to call upon development agencies to demonstrate the impact of the various programmes they implement. This would provide a measure of the value for money invested. As has already been highlighted the Millenium Development Goals (2011) reports that although there has been reported progress there still remain a challenge of reaching the most vulnerable. There is need to understand the dynamics that are faced by the most vulnerable as a means of intensifying efforts of developing the communities. It is against this background that this study set out to explore household vulnerability and the differences across communities, seasons and the use of household vulnerability index in the classification of households.

Importance of community participation was explored through community engagement were comparisons were done for community weighting to the ones identified by FANRPAN. Community participation is critical to any development process aiming to empower poor people (Mansuri and Rao, 2001) so as to enhance sustainability. The study identified the spatial differences of community weights in different areas which showed the importance of community engagement to bring development programming that is specific to the need of the people. The study also explored the seasonality of household vulnerability using longitudinal data to show that although classification of vulnerable households is critical, there are other dynamics at play hence should not just focus on aggregate figures. There is incomplete knowledge of the extent and manner in which household vulnerability varies regionally and among households in different seasons. Finally the study looked at feasibility of using the classification of vulnerable households using the FANRPAN HVI compared to the community-based approaches.

This chapter's presentation first looks at the synthesis of the empirical evidence of the study in answering the research objectives. It further provides the theoretical and policy implications of the empirical evidence presented by the study. Recommendations for future research are also presented in light of what can be done in the field of understanding household vulnerability.

7.2 Synthesis of the Results

The main empirical findings are chapter specific and were summarised within the respective empirical chapters. This section synthesizes the empirical findings to answer the research objectives;

(a) determine how various social groups in the community assigned weights of vulnerability to the capitals at their disposal compared to those of the HVI;

(b) assess how the community weightings of vulnerability affected the magnitude of HVI indices in various communities;

(c) assess the seasonality of vulnerability and its effect on the household vulnerability index

(d) compare household classification of the HVI and community-based selection methodologies;

The synthesis aims to provide the methodological issues and theoretical underpinnings of the study.

7.2.1 Methodological issues

The study was based on livelihoods approach as developed by DFID (1999) in collecting both qualitative and quantitative information. Household information was collected using variables under each livelihood capitals/ capabilities namely human, social, natural, financial and physical capital. Several studies have used the livelihoods framework in their analysis of the household vulnerability (Vincent and Cull, 2010, Eaking et al, 2007,). What differed among these studies in the descriptive variables under each capital or capability despite using the five livelihood capitals. What also differed among the studies was the shock under study either climate, disease, and its effect on the household. However the range and extent of indicators varied from study to study (Eriksen and Kelly, 2007). Complex analyses incorporating multiple stressors have been carried out at the local level in various locations (Bankoffet *al.*, 2007; Cutter, 1996). But the scale specificity of indicators means that it is often not methodologically possible to apply the exact frameworks across different units of analysis (Vincent, 2007).

Vulnerability is a multidimensional concept and every indicator of vulnerability is likely to have different effect at the household (Eakin and Luers, 2006). Although several studies have used livelihood approach in assessing vulnerability at household level, remarkable little attention had been given to a comprehensive analysis of the interaction of the household with its capitals in the face of both internal and external vulnerability such as diseases and drought. The FANRPAN household vulnerability index looked at both internal and external vulnerability. This study built on the work developed by FANRPAN (2004).

There are generally two options that are available for researchers that wish to use an index to categorise population according to vulnerability that either assume that all indicators have equal weights or engaging in a process of assigning weights (Eakin et al, 2007). A study done by Eakin and Tiapia (2007) developed a household vulnerability index using livelihood framework and multi-criteriondecision analysis to assign weights to household attributes according to their importance based on theory and existing theory. A study done by Vincent and Cull (2010) used a household social vulnerability index where it assumes that all the five capitals are of equal importance hence equal weighting were used. However in reality at household level different aspects have different effects such that this study focused on assessing the different weights of the indicators.

This study differs from other studies in that it engaged the communities in assigning weights to the capitals and capabilities instead of using literature. Valuable insights provided by the livelihoods frameworks were used to engage communities on how they tape and utilise all the five capitals. Communities were also engaged to get their understanding of vulnerability. Representatives of social groups were engaged in focus groups discussions deliberating on issues that they are vulnerable to in their community. They assigned weights to the capitals depending on the one they were most vulnerable to and the weighting process continued down to the variables under each capital that are critical to their livelihoods as a community. In building upon the work done by FANRPAN the community engagement weights were compared to the ones derived by FANRPAN from literature.

In engaging the community, the study used a modified ten seed tool developed by Jayakaran (2002). The ten seed tool is a rapid participatory learning tool. The technique stimulates discussion on the relative importance of various factors in their community. Although in its initial use the ten seed tool was not used to provide figures for an absolute amount, for this study a hundred stones were used to correspond to the overall contribution of the five capitals to the household. The hundred seed were given to each social group where through discussion and deliberation they would assign a certain number of seeds to each capital depending on its importance in their survival as a community. The visual nature of the process creates a lot of discussion and an in-depth understanding of vulnerability is achieved.

The household information data collected together with the weights from community engagement were used to calculate a household vulnerability index using the FANRPAN framework presented in section 2.3.3 where continuous and discrete data were analysed using formulas presented in Appendix 1. The classification of the households using the index was checked for seasonality to check for its sensitivity to the dynamic in the community. The classification was further compared to community-based methods.

7.2.2 Community participation in vulnerability assessments

The participation and inclusion of different social groups in the community weighting process brought insights about community perceptions on vulnerability at household level. Thematic discussions on household vulnerability pointed to household vulnerability as "limited diverse livelihood strategies that sustain households in times of difficult times" as presented in Chapter 3. This notion is supported by earlier research (Adger 1999, Watts and Bohle 1993, Chambers 1989) who defined vulnerability at household level as the presence or lack of ability to withstand shocks and stresses to livelihood. This laid the foundation to show that communities understand vulnerabilities. When vulnerability is taken to be a potential state that affects the different communities, context-specific methods of assessment are required to assess the levels of vulnerability and the participation of the people who are affected by the vulnerability is critical (Groshet *al.*, 2008).

The sustainable livelihoods framework was used for assessing local level vulnerability and adaptive capacity through analysing the status of five "capitals" – financial, human, social, physical and natural (Chambers and Conway, 1992; DFID, 1999) not only in a passive way of administering the questionnaire but through active engagement where their views of the factors that affect them was considered. The sustainable livelihoods framework has variously been applied to investigate the contextual and multi-dimensional nature of vulnerability (Christiansen *et al.*, 2005)). The analysis of the overall weights through community engagement gave insights to the local dynamics of vulnerability. Within a community there are intrinsic dynamics that are crucial that inform development programmes to address different social groups.

Results for Chapter 3 indicate that for Rushinga community, the women groups gave more weights to human capital at 30.3 % weight, youth's physical capital 32% , men Natural capital at 30.6 % and local leaders' human capital at 30.6 % . In the calculation of the indices, the weights contributed to the value of the source of vulnerability. Although the analysis of the significant differences between the weights allocated by the different groups under each capitals showed that some significantly differed and some did not from the FARNPAN weights. Although there were no significant differences in the overall indices calculation after the inclusion of the community voice in the weight values, the social grouping weights for the capitals provided insights on the capitals that may be a source of vulnerability for the community. These capitals differed from the ones that had been prioritised by the standard HVI for instance Lesotho prioritised financial where as the standard had prioritised physical capital.

It is also important to note that despite the insignificant differences in the comparisons of the indices, it is important to get active participation of communities in decisions that affect them. Community development is about respecting and developing relationships so decisions should not be just based on statistics but should value opinions of people.

7.2.3 Spatial Differences in Vulnerability assessments

The study brought out that vulnerability indicators weight cannot be universal but should be community specific for more informed vulnerability assessments and insights into the livelihoods of people.

It is widely recognised that there are multiple driving forces of vulnerability in relation to specific outcomes (Adger and Vincent, 2005). Vulnerability should take into account the social groups of that community. The evidence provided in Chapter 4 indicated that there are differences in assigned weights that reflect the communities livelihoods. The hypothesis test for proportions done showed that the inclusion of the community voice into the weighting process does not change significantly the overall HVI values for a particular household because the aggregate figure of hundred is used in both FANRPAN and community weights. It is important to note that the inclusion of community voice assisted in identifying the capitals that are making the community vulnerable. The capitals that had the highest values showed that vulnerability was inclined towards those capitals. The analysis showed that the inclusion of community voice either affirmed the HVI standard or identified the capital that is most critical to that community. The analysis done for the computed HVI for the different types of household heads across countries showed that the source of vulnerability differed from each community.

7.2.4 Seasonality of vulnerability

A household's vulnerability to poverty at any point in time depends on how its livelihood prospects and well-being is likely to evolve over time. And that in turn depends on its interaction with the livelihoods capitals at its disposal. The livelihoods also depend on the complex dynamic interlinkages between the environment–macroeconomic, institutional, socio-political and physical in which the household operates, the resources, human, physical and financial it commands, and its behavioural responses (Cafiero and Vakis, 2008). Such a dynamic perspective on household well-being suggests that the proximate causes of vulnerability are exposure to adverse aggregate shocks. These shocks differ during the year depending on social and environmental dynamic (DFID,1999).The seasonality of the household vulnerabilities was done and there was a shift as the year progressed from harvesting to farming season. More households were classified as highly vulnerable during the farming season than the harvesting season. During harvesting season different capitals are positively affected making the households more able to cope. The study showed that there was a change in the financial capital as households sell their harvest. Food stocks in the household increase during harvesting but as the year progresses the number of meals consumed decrease. Household vulnerability assessment ought to take into account seasonality vulnerability as this can inform of the types of programmes requiredat different times of the year. This therefore call for a need to regularly update household information through cheaper sustainable means especially if the data is to be used for monitoring household progress. When checking for progress it is critical to consider the season and comparisons should be done for data collected in during the same time of the year otherwise distorted information will be derived.

7.2.4 Classification of households by the HVI in comparison with community-based methods

Household classification in relief and development interventions helps to bring the most significant impact under resource-limited situations. The anticipated product of this study was to provide insight into the significance of community participation in the proposed HVI as a household classification tool. In the analysis done in Chapter 4 the study proposed modifications to the HVI approach accordingly. In chapter 6, classifications were done using the Household Vulnerability Index and the community-based approaches. A method of classification that picks up the weakest source of vulnerability for a household goes a long way in addressing the challenges that most organisations face in targeting (Lambert, 2002;

Taylor, 2004). It was shown in chapter 3 and 4 that the sources of vulnerability could be achieved through community engagement. The community-based approach of classifying the most vulnerable categorised more people as vulnerable compared to the HVI classification using community weights. The HVI calculation using HVI standards weights from literature put few people as highly vulnerable. The HVI community weights classification incorporates community participation and calculation of the index using household variables providing a balance of objectivity.

7.3 Recommendation for policy, development and further studies

Dynamics of household level vulnerability are critical in understanding the challenges that are faced by vulnerable households in the livelihood strategies. This ensures that appropriate strategies are developed in trying to eradicate poverty in community development

7.3.1 Recommendations for policy and community development

The approach proposed in this study seeks a balance between community engagement and the use of proxy means of household vulnerability. It shows how diverse perspectives can be included through the participation of various social groups in the community in identifying sources of vulnerability. By explicitly defining weights in a deliberative manner, the study showed how to enhance the analysis of vulnerability by engaging the communities themselves. Community vulnerability cannot be solved by uniform programming but should be contextualized as indicated by the spatial differences in vulnerability. Uniform weights do not realistically reflect the dynamics that happen at household level as shown by different weights that were allocated to similar capitals in different communities. The study showed that social actors priorities can serve to assess the source of vulnerability for different groups of people and can inform the different programmes required to address the different needs in the community.

The seasonality of household vulnerability shows that in community development there is need to have different programmes that address the seasonal needs in the community. Care also ought to be taken when tracking vulnerability levels of households and comparisons since there may be seasonal bias in the vulnerability levels of people and may not give a true reflection of the changes brought by programming. There is therefore need for community-based mechanisms of continual update of information due to the dynamic nature of vulnerability. Household vulnerability classification methods are important in identifying the vulnerable households. However care must be taken in ensuring community participation for ownership of the process. Household vulnerability index classification that involves the community is important in identifying the vulnerable households and for acceptability.

The FANRPAN HVI is a crucial tool in household classification. Its combination of the livelihood approach in analyzing all the available options at household level is critical in identifying areas of weakness. This informs development agencies to identify areas for programming. Although the study showed that there were no significant differences in the HVI indices calculated using the two weights, analysis of how the weights affect the classification of a household showed that there were significant differences.The classification of households in different vulnerability levels significantly changed with the inclusion of the community voice.

7.3.2 Recommendations for further studies

The operational task of reaching beneficiaries is prone to trade-offs between the cost of targeting and the cost of leakages. The use of the HVI as a targeting tool requires the following considerations;

a) Comparing both financial and qualitative costs and benefits -The financial costs of the HVI as a targeting method must be balanced by the expected benefits of reaching intended beneficiaries more effectively. The costs and benefits of targeting depend on the type of resource that is available to benefit the community, the characteristics of the intended beneficiary group, the chosen intervention, and institutional capacity. There is need to go beyond just classification but implementation of the HVI categories and tracking them through an identified intervention.
b) The difference between acceptable leakage of benefits and wastage. Allowing leakage to the unintended beneficiaries is not necessarily wasteful. The financial and political cost of screening out unintended beneficiaries may exceed the benefits to be derived from excluding them. There is need for full financial analysis of the proportion of a budget that is consumed by targeting cost of the HVI versus the amount of money that goes to beneficiaries
c) Analysis of possible monitoring information that can be collected through existing mechanisms. As targeting relies on information, there is need to assess the structures that can be used collect data on beneficiaries and the areas in which they live.

Depending on the degree of fine-tuning, these data can reveal much about the changing needs of beneficiary populations over time.

7.4 Conclusions

It is critical that as development practitioners identify programmes that can impact the lives of people they should be sensitive to programmes that target the different social groups. The analysis of this study's empirical findings showed that various social groups prioritised different capitals showing the areas of sustainability that are critical to groups as sources of vulnerability.

Poverty prevention efforts that aim to reduce vulnerability to poverty and prevent the transmission of poverty must go beyond the proximate causes of vulnerability to address the multiple underlying causes of vulnerability.

The ultimate impact of improved development in the rural communities and programmes on the welfare of these communities is determined by the response of the most vulnerable households to the interventions to bring development. Hence it is of fundamental importance to correctly identify the most vulnerable households so that they do not lag behind in development. The results of development practitioners and government efforts based on the incomplete understanding of vulnerability dynamics at household levels are likely to be disappointing. Based on the empirical findings from this study, the research has major additions to our understanding of household vulnerability in the area of community participation in providing insights to household vulnerability for their communities, importance of engaging communities in different communities to get spatial differences, seasonality of vulnerability and use of household vulnerabilities for classification. This knowledge should hopefully improve the ability of development practitioners to design and classify better the most vulnerable groups to enhance impact of development.

Bankoff, G.; Frerks, G.; and Hilhorst E., 2007, *Mapping Vulnerability: Disasters, Development and People*, London.

Barnett, C. 2005. *The Political Ethics of Consumerism,Consumer Policy Review*, **15(2):**.p45-51

Barnett, T. 2012. *Social policy interventions to enhance the HIV/AIDS response in sub-Saharan Africa*, Cambridge, UK,**16**: 281-292.

Barnett, T. and Whiteside, A. 2000.*Guidelines for studies of the social and economic impact of HIV/AIDS*. Joint United Nations Programme on HIV/AIDS (UNAIDS), Geneva, Switzerland

Barrett, J C. 1992. *Valuing animal draught in agropastoral farming systems in Zimbabwe. In: 'Tillage, past and future', CIMMYT Food Security Networkshop Report* 22

Besley, T., and Kanbur. R. 1999. *The principles of targeting. In Including the poor.* World Bank.Institute for Computational Earth System Science, University of California, Santa Barbara, CA 93106-4060, USA

Brooks, N., Adger, W.N., and Kelly, P.M., 2005. The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation.*Global Environmental Change*,**15**:151–163.

Cafiero, C. and Vakis, R. 2006. *Risk and vulnerability considerations in poverty analysis.*Food Consumption and Nutrition Division Discussion Paper Number 174. Washington, D.C.: International Food Policy Research Institute.

Caldes, N., Coady, D. and Maluccio, J., 2004, *The Cost of Poverty Alleviation Transfer Programmes: A Comparative Analysis of Three Programmes in Latin America*. FCND Discussion Paper 174. Washington, DC: International Food Policy Research Institute.

Cannon, T.; Twigg, J. and J. Rowell, 2003.*Social Vulnerability, Sustainable Livelihoods and Disasters.Report to DFID.*Conflict and Humanitarian Assistance Department (CHAD.Sustainable Livelihoods Office London.

Cardona, O.D. 2004.*The Need for Rethinking the Concepts of Vulnerability and Risk from a Holistic Perspective: a Necessary Review and Criticism for Effective Risk Management*. London

CARE International, CRS, WVZ., 2007. *C-SAFE Beneficiary Registration Manual*, United States Agency for International Development

Carter, M. 1997, *Environment, technology and the social articulation of risks in West Africa*

Central Statistics Office, National Profile Central Census Office, Causeway Harare

Chambers, R. 1995, '*Poverty and Livelihoods: Whose Reality Counts?* IDS Discussion Paper 347, IDS, Brighton, UK.

Chambers, R. and Conway. G. 1992, *Sustainable Rural Livelihoods: Practical concepts for the 21st Century*. IDS Discussion Paper 296, IDS, Brighton, UK, February 1992.

Chambers, R., 1989,*Editorial Introduction: Vulnerability, Coping and Policy*. IDS Bulletin

Chambers, R.,1995, *Poverty and Livelihoods: Whose Reality Counts*,*Discussion Paper* 47.Brighton, UK: Institute of Development Studies.

Chaudhuri S,. 2003, *Assessing vulnerability to poverty: concepts, empirical methods and illustrative examples*, Department of Economics, Columbia University

Chaudhuri, S., Jalan, J. and Suryahadi, A. 2002.*Assessing household vulnerability to poverty from cross-sectional data: A methodology and estimates from Indonesia*.Department.of Economics, Columbia University, Discussion paper, No. 0102-52.

Chaudhuri, Sarbajit, 2011. *Poverty alleviation programs, FDI-led growth and child labour under agricultural dualism*, MPRA Paper 29997, University Library of Munich, Germany.

Chesley W., 2007. *Review of: Just and lasting change: when communities own their futures*, SIL Electronic Book Reviews 2007-007: 9.

Chiwaula S. L., and Waibel Hermann, 2011.*Seasonal bias in household vulnerability to porvety estimates: Insights from a natural experiment*, Munich Repec Archive MPRA paper 30716.

Christiaensen, L. and Boisvert, R.N. 2000.*On measuring households food vulnerability: Case evidence from northern Mali.*Cornell University. Department of Agricultural and Managerial Economics, Working Paper, No. WP 2000–05.

Christiaensen, L., and Subbarao, K. 2005. *Toward an understanding of household vulnerability in rural Kenya.Journal of African Economies*, **14(4):** 520-558.

Coady D., Grosh M. and Hoddinott J., 2004, *Targetng of Transfers in Developing Countries: Review of Lessons and Experience,* Washington, World bank.

Commonwealth Secretariat (2000): *A commonwealth Vulnerability Index for Developing Countries*, Commonwealth Publication.

Conning, J. and Kevane, M. (2000), *Community Targeting Mechanisms for Social Safety Nets*, Department of Economics, Boston: Williams College and Institute for Economic Development.

Cornwall A., Guijt I., 2004, *Shifting Perceptions, Changing Practices in Participatory Rural Appraisal*: From Infinite Innovation to the Quest for Quality", Participatory Learning and Action Issue 50

Costa, R..2002., *A Multidimensional Approach to the Measurement of Poverty: An Integrated Research Infrastructure in the Socio-Economic Sciences,* IRISS Working Paper Series No. 2002-05

Cuna, L., 2004, *Assessing household vulnerability to employment shocks: a simulation methodology applied to Bosnia and Herzegovina*, Bangkok, Thailand

Cutter, S.L., Boruff, B.J., Shirley W. L., 2003.*Social vulnerability to environmental hazards, Social Science Quarterly***84(2)**: 242–261.

Dagum C., 2002, *Analysis and measurement of poverty and social exclusion using fuzzy set theory: Application and policy implications*, University of Bologna.

Davies, Rick and LasseKrantz.*A Study of Perceptions and Responses to Poverty within The Vietnam-Sweden Mountain Rural Development Programme.* Report prepared for SIDA, Cambridge and Göteborg, August 1999.

Dercon, S., and Krishnan, P. 2000. *Vulnerability, Seasonality, and Poverty in Ethiopia*, *Journal of Development Studies*, **36(5)**: 25-53.

DFID, 2000, *Achieving Sustainability: Poverty Elimination and the Environment, Strategies forAchieving the International Development Targets*. London: Department for International

DFID. 1999, *Sustainable Livelihoods and Poverty Elimination: Background Briefing Sustainable Livelihoods Guidance Sheets*. DFID, London.

Dilley, M. and Boudreau T. E, 2001, *Coming to terms with vulnerability: a critique of the food security definition,* Scientific and Technical Advice, Buenos Aires, Argentina *Food Policy*

Eakin H. and Tapia B, L,.2007, *Insights into the composition of household vulnerability from multicriteria decision analysis,Global Environmental Change***18**: 112-127.

Eakin, H., 2005. *Institutional change, climate risk, and rural vulnerability: cases from Central Mexico. World Development **33 (11),** 1923-1938.*

Eakin, H., 2005. *Weathering Risk in Rural Mexico: Economic, Climatic and Institutional Change*. University of Arizona Press, Tucson.

Eakin, H., and Luers, A., 2006. *Assessing the vulnerability of social–environmental systems. Annual Review of Environment and Resources***31,** 365–394. Economics, Columbia University, Discussion paper, No. 0102-52.

Ellis, F. 2000, *Rural Livelihood Diversity in Developing Countries: Analysis, Methods*, Policy. Oxford University Press, Oxford.

Emmanuelle L.,Olivier A., Laure Pasquier-Doumer and Anne-Sophie Robilliard, 2010. *Poverty alleviation policy targeting: a review of experiences in developing countries,* Working Papers DT/2010/10, DIAL (Développement, Institutions etMondialisation).

Emmi, A., Ozlem, E., Maja, K., Ilan, R. and Florian, S., 2011, *Value for Money: Current Approaches and Evolving Debates,* London School of Economics, London

Eriksen, S., Brown, K.., 2005.*The dynamics of vulnerability: locating coping strategies in Kenya and Tanzania.*The Herzegovina. Working Paper N. 1579, Dipartimento di Scienze Economiche. University

FAO,2008a.*Bioenergy, food security and sustainability – towards an international framework.* Paperprepared for the High-Level Conference on World Food Security: The Challenges of ClimateChange and Bioenergy, 3–5 June 2008 (www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/HLC08-inf-3-E.pdf).

FOSENET Food Security Network. 2007. *Impact of HVI and AIDS on Rural Agricultural Production and Food Security in Chivi and Makoni District.* The Food Security Network of Zimbabwe

Foster, J., Greer, J. and Thorbecke, E. 1984. *A class of decomposable poverty measures.*University of California, Santa Barbara, CA 93106-4060, USA of Bologna.*Econometrica,***52(3),** 761-766.

Franks, T., A. Toner, I. Goldman, D. Howlett, F. Kamuzora, F. Muhumuza, T. Tamasane.2004. *Goodbye to Projects? The Institutional Impact of Sustainable Livelihoods Approaches on Development Interventions*, Department for International Development

Grassly N. C and Timaeus I. M, 2003, *Orphans and AIDS in Sub Saharan Africa*", Department of Economic and Social Affairs, United Nations Secretariat.

Grosh, M. 1994. *Administering targeted social programs in Latin America: From platitudes to practice.* Washington, D.C.: World Bank.

Grosh, M. and Del Ninno, C. 2008,*For the protection and promotion: the design and implementation of effective safety net*, World Bank Publications

Gwatkin, D. 2000. *Poverty and inequalities in health in developing countries: In Poverty, inequality, and health: an international perspective.*Oxford University Press, Oxford.

Haddad, L. and Zeller, M. 1996. *How can Safety Nets do More with Less? General Issues with Some Evidence from Southern Africa.*Discussion Paper 16, International Food Policy Research Institute, Washington D.C.

HallieeEaking and Luis A. Bojorquez – Tapia. 2006. *Insights into the composition of the Household Vulnerability from multicriterion decision.*Science Direct.Global Environmental Change hazards.*Social Science Quarterly,***84 (2):**242–261.

Hans de Kruijk and Martine Rutten, 2007.*Weighting Dimensions Of Poverty Based On Peoples Priorities: Constructing a Composite Poverty Index for the Maldives*, IIDE Discussion Papers, Institute for International and Development Economics.

Heck, B., V.,2003,*Rural institutions and participation service. Rural Development Division Food and Agriculture Organization of the United Nations.* Retrieved April 28, 2011 from http://www.fao.org/docrep/007/ad817e/ad817e0j.htm .

Heitzmann, K., Canagarajah, R.S. and Siegel, P.B. 2002. *Guidelines for assessing the sources of risks and vulnerability,* Social Protection Discussion Paper No. 0218, The World Bank, Washington.

Hentschel, J. and P. Lanjouw, 1998, *Combining Census and Survey Data to Study Spatial Dimensions of Poverty and Inequality, World Bank Economic Review.*

Hoddinott J., 2000. *Participation and poverty reduction: An analytical framework and overview of the issues.* Department of Economics Dalhousie University Canada

Hoddinott, J. 2001. *Targeting: Principles and Practice*. Washington, D.C.: International Food Policy Research Institute.

Hoddinott, J. and Quisumbing, A. 2003.*Methods for micro-econometric risk and vulnerability assessments: A review with empirical examples.*World Bank Policy Research Working Paper No. 0324.

Hoddinott, J.. 1999. *Targeting: principles and practice. Technical Guide No. 9.* Washington, D.C.: International Food Policy Research Institute.

Ireland C, Sibanda L. M, Mupetesi T. and Mhlanga S. 2004, *Livelihoods Insights: Challenges and Trends in Zimbabwe with Case Studies Matabeleland and Mashonaland,* the IDLS group

Jama, M. 2011. *Determinants of household vulnerability among rural communities in Maphutseng area development programme of Lesotho.* Masters Thesis University of Venda, South Africa

Janjaroen, W. S. 1998. *Soio-economics impact of HIV/AIDS on Households in Thailand,* Forum of International Development Studies 6, Nagoya University, Japan

Jayakaran R., 2002 ,*The Ten Seed Technique*, World Vision, China.

John A. Maluccio, Cornelia Loechl, 2004, *Preventive versus Recuperative Targeting of Food Aid: Accounting for the Costs*, The Food and Nutrition Technical Assistance (FANTA) Project

Johnson, C. and D. Start. 2001. *Rights, Claims and Capture: Understanding the Politics of Pro-Poor Policy.* Overseas Development Institute.

Sibanda L. M, andKureya T.,2007,*Food Security, HIV and Resilient Livelihoods in AfricaResilience,* Realities and Research in African Environments Workshop Oxford University Centre for the Environment, Oxford, UK

Lambert, 2002, *Child Vulnerability and AIDS: Case Studies from Southern Africa*, report prepared for WFP/IFPRI

Ligon, E. and L.Schechter. 2003,*Measuring Vulnerability.*, Economic Journal, **113(486):**95-102.

Littlefield E. J,Murduch and S. Hashemi, 2003, *Is microfinance and effective strategy to reach the millennium development goal?* CGAP Focus Note No. 24

Makoka, D. 2008, *The impact of drought on household vulnerability: The case of rural Malawi,*Centre for Development Research University of Bonn Walter-Flex-Str. 353113 Bonn, Germany

Makoka, D. and Marcus K. 2005, *Poverty and Vulnerability – An Interdisciplinary Approach*, Centre for Development Research, University of Bonn

Maluccio, J., and C. Loechl. 2004, *Preventive versus recuperative targeting of food aid: Accounting for the costs. Mid-term Cost Report*. A report submitted to The Food and Nutrition Technical Assistance (FANTA) Project, Washington, D.C., 2004.

Maphutseng ADP Design Report, 2008, *Programme Design Report* ,World Vision Lesotho.

Mpolonjeni Assessment Report, 2004, *Assessment Report for Mpolonjeni Area Development Programme*, World Vision Swaziland.

Nxumalo, D. 2011. *Community-Perceived household vulnerability to poverty in Mpolonjeni, Swaziland*.Masters Thesis University of Venda, South Africa

United Nation, 2011, *The Millennium Development Goals Report*, United Nations New York.

Mies, M., 1996 ,. *Liberating women, liberating knowledge: Reflections on two decades of feminist action research*", Atlantis.

Morris M., Butterworth J., Lamboll R., Lazaro E., Maganga F. and Marsland N., 2009, *Household Livelihood Strategies in Tanzania*, Natural Resources Institute, University of Dar es salaam

Moss, R.H., Brenkert, A.L., Malone, E.L., 2001 *Vulnerability to Climate Change: a Quantitative Approach*. Pacific Northwest National Laboratory, Battelle Institute, Washington, DC.

Norton A. and Moser C., 2001,*To claim our rights: Livelihood security, human rights and sustainable developmen*,London: Overseas Development Institute.

Odenya W. O., 2003, *HIV/AIDS and Food Security Within the Southern African Development Community*, School of Agriculture, National University of Lesotho

Pimbert, M., 2004, *Natural resources, people and participation*, Participatory Learning and Action **50**: 131–139.

Poate C. D., Daplyn P. F., 1993, *Data Agrarian Development*, Cambridge University Press.

Pretty, J. N., Guijt, I., Thompson, J., and Scoones, I., 1995, *Participatory learning and action: A trainer's guide*, London, International Institute for Environment and Development.

Pritchett, L. 2005, *The political economy of targeted safety nets*, Social Protection Discussion Papers.

Rachel Slater and John Farrington., 2009,*Cash transfers: targeting*, London Overseas Development Institute

Rakodi, C., 1999 , *A Capitals Framework for Analysing Household Livelihood Strategies: Implications for Policy*, Development Policy Review.

Ravallion, M. 2000, *Targeted Transfer in Poor Countries: Revisiting the Trade-off and Policy Options*, Washington, DC: World Bank.

Ravallion, M. and Wodon, Q. 1997, *Evaluating a transfer social programme when placement is decentralised?*Policy Research Working Paper No. 1 Washington, DC: World Bank Development Research Group. Recent advances and future directions. World Bank, SP Discussion paper, No. 0610.

Scoones, I., 1998. *Sustainable rural livelihoods: a framework for analysis.* IDS Working Paper /www.ids.ac.uk/ids/bookshop/wp.html.18/6/12

Slater, R. and Farrington, J., 2010, *Making Social Transfers Appropriate, Achievable and Acceptable: A Practical Tool for Good Targeting*, Social Protection Toolsheet, Overseas Development Institute (ODI), London

Smit, B. and J. Wandel. 2006. *Adaptation, adaptive capacity and vulnerability. Global Environmental Change*, **16(3):**282-292.

Taylor E,, 2004,*Horizontal inequalities: a neglected dimension of development*, Annual Lectures, No.5, World Institute for Development Economics Research, Helsinki.

Thomas T.S., 2003, *A Macro-Level Methodology for Measuring Vulnerability to Poverty, with a Focus on MENA Countries,* Presentation for the Fourth Annual Global Development Conference, Globalization and Equity, Cairo, Egypt

UN ESCAP,2008, *Statistical Yearbook for Asia and the Pacific*, Bangkok, United Nations Economic Commission for the Asia and the Pacific

UNAIDS,.2004, Sub-Saharan Africa HIV/AIDS Estimates for 2004, at http://www.unaids.org/EN/Geographical+Area/By+Region/sub-saharan+africa.asp18/8/11

UNAIDS,.2010, UNAIDS Report on the global AIDS epidemic 2010,http://www.unaids.org/globalreport/Global_report.htm 11/01/13

UNEP and SOPAC, 2005.*Building Resilience in SIDS: The Environmental Vulnerability Index,* SOPAC Secretariat, Fiji Islands; UNEP, Nairobi, Kenya

United Republic of Tanzania.(URT) 2004,*Vulnerability and resilience to poverty in Tanzania: Causes, consequences and policy implications.* Participatory Poverty Assessment (PPA), Dar-es-Salaam,Tanzania.

Vincent, K., 2007. Uncertainty in adaptive capacity and the importance of scale. Global Environmental Change **17**, 12–24.

Vincent, V. and Thomas, R.G. 1961. *An agricultural survey of Southern Rhodesia*. Part I Agro-ecological survey. Government Printer, Harare.

Watkins. B, 2008, *Alternative Methods for Targeting Social Assistance to Highly Vulnerable Groups,.* Kimetrica International Limited 2020 Pennsylvania Avenue, NW, Box 715 Washington, DC.

Watts, M. and Bohle, G. H, 1993. *The space of vulnerability: the causal structure of hunger and famine*. Progress in Human Geography **17(1)**: 43-67.

World Bank, 2000, *Poverty Reduction and Global Public Goods: Issues for the World Bank in Supporting Global Public Collective Action*. DC/2000-16. Washington, D.C.

World Bank, 2007, *Providing Financial Services in Rural Areas: A fresh look at financial cooperatives*, The World Bank, Agriculture and Rural Development Department.

World Vision Zimbabwe, 1999. *Participatory Rural Appraisal Rushinga ADP*Report, World Vision Zimbabwe

World Vision PRA, 2004, *Participatory Rural Appraisal Rushinga Area Development Programme*, World Vision Zimbabwe.

www.worldvision.org accessed 22/06/2012

Yohe, G., Tol, R., 2002. *Indicators for social and economic coping capacity—moving toward working definition of adaptive capacity. Global Environmental Change*,**12:**25–40.

Zimbabwe Vulnerability Assessment Committee (ZIMVAC), 2009*Rural Food Security Assessment*, National Report Zimbabwe.

Appendix 1: Construction of the HVI using an example of household responses

Capital (weight)	Asset	Hypothesis tested	Variables for testing hypothesis (example detail)	Transformation (weight within capital) (type) (example)
Natural (10)	Capital	Soil fertility declines for vulnerable households as application of natural fertilizers declines.	Proportion of field fertilized by natural means. Proportion X of the fields that is fertilized by natural means where A is the land size fertilised and B is the total land size. Total Land Size = 2.32, Land Size fertilized = 1.16	X = A / B (4) (continuous) (X = 1.16 / 2.32 X = 0.5)
		Environmental management deteriorates with increasing vulnerability: Households revert to the environment for "free" products such as wood when vulnerable. HIV and AIDS affected households rely more on the forest for their livelihoods.	Tree cutting or wood selling as a means of survival, wild fruits' collection, environmental management in the presence of sickness or death, quality of water used by household, participation in water or environmental management. Total Number of yes responses provided (C), total possible yes responses (D). Have you ever resorted to cutting down trees and selling wood?: No Have you ever resorted to collecting wild fruits?: Yes Has sickness/death prevented you from managing your environment?: No Has sickness/death affected the amount/quality of water used? No Has sickness/death prevented your household from ever developing or participating in planned water or environmental management projects? Yes Therefore C = 2, D = 5	X = C / D (3) (Discrete) (X = 2 / 5 X = 0.4)

	Affected households have difficulties in fully utilizing their land due to limited labour and draft power availability. Vulnerable households do not fully utilize their existing land	Which proportion of land is available but not used due to illness or death? Proportion of total land size that is not cultivated (X), Size of land not utilized (E), total land available for cultivation (F). Total Land Size= 2.32 ha, Unused Land= 1.16 ha Therefore E = 1.16, F = 2.32	X = E / F (3) (continuous) (X = 1.16 / 2.32 X = 0.5)
Human Capital (25)	Affected households are vulnerable when they have sick members, and the more the number of sick members, the more the vulnerability. Also worse if the sick member is the head of the household.	Proportion of sick members (X). What is the total Household size (Z)? How many members are sick regularly (have been bedridden for at least three different times in the last year, with each bout extending up to a week? Or have been diagnosed with any of TB, Meningitis, Caporsi Sarcoma, Hepatitis, Pneumonia (Y)?) Total Household Size= 4, Regularly sick/diagnosed with above diseases= 1 Therefore Y = 1, Z = 4	X = Y / Z (6) (Discrete) (X = 1 / 4 X = 0.25)
	Households that have productive sick members are more vulnerable.	Households that have sick/bedridden economically active members (18-64 years) are more vulnerable than households with sick dependants (<18years and >64 years). Indicate the ages, sex, relationship to household head and health status of the productive sick members. Household Head = 4, Spouse = 3, Productive Adult = 2. Total score of productive sick (X), Summation of weights of productive household members who are sick (Σwi). Sick household member age: 32, Relation to household head: Son. Therefore sick member is a productive adult, relevant weight = 2. Thus Σwi = 2.	X = 1 / Σwi (7) (Discrete) (X = 1 / 2 X = 0.5)

	Affected households have a greater number of dependents due to the increasing number of orphans in such households	Dependency ratio (X), Economic Burden: Number of dependants ({0-15}+{>64} +{bedridden or disabled}) (y), Number of economically active {>15 and <65} (Z). Number of dependants= 1, Number of economically active= 4 Therefore y = 1, Z = 4	X = y / Z (4) (continuous) (X = 1 / 4 X = 0.25)
	Female headed and/or child headed households are less able to cope with shocks, compared to male headed households	The age and gender of the household head determines the household's vulnerability. Male = 0, Female = 1, Dependant = 3. Household Head Score (X), relevant household head weight (w), Summation of possible weights (Σy). Household head sex: Female, Age: 53. Therefore relevant weight= 1 Σy = 0 (Male) + 1 (Female) + 3 (Dependant) = 4	X = w / Σy (4) (Discrete) (X = 1 / 4 X = 0.25)
	Diseases such as HIV and AIDS have caused disintegration in affected households	If household members who have moved away due to sickness or death, 1 is assigned. If there are no members who have moved, 0 is assigned. Number of household members who moved away= 0	Yes = 1, No = 0 (4) (Discrete) (X = 0)
Physical Capital (25)	Vulnerability especially to food insecurity increases with less use of fertilizers	Nitrogen fertilizer use for staple crop(X). What is your land size Y in ha? What is the weight Z of top dressing fertilizer used in the last season in Kg? (Assumption: 400kg/ha fertilizer application for maize crop) Total Land Size= 2.32 ha, Top dressing fertilizer used= 0Kg Therefore Z = 0, Y = 2.32	X = Z /400Y (4) (continuous) (X = 0 / 400*2.32 X = 0)

	Affected households have reduced harvests due to limited labour and draft power	Per capita staple cereal output (X). What is the total household size (Y)? How many Kgs of Maize were harvested (Z)? What is the staple cereal requirement for an individual household member (S)?	$X = Z/(Y*S)$ (2) (continuous)
	Households that do not own an ox drawn plough or cart are likely to face difficulties in cultivation, planting and other farming operations.	Ownership of a plough or ox drawn cart. Owns a plough or cart = 0, does not own a plough or cart = 1. Household owns plough/cart: No	Yes = 0 or No = 1 (4) (Discrete) X = 1
	Households that do not own or own fewer cattle and other livestock are more vulnerable due to limited access to draft power and alternative sources of income and nutritious food.	How many Cattle do you own (C)? Goats (G)? Sheep (S)? Donkeys (D)? Productive livestock index (X), Applicable livestock weights (a, b, c, d). Table 3 compares livestock in terms of utility, convertibility, cost of management and relevance to household. Livestock owned by household: Cattle (6), Goats (1) and Poultry Therefore Ca = 6, Gb = 1	$X = 1 / (Ca+ Gb + Sc + Dd)$ (5) (continuous) $(X = 1 / (6+1)$ $X = 1 / 7$ $X = 0.14)$
	Affected households adopt unsustainable short term coping strategies which might include the selling of assets such as livestock and farm	How many Cattle do you own (C)? Goats (G)? Sheep (S)? Donkeys (D)? How many Z (=ca+gd+sc+dd) of each were sold in the last year? Livestock sales index (X), Total livestock owned (Y=Ca+ Gb+Sc+Dd), Applicable livestock weights (a, b, c, d). Livestock owned by household: Cattle (6), Goats (1) and Poultry Livestock types sold: Goats (1). Therefore Z = 1, Y = 7	$X = Z / Y$ (3) (continuous) $(X = 1 / (6+1)$ $X = 0.14)$
	Affected households have limited access to extension	Do you have access to livestock and/or crop extension services? If yes to both then assign 0, if no to both assign 3, if yes to one assign	$X = Y / Z$ (2)

	services due to ill health and inadequate time to devote to such activities.	1. Extension Services Index (X), Assigned value from responses (Y), Maximum possible response value (Z). Access to livestock extension services: No, Access to crop extension services: No Therefore Y = 3, Z = 3	(Discrete) (X = 3 / 3 X = 1)
	Affected households eat less variety per day due to inadequate food availability	Describe the typical food stuffs in meals taken in your household. Nutrition Index (X), Number of food groups taken at least once in the past 7 days (Y), Total number of available food groups= 12. Number of food groups taken at least once in the past 7 days= 5 Therefore Y = 5	X = Y / 12 (3) (Discrete) (X = 5 / 12 X = 0.42)
	Affected households eat less per day due to inadequate food availability	How many meals are taken daily? If 3 or more than 3 meals assign 0, if 2 meals assign 2 if 0 or 1 meal, assign 3. Meals Index (X), Weight of no. of meals taken (m), maximum weight of meals taken (z). Number of meals taken= 1. Therefore m = 3, z = 3	X = m / z (2) (continuous) (X = 3 / 3 X = 1)
Financial (25)	Households with little or no savings are more vulnerable	Households with bank savings, receive remittances, joined a savings scheme, do not have unpaid debt and receive family support are less vulnerable. Savings Score (X), total number of yes responses + no response for unpaid debts (Y), Total number of variables (Z). Do you have bank accounts? No	X = Y / Z (3) (Discrete) (X = 2 / 5 X = 0.4)

		Did you receive any remittances from family/relatives? Yes Have you joined any community or formal savings credit scheme? No Do you have any Unpaid debt? No Do you receive family support? No Therefore Y = 2, Z = 5	
	Affected households have fewer sources of regular income due to unavailability or limited number of formally employed members in a household	Indicate the household's two main sources of income. Income Index (X), summation of weights for two sources of income indicated (ΣYi), highest income source weight value (Z). Income Sources: Informal Work (4), Remittances (1), thus ΣYi = 5 Z = 2*5 = 10, (2 being the maximum possible income sources and 5 being highest income source weight value derived from the Salary income source)	X = ΣYi / 2Z (6) (Discrete) (X = 5 / 10 X = 0.5)
	Affected households have limited access to credit loans due to increased risks and lack of collateral associated with such households	Have access to credit loans = 0, do not have access to credit loans = 1. Have you joined any community or formal savings credit scheme? No	Yes = 0 or No = 1 (4) (Discrete) X = 1
	Households with unpaid debts are most vulnerable.	Presence of unpaid debts = 1, no unpaid debts = 0. Do you have any Unpaid debt? No	Yes = 1 or No = 0 (2) (Discrete) X = 0
	Affected households experience increased expenditure on health care	Where does the HH spend most of its financial resources? Expenditure Index (X), summation of weights for the two areas of expenditure indicated (ΣYi), highest area of expenditure weight value	X = ΣYi / 2Z (4) (Discrete)

	due to the presence of more ill members in the household	(Z). Expenditure Areas: Food (2), Non-food Basic Goods (1), thus ΣYi = 3 Z = 2*2 = 4, (2 being the maximum possible expenditure areas and 2 being highest expenditure area weight value derived from the Food expenditure area)	(X = 3 / 4 X = 0.75)
	Use of additional resources indicate choices under vulnerability	Where would you spend any additional financial resources if they were availed to you? Additional Expenditure Index (X), summation of weights for the two areas of additional expenditure indicated (ΣYi), highest area of additional expenditure weight value (Z). Additional Expenditure Areas: Food (2), Savings (1), thus ΣYi = 3 Z = 2*2 = 4, (2 being the maximum possible expenditure areas and 2 being highest expenditure area weight value derived from the Food expenditure area)	X = ΣYi / 2Z (3) (Discrete) (X = 3 / 4 X = 0.75)
	Purpose for selling harvests indicates levels of vulnerability.	For what purpose did the household use financial resources from sale of crops/ livestock from the last season? Crops and Livestock Sales Index (X), summation of weights for the two areas of expenditure from crops/livestock sales income (ΣYi), highest area of expenditure weight value (Z). Crop/Livestock Sales Income Expenditure Areas: Non-food Basic Goods (2), Health (5), thus ΣYi = 7 Z = 2*5 = 4, (2 being the maximum possible expenditure areas and 5 being highest expenditure area weight value derived from the Health expenditure area)	X = ∑Yi / 2Z (3) (Discrete) (X = 7 / 10 X = 0.7)

	The lesser the number and quality of support channels from external sources, the greater the vulnerability	What support was obtained from Government, NGOs, community and other external support networks in the last 3 months? Support Index (X), summation of support areas weight values ($\sum wi$), Summation of all weights (Z). Support received: Farming Inputs. Therefore $\sum wi = 1$, $Z = 14$	$X = \sum wi / Z$ (7) (Discrete) ($X = 1 / 14$ $X = 0.07$)
Social Capital (15)	The inadequacy of support from external sources contributes to vulnerability	How would you rank the adequacy of the support you receive from external support networks? Satisfied = 0, Fair = 1, Not Satisfied = 3. Support Adequacy Index (X) = summation of support types rankings ($\sum ri$), N = total number of support types, S = Maximum possible ranking score. Support Received Ranking: Farming Inputs = Satisfied. Therefore $\sum ri = 0$, $N = 14$, $S = 3$	$X = \sum ri / (N*S)$ (6) (Discrete) ($X = 0 / (14*3)$ $X = 0$)
	The more informed a household is, the less vulnerable the household	How often do you discuss HIV/AIDS related issues? Rare = 1, Regular = 0, Never = 3. HIV/AIDS Knowledge Index (X), Ranking score provided (r), Maximum possible ranking score (S). How often do you discuss HIV/AIDS related issues?: Rare. Therefore $r = 1$, $S = 3$	$X = r / S$ (2) (Discrete) ($X = 1 / 3$ $X = 0.33$)

Appendix 2:Community-based household vulnerability classification

Capital	Minimum for Low vulnerability level households	Threshold set by the community	Minimum for high vulnerability level households	Threshold set by the community
Human	• Household is headed by an economically active household member • Dependency ratio is low, • Less sick household members • No orphans. • At least two economically active household members.	Yes 1:4 1 or less 0 2 or more	▪ Household is headed by an economically in active, elderly or child ▪ Dependency ratio is high ▪ More orphans ▪ Sick household members. ▪ Economically active household members are few.	Yes 1:8 3 2 or more 1 member
Natural	• Household use both inorganic and organic fertilizers • High agriculture productivity • Utilize much land for subsistence farming	Yes 1 tonne sorghum 1acre	▪ Organic fertilizers are the main sources of fertilizers ▪ Low agriculture productivity ▪ Utilize less land for subsistence farming	Yes 200kg sorghum ½ acre
Social	• May receive some means of support from NGO's and government • More knowledgeable on agriculture	Yes (exclusion from intervention due to capacity) Yes	▪ Receive support from NGO's and government ▪ Less knowledgeable on agriculture	Yes (inclusion due to incapacity) Yes
Financial	• Have a diversified income source • Household income is used on a balance of needs (farming inputs, education, health, recreation etc)	2 or more sources of income Yes	▪ Have no basic source of income ▪ Most of the household income is used on food and medicines	Yes Yes
Physical	• Own important livestock for example. cattle, in sustainable numbers • Have labour for farm and off farm work • Owns farm implements • Receive some agricultural extension services • At least three meals per day	5 or more Yes Yes Yes Yes	▪ May have no or few livestock ▪ No labour for farm and of farm work ▪ Do not own farm implements ▪ Does not receive agricultural extension services ▪ Do not regularly eat three times a day	2 or less Yes Yes Yes 1 meal

World Vision

Appendix 3. Household Questionnaire

FANRPAN
Food Agriculture and Natural Resources Policy Network

Household Baseline Vulnerabilit

Southern AfricaTrust

- Hello. My name is __________________________.
- I am working with the development programmes team of World Vision in this area. In order to get more information about development issues and qual of life in *Rushinga ADP*, we are conducting a census of households in the area. I would like to ask you some questions related to your household.
- The information you provide will be useful to find out the status of quality of life in your household, and will be used to plan future development programs this area and also in the country. World Vision is conducting this census on household vulnerabilities in all Rushinga ADP households.
- Participation in the survey is voluntary, and you can choose not to take part. However; the information collected by this effort will be used for planning a guiding interventions for several years; and it is in yours households' interest to be part of this census. All the information you give will be confidential. T information will be used to prepare general reports, but will not include any specific names.
- If you have any questions about the survey, you can ask me, my field supervisor who is here with the census team, or one of the development workers World Vision in *Rushinga ADP* At this time do you have any questions about the survey?

General Information

Name of Respondent:	Date: ..../............/.........	Start Time:	Stop Time:

Respondent agreed to be interviewed: 0 = No 1= Yes		Name of household head:
Homestead Number (assign):		Household Number (assign):
Province:	District:	ADP Name:
Chiefdom:	Ward:	Village:

A: HOUSEHOLD SURVEY (For every household in the community)

Occupants *(For 1-11 include members who have stayed for three months and above)*														
	A1.1 Full Name Choose by *order, starting with Head = 1*	**A1.2** Sex *1=M 2=F*	**A1.3** D.O.B.	**A1.4** ID No.	**A1.5** Relation to Head[1]	**A1.6** Marital Status [2]	**A1.7** Education[3]	**A1.8** School attendance (6-18 years)[4]		**A1.9** Employment [5]	**A1.10** Health Status[6]	**A1.11** If 1, 2 and 3 then record sickness[7]	**A1.12** Disability[8]	**A1.13** Parenthood Status for children Less than 18yrs[9]
								Are you going to school *1=Yes 2=No 99=n/a*	**Reason for not going to school[10]**					
1					**Head**									
2														
3														

---

[1] 1Spouse 2=Mother 3=Father 4=Son 5=Daughter 6= Niece/ Nephew 7=Grandpa 8=Employee 9=Other

[2] 1=Married 2=Single 3=Widow 4=divorced 5=separated 6=consensual

[3] 0=Illiterate 1=Some Primary School, 2=Completed Primary School, 3=Some Secondary School, 4=Completed Basic Secondary School 5=Completed High School/ Pre-University School 6=Professional College Certificate 7=University Education 8=Adult Education 9=Other

[4] 1=lack of finance, 2=health 3=no interest, 4=work 5=family disputes 6=other 99=n/a

[5] 0=Unemployed/ homemaker/ N/A 1=Subsistence farmer 2=School child 3=Artisan/ Skilled tradesman/woman 4=Petty trade 5=Formal employment 6=Harvesting natural resources (wood, panning, etc.) 7=Other (specify)

[6] 0=Good 1=Infrequently sick 2=Regularly sick (sick at least once every month) 3=Bedridden 4=n/a

[7] 1=TB/Pneumonia/Kaposi 2=Malaria 3=Headache/ Whole body 4=Stomach ache 5=Other 99=n/a

[8] 1=visually impaired 2=deaf and or dump 3=physically challenged 4=mentally challenged 0=none 99=n/a

[9] 1=Both parents alive 2=single parent orphan (mother alive) 3=single parent orphan (father alive) 4= Double parents orphan

4														
5														
6														
7														
8														
9														
10														
11-13, Record household members that have relocated away within the last three months														
11														
12														
13														
14-15, Record household members who have died in the last three months														
14														
15														

B: FARM IMPLEMENTS AND LIVESTOCK ASSETS

Farm Implements

	Item	B1.1 Do you own any ox-drawn plough? 1=Yes 2= No	B1.1 Number functional	B1.2 Number not functional
a	Ox-drawn plough			

Livestock

	Livestock	B1.4 Total No	B1.5 Increased in the past year *1= Yes, 0 = No*	B1.6 Decreased in the past year *1= Yes, 0 = No*	B1.7 Reason for increase or decrease	B1.8 Uses *1= draught, 2= commercial, 3= subsistence, 4=Other*
a	Cattle					
b	Donkeys					
c	Goats					
d	Sheep					
e	Pigs					
f	Poultry					
g	Other (specify)					

C. FOOD CONSUMPTION

C1.1	Yesterday, how many times did the <u>adults</u> (over 18) in this household eat?	|__| times	C1.2 Yesterday, how many times did the <u>children</u> (0-17) in this household eat?	|__| times

Could you please tell me how many days in the **<u>past ONE WEEK</u>** your household has eaten the following foods and what the source was (***use codes below, write 0 for items not eaten over the last 7 days and if several sources, write up to two***)

	Food Item	C1.3 Number of days eaten last 7 days (0 to 7)
A	Maize (*for example. Pap, thin porridge*)	|__|

B	Rice	|__|	
C	Bread	|__|	
D	Other cereals *(sorghum, millet, pasta, etc.)*	|__|	
E	Roots and tubers *(cassava, irish and sweet potatoes, etc.)*	|__|	
F	Beans, peas, nuts	|__|	
G	Vegetables and leaves	|__|	
H	Fruits	|__|	
I	Meat *(domestic or wild)*	|__|	
J	Poultry *(chicken, ducks)*	|__|	
K	Fish	|__|	
L	Eggs	|__|	
M	Oil, fat, butter	|__|	
N	Sugar and sugar products	|__|	
O	Milk and milk products	|__|	

D. WATER, SANITATION AND HEALTH

	(i) Water Source	**D1.1**Is source of water used? 1= Yes, 0 = No	**D1.2** State of water source 1= protected, 2= unprotected
A	Tap water		
B	Water tank		
C	Well in yard		
D	Communal borehole		
E	Dam		
F	River		
G	Spring		

H	Communal Well											
I	Canal											
J	Other (Specify)											
Sanitation												
D1.3 Which type of toilet is mainly used by the household? (Tick appropriately)		Bush		Flush toilet		VIP toilet		Pit latrine		Other		
D1.4 Current Status / condition of toilet (limit to pit latrine and VIP)		**Poor**		**Fair**			**Good**					

EXTERNAL SUPPORT NETWORKS

	List of support	**E1.1** Get support 1=Yes, 0=No	**E1.2** Source of support 1=Government 2=NGOs/CBOs/FBOs 3=Relatives 4=neighbours 5=churches 6=any other external support, 99=n/a	**E1.3** Please rank adequacy of support offered on a scale of 1-3 (1= satisfied, 2= fair, 3= not satisfied, 99=n/a)
a	Food			
b	Non-food basic			
c	Health			
d	Savings/Financial Services			
e	Transport to work			
f	Transport to clinic			
g	Burial expenses			
h	Farming inputs			
i	Recreation (sports equipment)			
j	School fees, uniforms, stationary			
k	Income Generating Activity			
l	Spiritual			
m	Counselling			
n	Other (specify)			

E1.4. Do your household go to church? (1= yes 0= No) **(Please link to spiritual support)**		**E1.5** If yes what denomination? *1= Zionist, 2=Pentacostal, 3=Catholic, 4=Anglican, 5=Jericó, 6= Other (specify)*	

F: HOUSEHOLD INCOME

F1.1 What is the household's two main main sources of income? *(Circle the two) 1= salary 2=informal work 3=livestock sales 4=crop sales 5=remittances 6=trading 7=donations from NGOs 8=government allowances 9=other (specify)*	
F1.2 Do you have access to projects or interventions that can raise income for your household?*Yes = 1, No = 2*	

NB- For the QF1.3 – QF1.5 use the following codes:	1=food 2= non-food basic goods 3=health 4=savings 5=transport to work 6=transport to clinics 7=burial expenses 8=farming inputs 9=beer and recreation 10=school fees 11= income generating projects 12=other (specify)	
	Option 1	**Option 2**
F1.3 Where does the HH spend most of its financial resources (give 2 of the most common)		
F1.4 Where would you spend any additional financial resources if they were availed to you: (give 2 of the most important)		
F1.5 For what purpose did the household use financial resources from sale of crops/ livestock from the last season? (give 2 of the important)		

		F1.6 1= Yes 0= No	**F1.7** Amount /Type (for goods)	**F1.8** Has the status/amount changed within the last year 0=did not change 1=increased 2= decreased 88=don't know 99=n/a	**F1.9** If changed state the reason 1= to meet food 2= to meet medical expenses 3= to meet other needs eg school fees 4=forcibly taken away by relatives or local authorities 5= Death 6 = to service a debt 88=don't know 99=n/a
a	Do you have bank accounts?		**Number/Type of bank accounts held:**		
b	If household received any remittances from family/relatives please indicate amount or type of goods?				
c	Have you joined any community or formal savings credit scheme?				
d	Do you have any Unpaid debt?				

G: AGRICULTURAL PRODUCTIVITY

		G1.1 Size /amount	G1.2 Are you satisfied with the quality and/or quantity? 0=poor/need improvement 1=satisfactory quality 2=good 88=don't know 99=n/a	G1.3 Did Asset Increase/reduced within the last year 0=did not change 1=increased 2= decreased 88=don't know 99=n/a	G1.4 If there is a decrease, what are the reasons? 1=sold to meet food 2= sold to meet medical expenses 3= sold to meet other needs e.g. school fees 4=forcibly taken away by relatives or local authorities 5=lost to natural causes 88=don't know 99=n/a
A	Land Size (ha)				
G1.5 Did you plant the previous year (2007/2008)? (*1=Yes , 0=No*) ***If no please proceed to G1.6***					
A	Land area under staple crop in the last season (acres/ha)				
B	Total land area under crop cultivation in the last season (acres/ha)				
C	Land fertilised by manure in the last season (acres/ha)				
D	Land available but not used due to illness or death in the last season (ha)				
E	Top dressing fertilizer used for staple crop (kg) in the last season?				
F	Basal fertilizer use for staple crop (kg) in the last season?				
G	Manure use for staple crop in the last season(bags/wheelbarrows/carts)				

	Agricultural Extension Services	G1.6 1= Yes, 0 = No	G1.7 If yes indicate No. of visits/month	G1.8 If yes indicate time spent/ visit
a	Do you have access to agriculture extension services for livestock?			
b	Do you have access to agriculture extension services for crops			

I: HOUSEHOLD ENVIRONMENT	
Use and management of the environment within the last year	**1= Yes, 0= No**
I1.1 Have you ever resorted to cutting down trees and selling wood as a means of survival?	
I1.2 Have you ever resorted to collecting wild fruits because you do not have enough food to eat?	
I1.3 Do you practice environment management activities in your area? for example. tree planting, gully filling, manure collection	
I1.4 Have you had any awareness sessions on preventing environmental degradation?	
I1.5 Has sickness or death of a family member prevented you from managing your environment? for example. tree planting, gully filling, mc collection, etc	
I1.6 Has sickness or death affected the amount or quality of water used by your household? For example. resorting to collecting water from n but unsafe sources or failing to pay for piped water or failing to pay for repairs to safe water sources?	
I1.7 Has sickness or death prevented your household from ever developing or participating in planned water or environmental manage projects? For example. borehole drilling, tree planting, participation in community initiatives?	

	J: HIV/AIDS AND AGRICULTURAL KNOWLEDGE	
J1.1	Do you know what is HIV/AIDS *1=yes, 0=no*	
J1.2	How is it transmitted? *1=Blood transfusion, 2=contact with infected blood, 3=sex with an infected person,4=organ transplant of an infected person, 5= from infected mother to child, 6=other, 99=n/a)*	
J1.3	How often are AIDS related issues discussed with parents *1=Rare, 2=Regular, 3=never*	
J1.4	Main Information source for HIV/AIDS *1=radio, 2=TV, 3=newspaper, 4=peer educators, 5=Health centre, 6=other*	
J1.5	Do you have adequate knowledge on type of crops to grow, and when to grow them? *1=yes, 0=no*	

J1.6	In any given season, do you know- in advance- the weather forecasts and use this for farming planning? *1=yes, 0=no*	
J1.7	At any given time, do you have adequate knowledge on prices of agricultural and non-agricultural commodities in the market? *1=yes, 0=no*	

H: CLIMATE CHANGE		
H1.1	**Total area planted last season? ....acres/ha**	**Total area to be planted this season?................acres/ha**
H1.2	Area in crops affected last season?............................acres/ha	
H1.3	What types of crop did you plant last season? List all	
H1.4	What types of crops are you planning to plant this season?	
H1.5	Which crops do you plant in summer?	
H1.6	Which crops do you plant in winter?	
H1.7	What %age of your income comes from agricultural activities?	
H1.8	In your own opinion are the seasons changing? *1=yes, 0=no*	
H1.9	If yes, how are they changing?	
H2.0	What has been the impact of changing season?	
H2.1	How have you changed your farming practices in response to the changing seasons?	
H2.2	If you have changed, what were your reasons?	
H2.3	Are there any signs that you use to predict the nature of the season? *1=yes, 0=no*	
H2.4	If yes what are the signs?	
H2.5	Have you experienced crop losses due to seasons changing? *1=yes, 0=no*	
H2.6	If yes what is the %age?	
H2.7	Do you experience problems of pests in the area? *1=yes, 0=no*	

H2.8	If yes, what pests?	
H2.9	How often do they come?	
H3.0	What do you think is bringing the pests?	
H3.1	How do you control them?	

COMMENTS	
Question Number	**Comments**