

**A GENDER-SENSITIVE ANALYSIS OF FARMERS'
PERCEPTIONS ON CONSERVATION FARMING
TECHNOLOGIES: CASE STUDY OF INSIZA DISTRICT IN
MATABELELAND SOUTH PROVINCE, ZIMBABWE**

BY

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**A minithesis submitted in partial fulfilment of the requirements for the
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ABSTRACT

Despite considerable research on agriculture and natural resource management over the past three decades, very few of the world's developing countries have managed to eliminate poverty and hunger. Lack of adoption of research outputs is evident, particularly in Sub-Saharan Africa. While low levels of technology adoption are attributed to a number of factors (Kaliba A. R. M. *et al*, 1998), it is important to get an in-depth understanding of why targeted beneficiaries fail to adopt new farming technologies. This research explored some of these factors from the perspective of farmers, who are at the bottom end of interventions.

Given that much agricultural research that has been aimed at reducing poverty has been silent on gender issues, this research gave particular attention to the gendered perspectives of female and male farmers. The research focused on male and female farmers' perceptions on 'conservation farming' technology in selected communities in the Insiza District of Matabeleland South Province in southern Zimbabwe.

Conservation farming, also known as 'conservation agriculture', is one of the practices that are being promoted so as to increase yield while conserving the productive resource base and sustainability of past productive gains. Zimbabwe, like most African countries, is a patriarchal society where women and men have distinct and different roles. Perceptions on conservation farming by farmers and other stakeholders in agriculture may therefore differ along gender lines. Without in-depth understanding of gender roles, relationships and perspectives, achieving increased adoption of farming technologies by female farmers will remain an elusive goal.

The aim of the research was to identify what female and male farmers

think are the best strategies to enhance the role of conservation farming as a buffer against social, economic and environmental hazards, and a means of ensuring livelihood sustainability and food security. The study also aimed at coming up with information useful to policy and other decision makers on how to improve adoption of these technologies. The empirical component of the research included a questionnaire survey of one hundred and fifty two(152) selected households in one identified ward in Insiza District, focus group discussions and semi-structured interviews with key informants and in-depth interviews of individual male and female members of a few selected farming households from the sampled population. The desktop portion of the study used secondary data from non-governmental organizations (NGOs), government and other stakeholders involved in conservation farming. Collected data was then disaggregated by gender and analyzed using the Statistical Package for the Social Sciences (SPSS). Perception statements that emerged as significant in chi-square tests of independence were subjected to factor analysis and weighted factor scores from factor analysis were then used as independent variables in binary logistic regression analysis.

The study concluded that both practising and non practising farmers were of the opinion that conservation farming was good though they indicated that information on conservation farming was not readily available

The study found out that most farmers agreed on the possible positive effects of CA in addressing livelihood challenges effected by hazards such as HIV and AIDS and environmental hazards such as declining soil fertility but it had is labour intensive therefore is not suitable for people affected and infected by HIV and AIDS. However the farmers pointed out that information on Conservation farming was not readily available and this can affect take up rate of the technology by farmers.

The study concluded that though CA has many potential benefits responsible authorities should promote the technology more vigorously giving farmers relevant information as it is said, ‘Knowledge is Power’

KEY WORDS

Conservation farming, Conservation Agriculture (CA), Gender, Farmers’ perceptions, Technology adoption, Rural livelihoods, Food security, Vulnerability, Coping strategies.



Dedication

To my lovely daughter Kupakwashe, you are the greatest gift from God.



DECLARATION

I declare that *A Gender-Sensitive Analysis of Farmers' Perceptions on Conservation Farming Technologies: Case Study of Insiza District in Matabeleland South Province, Zimbabwe*, is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references

Rutendo Nhongonhema

November 2009



Signed:

UNIVERSITY of the
WESTERN CAPE

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ABBREVIATIONS USED IN THE THESIS

AIDS	Acquired Immune Deficiency Syndrome
AGRITEX	Agriculture Technical and Extension Services
CA	Conservation Agriculture
CAPNET	Conservation Agriculture Promotion Network
CF	Conservation Farming
CFU	Commercial Farmers' Union
CGIARs	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Centre
CSO	Central Statistics Office
DAAC	District AIDS Action Committee
DFID	Department for International Development
FAO	Food and Agriculture Organisation
FGDs	Focus Group Discussions
GAD	Gender and Development
HIV	Human Immuno Virus
NGOs	Non Governmental Organizations
NTCA	National Taskforce on Conservation Agriculture
NEPAD	New Partnership for African Development
PCA	Precision Conservation Farming
RoL	River of Life
SADC	Southern African Development Community
SPSS	Statistical Package for Social Sciences
UN	United Nations
UNAIDS	The United Nations Joint Programme on HIV and AIDS
WAAC	Ward AIDS Action Committee
WAD	Women and Development
WID	Women in Development
ZCATF	Zimbabwe Conservation Agriculture Taskforce
ZFU	Zimbabwe Farmers' Union

CHAPTER I

INTRODUCTION

1.1 Introduction

Globally, there have been more than three decades of sustained agricultural research that has generated a body of technical knowledge and led to dramatic growth in agricultural productivity in regions like Asia. Farmers in such regions have benefited from the development of crop varieties with higher yields and better tolerance of severe environmental stress, such as drought. These farmers have been shown to have achieved improved living standards as a result of adopting new farming technologies. This has not been the case in Sub-Saharan Africa. In fact, even prior to the post-2000 economic decline, agricultural production in Zimbabwean communal areas has declined. Income disparities have not been reduced and, in some instances, have increased especially between adopting and non-adopting farmers (Delehanty, 1990). Degradation of agricultural lands in Southern Africa has left the farming sector, which is directly responsible for the livelihoods of approximately 55% of the population, vulnerable to hazards such as drought and declining soil fertility. Challenges facing Sub-Saharan Africa as a whole and the Southern African region specifically are mirrored by the case of Zimbabwe.

Conservation farming systems have been vigorously promoted as a buffer against climatic and environmental hazards, such as droughts and deteriorating soil fertility. These hazards are among the numerous factors that have contributed to declining yields over the past decade. Rural livelihoods, which are mostly agriculture based, have been left vulnerable by uncertainties induced by variations in water supply. There have also been uncertainties due to changes in the socio-economic and political environments. Coping strategies adopted by farmers include switching from conventional to conservation farming methods. It is therefore imperative to ascertain if farmers in the Zimbabwean context perceive conservation farming as providing an effective buffer against social,

economic and environmental hazards, and a means of ensuring livelihood sustainability and food security.

More than 70% of maize (*Zea mays*) produced in Zimbabwe is grown in communal areas, where farmers depend mostly on rain-fed agriculture. Risk of crop failure tends to be high due to rainfall unreliability. Even in good years, midseason droughts often reduce yields significantly, with critical implications on food security since maize is the staple crop and also an important cash crop in the country. To increase productivity in the more arid communal areas, options taken are either to increase irrigation or to embark on water conservation techniques. It is difficult to increase the area under irrigation because of the high financial, social and ecological costs associated with such projects. Conservation measures are therefore the more realistic option. There have been vigorous campaigns to promote conservation farming as a way of cushioning farmers against climatic hazards, such as drought, and environmental hazards, such as declining soil fertility and land degradation. At the same time, these campaigns have sought to maintain the productive resource base, hence ensuring sustainable crop production.

United Nations (UN) partners and various non-governmental organizations (NGOs) have acted in partnership with the Zimbabwean government to spearhead these campaigns through various input support programs and related development programs. Intervention technologies that are currently promoted include 'basins' and 'animal powered systems'. Basins are small pits measuring about 15cm by 15cm by 15cm in size, which are made by a hoe and dug in rows whose spacing depends on the intended plant population. Animal powered systems are of two types. They include 'direct seeding', which uses animal powered direct seeders that open planting lines and apply fertilizers and seed at the same time. Animal powered systems also include 'ripping and deep ripping systems', in which rip lines are made into the soil by the use of ripper tines and fertilizer and seed applied manually.

A common assumption among agricultural researchers and practitioners has been that if the 'right' or 'appropriate' technology can be found, there will be greater participation and adoption of that farming technology by targeted groups, including women farmers (Anderson, 1985:59 in Stamp, 1989:51). However, even though women do adapt and innovate technologies, their expertise remains largely unrecognized while a range of problems and constraints exist which limit women's access to and use of technologies (Bob, 2004). A number of reasons have been put forward in support of promoting conservation farming technologies.

Literature suggests that adoption of conservation farming at the farm level is associated with lower labour and farm-power inputs, more stable yields and improved soil nutrient exchange capacity. Profitability of crop production under conservation farming tends to increase over time relative to conventional agriculture (FAO, 2001). In a survey carried in Zambia in the 2001 to 2002 cropping season, data collected suggests that conservation agriculture farmers who used hand hoes produced 1,5 tonnes more maize and 460kg more cotton per hectare than farmers practicing conventional farming methods (Haggeblade & Tembo, 2003). With such impressive results, it is reasonable to expect that most farmers would opt for conservation agriculture. However the situation on the ground is different. Adoption of the technology by African farmers has been very slow.

Two decades of conservation farming development and promotion in Zimbabwe appear to have yielded similarly slow technology adoption. Data collected through the Food and Agriculture Organization (FAO), however, shows an increase in the area put under conservation farming by farmers in the country. While this may imply an increase in adoption by farmers of the technology by farmers, it also presents a two-fold dilemma. This is the uncertainty that remains to be seen on whether adoption is due to incentives offered by organizations promoting the program or it is because farmers are embracing the technology.

There are many factors that influence farmers to adopt soil and water conservation technologies. Kaliba A. R. M. et al (1998) state that factors influencing the adoption of new agricultural technologies can be divided into three major categories: farm and farmers' associated attributes, attributes associated with the technology and the farming objective. Factors in the first category include a farmer's education, age, or family and farm size. The second category depends on the type of technology (e.g., the kind of characteristics a farmer likes in an improved maize variety). The third category assesses how different strategies used by the farmer, such as commercial versus subsistence farming, influence the adoption of technologies. There is also a view that in order to determine the factors, there is a need to look beyond the characteristics of farmers and plots of land (CIMMYT, 1993).

The research argued that gender issues, which are critical to understanding dynamics of adoption of conservation farming technology, are not yet fully understood and there is therefore a need for gender-sensitive research. From such a realisation emanates the dire need to pay more attention to the significant roles of women in the evolution of farming and its methods. Historically, women, more than men, have been the custodians of indigenous knowledge in African societies, yet their knowledge has failed to be utilised through the functioning of an unequal society.

Many traditional societies draw insights from the knowledge, cultural values, practices, and perceptions learned and passed on through the generations (Thrupp, 1989 in Odoul, 1995). They selectively adopt innovations according to their needs, while adapting or rejecting those that do not fit into their cultural orientation (Rogers 1983 & Thrupp 1989 in Odoul, 1995). Poor rural women utilize a range of technologies in both productive and reproductive activities which are central to their livelihood strategies, especially at the household level (Bob, 2004). In addition, although women are adapting and innovating

technologies, their expertise remains largely unrecognized and a range of problems and constraints exist which limit women's access to and use of technologies (Ibid.). An objective of the study was to examine perceptions by female and male members of farming households on the usefulness of conservation farming in addressing livelihood sustainability, food security and HIV and AIDS-related hazards and vulnerability. Stamp suggests that agricultural technology has had the most negative impacts upon the ability of African women to maintain not only their responsibilities as food producers but also their position within the village and family (Stamp, 1989:48).

It is worth considering that communal farmers are both consumers and producers. They therefore react in a number of ways to declining productivity or to variations in production that undermine consumption needs. Farmers either modify existing technologies or adopt new ones. With regard to the latter, farmers depend mainly on information diffusion from external parties to learn about new technologies. The manner in which conservation farming is articulated at the interface between local farmers and external agencies may determine farmers' views on the technology and their response to efforts to promote its adoption. Research has tended to emphasize differences in national yields, thus failing to compare the outcomes of research to matched control groups of farmers and farming conditions. There are many reasons given for this, including the modernist approach of technology handouts, where farmers are usually handed down new technology without taking into cognisance their perceptions. Despite recent shifts towards participatory action research in agriculture, elements of the top-down approach may still persist due to the fact that women, who provide most of the agricultural labour in countries like Zimbabwe, are rarely included in decision making about what technology to adopt. This raises questions whether desired outcomes in conservation farming can be achieved without the mainstreaming gender within interventionist strategies. A second objective of this study was to develop an understanding of the role of gender in decision-making around conservation farming both within households and within projects

supported by external agencies.

It is important to understand that the motivating factor for creating technological innovations originates from the need by human beings to transform the world to their advantage. Decisions determining invention, adoption, adaptation and rejection of technology rely wholly on people (Odoul, 1995). As Readon & Vosti (1997) put it, a farmer is mainly concerned with the time it will take for him or her to get the benefits of soil and water conservation investments. A third objective of the study was to find out whether perceptions affect adoption decision.

1.2 PROBLEM STATEMENT

The research problem for the proposed study is captured in the following questions:

- What are the perceptions of female and male members of households on conservation farming as a buffer against environmental hazards, such as low soil fertility, and economic uncertainties, such as lack of inputs? What are the gendered perceptions on effects of the five capitals for sustainable livelihoods on adoption of conservation farming technologies within households? What is the impact of HIV and AIDS on households that are adopting the conservation farming technology?
- Do decisions to adopt conservation farming technologies reflect the cultural and social beliefs of farmers and farmer attributes, such as gender, age, education and socio-economic status within households and within projects supported by external agencies? In particular, does decision making around conservation farming and production related activities differ according to gender or position within the household?
- Does these perceptions affect decisions to adopt or not

1.3 PURPOSE OF THE STUDY

The purpose of the study was to explore and gain an in-depth and gender-sensitive understanding of Insiza farmers' perceptions on conservation farming. Emphasis was made on female and male farmers' perceptions on livelihood and food security implications of conservation farming, decision-making around the technologies and determining whether these perceptions affected adoption of conservation farming. The study also generated recommendations useful to policy and other decision makers on how to improve adoption of these technologies.

1.4 AIMS AND OBJECTIVES

1.4.1 Aim of Research

The aim of the research was to identify what farmers think about the role of conservation farming as a buffer against social, economic and environmental hazards, and as a means of ensuring livelihood sustainability and food security.

1.4.2 Research Objectives

Objectives of the study were to:

- Examine perceptions of female and male members of farming households on the usefulness of conservation farming in addressing livelihood sustainability, food security and HIV and AIDS-related hazards and vulnerability.
- Develop a deeper understanding of the role of gender in decision-making and production related activities around conservation farming both within households and within projects supported by external agencies.
- Determine whether these farmers' perceptions had an effect on adoption

decision.

1.5 STUDY AREA

The study was carried out in two communities within Insist District in Matabeleland South Province, which is found in the Southern part of Zimbabwe (Figure 4 on page 41). The study area is located within the Limpopo River Basin, in agro-ecological region V of the country. This region is characterized by low, erratic and unreliable rainfall (450 – 600mm per annum), brown to reddish brown soils and granitic sandy soils with inherent low fertility (www.icrafsa.org)

Insiza lies in close proximity to two neighbouring countries namely, Botswana and South Africa. With the economic and other hardships that Zimbabwe has faced since 2000, there has been a huge outward migration to neighbouring countries. More often than not, these migrations are illegal. This has got an impact on labour availability as well as greater risk of HIV and AIDS infection.

1.6 RESEARCH METHODOLOGY

The investigation consisted of empirical research and a desktop study. The empirical component of the research included a questionnaire survey of one hundred and fifty two (152) selected households in Insiza District, focus group discussions and semi-structured interviews with key informants and in-depth interviews of individual male and female members of a few selected farming households from the sampled population. The desktop study used secondary data from non-governmental organizations (NGOs), government and other stakeholders involved in conservation farming. Questions were asked on household demographics, agriculture and gender roles and responsibilities and decision making within the household. Questions on farmers perceptions on different aspects connected to conservation farming were also asked. Five Likert scale responses were given.

The quantitative data was supplemented with qualitative data collected through informal interviews, key informant interviews, direct observation and focus-group discussions. These techniques were used to obtain in-depth information on farmers' socio-economic characteristics, farming practices and perceptions on conservation farming technologies.

1.7 DATA COLLECTION

Interviews were held with both male and female members of a few selected households among the questionnaire sample population. Interviews were also held with key resource persons from the ward, government departments, NGOs and UN partners. As far as possible, both male and female respondents from these institutions were interviewed. Focus group discussions were held with farmers and with other key stakeholders. Two research assistants were engaged to improve on the quality of data collected. There were two main visits to the study site. The first visit was in the first week of September 2008. The purpose of this visit was to make formal arrangements for entry into the study area and to establish contacts with key institutions and resource persons. The first visit also intended to gather information on the general socio-economic profile of the ward, conservation farming interventions and farmers' responses in technology adoption. During the first visit, a semi-structured checklist of questions was used in interviews and focus group discussions with key informants at the ward and community level. Participatory rural appraisal (PRA) methods and representation of both men and women was critical in the focus group discussions. The second visit was in the third week of October. The purpose of the second visit was to administer the questionnaire, conduct in-depth and informal interviews and to convene focus group discussions.

1.8 DATA ANALYSIS

Analytical framework used in the study mainly borrowed concepts from the Technology Diffusion and Adoption Model, however the Sustainable Livelihoods framework and the gender analysis framework were also used to build up the underlying construct on conservation farming adoption. Collected data was disaggregated by gender and analyzed using the Statistical Package for the Social Sciences (SPSS). Perception statements which emerged as significant in chi-square tests of independence were subjected to factor analysis and weighted factor scores from factor analysis were used as independent variables in binary logistic regression analysis. All statistical analyses were conducted with SPSS.

To determine if perceptions could be used to explain choices pertaining to adoption of conservation farming, Likert-Scale responses to perception statements were combined with choices regarding adoption of conservation farming in chi-square tests of independence. Perception statements which were significant in chi-square tests of independence were then subjected to factor analysis in order to create a reduced number of variables that were uncorrelated with one another but still contain useful information from original responses to perception statements. Weighted factor scores from factor analysis were used as independent variables in binary logistic regression analysis. The farmer perceptions and attitudes towards technology were compared with literature on evaluation experiments already done with the technologies.

1.9 ETHICAL CONSIDERATIONS

1.9.1 Ethical Questions

Although the study had a specific emphasis on agriculture, conservation farming and livelihood, it followed principles and methods generic to all scientific

explorations of this nature. It was also inevitable that it took into cognisance issues pertaining to HIV/AIDS and the scourge's effects on households as well the need to address ethical considerations. In the study, human subjects were involved in matching perception to livelihoods and face to face interviews were administered to household members. Research with human participants raised ethical concerns because respondents mostly accept risks and inconvenience primarily to advance knowledge and to benefit others, in most cases without direct benefits to the participants.

Worldwide research protocol has laid down strict norms for ethical treatment of human subjects. In view of this, the study since it included aspects on HIV/AIDS considered three basic ethical principles: (a) respect for persons (viewing individuals as autonomous and respecting their autonomy as well as protecting those with reduced autonomy), (b) beneficence (the effort to secure the well-being of participants), and (c) justice -the equitable application of research and its benefits (Wolf L & Bernard , 2001; King et al in Denzin et al, 2005). This study upheld these principles and the researcher strived to avoid discrimination in conducting research. Such discrimination might have come about, for example, if certain people were omitted from study or some people were included only because they are readily available. The study was based on the principle of human consideration first. As humanly as possible, need for data tried not to preclude considerations, feelings and values of research participants.

1.9.2 Justice and Research Design

Research protocol stipulates that it is unethical to expose human subjects to the risk of participating in a research study unless the design is sufficiently rigorous so that the results are valid and generalizable for the area of study. To meet this ethical obligation this study involved a sample size of 152 participants, which is big enough to give a generalized view of the community. To ensure justice, selection of participants was as random as possible and no respondent were excluded or included because of their vulnerability.

1.9.3 Informed Consent

Some of the questions in this study included possible invasion of privacy and hence consent was sought. The purposes and procedures of the research and uses of data were explained verbally in the process of arranging the interviews. Respondents were also told on how the data obtained from interviews will be used. Informed consent was obtained by the interviewee's willingness to answer questions after having received this information. Because of the possible AIDS related dementia, in the case of HIV positive respondents who were at the symptomatic stage of HIV/AIDS, the researcher consulted next of kin regarding informed consent.

Many research participants did not understand randomization and expected that decisions about their problems would be based on their individual needs.

At the time of study, Zimbabwe was undergoing a huge humanitarian crisis, in response there were many NGOs working in the agriculture, food distribution and health sectors. These NGOs interview households to select recipients and there is a potential risk of respondents having the misconception that the study is for them to have food handouts, medical help or any other NGO assistance. Because of this, there were misconceptions about the study because respondents applied their own experience with health care providers, who had an ethical obligation to place patients' interests first, to the research setting, which must take responsibility for the scientific and logistical aspects of the research as well as the interests of the individual participant. Because of such hopes and misconceptions, respondents may have misinterpreted the information given to them about the study. To minimise this, all relevant information about the study was disclosed and the researcher answered all questions and queries from the respondents honestly.

1.9.4 Vulnerable participants

Some people may be at greater risk from research and are considered vulnerable. Vulnerability is particularly important in the context of HIV-related research. . In

this study vulnerable participants were child headed households, female headed households and those heads infected by HIV/AIDS. Those infected with HIV are more likely to be medically vulnerable because of their infection, child headed households and female-headed households are more likely to be socially and economically vulnerable because of historical attitudes and discrimination. Accordingly the research paid particular attention to vulnerability and take steps to protect potentially vulnerable research participants. In the case of child headed households, where respondents were minors (i.e. below 16 years), consent was sought from guardians prior to the interview. However, this did not preclude these minors' individual rights to accept or decline the invitation to participate in the research, to ask questions or to terminate interviews when they so wish. Child headed households may have reduced decision making capacity. According to Wolf L and Bernard, 2001 persons who lack decision-making capacity and are therefore not autonomous must be protected. To protect such households there will be strong collaboration with World Vision and ICRISAT who are already doing work with the community and have established links with such structures like Ward AIDS Action Committee (WAAC) and District AIDS Action Committee (DAAC) which are responsible for integrating multi-sectoral efforts to mitigate the impacts of the pandemic (including to minors). These structures have trained caregivers who are sensitive to the needs of such households and are considered trustworthy by such households.

1.9.5 Respect and Protection of participants

The possible risks and benefits of participating in the research were discussed with respondents. Potential risks to the respondents include anxiety produced from talking about their and other household members' HIV status, interview fatigue and uneasiness in talking about incomes and wealth. Although the researcher took all necessary precautions to avoid any risks or harm to respondents, and although assurance in this regard was given, respondents were also made aware of their right to accept or decline the invitation to participate in the research, to ask questions before, during and after each interview, and to

terminate an interview at any point if they so wish.

1.9.6 Confidentiality

To assure confidentiality during data collection, research assistants were made aware of their ethical responsibility with regards to confidentiality. The use in the study of local extension workers who are already working and are knowledgeable on the culture, norms and values of the community greatly improved confidentiality and privacy of participant information. The principle of confidentiality was upheld throughout this research. Data was not accessible for unauthorized observation. Respondents were assured that the information would be kept confidential prior to the interview and the researcher was not going to be professionally negligent.

1.9.7 Beneficence

The timing of the study coincided with a volatile political climate in Zimbabwe. The role of NGOs, who played a major role in development, humanitarian and conservation agriculture projects, was questioned by the government, which at one point cancelled all their licenses. Although the licenses were later renewed uncertainty hanged about their projects and the communities, which they serve and this had an impact on service delivery. In view of this all protocols were observed to protect respondents. Particular attention was given to making acceptable formal arrangements for entry into study area as well as establishing links with relevant stakeholders.

In this study, due to its sensitivity, information on HIV/AIDS status was not asked directly to respondents but was extracted and response was optional. Possible responses on the HIV/AIDS issue included such options as where the respondent could evade the question if he/ she wish. Attention to issues of HIV and AIDS by the study also carried the risk of stigmatization and social exclusion for respondents disclosing health status in this regard. The researcher therefore

endeavored to avoid putting the safety and privacy of respondents at risk. Respondents were also made aware that participation in the study was voluntary and if at any time during the interview they felt uncomfortable for whatever reason, they were entitled to withdraw from the research.

To deal with possible negative results; participants were protected by assuring freedom not to answer questions they thought were of a sensitive nature.

1.9.8 Deception

No concealment or deception was used when seeking information that could have encroached on privacy. Respondents were not coerced into participating in the interviews.

As Tapela et al, 2007 argues, research ethics should be understandable and agreeable with the local interest, respect of indigenous cultures, values and norms was upheld throughout this study.

1.9.9 Potential Benefits of the study

Although the study did not have direct **tangible** benefits to the respondents, there are much more sustainable benefits to be derived from the study. Potential benefits include improvement and appropriate interventions to the community. Study also intended to establish policy requirements in connection with Conservation farming which has shown so much potential in improving agricultural production and subsequently livelihoods of communities. Another potential benefit is from policy makers creating an enabling environment especially for the private sector and CGIARs on appropriate machinery and on the technology itself to make conservation farming easier.

1.9.10 Feedback

Respondent were assured that results from the research will be principally for academic purposes. Although it is important to give feedback to the respondents, logistically this might be difficult because most of the respondents are illiterate

and therefore giving them copies of the thesis might not help them much. However, feedback of research results will be given to relevant key stakeholder institutions and also to literate respondents if these request such. The local extension worker will also be used to orally give feedback of the study during their usual farmer meetings.

1.9.11 Inclusion of the communities in the study

To foster a sense of belonging community members specifically the community leaders was involved in the sampling and selection of households. Although this was done randomly and in a statistically correct manner, the village head provided the list of members of the community.

1.10 STRUCTURE OF THE MINI-THESIS

Chapter 1: Introduction

This chapter introduces the research by providing conceptual definitions and background information on conservation farming. The chapter states the research problem, aims and objectives, research methodology, justification, limits and ethical considerations of the study.

Chapter 2: Literature review

This chapter reviews literature on previous work on farmer's perceptions on natural resource management in other countries. Attention is also given to the relationship between conservation farming and livelihoods in Zimbabwe and Sub Saharan Africa as well as the relationship between gender, health and adoption of technologies. The discourse on social, economic and natural resource

management cost and benefits of conservation farming will be outlined. The sustainable livelihoods framework and the Conceptual framework will also be outlined.

Chapter 3: Methodology

The Research Methodology chapter includes the research design for data collection and analysis. It also includes an overview of the sampling methods, wealth indicators, data analysis tools and analysis plan. A summary of the research question versus the means of analysis is laid out. Literature sources include journal articles, project and programme reports, books, newspapers, theses and electronic sources on the internet.

Chapter 4: Characterisation of study area and sampled households

This chapter describes general socio-economic characteristics of the study area and sampled households. It gives an insight on the background through which the technology is introduced in the community.

Chapter 5: Findings

Findings of the study are presented and discussed.

Chapter 6: Conclusion and Policy Recommendations

The study is summarised, conclusions drawn from research findings and recommendations for further research highlighted. Considering the immense

benefits of Conservation Agriculture the study also comes up with recommendations for stakeholders, policy makers and government to improve uptake by farmers and hence scaling up the technology



CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews work that has been done. It will look into the definition of Conservation Agriculture, gender, poverty and sustainable livelihoods. It will review shifts from feminism through women in development, women and development to recently gender and development. The chapter will appreciate the diffusion model for technology adoption, the sustainable livelihoods framework and the gender theories but also points out the fact that these, on their own cannot explain the relationship between sustainable livelihoods and technology adoption. Finally the three aspects, sustainable livelihood framework, diffusion model and gender analysis framework are reviewed together to come up with the conceptual framework of the study.

2.2 DEFINITION OF CONCEPTS

Conservation Agriculture (CA)

CA is a concept for resource saving agricultural production that strives to achieve acceptable profits together with high and sustained production levels while concurrently conserving the environment. It is based on enhancing biological processes above and below the ground. Interventions such as mechanical tillage are reduced to an absolute minimum, use of inputs such as nutrients of mineral or organic origins are applied at an optimum level in a way and quantity that does not interfere with or disrupts biological process (FAO^a). It can be described as any tillage sequence, the object of which is to minimise or reduce the loss of soil and water, operationally a tillage and planting combination which leaves at least 30% of the residue on surface. In Zimbabwe basically three principles are being

^a FAO web Conservation Agriculture site <http://www.fao.org/ag/ca/index.html>

promoted which are

1. Direct seedling
2. basin tillage
3. Ripper tines.(adapted fro FAO, 2001)

Conservation Farming (CF) is a particular technology developed by Brian Oldrieve using planting basins and soil cover. This is a modification of the traditional pit system once common in Southern Africa which is a variation of the *Zai* pit system from West Africa.(Mashingaidze et al 2006)

Conservation Farming in Zimbabwe is not a new technology. It has been developed and promoted in Zimbabwe for the last two decades though adoption has been very low. Brian Oldrieve, developed Conservation Farming using planting basins and soil cover which is a modification of what has been traditionally practised (pit system).

Precision Conservation Farming (PCA) These are interventions currently promoted/ tested in Zimbabwe which are

- Basin tillage and shallow planting furrows(hand hoe based)
- Basin tines attached to the beam of the mouldboard plough, to prepare planting lines in unploughed soil for households with draught power; and or
- Specialised no till, direct planting seeders aimed at the emerging commercial farmers with draught power.(Mashingaidze et al; 2006, Twomlow et al; 2008)

“Conservation Farming development has been done for nearly two decades with very little results in terms of adoption by smallholder farmers. In response to this the Zimbabwe Conservation Agriculture Task Force (ZCATF) was formed to examine the potential of CA to improve crop production and to promote the adoption of CA through supporting the relief efforts and facilitate the uptake of hand based PCA interventions promoted by NGOs under a wide range of humanitarian relief initiatives that have been operating in Zimbabwe since 2004”

(Twomlow et al, 2008).

“Many organisations in the country use the terms CA and CF interchangeably as if they are the same yet they are different” (Twomlow et al, 2008). In view of this observation and considering that this study will focus on NGO promoted CF the terms will be used interchangeably in accordance with many NGOs.

Gender is defined as socially constructed roles, relationships and learned behaviours of males and females (Dejene, 2007). Gender can also be viewed as a household resource and is usually seen as power relationship between men and women which is characterised by negotiation and conflict

Poverty: For many decades the concept of poverty has been a topical issue worldwide with what exactly is poverty being debated and its definition evolving from it being associated with low income or consumption through it being associated with deprivation of material requirements to meet minimally acceptable human needs such as health, education, clean water and other services required to sustain livelihoods to the latest definition proposed by the Development Action Committee's (DAC) Guidelines on poverty reduction which defines poverty as an encompasses different dimensions of deprivation that relate to human capabilities including consumption and food security, health, education, rights, voice, security, dignity and decent work (OECD in Bene, 2004).

2.3 CONSERVATION FARMING AND LIVELIHOOD SUSTAINABILITY: IMPLICATIONS FOR FOOD SECURITY AND HIV/AIDS

The prevalence rate of HIV and AIDS in Southern African is reputed to be among the highest in the World. In 2007, this sub-region accounted for almost a third (32%) of all new HIV infections and AIDS-related deaths globally, with national adult HIV prevalence exceeding 15% in Median HIV prevalence among

women (15–49 years) attending antenatal clinics in consistent sites in southern African countries, 1998–2006 eight countries in 2005 (Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe) UNAIDS, 2008. The epidemic has increased the vulnerability of women, children and poor households to hazards such as lack of draught power, which result from households selling all livestock in order to take care of the ill, pay medical bills or prevent their seizure by relatives after death of a spouse or father. The pandemic may be an important factor in the adoption of conservation farming. Enhanced understanding of gender issues relating to HIV and AIDS will shed light on how men and women in Insiza District perceive conservation farming.

Sustainable livelihoods

Farmers, who are the centre of this study, have complex livelihoods. They differ in many aspects (e.g. socio-economic differentiation of individuals and households, male and female, young and old, HIV and AIDS infected/affected status). These attendant livelihood complexities, rights, power and gender issues make the Sustainable Livelihood framework central to this study. Chambers and Conway (1992) describe livelihoods as comprising capabilities, assets and activities required for a means of living. DFID came up with five key capitals for a sustainable livelihood. These are:

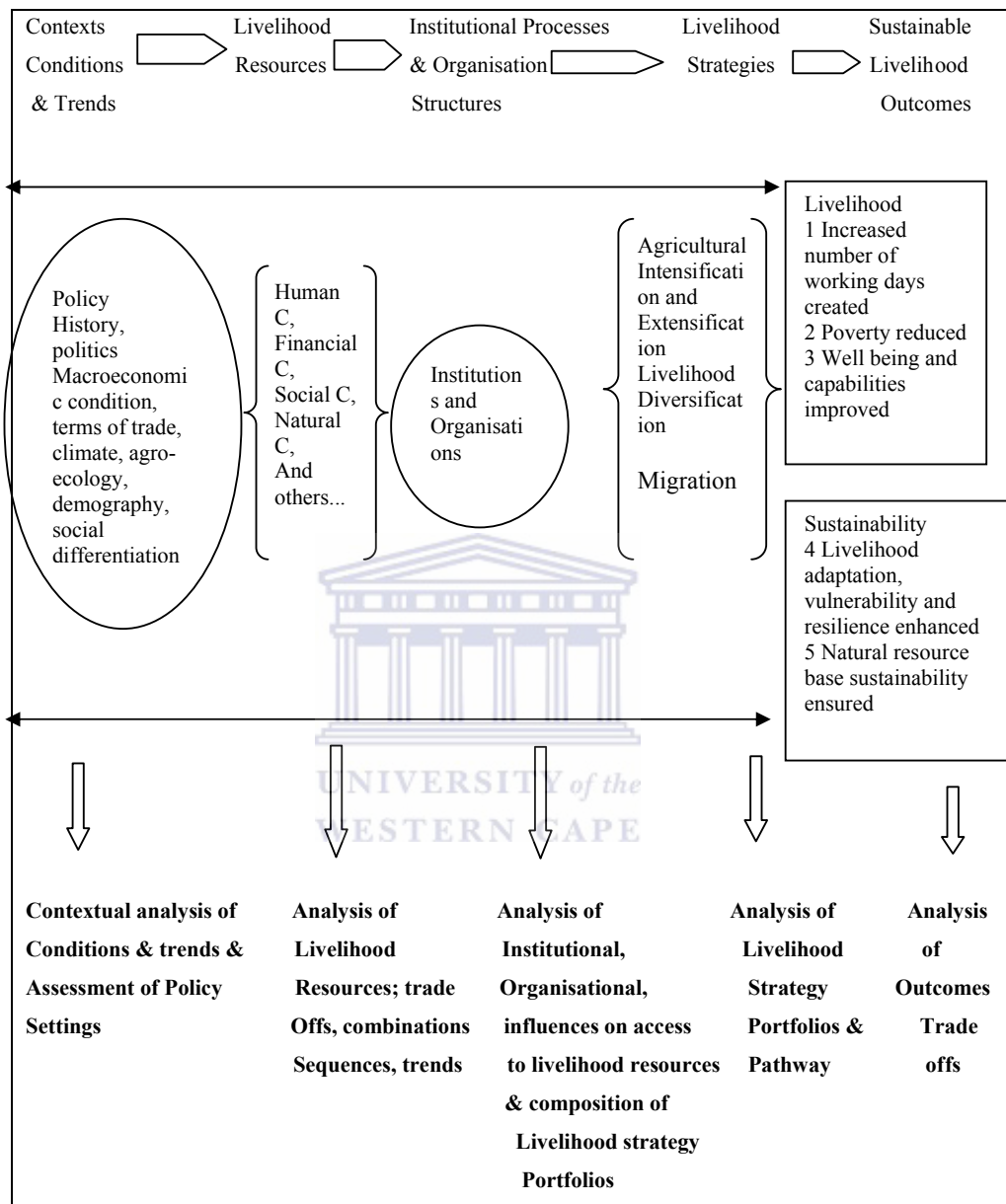
- *Human Capital*: the skills knowledge, ability to labour and good health and physical capabilities important for the different livelihood strategies.
- *Natural Capital*: natural resource stocks and environmental services from which resources flows and services from which resources flows and services useful for the livelihoods are derived.
- *Financial capital*: refers to the capital base which are essential for the pursuit of any livelihood strategy
- *Social capitals*: the social resources upon which people draw when pursuing different livelihood strategies requiring coordinated actions. (Scoones, 1998)
- *Physical capital*: producer goods and physical infrastructure (Castro,

2002)

The sustainable livelihoods framework is a useful tool for assessing rural livelihoods and can be used to find out the impact of a technology such as CA. It takes into consideration the complex and multidimensional relationship between the social and physical environments clearly bringing out the vulnerability contexts in which decisions takes place (Castro, 2002). Farmers' perceptions are also centred on these.



Figure 1 Sustainable Rural Livelihoods: A framework for analysis



(Source: Scoones, 1998)

However the framework does not encompass all the aspects of Sub Saharan Africa rural livelihoods. It is silent on some of the pertinent livelihood issues prevalent in a rural society such as power sharing (within the households and communities) and rights such as land rights and resource rights. Poverty, though

a subjective issue which differs from community to community is also like livelihoods, complex, diverse and dynamic in nature. One of the aims of bringing out new technology is to improve livelihoods and bring communities out of poverty. To achieve this objective it is important in introducing technology to embrace the poverty status and vulnerability context. Although the livelihood framework considers the current state of poverty and conceptualise poverty alleviation it has shortcomings in viewing the vulnerability context as static whereby research has showed that physical and social environment have greater degrees of variability and unpredictability (Leach et al, 1991; in Castro, 2002). There is therefore a need to strengthen the Sustainable Livelihoods framework with other analytical tools addressing issues of power such as inequalities of power between practitioners and farmers and among male and female farmers/farmers' households - to take up and retain knowledge gain (conservation farming technology, Other inequalities are between 'agency' of farmers in taking up innovative technology versus dependency upon external assistance (and hence unsustainability of interventions). Alternative tools include the gender framework which was adopted for the study.

Zimbabwe's economy is largely agro-based with over 70% of the rural population depending on rain fed agriculture for their 'livelihoods' while at the same time 70% of the global infections are located in the region(UNAIDS, 2004). This shows the enormous effect the pandemic has on the agriculture sector. Recurrent droughts and depleted soil fertility coupled with deteriorating macro-economic environment have left these agro dependant rural households susceptible to hazards and stresses such as drought and climatic variability. The result has been unsustainable agriculture which has become a major root cause of food insecurity and poverty. HIV and AIDS effects haven't spared these households either as they are at high risk because of high morbidity and migration when male members of household migrate to other countries in search of work. Some of the coping strategies that have been employed by the households affected by HIV/AIDS, made in desperation such as selling livestock used for draught power have been found to considerably decrease crop yields and

hence decreasing the buying power of the already low income earners and this has exacerbated the effects of poverty (Egal & Valstar, 1999). Their livelihoods have become unsustainable and as Gandure et al, 2007 puts it, a livelihood is sustainable when it can cope with and recover from stresses and hazards, maintain or enhance its capabilities, assets and ensure that the next generation will equally have access to a sustainable means of living.

HIV and AIDS has affected the agriculture sector as much as it has affected all sectors of the economy through leading to the erosion of productive assets and loss of agricultural productivity through its effects on both quality and quantity of farm labour. Over the past few years, communal agriculture output in Zimbabwe has fallen by 50% and labour reduction due to the HIV and AIDS epidemic has been estimated to be about 23% (UNAIDS 1999). The pandemic has increased the amount of time and money allocated to healthcare at the expense of other necessities such as food and education, has led to the reduction in cultivated land through labour constraints. It has also led to reduction in farm inputs and has increased the sale of assets such as livestock whose population in the country has been reduced by about 40%. (UNAIDS, 1999; Engh et al 2000, Kwaramba, 1997), leading to food and nutrition insecurity and households falling deeper into poverty (Topouzis & Hemrich, 1996). Households affected by HIV/AIDS can hardly manage labour requirements during peak farming periods.

2.4 GENDER

Given the principal role that women play in agriculture in many rural communities in Zimbabwe, the absence of gender perspectives in much of agricultural research and projects is a compelling reason for a gender-sensitive study such as this. Welch (1993) puts forward the notion that women have got critical contributions to society but have limited access to necessary resources, decision on allocation and use of these resources and to derive benefits from these resources.

Gendered perceptions on conservation farming are defined by social and cultural norms (which defines the relationships between men and women). This is in terms of rights, resource access and the decision making power they have. Impacts of interventions to improve livelihoods (like conservation farming) differ according to gender and thus it is imperative to consider the complex relationship between gender, sustainable livelihoods and poverty. Women and men often highlight different concerns in most cases having differing perceptions and concerns regarding culturally acceptable practices as shown in a study done in Darko, Ghana. Here it was found that women and men's perceptions on understanding poverty (and hence in terms of their different livelihoods) differs in aspects like wealth indicators and how to categorise well being. However both concurred on the fact that being wealthy does not always mean better off (Shah, M, 1998).

The DFID gender analysis framework is a useful tool for incorporating gender issues into broader livelihood framework. This framework is important in that it addresses issues such as power and decision making and needs, priorities and perspectives which the sustainable livelihood and technology diffusion are silent on. The framework is illustrated below;

Table 1: Gender analysis framework

Category of enquiry	Issues to consider
Roles and responsibilities <ul style="list-style-type: none"> • What do men and women do? • Where (location/patterns of mobility) • When (daily and seasonal patterns)? 	<ul style="list-style-type: none"> • <i>Productive roles</i> (paid work, self-employment, and subsistence production) • <i>Reproductive roles</i> (domestic work, child care and care of the sick and elderly) • <i>Community participation/self-help</i> (voluntary work for the benefit of the community as a whole) • <i>Community politics</i> (decision-making/representation on behalf of the community as a whole)
Assets <ul style="list-style-type: none"> • What livelihood assets/opportunities do men and women have access to? • What constraints do they face? 	<ul style="list-style-type: none"> • <i>Human assets</i> (e.g. health services, education) • <i>Natural assets</i> (e.g. land, labour) • <i>Social assets</i> (e.g. social networks) • <i>Physical assets</i> (e.g. fences, schools) • <i>Financial assets</i> (e.g. capital/income, credit)
Power and decision-making <ul style="list-style-type: none"> • What decision-making do men and/or women participate in? • What decision-making do men and/or women usually control • What constraints do they face? 	<ul style="list-style-type: none"> • <i>Household level</i> (e.g. decisions over household expenditure) • <i>Community level</i> (e.g. decisions on the management of community water supplies)
Needs, priorities and perspectives <ul style="list-style-type: none"> • What are women's and men's needs and priorities? • What perspectives do they have on appropriate and sustainable ways of addressing their needs? 	Needs and priorities <ul style="list-style-type: none"> • <i>"Practical" gender needs</i> (i.e. in the context of the existing gender roles and resources e.g. more convenient water point to save women time and energy) • <i>"Strategic" gender needs</i> (i.e. requiring changes to existing gender roles and resources to create greater equality of opportunity and benefit e.g. increasing women's access to employment on roads) Perspectives <ul style="list-style-type: none"> • <i>Perspectives on delivery systems</i> – choice of technology, location, cost of services, systems of operation, management and maintenance

Source: (Pasteur, K, 2002)

Agarwal, 1997 points out that in a household, contribution may be overvalued or undervalued because of the gender of the person thus stressing the importance of gender important role in intra-family gender relations and this is often seen in gender conflicts over critical household properties such as arable land. He argues that maybe the reasons why gender issues have not been taken seriously in other technologies is because most of the models which are used to analyse gender relations do not take economic self interest into consideration, giving an example of the commonly used standard economic theory which takes a family as an

undifferentiated unit governed primarily or solely by altruism. (Agarwal, 1997) Access and control of resources indicates the extent to which individuals have the opportunity to participate in change towards adoption of conservation farming. In most households men often take a dominant role in planning field operations in which women supply most of the labour.

Gender can be said to be a household resource which usually involves power relationship between men and women and is characterised by both conflict and negotiations (Kabutha, 2002).

Statistics show that women are more affected by HIV/AIDS than men yet they still take a leading role in sourcing food, agricultural fieldwork and looking after the sick. The gendered effects of HIV and AIDS can be demonstrated in Chivi, a district of Zimbabwe where it was found that in 2007, about 58,8% of females had chronic illness which is considered a proxy indicator of HIV/AIDS compared to 41,2% of their male counterparts (Gandure et al, 2007). This put a greater constraint on household labour considering that most of the agriculture labour is provided by women and when they are chronically ill, they are weaker for longer periods and their productivity is lowered. About 48% of households in Tsholotsho affirmed Conservation Agriculture as an effective intervention in relation to HIV/AIDS. (Gandure et al, 2007).

2.4.1 Gender roles in technology adoption

In view of this, many pro women gender approaches have been put forward and previously, the focus have been on Women In Development which centered on women rather than developing approaches for both poor men and women. Considering that men and women's well beings are intertwined, this entails that research has to take into cognisance the fact that to help women, it is also critical to understand men's roles within the household and reach men. Over recent decades, the discourse on the advancement of women and gender equality in

relation to the development process has evolved from the *women in development* (WID) through Women and Development to the *gender and development* (GAD) approach. In the WID approach development resources were used to improve women's conditions and make their contributions visible, but this approach did not address the basic structure of inequality in relations between women and men, as it tended to focus solely on women (FAO, 2003).

The GAD approach differs with all these other approaches in that it examines how the relative positions of men and women in society, and the system governing the relations between them, affect their ability to participate in development (FAO, 1997). It is no longer emphasizing on incorporating women (who are involved in much of the work, yet continue to be left out of most of the benefits), but rather of empowering them in order to transform to equality. This research will be informed by the GAD approach which requires that social, political and economic structures and development policies be re-examined from the perspective of gender relations (Jackson & Pearson, 1998; UN, 1999). The underlying assumption of GAD approach is that women as well as men may be privileged or disadvantaged by social and economic structures. In this context, a better understanding of women's as well as men's perceptions, position and scope for changing gender relations is indispensable.

Social perceptions and social norms can affect subsistence distribution when intra-household allocations of resources between men and women depend on the perceptions about deservedness and prevailing norms of sharing within families. Normally there is a difference between what a person contributes to a household, needs or is able to do within a household and perceptions about his or her contributions, needs or abilities.

2.4.2 Gender and conservation agriculture

Although women are said to be a disadvantaged group in society a study in Kenya showed that there was no difference in area cropped under maize between female and male farmers in Conservation Agriculture (Haggblade & Tembo,

2003). This was echoed by Langmead (2006) in his study where it was shown that female farmers in Zambia did not under perform their male counterparts in terms of yield.

2.5 ADOPTION OF CONSERVATION AGRICULTURE

One of the reasons why research products uptake have been low is because researchers' understanding of farmers' perceptions about technology adoption is often clouded by the misguided metaphor through which technology delivery are described. Mostly farmers are seen as passive recipients of technology. And more often than not their perceptions are not sought. In most cases perception influence adoption and farmers' perceptions of relevance of technologies is affected by awareness and inherent characteristics of the technology itself (Oladele et al, 2007). Factors that may affect adoption rates in CF include crop under CF, age, gender and the length of time the individual farmer has been practising CF either through trials or input assistance.

One of the hotly contested issues about CA in Zimbabwe which has attracted a lot of debate is whether farmers have adopted the technology because they have found it paying or it is because promotion usually comes with inputs. In studies done in Zambia it was found that 20% of the households spontaneously adopted the technology while 80% practiced CA as a condition for receiving inputs (Haggerblade & Tembo, 2003).

Gender is one of the most important factors in determining adoption of an agricultural technology by farmers because most agricultural activities in Zimbabwe are gendered. Access to land, labour and inputs are all gendered and issues of labour allocation and gender have been shown to have a huge impact on technology adoption. Ownership of draft power in Zimbabwe is a proxy indicator of poverty. Poor households in most cases do not have draft power. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has been working with NGO partners and the Food and Agriculture Organization (FAO), and has

been promoting conservation agriculture as a technology which is ideally suited to vulnerable smallholder farmers in drought-prone areas of southern Zimbabwe with limited or no draft animal power (Twomlow & Hove, 2006). Therefore for effective results, tillage systems should be differentiated according to gender, labour activities as well as the type of crop. As Truscott, 1991 correctly puts it, the major constraints that continually hamper adoption of new technology by farmers who are willing to do so are labour, draught power, implements, technical know how and capital. Type of extension also affects technology adoption by farmers. Introduction of on farm trials and demonstrations such as the farmer field schools helps.

2.6 THE CONCEPTUAL FRAMEWORK ADOPTED FOR THE STUDY

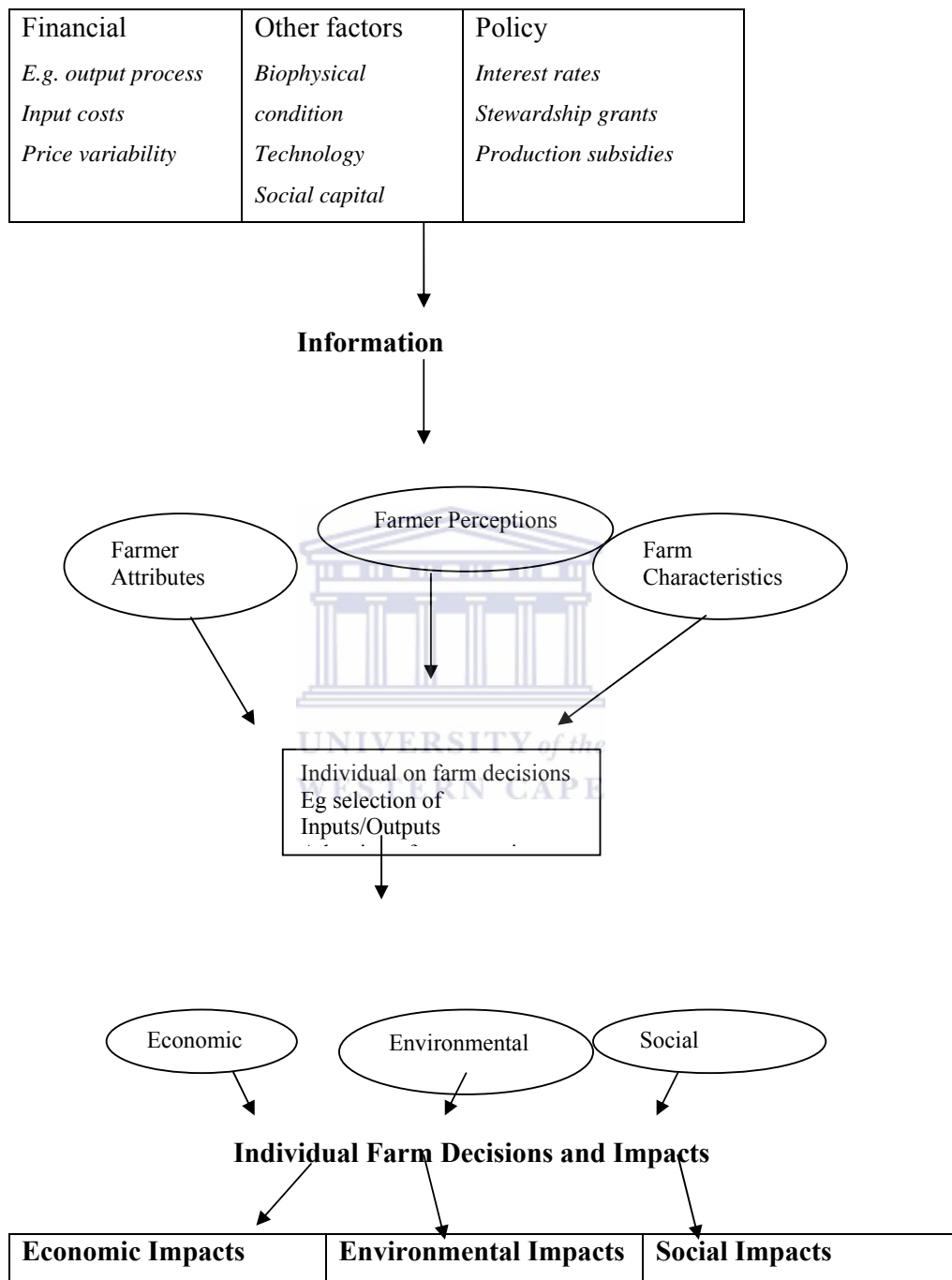
Conceptual framework alludes to the importance of information on adoption of conservation farming. Importance of information and learning by doing is emphasised by Dong & Saha (1998) who argue that studies show that producers' choices are significantly influenced by their exposure to information about new technologies. The level of farmers' acquired information determines whether a farmer adopts or not and the extent of adoption is determined by both the level and quality of awareness. Whether or not farmers adopt conservation farming is an individual or household level decision and may vary for a number of reasons. Some farmers adopt conservation farming because they have found the immediate yield, benefits or profits attractive. Others may have been given incentives to do so by organisations promoting conservation farming in their areas.

This study borrowed from the F.A.O. technology diffusion model (Figure 2), the sustainable livelihoods and the gender analysis framework to capitalize on the strengths of each framework. This is in line with Lubwana (1999) who identified financial capital (credit), Policy (import tax), ownership of property, culture and traditional norms, gender and technology information as factors that affect

conservation practices adoption (Lubwana, F,1999) Although Lubwana's factors are not exhaustive they give an indication of issues to consider when planning technology intervention. The five livelihood capital assets namely, 'financial', 'physical', 'human', 'social' and 'natural' capitals as well as farmer attributes, farm characteristics and policy, all affect the farmers perception on conservation agriculture. This in turn may lead the farmer to change the current farming practises and hence decide on whether to adopt or not adopt conservation farming. The decision will have economic, environmental and social impacts both locally, regionally and globally.



Figure 2: Diffusion model for Conservation Farming adoption



Adapted from FAO, 2001

The conceptual framework for adopting conservation farming mainly centres on the fact that farmers' perception on a technology are central to whether the farmer adopts the technology or not. Farmers' decision to adopt a farming technology is affected by a number of factors which are better explained by the diffusion model developed by FAO (Figure 1). In the model, the adoption and diffusion of the innovation process has been characterized as the acceptance, over time, of some specific item by individuals (or adopting units) linked to specific channels of communication. Central to this model of the decision-making process are farmers' perceptions. Although in the model perceptions are in turn influenced by policy, financial capital and other factors, the framework is somewhat silent on other livelihood capital that are important in technology adoption. The main aim of technology introduction is to improve livelihoods. Livelihoods are location specific, diverse and dynamic. They are diverse in the sense that they are applied locally but are shaped and influenced locally, nationally, regionally and globally (Omossa, 2002). Likewise technology should be diverse, location specific and dynamic. While the framework correctly brings out the importance of financial capital in technology adoption it does not clearly eludes the interaction of this with other capitals, (social, and physical, natural and human). Livelihood capitals that are important for sustainable livelihoods have complex interactions and thus should be examined thoroughly to bring out the underlying construct. Information dissemination to the farmer is also important for technology adoption. Although the diffusion model addresses an important aspect in extension which is communication, it is silent on livelihoods and their complexity. This is addressed by the Sustainable Livelihoods framework. This is complimented by the diffusion model by providing clarity specifically on knowledge transfer pathways.

The role of tenure security, especially for women and children, has often been overlooked by research and projects that deal with adoption of conservation farming. It is reasonable to assume that female and male farmers are likely to adopt new farming technology if they have secure tenure, particularly if adoption

of such technology involves investments in terms of hard labour and risk. The conceptual framework therefore addresses the need for deeper understandings of gender issues pertaining to land rights and agricultural investments, as well as interactions between interventions and gendered roles, relationships and livelihood resources in general.

The conceptual framework for the study similarly conceives of farmers' perceptions as resulting from a combination of their innate gendered individual and group attributes characteristics of their farms and their livelihood strategies. Understanding of environmental, economic and social factors determine perceptions of male and female farmers of the need for interventions, such as conservation farming. Conversely, farmers' perceptions of the need for interventions impact on how they manage, use, develop and conserve the environmental resource base. Their perceptions of the need to adopt and adapt old and new technologies affect uptake of such technologies, with some impacts on livelihood assets, such as income, nutritional status, health, social networks, infrastructure and access to support services.

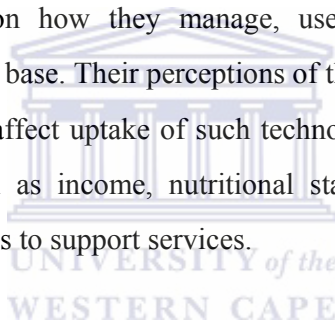
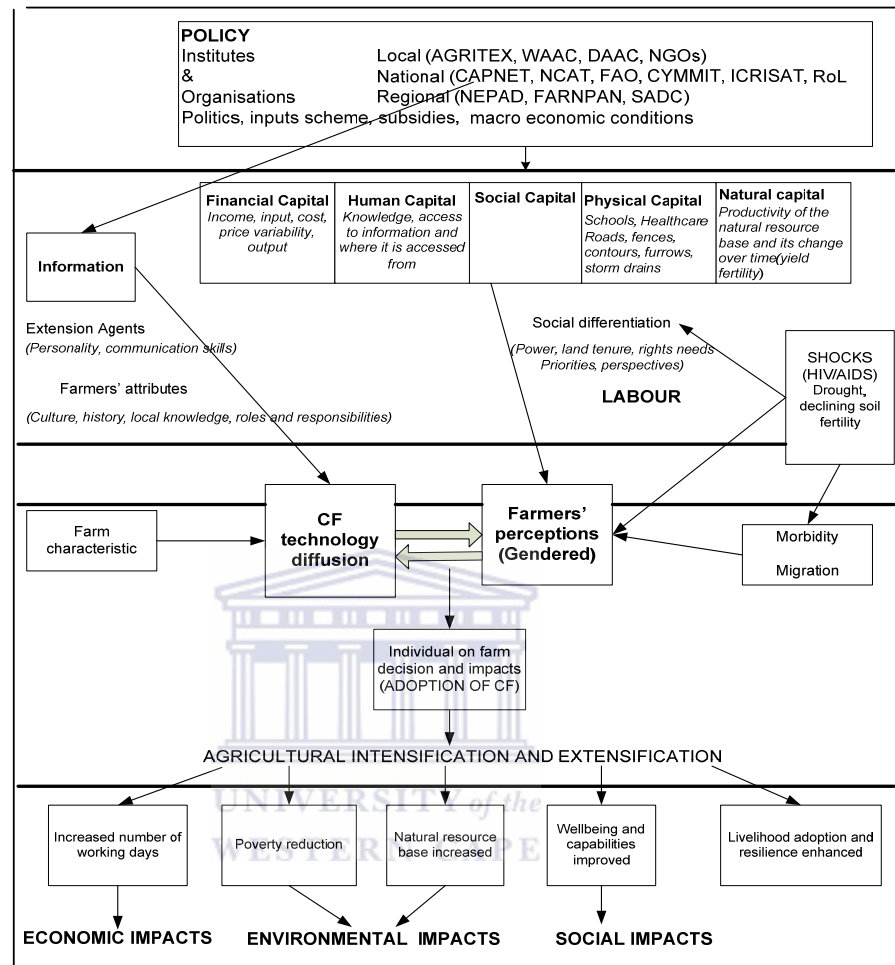


Figure 3: The Conceptual Framework for The study



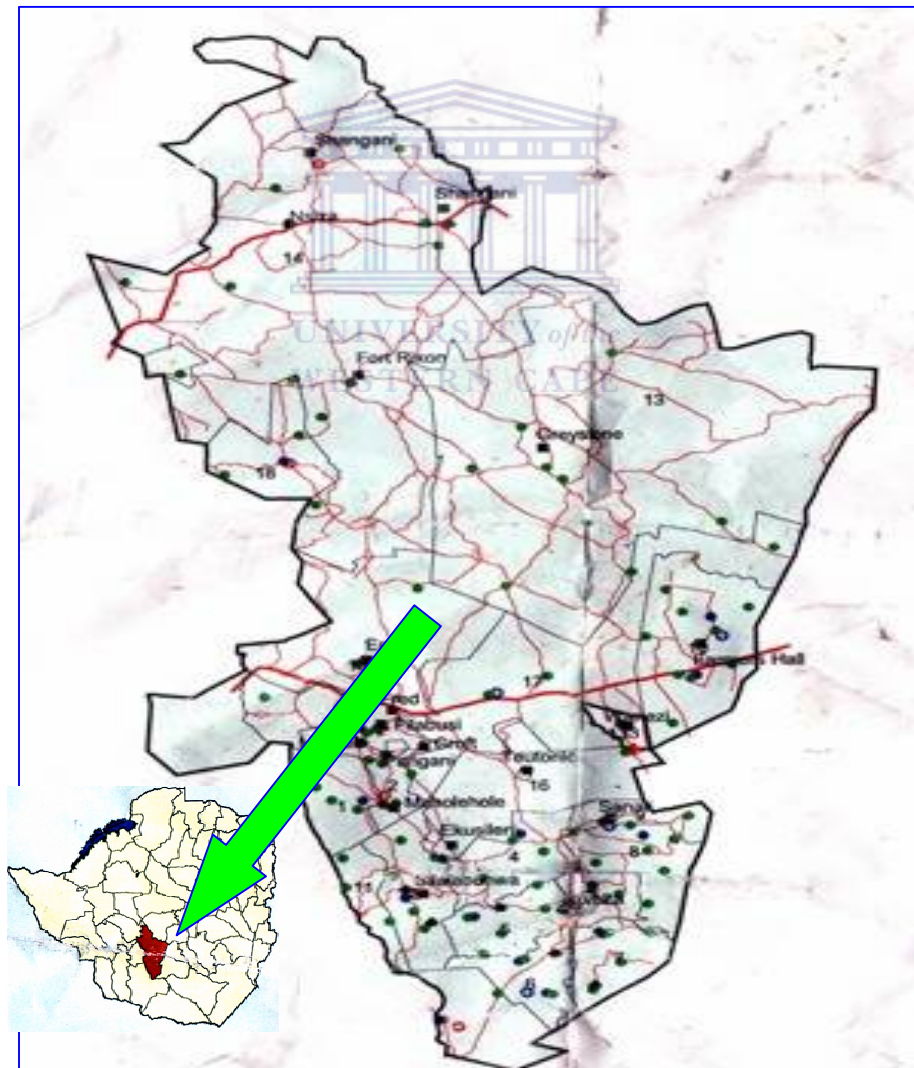
Adapted from FAO, 2001; Scoones, 1998)

CHAPTER 3 METHODOLOGY

3.1 INTRODUCTION

This chapter presents the general material and methods used in the study including the analysis.

Figure 4: Map of the Study Area
Matabeleland South Insiza District



3.2 RATIONALE FOR SELECTION OF STUDY AREA

The study area is in a marginal part of the country, in terms of agricultural productivity due to low annual rainfall and agricultural productivity. Preliminary assessment of the study had revealed that the Insiza area has been subject to a widespread campaign by the Zimbabwean government and NGOs to promote conservation agriculture. The area has also been subject to effects of environmental, economic and social hazards, as well as hazards related to HIV and AIDS.

3.3 DETERMINATION OF POVERTY IN THE COMMUNITY

During the Focus group discussions in ward 2 and 3, community members came up with the categories they use to determine poverty in the community.

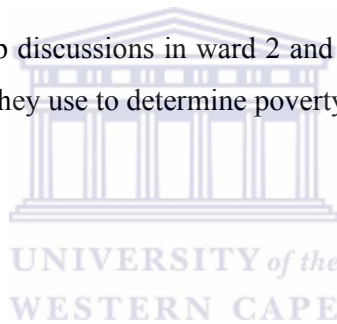


Table 2: Wealth Indicators in the Community

Indicator		Poor	Average	Non poor
Livestock	Cattle	0	1-5	More than 6
	Donkeys	0	1-5	More than 6
	Goats	0	1-19	More than 20
	Sheep	0	1-8	More than 9
Implements				
	Scotch-cart	0	1	2 or more
	Tractor	0	1	2 or more
	Cultivator	0	0	2 or more
	Harrow	0	1	2 or more
	Hoes	0	1-7	8 or more
	Wheelbarrow	0	1	2 or more
	bicycle	0	1	2 or more
	TV/radio	0	none	Has at least one of the two

3.4 SAMPLING

Both purposive and random sampling was done to come up with households to interview. Purposive sampling was done to rank households according to poverty status and then random sampling was done to select the required households.

Pre-testing of the questionnaire was done with a single visit to the study site so as to come up with a questionnaire that can be administered easily and give an accurate picture on perception.

The sampling procedure's aim was to get a sample that was representative of socio-economic differentiation and involvement in conservation farming in the study area. The one hundred and fifty two (152) selected households comprised of the following: forty six (46) households composed of those considered to be living in poverty; sixty (60) falls in the middle-income group; and forty six (46)

households who are considered ‘non-poor’ or not living in poverty (Table 3). Key resource persons who were the local AGRITEX extension worker and community leaders helped in the identification of the three categories of respondent households.

Table 3: Selection of Respondent Household: Summary

Household Class	Socio-Economic	CFA	CF	NCF	Total Number
Non-Poor		10	15	22	46
Middle Income		30	6	24	60
Poor		15	24	9	46
Legend: CFA - Involved in conservation farming with input assistance from NGOs CF - Involved in conservation farming through seeing others but are not given any input support NCF - Not involved in conservation farming					

3.4.1 Rationale for sampling choice

Household selection for the three household categories was done basing on simple proportion while at the same time trying to get a representative sample which can be compared statistically. In the non poor category the smaller proportion was for the households doing assisted conservation farming because according to the selection criteria for the NGO promoting CA non poor families are unlikely to be beneficiaries. Those practicing without assistance and those not practicing were given almost similar proportion to find if there are variations between the two groups. In the middle income category those practicing and not practicing were given almost similar weight for comparison purposes while those practicing without assistance were given less weight because it was unlikely that they will take up the technology without incentives. Households in the poor category were more likely to be assisted and also farmers in this category are likely to take up a technology with at least some benefits even without assistance in an effort to improve themselves. These two were given similar weight for

comparison. And the lowest weight was given to not practicing because it is unlikely.

3.5 FOCUS GROUP DISCUSSIONS (FGDS)

The main aim of the focus group discussion was with the help of knowledgeable community members come up with poverty status ranking and also gain a clear understanding of farmers' perceptions on conservation farming.

Qualitative data was generated from Focus group discussions (FGDs) to complement the household survey. Group discussions with a fair representation of both men and women were conducted in both wards. This was guided by a facilitator, and community members were allowed to talk freely and spontaneously about how they perceive conservation agriculture. The facilitator was provided with a discussion guide with open-ended questions covering various issues on conservation agriculture. The FGD helped to rank households according to poverty status and obtain in-depth information on principles of conservation agriculture employed by the community, concepts, and perceptions, ideas of the farmers and improvements on conservation agriculture. Members of the FGDs in each case were key informants that are members who were knowledgeable about the community.

Poverty status was established through ownership of mainly livestock and other household assets such as agricultural implements.

3.6 SUMMARY OF RESEARCH QUESTIONS VERSUS METHODOLOGY

Research Question	Hypothesis	Data needed	Source of data	Analytical Tool
Perception of female and male members of the household of CA as a buffer against low soil fertility and poor rainfall and economic variability		Socio-economic data to establish perceptions	Household survey questionnaire, Focal Group Discussions and Key informants Such as AGRITEX personnel, NGOS and Direct Observations	Descriptive analysis to determine means and standard deviations. Data will then be graphed to assess quality. Likert Scale responses regarding perception were subject to reliability analysis (Chronbach's alpha) Individual items that seemed to be reliable were subjected to factor analysis Resultant weighed factor scores were used as independent variables in binary regression
Relationship between choices on CA adoption and access to livelihoods capitals.		Knowledge on CA, level of education, increase in yield as a proxy of increase in income, labour adequacy, Access to information on CA		Livelihood indicators were used and descriptive analysis was done on each indicator.

CA in mitigating the impacts of HIV/AIDS	CA helps in mitigating effects of HIV/AIDS	Information on presence or absence of chronic illness in the household and perception statement on relationship between chronic illness and decision to adopt or not	Household questionnaire	Descriptive statistics to determine means and standard deviation. Cross tabulation and Chi square test was done on perception statements and presence/absence of chronic illness
Does decision to adopt reflect farmer attributes e.g. gender, age, level of education, chronic illness and socio-economic class			Household questionnaire	Dummy variable regression analysis was used to explore relationship between decision to adopt versus attributes
Does decision differ according to gender and position within house			Household Questionnaire	Descriptive Statistics. Frequency tables on who is responsible for different activities within the household

3.7 QUESTIONNAIRE

Questionnaires were administered to 152 adult members of respondent households. These were mostly household heads but in cases where the heads were not available, any other members who were knowledgeable about agriculture, development and related issues within the household responded. Quantitative data was collected on variables like household characteristics, farmer perceptions and resource allocation to different activities

The following gives a brief description of the questionnaire. Some questions in the questionnaire were specifically made for this study while some were adapted from other livelihood surveys. Some item questions were deliberately repeated so as to try and get some information from the respondent that will not have come out in the first instance.

The first section is generally about household demographics. Questions regarding general household characteristics which include household type (married, female headed, child headed etc), questions to measure adult equivalents such as number of household members, their age, sex, level of education and whether the household receives remittances from outside the country were asked. During focal group discussions it came out that those households which receive foreign currency were better off than those who did not and most assets in the area like livestock were sold in foreign currency due to the hyper-inflationary environment the country was operating in during the time of the study.

Questions on HIV/AIDS are difficult to administer directly because of their sensitivity, therefore the study did not use HIV/AIDS specific quality of life questions. Instead proxy indicators were used. According to Stokes, 2003, Mastaglio, 2000 chronic illness and death in a household can be used as proxy indicators of HIV/AIDS afflicted households.

The second section was mainly to find out households' knowledge about CA and their access to information on CA. Because CA is a set of principles, some households may be practising CA whilst they do not know that they are practising it therefore questions around this were asked in such a way that any form of soil and water conservation came out in addition to whether the household was practising CA. Total arable area for the household versus area put under CA was asked and used as a measure of perception

Questions were asked on the gender roles in Conservation farming. The aim was to come up with division of roles and responsibilities within the household and specifically find out who was responsible for different agricultural activities such as weeding, ploughing and planting versus who made decisions on the same tasks and activities.

According to the NGO that has been promoting CA in the area, their criteria in choosing recipients include the poor, those with no draught power, female headed households and households with a chronically ill member. To measure perception on CA Likert scale was created and respondents were asked the extent to which they agreed or disagreed with statements such as CA is an appropriate technology both for their situation and in other areas, for female headed households, households with chronic illness and households with no draught power. Respondents were also asked on the extent to which they agreed or disagreed that information on CA was readily available both to them and to others and in form they understand. Views of farmers on CA in terms of labour concerns, soil and water conservation were also asked. The Likert scale was used to measure perception whereby the respondents were asked the extent to which they agreed or disagreed with the statement pertaining CA.

Respondents were asked to affirm or deny the sale of productive assets such as cattle and donkeys and the disposal of liquid assets such as scotch-carts, cultivators as a coping strategy to mitigate the effects of hazards such as poor

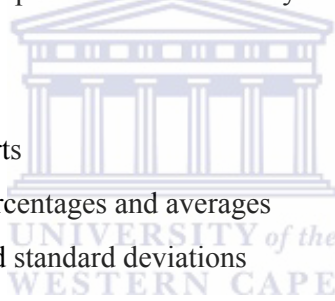
harvests and HIV/AIDS. These items were adopted from Mutangadura et al (1999) who listed some items commonly sold as a coping strategy in the face of HIV/AIDS

3.8 ANALYSIS PLAN

3.8.1 Livelihood capitals

Data analysis was done using SPSS version 12. The simple method of percentage was used to assess the present status of livelihoods capital assets in households. In terms of measurement the total scored value of indicators was averaged to avoid any complexities of double scoring because of higher or lesser number of indicators in different capital assets. Data analysis was done using the following tools

- Tables
- Graphs and charts
- Frequencies, percentages and averages
- Mean, mode and standard deviations



Access to at least one of the indicators under the different capitals was measured and computed in frequency tables

3.8.2 The analytical Framework

The objective of the analytical framework was to model and estimate the probability that farmers will adopt conservation farming on condition of their perceptions, farm and farmer characteristics such as age, education, gender and access to information. Whether farmers' decision to uptake conservation farming can be considered a dichotomous choice problem, limited dependant variables models can be applied for econometric estimation. For this kind of discrete binary choice the logit model or probit model are most appropriate (Amemiya, 1985). According to Amemiya, the choice of which probability distribution to use for

producing predictions cannot be justified on theoretical grounds. For this study the probit model was used to explain a dichotomous variable with the empirical specification formulated in terms of a latent response variable. This latent variable stands for contingent participation in conservation farming programmes and is defined by the equation

$$Y_i = \beta_0 + \sum \beta_{k1} X_{ki} + \epsilon_i$$

Where Y_i is the respondent

X_{k1} : $k=1$ through k independent variables that explain the phenomenon for respondent i

β_{k1} = parameter that indicates the effects of X_k on Y

β_0 = intercept that indicates the expected value of Y when all $X_k=0$

ϵ_i = stochastic error term for respondent i

All the data collected in the questionnaire were subjected to descriptive analysis procedures.

3.8.3 Test for independence

Perception statements were subjected to chi square test for independence to determine existence of association between them and whether a farmer was practising CA or not, whether the farmer would practise CA the following season or not and whether practising farmers would increase area under CA or not. Fisher's exact test was used to establish significance of the results

3.8.4 Factor analysis

Likert scale responses to the 18 statements pertaining to Conservation Farming were subjected to reliability analysis and Chronbach's alpha was used. There were no items that did not have acceptable reliability.

All items were subjected to factor analysis. In factor analysis items were tested for mild multicollinearity (that is variables that are very highly correlated) and singularity (variables that are perfectly correlated). To determine

multicollinearity the R matrix determinant was used and this should be greater than 0,00001. In this study the R matrix was 0.001 which showed that unique contribution of variables to a factor can be determined.

The KMO and Bartlett's test of sphericity which produces the Kaiser Meyer Olkin measure was also done to determine sampling adequacy. Kaiser, 1974 in Field, 2005, recommends that the KMO value should be greater than 0,5 if the sample is adequate. In this study the KMO value was 0,716 which showed that the sample size was big enough.

The Bartlett's measure is used to test the hypothesis that the original correlation matrix is an identity matrix. For factor analysis to work there is need for some relationship between variables. If the R matrix was an identity matrix then all correlation coefficients would be 0. The test should be therefore significant (i.e. have a significant value less than 0.05). According to Field, 2005 a significant test shows that the R matrix is not an identity matrix implying that there are some relationship between the variables in the analysis. For this study Bartlett's test $p < 0,001$ hence factor analysis is appropriate.

Factors that seemed to be significant with an Eigen value greater than 1 were extracted using the principal component procedure. Six factors were extracted from factor analysis. Decision on how many factors to retain was reached using Kaiser's criterion which is accurate if there are less than 30 variables and communalities after extraction should be greater than 0,7 and the average communality is greater than 0,6. In this study most communalities are greater than 0,7 and average communality is 0,65 which showed that the Kaiser criterion which stipulates that all factors with an eigen value of 1 or more should be retained is accurate for this study. Four factors were constructed using the Kaiser criterion and were all retained. Individual items that loaded into these four factors with a factor loading score of 0,5 or more were tabulated and grouped according to common themes and assigned a descriptive name.

3.8.5 Binary Regression

In statistics logistic regression is used for prediction of the probability of an occurrence of an event by fitting data into a logistic curve. Coefficients can be used to estimate odd ratios for each of the independent variables. In this study, binary logistic regression utilises factors and information from factors to explain past and planned behaviour of farmers with regard to Conservation Farming (CF).

Information from factor analysis were subsequently used to create independent variables for a binary logistic regression of analysis of farmer's action related to Conservation Farming. Sets of independent variables which were utilised were

1. weighted factor scores for each of the four factors as computed by principal component analysis
2. Weighted factor scores for each of the four factors as computed by the principal component analysis plus information on gender, education level, age of the household head and arable land size.
3. items that had the highest factor loading scores from each of the four factors
4. Items that had the highest factor loading score from each of the four factors plus information on gender, education level, age of the household head and arable land size.

The dependent variables were

1. Practising CF
2. Planning to practise CF next season
3. Planning to increase or decrease area under CF.

Information that was collected from binary regression includes

1. The Hosmer and Lemeshow goodness of fit test

In this test the value given in the Sig column is the probability of obtaining the chi square statistic in the table, if there is no effect of the independent variable, taken together on the dependent variable. This is the p-value which is compared to a critical value (0,05 or 0,01) to determine if the overall

model is statistically significant. In this test, the
 H_0 -there is no difference between the observed and predicted value
 H_1 .there is a difference between the observed and predicted value
If $p > 0,05$ accept the null hypothesis

2. The Exponential (B) which refers to the exponential value of the estimated coefficient. When the Exponential B is less than 1 increasing the value of the variable corresponds to decreasing odds of the event's occurrence. When Exponential B is greater than 1 increasing the value of the variable corresponds to increasing the odds of the event's occurrence.

3. Nagelkerke-R-square values

4. The correctly classified cases

3.9 ADOPTION DECISION

To determine whether adoption decision differ according to attributes such as gender, age, level of education, chronic illness in the house and socio-economic class, dummy variable regression analysis was done.

CHAPTER 4

CHARACTERISATION OF STUDY AREA AND SAMPLED HOUSEHOLDS

4.1 INTRODUCTION

This chapter describes general socio-economic characteristics of the study area and sampled households. It gives an insight on the background through which the technology was introduced in the community.

4.2 POVERTY IN ZIMBABWE

In Zimbabwe poverty is reflected through problems such as malnutrition, poor health, inadequate housing and living conditions. Access to land is a major contribution to poverty and is further compounded by high population growth rates, high unemployment and hyperinflation. The situation is worse in rural areas where people have a high dependency on land and natural resources. As a result people often venture into unsustainable livelihoods such as cultivation of marginal lands.

Table 4: Distribution of Poverty in Zimbabwe

Sector/Province	Poverty Category (%)			
	Very Poor	Poor	Non Poor	
National	46	16	38	
Rural	57	15	28	
Urban	25	21	54	
Communal	68	13	19	
LSCF	30	21	49	
SSCF	54	13	32	
Provinces				

Manicaland	64	12	24	
Mashonaland Central	48	19	33	
Mashonaland East	61	15	24	
Mashonaland West	50	19	33	
Matabeleland North	57	13	30	
Matabeleland South	51	17	32	
Midlands	56	16	28	
Masvingo	63	11	26	

NB Person whose income is not enough to buy the food basket are described as very poor, while those whose income are below the Total Consumption Poverty Line. (TCPL) are described as poor. Non poor are those with income are above the TCPL

Source: Ministry of Public Service, Labour and Social Welfare.

4.3 SOCIO-ECONOMIC CHARACTERISTICS OF THE STUDY AREA

The study was undertaken in Insiza district of Matabeleland South province of Zimbabwe. Specifically the survey was carried out in two wards of the district which are Ward 2 and Ward 3. Insiza district has population of 41 633 and about 17 471 households with each household averaging 4.9 people (CSO 2002). In the 2007/8 season the average yield for the district was 0.1t/ha giving a production of 1805 tonnes. The district with an adult population of 36727 needs about 7345 tonnes of maize per year, leaving a shortfall of about 5540 tonnes.

4.3.1 Economic hazards

The country has undergone economic crisis with hyperinflation and reduction in the value of the local currency. The disparity between household incomes from such remittances and incomes of households relying on the local currency is very high. Households with children working in neighboring countries, commonly

referred to as “njiva” or “injiva” in local languages, receive remittances in foreign currency. A result of such remittances is that the sale of livestock and other commodities has shifted from away from use of local to foreign currency. This has made households without remittances in foreign currency vulnerable to food and livelihood insecurity.

4.3.2 Social hazards

Ripple effects of economic hazards are exacerbated by the HIV and AIDS pandemic, which continues to erode efforts to overcome hardship. Considering that most migrants have young families who are in the sexually active stage of life, dependence by households in the study area on migrant labour has implications on rates of HIV and AIDS prevalence and infection. Traditionally communities have had safety nets which helped in times of problems like ‘Zunde ramambo’ (“*isiphala senduna*” (i.e. ‘the chief’s granary’, in local parlance of Insiza Distirct) whereby the chief had granaries where every household had to contribute to cater for poor families and child headed households, they also used to help each other in times of death in the communities. These social networks have been eroded whereby the chief’s strategic grain reserve is no longer there because of successive droughts leading to poor harvests over the years and the economic hardships have made helping others difficult. The HIV/ AIDS pandemic has made death a common feature in communities and hence the help is now limited.

4.3.3 Environmental hazards

Recurrent droughts which have been experienced in the area over the past decade had meant that people had to opt for unsustainable ways of farming such as stream bank cultivation for their gardens. Gold panning which is another important source of income for these communities have left a trail of destruction to the environment when those practicing it dig holes which they do not fill at the end of panning.

The combination of environmental, economic and social hazards, and the interaction of these with the shock of HIV and AIDS, has contributed to sharp declines in crop production, income, livelihood sustainability and food security. Insiza has also seen the dissolution of households due to HIV and AIDS over the past few years. Conservation farming in the study area may therefore play a critical role in mitigating vulnerability to the multiple hazards. Socially constructed gender roles and relationships, and power dynamics in particular, appear to be critical to the effectiveness of interventions relating to conservation farming.

4.4 SELECTION OF THE STUDY SITE AND HOUSEHOLDS

Insiza was chosen because it is in the marginal parts of the country where land degradation and low rainfall has drastically reduced crop yields and has left many households in abject poverty. Conservation Agriculture is being vigorously promoted in this area in an attempt to rescue the soils from further nutrient depletion and also to maximise utilisation of the low rainfall those parts of the country receive and hence ultimately improve livelihoods. Beneficiaries join voluntarily. Ward 3 is in the communal areas and alongside is an irrigation scheme that has been of immense benefit to households in this dry and impoverished part of the country. Some of the respondents have got plots in the irrigation scheme and through informal interviews with them have shown appreciation of the scheme in improving their livelihoods. Though some households have got plots in the irrigation scheme, they are too small to provide them with their cereal throughout the year.

4.5 BACKGROUND OF CONSERVATION FARMING IN THE AREA

NGOs have supported conservation agriculture in the district over a number of years.

International Crops Research Institute for the Semi-Arid Tropics

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) provides training to farmers in the study area on conservation farming principles.

World Vision

World Vision Zimbabwe is a Christian Relief and Development Organization involved with communities in initiatives to achieve transformation supported about one thousand and twenty (1020) households in the 2007/08 season. Among their beneficiaries are vulnerable households which are selected according to income levels, draught power ownership, female and child headed households. The beneficiaries are trained on conservation farming by ICRISAT. The organization is going to support conservation farming technology in the 2008/9 season

Table 5: Institutional framework for conservation farming support

Institution	Members	Responsibilities	Level
CAPNET(Conservation Agriculture Promotion Network	Government ministries(Agriculture, Environmental Management Agencies, Education	Research, training and extension. Awareness	National level
National Taskforce on Conservation Agriculture	FAO, NGOs, CGIARs, NARES	Coordinating promotion of CA through interventions	National level
Farmer Groups	ZFU, ZCFU	Extension and training of CA	National right

		to their members	through to ward level
CGIARs	CYMMIT, ICRISAT, etc	Research and extension	National level with collaborate programmes with AGRITEX at national down to ward level
Department of Agriculture Technical and Extension (AGRITEX)	CA coordinator, extension specialists, extension officers and extension workers	Training and extension	National, provincial, district and ward level
Universities, colleges	Universities and agricultural colleges	Research and training on CA	
Private sector	All private companies	Research into machinery and production of machinery for use on CA	
District AIDS Action Committee (DAAC)		Coordination with extension workers to mainstream HIV and AIDS on CA programs	District level
Ward AIDS Action Committee (WAAC)		Coordination with extension workers to mainstream	Ward level

		HIV and AIDS on CA programs	
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Beneficiaries join conservation farming input assistance programme voluntarily and according to key resource persons, inputs being the main incentives. Other farmers are allowed to attend demonstrations in order to get the concepts of the practise even if they are not beneficiaries in terms of inputs.

In the 2007/8 season 11 beneficiaries were chosen per village and in the 2008/9 season this was reduced to 2 per village. Key resources persons perceive this scaling down as having been caused by three main factors, which are shortage of input, beneficiaries selling inputs and no clear results from the practise due to drought spells but the NGO said they were scaling down because of shortage of inputs.

4.6 HOUSEHOLD CHARACTERISATION

4.6.1 Gender of the household head

Table 6: Gender of household head

Gender	Frequency	Percent
Male	108	71,1
Female	44	28,9
Total	152	

108(71, 1%) of the household heads in the survey were male, while 44(28,9%) were female. 100(65,8%) of the household heads were married, 14(9,2%) were divorced or separated, 36(23,7%) were widowed and only 2(1,3%) never married. Most cases of household heads who never married were households where both parents had passed away and though the head is over 16 he/she was looking after his/her siblings. During FGDs the community indicated that they considered such households child headed.

4.6.2 Level of education of household head

Table 7: Level of education of household head

category	number	%
primary	70	46,1
secondary	51	33,6
No education	15	9,9
Don't know	11	9,9
College and other tertiary	2	1,3
preschool	3	2

Of the 152 household heads, a significant number, 15 (9,9%) had received no education while 11(7,2%) indicated that they were no longer sure of the level of education they attained. 3 (2%) of the respondents only had primary education while 2 (1.3%) had gone as far as tertiary education. The majority of the respondents, 70(46,1%) had done only primary school and 51 (33,6%) had attended secondary school.

4.6.3 Chronic illness in the household

Table 8: Chronic illness in the household

category	number	%
Yes	38	25
No	114	75

Respondents were asked whether in the household they had any chronic illness and 114 (75%) out of the 152 indicated they had no chronically ill members while 38(25%) indicated there was a member with chronic illness. Of the 38 with chronically ill members, 18 reported the member indicated General Body Weakness 10(6,6%) indicated that the member was suffering from TB, while other diseases were reported by 8 (25%) were diseases such as meningitis and cancer were reported more often.. HIV/AIDS was reported by only 2 (1,3%).

Table 9: Nature of diseases

Disease	Number of households	Percentage
TB	10	6.6
HIV/AIDS related illness	2	1.3
General Body weakness	18	11.8
Other	8	5.3
None	114	75.0
Total	152	100.0

4.6.4 Wealth Ranking

Wealth ranking was done during Focal Group Discussions and it came out those households with spouses, children and relatives working outside the country and were receiving remittances from them were better off compared to those without. In the survey 31(20, 4%) of the households received remittances from outside while 121 (79, 6%) did not have any outside assistance.

4.6.5 Income sources

Most 99(65, 1%) of the households in the survey indicated that farming was their main source of income while 20(13, 2%) indicated they mostly rely on remittances, 8 (5,3%) had formal employment as their main source of livelihood and 10(6,6%) derived their livelihood from non-formal activities such as selling vegetables and wares. A significant number 14 (9, 2%) had other sources of income and gold panning was top on this category.

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 INTRODUCTION

This chapter details the findings of the research and discusses these findings. In the chapter, findings from the main sources of livelihoods will be first analysed to establish the socio-economic background of respondents and also the importance of Conservation Agriculture as a source of livelihood in the community. Findings on perceptions of both female and male members of farming households on the usefulness of conservation farming in addressing livelihood sustainability, food security and HIV and AIDS-related hazards and vulnerability will be discussed first. These perceptions were established through selected perception questions. AIDS related hazards analysed in the study includes labour issues and increase in vulnerable households (child headed and female headed) Findings on the role of gender in decision-making and production related activities around conservation farming both within households and within projects supported by external agencies will also be analysed. This will include analysis of questions around decision making and management of resources firstly in all households and then comparing this with analysis of male headed households.

Whether these perceptions play a role in whether farmers adopt or do not adopt conservation farming will also be discussed. These were established through analysis of access to different livelihood capitals and how this relates to choices pertaining conservation.

5.2 AGRICULTURE

5.2.1 Crop Production

Farming is the main source of livelihood for most households in the study area. For those in the survey 128(84,2%) indicated maize as the main cereal they grow and 23 (15,1%) indicated cereal. Only one household indicated millets as the main cereal they produced. 141 (92,8%) households practised some form of soil and water conservation while 10(6,6%) did not practise any form of soil and water conservation, although 149 households (98%) had at least a member with knowledge on Conservation Agriculture

5.2.2 Livestock Ownership

41,4 % of the respondent indicated that they had no cattle and according to the wealth ranking done during the FGDs these are considered to be poor, 46,1 indicated they had between 1 and 5 cattle and these are considered to be average while 12,5% indicated they had more than 6 cattle and these are considered non-poor. 42,8 % had no donkeys, 52,6 had between 1 and 5 donkeys while 8,6% indicated they had more than 6 donkeys.

Table 10: Draft power ownership

Status	No cattle for draft	1-5 cattle for draft power	More than 6 cattle for draft	No donkeys for draft	1-5 donkeys for draft	More than 6 donkeys for draft
Combined	61,2	38	0,7	55,3	42,8	1,9
Practising CA	64,6	35,4	0	59,6	38,4	2
Not Practising	54,7	43,4	1,9	47,2	51	1,8

61,2% of the respondents indicated they had no draft cattle while 38, indicated they had between 1 and 4 draft cattle and 0,7 indicated they had more than 5 cattle they use for ploughing. 55,3% indicated that they had no donkeys used for

draft power, while 42,8 indicated they had between 1-5 donkeys they use for draft while 1,9% had more than 6 donkeys for draft. Donkeys are the most common form of draft power. 64,6 of the households practising CA had no draft power, 35,4% ha at least 4 cattle for draft power. 54,7% of those not practising CA had no cattle for draft power while 43,4% and 1,9% had more than 6 cattle for draft power. 59,6% of households practising CA had no donkeys for draft power, 38,4% had at least 5 donkeys for draft power while 2% indicated they had more than 6 donkeys for draft power. 47,2% of household not practising CA had no donkeys for draft power while 51% had at least 5 donkeys for draft power 1,8% had 6 or more donkeys for draft power.

5.3 ANALYSIS OF PERCEPTIONS ON THE ROLE OF CA IN ADDRESSING LIVELIHOOD SUSTAINABILITY, FOOD SECURITY AND HIV AND AIDS-RELATED HAZARDS AND VULNERABILITY

In the questionnaire there were 18 statements that pertained to the respondents' perceptions on different aspects of Conservation farming.

Table 11: Ranking of Means and Standard deviations on the level of agreement of respondents concerning perceptions about CA

Rank	Item	Mean	S. D ^a
1	Relevant information on conservation farming is easily obtainable	4.3	0.84
2	As a farmer you are satisfied with the benefits of conservation farming	4.04	0.83
3	Conservation farming is applicable to maize only	4.03	0.87
4	Labour concerns have affected my decision to adopt/not to adopt	3.95	0.87
5	Soil degradation and moisture stress are the major cause of crop failure in your area	3.89	0.94

6	Chronic illness in the household have affected my decision to adopt/not to adopt	3.70	0.94
7	There is need to be concerned about soil and water conservation	3.66	1.10
8	Conservation farming is applicable to all crops	3.66	1.01
9	I am well informed about conservation farming	3.27	1.14
10	As a farmer you are concerned about labour requirements in Conservation farming	3.03	1.08
11	Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) can be eliminated Are overcome by conservation farming?	2.26	0.91
12	Conservation farming is more yielding than conventional farming	2.26	0.91
13	Conservation Farming is appropriate to your area agriculture	2.16	0.99
14	Conservation farming is beneficial to women headed households who may not have labour and draught power	2.09	1.09
15	Conservation farming is appropriate to households with chronic illnesses	2.07	1.26
16	Conservation Farming is appropriate to Zimbabwean agriculture	1.74	0.99
17	Conventional Agriculture production has decreased over the last years	1.72	0.86
18	Farmers in general have sufficient knowledge on conservation farming	1.50	0.75

A Likert Scale was constructed with from 1- 5 with 1= strongly agree and 5 =strongly disagree. The highest mean of 4.3 means the respondents agreed with the statement and a lowest mean of 1.5 means the respondent disagreed. Even though in the technology diffusion model by FAO (Figure 1), information is at

the centre of any technology adoption, respondents indicated greater disagreement with the statement that relevant information on CF is readily available. This result indicates there is need to channel more resources in extension services when introducing new technology. This can be used to explain why in Zambia where Conservation farming has also been promoted, a survey showed that most of the farmers were only been practising it for the input assistance ((Haggerblade & Tembo, 2003).

5.3.1 Male and female perceptions on CA in addressing livelihood security

Perception statements were first subject to chi square test of independence to find the relationship between those practising CA and perception statements to do with the role of CA in addressing livelihood security. The following table gives the results of percentage of male and females and their opinion on CA

Table 12: Male and female perceptions on CA in addressing livelihood security

Perception statement	Gender	Agree (%)	No Opinion Disagree(%)	Sig ^a
CF appropriate for area agriculture	Male	81,5	18,5	0,473
	Female	79,5	20,5	
Conservation farming is beneficial to women headed households who may not have labour and draught power	Male	38	62	0,473
	Female	34,1	65,9	
Conservation farming is appropriate to households with chronic illnesses	Male	6,5	93,5	0,269
	Female	2,3	97,7	
As a farmer you are satisfied with the benefits of conservation farming	Male	99,1	0,9	0,497
	Female	97,7	2,3	

Conservation farming is more yielding than conventional farming	Male	71,3	28,7	0,401
	Female	75	25	
Soil degradation and moisture stress are the major cause of crop failure in your area	Male	68,5	31,5	0,556
	Female	68,2	31,8	

^a Fisher's Exact

A substantial number of male and female respondents agreed that CA is appropriate for area agriculture (81,5 and 79,5% respectively). However most of the respondents both male and female did not think CA plays an important role in addressing impacts of HIV/AIDS and also in helping reduce the vulnerability of women headed households, 62% of the male respondents and 65, % of the female respondents disagreed or had no opinion on the perception statement that CA is appropriate to women headed households. A bigger percentage (93, 5% male and 97, 7% female) disagreed with the perception that CA is beneficial to households with chronic illness which was used in the study as a proxy of HIV/AIDS. This can also be supported by cross tabulating the relationship between households with chronic illness or not and the perception statement that CA is appropriate for households with chronic illness. 94, 7% of households with chronic illness disagreed that CA is appropriate for them while 5, 3% of the households without chronic illness disagreed that CA is beneficial to households with chronic illness. Both males and females agreed that they were satisfied with CA benefits and that it is more yielding than conventional farming and also that soil degradation and moisture stress is the major cause of crop failure. All these statements were not statistically significant at the 95% confidence level.

Discussion

Although the results were not statistically significant they give us an insight of what male and female members think about important aspects of CA. One of the

criteria used by an NGO promoting CA in the area in identifying beneficiaries is that they mostly target women headed households and households with chronic illness for input assistance to promote the technology. However the study finds that the farmers think the technology is not appropriate for these households. The results also show that farmers are generally happy about CA and its benefits and this can help in adoption of the technology. This is despite the fact that the past few seasons had given very low production because of drought. During FGDs respondent gave the local name for CA as literally meaning “dig and die” and some were equating the technology with labour pains were a woman feels so much pain but soon after birth forgets the pain because of the benefits.

5.3.2 Households Perception on Conservation farming

Chi square test for independence was done to reveal statistically significant relationships among attributes such as whether a farmer is currently practising CA or not, whether a farmer plans to practise next season or not and if a farmer is practising whether the farmer wishes to increase or decrease area under CA and also farmer attribute such as gender, marital status, level of education. To reduce the number of cells with expected value less than five, variables recorded in the Likert scale (1- strongly agree to 5- strongly disagree) were collapsed into bivariate. Strongly agree and agree were combined into one variable and neutral, disagree and strongly disagree were combined into one variable. Fisher’s exact test was used to cater for the remaining situations with expected values less than five.

Results from tests of independence showed that farmers practising CA were more likely to agree that conventional agriculture production has decreased over the years than those who are not practising CA. This may indicate the likelihood that these people are doing CA as an alternative to conventional agriculture. They were also more likely to agree with the statements that CA is appropriate to Zimbabwean agriculture and their area agriculture than those not practising.

Practising farmers were more likely to be convinced of benefits of CA than those not practising as can be seen with higher percentage of agreement with

perception statements on CA being beneficial to women headed households and problems encountered in conventional agriculture are overcome by CA.

However information on CA seemed not to be readily accessible even to the practising farmers as can be seen by a higher percentage of farmers disagreeing with the statement that they are well informed about CA and relevant information on CA is easily obtainable than those who are likely to agree.

Respondents whether practising or not were more likely to agree that soil degradation and moisture stress are the major cause of crop failure in the area.

Table 13: Test of independence: Farmer practising CA or not versus farmers' perceptions on CA

PERCEPTION STATEMENT	Farmer practising / not ^a		Sig. ^b
	Practising	Not practising	
Conventional agriculture production has decreased over the years			
Agree	63,2%	28,3%	
No opinion or disagree	2,6%	6,6%	0,002
Conservation Farming is appropriate to Zimbabwean agriculture			
Agree	44,7%	17,8%	
No opinion or disagree	20,4%	17,1%	0,024
Conservation Farming is appropriate to your area agriculture			
Agree	59,9%	5,3%	0,000
No opinion or disagree	21,1%	13,8%	

disagree			
Conservation farming is beneficial to women headed households who may not have labour and draught power			
Agree	36,2%	0,7%	
No opinion or disagree	28,9%	34,2%	0,000
Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) can be eliminated Are overcome by conservation farming			
Agree	60,5%	28,3%	
No opinion or disagree	4,6%	6,6%	
I am well informed about conservation farming			
Agree	17,8%	2,0%	
No opinion or disagree	47,4%	32,4%	0,001
Relevant information on conservation farming is easily obtainable			
Agree	14,5%	14,5%	
No opinion or disagree	50,7%	20,4%	0,011
Conservation farming is applicable to all crops			
	35,5%	7,2%	

Agree			
No opinion or disagree	29,6%	23,7%	0,006
Soil degradation and moisture stress are the major cause of crop failure in your area			
Agree	40,1%	28,3%	
No opinion or disagree	25,0%	6,6%	0,01
^a respondent percentage			
^b Fisher's Exact Test significance (I sided)			

More farmers who planned to practise CA next season agreed that conventional agriculture production had decreased over the years. However these farmers were also likely to disagree on the appropriateness of CA in the country agriculture though they agree on its appropriateness in their area.

Farmers who planned to practise CA next season were more likely to agree that CA could solve problems encountered in conventional agriculture than those not planning to practise. Even farmers who planned to practise CA next season were more likely to disagree with the perception statement that relevant information on CA is easily obtainable. More people are likely to agree that CA is more yielding than conventional farming.

Table 14: Test of independence: Plan to practise next season or not versus farmers' perceptions on CA

PERCEPTION STATEMENT	Plan to practise CA next season		Sig.
	Yes	No	
Conventional agriculture production has decreased over the years			
Agree	51,3%	40,1%	
No opinion or disagree	2%	6,6%	0,022
Conservation Farming is appropriate to Zimbabwean agriculture			
Agree	15,1%	22,4%	
No opinion or disagree	38,2%	24,3%	0,010
Conservation Farming is appropriate to your area agriculture			
Agree	48,7%	32,2%	0,000
No opinion or disagree	4,6%	14,5%	
Conservation farming is beneficial to women headed households who may not have labour and draught power			
Agree	24,3%	12,5%	
No opinion or disagree	28,9%	34,2%	0,012

Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) can be eliminated Are overcome by conservation farming			
Agree	50,7%	38,2%	
No opinion or disagree	2,6%	8,6%	0,009
I am well informed about conservation farming			
Agree	13,8%	5,9%	
No opinion or disagree	39,5%	40,8%	0,032
Conservation farming is more yielding than conventional farming			
Agree	42,1%	11,2%	
No opinion or disagree	30,3%	16,4%	0,038
Conservation farming is applicable to maize only			
Agree	29,6%	17,1%	
No opinion or disagree	16,4%	30,3%	0,006
^a respondent percentage			
^b Fisher's Exact Test significance (I sided)			

For those practising CA, and want to increase area under CA more people were likely to agree that CA is appropriate to Zimbabwe agriculture as well as beneficial to women headed households. More people who want to increase area

under CA were likely to disagree with the statement that CA has affected their decision to adopt CA or not and for those not going to increase no-one has agreed to this statement.

Table 15: Test of independence: Plan to increase area under CA or not versus farmers' perceptions on CA

PERCEPTION STATEMENT	Plan to increase area under CA next season		Sig.
	Yes	No	
Conservation Farming is appropriate to Zimbabwean agriculture			
Agree	44,4%	24,2%	
No opinion or disagree	26,3%	5,1%	0,041
Conservation farming is beneficial to women headed households who may not have labour and draught power			
Agree	46,5%	9,1%	
No opinion or disagree	24,2%	20,2%	0,002
Conservation farming is more yielding than conventional farming			
Agree	47,5%	27,3%	
No opinion or disagree	23,2%	2,0%	0,005
Labour concerns have affected my decision to adopt/not to adopt			
Agree	10,1%	0	
No opinion or disagree	60,6%	29,3%	0,025
^a respondent percentage			
^b Fisher's Exact Test significance (I sided)			

PERCEPTION STATEMENT	GENDER		Sig.
	male	female	
I am well informed about conservation farming			
Agree	10,5%	9,2%	
No opinion or disagree	60,5%	19,7%	0,017
Relevant information on conservation farming is easily obtainable			
Agree	23,7%	5,3%	
No opinion or disagree	47,4%	23,7%	0,045
^a respondent percentage			
^b Fisher's Exact Test significance (I sided)			

Table 16: Test of independence: Marital Status versus farmers' perceptions on CA

PERCEPTION STATEMENT	MARITAL STATUS		Sig.
	Married	Divorced/ Separated/Widowed/Never married female	
I am well informed about conservation farming e			
Agree	9,9%	24,3%	
No opinion or disagree	9,9%	55,9%	0,036
Relevant information on conservation farming is easily			

obtainable			
Agree	5,3%	28,9%	
No opinion or disagree	23,7%	42,1%	0,006
^a respondent percentage ^b Fisher's Exact Test significance (I sided)			

Table 17: Test of independence: Age versus farmers' perceptions on CA

PERCEPTION STATEMENT	AGE		Sig.
	≤49	≥50	
Conservation farming is beneficial to women headed households who may not have labour and draught power			
Agree	21,1%	15,8%	
No opinion or disagree	23,7%	39,5%	0,015

When perception statements were paired with age of respondent only one statement was significant showing that there is not much significant relationship between choices of CA and age of head of household. According to Adesina & Forson, 1995 there is no agreement in literature on adoption on the effects of age on technology adoption. However in the study older people disagreed on the positive benefits of conservation farming to women headed households more than younger people. This can be attributed to the fact that older people are more cautious and therefore are less likely to be flexible than younger people when experimenting with new technology. Non married females are better informed about CA because most NGOs that promote the technology use female headed households as a criterion for selecting beneficiaries.

Statements that were significant in the independence test were subjected to factor analysis. Factor analysis was applied to the all significant statements in the chi square test of independence for a)farmer practising Conservation Farming or not b) Farmer planning to practise Conservation Farming or not c) whether practising farmers wish to increase area under CA or not. This was done in order to find out the underlying construct of the dataset and also to reduce the number of variables to be used in binary analysis. In the factor analysis, all factors with eigenvalues greater than 1 were extracted using the principal component analysis. Varimax rotation with Kaiser normalisation was used to generate the rotated components matrix. Initially, a higher numerical value was associated with greater disagreement with a perception statement but after recording a higher numerical value was associated with greater agreement.

Results of factor analysis farmer practising CA or not and the perception statements with loading factors greater than 0,6 are shown in table(18) below
These three factors were then subjected to binary regression and the results are shown below

Table 18: Binary regression with factor scores as independents (Practising or not practising)

Factors^a and perception statements with factor loading values >0,6	Loading value	Exp (B)-Odds Ratio	Sig
Factor 1 CF applicable to all crops Soil degradation and moisture stress are the major cause of crop failure in your area	0,826 0,779	0,427	0,002
Factor 2 CF appropriate to area	0,721	0,121	0,000

agriculture Conservation farming is beneficial to women headed households who may not have labour and draught power	0,644		
Factor 3 Relevant information on conservation farming is easily obtainable Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) are overcome by conservation farming	0,694 0,612	1,642	0,032
Constant		0,353	0,000
Chi square ^b Nagelkerke R-square Correct Practising (%) Correct Not Practising (%) Correct Total (%)		8,486 P=0,387 0,579 90,9 64,2 81,6	
^a the three factors accounted for 47,8% variance in the original data ^b Hosmer & Lemeshow test (significant p-value indicate inadequate fit)			

Exponential (B) values or odd ratios reflected the impact of a one unit increase in the independent variable on the odd ratio of the dependent variable. It is difficult to generalise interpretations of factor scores because they are weighted averages of the 18 perception statements used to compute factor loading, however generally items that had higher factor loadings within a factor carried more weight in factor scores. A one unit increase in the weighted factor score for factor one which had to do with applicability and reasons for practising CA was associated with a decrease in the odds ratios that a farmer was practising CA or not by a factor of 0,427. Likewise greater agreement with the perception statements

- a. CF appropriate to area agriculture
 - b. Conservation farming is beneficial to women headed households who may not have labour and draught power
- was associated with a 0,121 decrease in the odds ratio that a farmer was practising CA.

Greater agreement with the perception statements, a) Relevant information on conservation farming is easily obtainable and b) Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) are overcome by conservation farming in factor 3 which had to do with how easily information can be obtained and advantages of CA was associated with a 1,642 increase in the odds that a farmer was practising CA. All the three factors were statistically significant at the 0,005 level. The insignificant Lemeshow (high chi-square) as well as Nagelkerke R Square value showed that the model fits well. The model correctly predicted 90, 9% of the respondents practising CA and 64, 2% of those not.

Results of factor analysis farmer planning to practise CA or not in the next season and the perception statements with loading factors greater than 0,6 are shown in table(19) below. These four factors were then subjected to binary regression and the results are also shown in the table

Table 19: Binary regression with factor scores as independents (Plan to practise next season or not)

Factors^a and perception statements with factor loading values >0,6	Loading values	Exp (B)-Odds Ratio	Sig
Factor 1 CF more yielding than conventional agriculture Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) are overcome by conservation farming	0,810 0,777	0,577	0,004
Factor 2 CF appropriate to area agriculture Conservation farming is beneficial to women headed households who may not have labour and draught power	0,856 0,6	0,490	0,000
Factor 3 I am well informed about CF	0,788	0,626	0,013
Factor 4 CF is appropriate to maize only Conventional agriculture production has decreased over	0,719 0,688	0,888	0,509

the years			
Constant		0,882	0,490
Chi square ^b		11,128	
		P=0,195	
Nagelkerke R-square		0,246	
Correct Yes (%)		84,0	
Correct No (%)		59,2	
Correct Total (%)		72,4	
^a the four factors accounted for 64,6% variance in the original data			
^b Hosmer & Lemeshow test (significant p-value indicate inadequate fit)			

Factor 1 seemed to be comparing CA to conventional farming and is mainly about agricultural output (production). Greater agreements with the perception statements a) CF more yielding than conventional agriculture and b) Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) are overcome by conservation farming was associated with a 0,577 fold decrease in odds ratio that a farmer would practise CA in the following season. Factor 2 is mainly about the appropriateness of the technology to the community. Also greater agreement with the perception statements a) CF appropriate to area agriculture and b) Conservation farming is beneficial to women headed households who may not have labour and draught power corresponded to a 0,490 fold decrease in the odds ratio that a farmer will practise CA in the next season. Factors 1 and 2 were significant at the 0,005 level. Factor 3 is about knowledge. Greater agreement with the perception statement “I am well informed about CA” which is in factor 3 was associated with a 0,626 increase in the odds ratio that a farmer will practise CA in the next season. Factor 3 was significant at the 0,01 level. Greater agreement with perception statements

in factor 4 which had the strongest impact on the dependent variable was associated with a 0.888 decrease in odds ratio that a farmer will practise CA the following season. Factor 4 was not statistically significant. The model fits well as indicated by an insignificant p-value. The model correctly classified 84% of farmers who planned to practise CA the following season and 59,2 % who did not.

Results for factor analysis of farmer planning to increase area under CA or not in the next season and the perception statements with loading factors greater than 0,6 are shown in table(20) below. These two factors were then subjected to binary regression and the results are shown

Table 20: Binary regression with factor scores as independents (Plan to increase area under CA or not)

Factors^a and perception statements with factor loading values >0,6	Loading values	Exp (B)-Odds Ratio	Sig
Factor 1		3,166	0,005
CF more yielding than conventional agriculture	0,798		
CF appropriate to Zimbabwe agriculture	0,6		
Factor 2		0,499	0,005
Conservation farming is beneficial to women headed households who may not have labour and draught power	0,994		
Constant		0,342	0,001
Chi square ^b		6,797	

Nagelkerke R-square		P=0,340	
Correct Yes (%)		0,294	
Correct No (%)		82,9	
Correct Total (%)		55,2	
^a the three factors accounted for 60,88% variance in the original data		74,7	
^b Hosmer & Lemeshow test (significant p-value indicate inadequate fit)			

Factor 1 which had to do with appropriateness and advantages of CA was statistically significant. Greater agreement with perception statements a) CF more yielding than conventional agriculture b) CF appropriate to Zimbabwe agriculture is associated with a 3,166 increase in odds ratio that a farmer would practise CA the next season. Greater agreement with the perception statement, Conservation farming is beneficial to women headed households who may not have labour and draught power is associated with a 0,499 decrease in odds that a farmer would practise CA the following season. Both factors were significant at the 0,005 level. The model fits well as shown by an insignificant p-value. It correctly predicted 82, 9% farmers who planned to increase area under CA and 55, 2% farmers who did not.

Table 21: Binary regressions with factor scores as independents and information on age, marital status, education and gender (Practising or not practising)

Factors^a and perception statements with factor loading values >0,6	Exp (B)-Odds Ratio	Sig
Factor 1 CF applicable to all crops Soil degradation and moisture stress are the major cause of crop failure in your area	0,432	0,006
Factor 2 CF appropriate to area agriculture Conservation farming is beneficial to women headed households who may not have labour and draught power	0,115	0,000
Factor 3 Relevant information on conservation farming is easily obtainable Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) are overcome by conservation farming	1,609	0,060
Gender	1,418	0,708
Age	0,712	0,535
Marital Status		
Dummy 1	0,146	0,408
Dummy 2	0,119	0,378
Dummy 3	0,102	0,331
Education		
Dummy 1	0,002	0,845
Dummy 2	0,842	0,844

Dummy 3	0,972	0,975
Dummy 4	0,001	0,866
Constant	2,319	0,708
Chi square ^b	11,543	
	P=0,173	
Nagelkerke R-square	0,613	
Correct Practising (%)	91,2	
Correct Not Practising (%)	72	
Correct Total (%)	84,4	
^b Hosmer & Lemeshow test (significant p-value indicate inadequate fit)		

Increasing the number of dependent variables with information on age, gender marital status and education increased the fit of the model as can be seen with increased Chi square value from 8,486 to 11,543 and also higher Nagelerkerke value. However no statistically significant variable was found. The model correctly classified 91, 2% of those practising and 72% not practising.

Table 22: Binary regressions with factor scores as independents and information on age, marital status, education and gender (Plan to Practise next season or not)

Factors^a and perception statements with factor loading values >0,6	Exp (B)-Odds Ratio	Sig
Factor 1 CF more yielding than conventional agriculture Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) are overcome by conservation farming	0,517	0,002

Factor 2 CF appropriate to area agriculture Conservation farming is beneficial to women headed households who may not have labour and draught power	0,502	0,001
Factor 3 I am well informed about CF CF appropriate to area agriculture	0,638	0,032
Factor 4 CF is appropriate to maize only Conventional agriculture production has decreased over the years	0,882	0,521
Gender	0,848	0,932
Age	1,067	0,876
Marital status		
Dummy 1	0,541	0,695
Dummy 2	0,241	0,387
Dummy 3	0,396	0,557
Education		
Dummy 1	0,537	0,659
Dummy 2	1,371	0,633
Dummy 3	1,027	0,970
Dummy 4	1,405	0,836
Constant	0,848	0,932
Chi square ^b	10,183	
	P=0,252	
Nagelkerke R-square	0,263	
Correct Yes (%)	80,8	

Correct No (%)	61,8	
Correct Total (%)	71,6	
^b Hosmer & Lemeshow test (significant p-value indicate inadequate fit)		

Addition of information about age, marital status, education and gender slightly reduced the fit of the model as can be seen by reduced chi square values from 10,128 without the additional information to 10,252 with the additional information.

Table 23: Binary regressions with factor scores as independents and information on age, marital status, education and gender (Plan to increase area under CA or not)

Factors^a and perception statements with factor loading values >0,6	Exp Ratio	(B)-Odds	Sig
Factor 1 CF more yielding than conventional agriculture CF appropriate to Zimbabwe agriculture	2,133		0,074
Factor 2 Conservation farming is beneficial to women headed households who may not have labour and draught power	0,444		0,011
Age	0,347		0,105
Marital status			
Dummy 1	6059		0,885
Dummy 2	748		0,913
Dummy 3	2577		0,897

Education		
Dummy 1	0,001	0,002
Dummy 2	0,293	0,842
Dummy 3	0,621	0,972
Dummy 4	1,137	0,001
Gender	12,33	0,8
Constant	0,000	0,852
Chi square ^b	4,947	
	P=0,763	
Nagelkerke R-square	0,415	
Correct Yes (%)	92,3	
Correct No (%)	46,2	
Correct Total (%)	79,1	
^b Hosmer & Lemeshow test (significant p-value indicate inadequate fit)		

Addition of information about age, gender, marital status and education moderately reduced the fit of the model as can be seen by reduced chi square values. One striking result was noted on the addition of new variable, specifically marital status which had a huge impact on odds ratio in the plan to increase area under CA equation. If a farmer is divorced it increased the odds of the farmer increasing area under CA by a magnitude of 6059, if the farmer is widowed it increase the odd that the farmer will increase area under CA by 748 and if the farmer had never married it increase the odd of the farmer increasing the area under CA by 2577. This result shows the need for a study to gain an in-depth understanding of the relationship between CA adoption and marital status. However, addition of only two variables (information on education) was possibly significant. If a farmer had no education odds that he will increase area under CA were increased by 1,137. Information on gender also strikingly improved the odds ratio in the equation. If the farmer was male odds that he will increase area

under CA were increased by 1233. The model correctly predicted 92,3% of respondents who had said yes and 46,2 who had said no.

Discussion

Perception statements were analysed to find the impact of these perceptions on choices around CA. Some of the perception statements used in this study can confidently be use to distinguish between farmers practising CA and those not practising and those planning to practise next season and not. Very few statements can be used to distinguish between those planning to increase area under CA and not. These statements however can limitedly be used to determine future actions i.e. whether farmers will adopt the technology or not.

Farmers who are currently practising CA are more optimistic on the benefits of CA than those who are not. Both farmers who are practising and not practising CA are not convinced on the benefits of CA to household affected and infected by HIV/AIDS and women headed households who are one of the targeted beneficiaries of the programme. Both groups of farmers (practising and not practising) farmers agree that information on CA is not readily available.

5.4 THE ROLE OF GENDER IN DECISION MAKING AROUND CA

Table 24: Disaggregating of who Does/Manages Household Resources and Activities by Gender

Resource/ Activity	Male (%)	Female (%)	Both (%)
Land Preparation	48,7	37,5	13,8
Ploughing	52,6	38,2	7,9
Weeding	8,6	53,9	37,5
Harvesting	10,5	45,4	44,1
Purchases of seed and other agricultural inputs	57,9	35,5	5,9
Daily purchases of other goods	36,8	55,3	7,9
Production of Food crops	15,8	74,3	9,9
Production of Cash Crops	13,2	75	10,5
Large Livestock production	46,7	38,8	13,8

Table (18) compares men's and women's participation in household activities and resources within the household. In Focal Group Discussions one concern that came up in connection with CA was that it is labour intensive especially basin digging and weeding. Although most respondents agreed that land preparation and ploughing was mostly done by men compared to women, the differences are small (48,7% for men compared to 37,5% for women for land preparation). However for weeding and harvesting it was overwhelmingly agreed that it mostly done by women (53,9%) for women compared to 8,6% for men for weeding). This result is in agreement with Truscott: 1991 pg 44 who in the following

activity profile indicated that ploughing in Zimbabwe is mainly considered a men's job while weeding is mainly a women's job.

Activity profile for men and women for cash and food crops in a household

Activity	Cash crops	Food crop
Ploughing	Both	women
weeding	Women	women
fertilisation	Women	
Harvesting	Both	women
Livestock production(herding)	Women and boys	

Adapted from Trusscott, 1991

This puts strain on women because mostly land preparation is done once within a season whereas there can be three or more weeding within a season depending on weed pressure. Although research has shown that with time weeding in CA will be reduced in the inception phase which influences adoption it puts a strain on women in terms of labour and time. There was almost equal number of respondents who indicated that harvesting is mostly done by women and those who said it is done by both. Large livestock production which is key for draft power in communities was said to be done mostly by men compared to women. More than half the respondents thought women were mainly responsible for weeding, daily purchase of goods other than seed and input, production of food crops and production of cash crops: while more than half the respondents indicated that men were mainly responsible for ploughing and purchase of seed and other inputs. This is line with gender disaggregation in the household and can also be seen in the production of food and cash crops whereby in most households, cash crops such as maize, cotton and tobacco are deemed household crops in which men and women perform certain tasks, while other crops especially food crops are deemed women crops. This clearly shows gender disaggregation which is tilted against women especially considering that they

also have extra tasks of the welfare of the household.

Table 25: Disaggregation of who Makes decisions about management of Household Resources and Activities by Gender

Resource/ Activity	Male (%)	Female (%)	Both (%)
Land Preparation	57,2	36,8	5,9
Ploughing	60,5	35,5	3,9
Weeding	11,8	55,3	32,2
Harvesting	14,5	47,4	36,2
Purchases of seed and other agricultural inputs	42,8	51,3	5,9
Daily purchases of other goods	28,9	65,8	3,9
Food crops(what crop to grow and when)	15,1	78,3	3,9
Harvest from these crops	15,1	76,3	7,9
Cash Crops (what crop to grow and when)	14,5	69,7	15,8
Proceeds from these crops	13,2	72,4	14,5

Table 26: Disaggregation of who Makes decisions about management of Household Resources and Activities among male headed households

Considering that a significant proportion (28.9%) of the respondent heads of households are female, while 71.1% are male, it was important to analyse male headed households separately to establish the extent of the effects of gender on decision making around the household.

Resource/ Activity	Male (%)	Female (%)	Both (%)
Land Preparation	65,7	15,7	18,5
Ploughing	69,8	18,9	11,3
Weeding	11,1	38,9	50
Harvesting	14,5	47,4	36,2
Purchases of seed and other agricultural inputs	57,4	34,3	8,3
Daily purchases of other goods	40,2	54,2	5,6
Food crops(what crop to grow and when)	21,9	72,4	5,7
Harvest from these crops	15,1	76,3	7,9
Cash Crops (what crop to grow and when)	20,4	58,3	21,3
Proceeds from these crops	17,9	67	15,1

Results from separate analysis of male headed households are an indication of women's increasing role in the management of resources they use. This is evidenced by the above two tables where it can be seen that women makes most decisions on the resource utilisation of activities they do for example they make decision on what crops to grow and when and also they make decision on harvests from crops

Discussion

Gender disaggregation in the household is manifest by women and men having socially constructed roles which has been traditionally defined in the African

society. Results in table 25 and 26 maybe influenced by an increase in women headed households especially now with the increase on the number of men going to towns and sometimes out of the country to look for employment and means of livelihoods. This may be attributed to declining agricultural productivity and worsening economic environment in the country. Test of independence between perception statements used in the study and education, age, marital status and gender, showed they were statistically independent of each other. However, there is strong correlation between them and this gives an understanding of how they affect decisions around adoption of CA. Only gender could be used confidently to determine whether a farmer is likely to increase or decrease area under CA. According to literature some studies have shown that women's ability to carry out labour intensive agriculture innovations is undermined by their limited access to resources such as land and labour and rights to natural resources(de Groote and Coulibaly, 1998), However this study has shown that gender can be used to determine adoption of conservation farming. This is in line with recent findings by Nhemachena and Hassan (2007) who in a Southern African based research found out that female headed households are more likely to take up climate change adaptation methods. This can attributed to the fact that most men in the study area have gone either to cities or nearby countries in search of work and women are left on the farm, these women have more experience in farming and are knowledgeable on various management practises and their effects and also on how to change them.

5.5 RELATIONSHIP BETWEEN CHOICES ON CA ADOPTION AND ACCESS TO LIVELIHOODS CAPITALS.

Relationship between access to financial capital and choices on CA

Remittances

Table 27: Frequency table for remittances

	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Practising	20	20,2	79	79,8
Not practising	11	20,8	42	79,2
Perason's Chi-square	0,936			
Pearson's R	-0,080			

Table 28: Sources of income

	Formal employment		Non formal		Remittances		Farming		Others	
	Fre	Perc	Fre	Perc	Fre	Perc	Fre	Perc	Fre	Perc
Practising	5	5,5	7	7,1	6	6,1	74	75,5	6	6,1
Not Practising	3	5,7	3	5,7	14	26,4	25	47,2	8	15,1
Pearson's Chi- Square	0,02									
Pearson's R	-0,438									

Key

Fre- Frequency

Perc- Percent

There was a significant relationship between source of income and whether a farmer was practising CA or not, however the relationship between those receiving remittances and not was not significant and the correlation was not

strong.

Human Capital

Table 29: Education

	Preschool		Primary education		Secondary Education		College		None	
	Fre	Perc	Fre	Perc	Fre	Perc	Fre	Perc	Fre	Perc
Practising	3	3,3	44	48,4	31	34,1	2	2,2	11	12,1
Not Practising	0		26	52	20	40	0		4	8
Pearson's Chi- Square 0,455										
Pearson's R -0,436										

Key

Fre- Frequency

Perc- Percent



Table 30: Chronic illness

	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Practising	23	23,2	76	76,8
Not practising	15	28,3	38	71,7
Pearson's Chi-square 0,492				
Pearson's R -0,684				

Table 31: Knowledge on CA

	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Practising	98	99	1	1
Not practising	51	96,2	2	3,8
Pearson's Chi-square 0,243				

Pearson's R	1,165
-------------	-------

Table 32: Labour availability

	1-5		6-10	
	Frequency	Percentage	Frequency	Percentage
Practising	27	27,2	72	72,8
Not practising	10	19	43	81
Pearson's Chi-square	0,189			
Pearson's R	0,783			

There was a strong negative correlation between level of education and whether the farmer was practising CA or not. There was a strong negative correlation between whether a farmer was practising CA or not. Farmers who are practising CA are better educated than those not practising.

5.5.1 Physical capital

Table 33: Ownership of TV/Radio for communication

	Yes		No	
	Frequency	Percentage	Frequency	Percentage
Practising	42	42,4	57	57,6
Not practising	17	32,1	36	67,9
Pearson's Chi-square	0,212			
Pearson's R	1,246			

There was a strong negative correlation between ownership of a TV/radio and whether a farmer is practising CA or not. Though road network in the study area was relatively good as compared to some areas in the country the harsh economic environment in the country makes it difficult for most households to afford transport. The difference between those with TV/radio and those without was

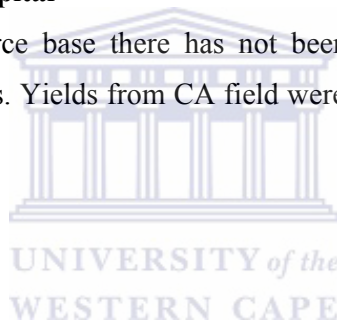
negligible and hence practising CA or not did not affect access to physical capital.

5.5.2 Social capital

This entailed community perceptions as to whether their social state is improving. During Focal Group Discussions it came up that social state has improved because of the way conservation farming is done in the area. To maximise labour they do community work at each household. If it is weeding, the whole group weeds at a household today and then goes to the next after they finish. This has helped households become member of social groups.

5.5.3 Natural Capital

In terms of the resource base there has not been a marked improved maybe because of the droughts. Yields from CA field were not very different from other practises fields.



CHAPTER 6

POLICY RECOMMENDATIONS AND CONCLUSION

The chapter summarises the study. Conclusions are drawn from research findings and recommendations for further research are highlighted. Considering the wide range of benefits of Conservation Agriculture, the study also makes recommendations for stakeholders, policy makers and government to improve uptake by farmers and scale out the technology.

6.1 Summary and Conclusion

Conservation farming has been widely promoted in Zimbabwe by both government agencies and NGOs. NGOs propose it as a low input form of farming, which is suitable for even the poorest households with no draft power. It is also seen as suitable for vulnerable households such as those affected by HIV/AIDS, and female and child headed households.

The study objectives were to:

- 1. Examine perceptions of female and male members of farming households on the usefulness of conservation farming in addressing livelihood sustainability, food security and HIV and AIDS-related hazards and vulnerability.*

The study explored Insiza farmers' perceptions of Conservation Agriculture and analysed the relationship between these perceptions and decision making pertaining to CA. The ultimate aim was to identify whether this relationship can be used to predict decisions about adoption of the technology.

The socio-economic data used to establish perceptions was gathered by household surveys, focus group discussions, direct observation, and key

informant interviews with AGRITEX personnel, NGOS and others. Descriptive statistical analysis determined means and standard deviations. Likert scale responses regarding perceptions were subject to reliability analysis (Chronbach's alpha). Individual items that seemed to be reliable were subjected to factor analysis. Resultant weighted factor scores were used as independent variables in binary regression.

Some of the perception statements used in this study can be use to distinguish between farmers practising CA and those not, and those planning to practise or not. However, very few statements can be used to identify those planning to increase area under CA. These statements are limited in their ability to predict whether farmers might adopt the technology or not.

Results show that perceptions can be used to predict future actions hence influencing adoption of CA, and can be used to distinguish between those practising CA and those not. Generally speaking, farmers practising CA were more optimistic about the benefits of CA than those not practising. Neither group, farmers practising and those not practising CA, are convinced of the benefits of CA to female headed households or those affected by HIV/AIDS, who are often the targeted beneficiaries of the programme. Both groups of farmers (practising and not practising) agree that information on CA is not readily available. Soil and water conservation is appreciated by many farmers, and although the term CA is relatively new, the technology has been practised for a long time. This can be seen from farmers' reactions during the study when one of their main concerns was that AGRITEX no longer peg storm drains to conserve soil and moisture.

2. Develop understandings of the role of gender in decision-making and production related activities around conservation farming both within households and within projects supported by external agencies.

Household questionnaires were used to gather this data. Farmers were asked who is responsible for first, doing each task and who was responsible for making decisions concerning those activities. Descriptive statistics and frequency tables reflecting responsibility for different activities within the household were used to analyse the data.

The study showed that though women are now sharing more activities with men and are playing an increased role in the management of resources they utilise, gender roles within households practising CA have not shifted significantly from the traditional division of labour. Initiation of conservation farming is a labour intensive technology and the fact that women still do most of the initial activities (such as basin digging and weeding) impacts them negatively, especially those affected and infected by HIV/AIDS. Therefore, more research is needed, especially on mechanisation, so that more women may adopt the technology.

Though perception statements used in the study were statistically independent of education, age, marital status and gender, there is strong correlation between them. This helps explain how they affect decisions around adoption of CA. Gender of respondent was the only factor that could be confidently used to determine whether a farmer is likely to increase or decrease area under CA.

Determine ways in which costs and benefits associated with conservation farming are perceived and shared between male and female members of farming households, and how this affects perceptions on and adoption of conservation farming.

An important conclusion from this study is that farmers say that relevant information on Conservation Agriculture is not easily available. They also point out that CA is not very beneficial to households with chronic illness, maybe because of the initial high labour requirements during inception.

Households and individuals respond differently to hazards, and these are often not socially acceptable or sustainable. This is demonstrated by the number of households whose main source of livelihood is gold panning—identified during community discussions as a major cause of environmental degradation. This implies the importance of diversification of livelihood strategies. The reality is that rural livelihoods in the study area are diverse, and no one technology can operate in isolation from other social perceptions and issues.

Farmers in the study area were of the opinion that extension advice both from the government and other agencies is lacking. Though farmers are willing to try conservation farming because of perceived benefits (soil and moisture conservation), these benefits have not yet started showing.



6.2 Policy Recommendations

Conservation of the productive base (soil and water) must be a major focus in agricultural development. Benefits of conserving these might not be immediately evident, but are set to benefit future generations. It is thus crucial for governments to protect the productive base to ensure sustainability. In order to do this, government should develop statutes to promote Conservation Agriculture with comprehensive conservation plans. To support these initiatives, government should offer incentives for highly effective, sustainable farming systems that maintain and protect the resource base.

Additional support is needed to promote CA. A dedicated funding source ought to exist, at the national level, to avoid relying on donors or other external funds. CA could be included in a line agency budget, such as the Ministry of Agriculture, to ensure the funds to promote this important initiative are available annually. This funding could be made available to extension, nonprofit and community-based organizations, educational institutions, farmers and others to increase awareness of CA opportunities. This would magnify government efforts

to enhance producer knowledge and other educational activities to increase farmer participation and the performance of these programs. Incentives such as lower interests rate to those farmers practicing CA on funds borrowed for agricultural purposes should be put in place by the government. This will encourage large scale farms to practice CA.

Outreach programs should also reach out to newly resettled farmers who need to implement conservation measures on their plots. Emphasis should also be put on limited resource producers, and women who require strong technical assistance and financial aid as incentives.

Conservation programs should be prioritized, and targeted at those farmers who tend to be left out of donor funded programs (A1, A2 and Large Scale Commercial farms). While Conservation Agriculture programs tend to be aimed at vulnerable households, CA has potential benefits for every farmer.

The Ministries of Agriculture, Mechanisation and Irrigation, and Environment should begin setting national, provincial and district targets for conserving soil, water, natural resources and the environment. Conservation farming is an old practice but has been promoted vigorously for the past five years. A lot of trainings have been done but still uptake by farmers is very low. Therefore there is an urgent need of monitoring and evaluation of the program to find out why. These institutions should be responsible for monitoring and evaluation of conservation agriculture programs. Funding is required to monitor and evaluate the technical effectiveness and economic efficiency of conservation practices and incentive mechanisms.

Appropriate institutions should develop and provide on-going funding for extensive training, outreach, research, and demonstrations so that staff, partners and farmers understand Conservation Agriculture and sustainable farming system. Communication has emerged as one of the constraints to widespread

promotion of CA. Therefore, improved use of both electronic and print media to increase awareness of the technology is necessary. Posters, fliers, advisories and manuals should be enhanced to ensure extensive outreach of the technology, in forms appropriate for a wide range of audiences. These should be updated regularly.

An education assistance component should be included in all financial assistance programs related to conservation, with incentives tied to sustainable production. Conservation programs should consider incentives for on-farm energy efficiencies and conservation this will be in line with efforts to mitigate the effects of climate change that is threatening the world. Intensive Conservation Areas that used to be in farming communities in the early 80's should be reintroduced. These will help in coordination of both CA and other conservation measures such as reduction in veldt fires that are currently a problem in the country.

The current socio-economic environment has impacted CA adoption. Most able bodied males most of the commercial labour force has left the country in search of livelihoods, leading to labour constraints as a frequently mentioned constraint. This highlights the need for research including both the public and private sectors to develop labour saving CA equipment that is appropriate for smallholder farmers.

Though policy on marketing of agricultural produce is wide ranging and has been debated over for a long time, for CA technology to impact rural livelihoods, transformation of the production chain, from production to marketing of produce, is necessary. Issues such as security of land and water rights, access to inputs and technical information, transport, prices and communication must all be addressed.

Study respondents strongly disagreed that relevant information on Conservation Agriculture is easily available to them. Appropriate extension has also been

identified by respondents as a major problem in the area. Respondents felt that extension advice focuses mainly on improving production, and seldom pertains to improving economic returns to various crops or farming systems as a whole. CA should be institutionalized and supported such that appropriate and effective extension methods are part of the package. This would rely on strong government, private sector and donor partnerships.

The study highlights the need for off-farm income generation activities, which are sustainable for households and socially acceptable so that communities will be able to diversify their livelihoods, and better withstand hazards.



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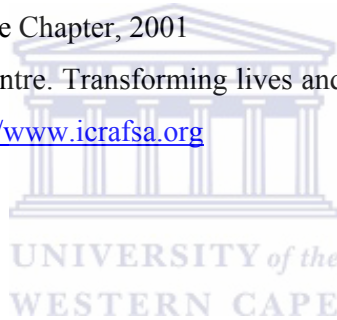
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ANNEXURE QUESTIONNAIRE

A GENDER SENSITIVE ANALYSIS ON FARMERS PERCEPTIONS ON CONSERVATION FARMING

Index.....
HOUSEHOLD INTERVIEW QUESTIONNAIRE

Section A: Introduction and Overall Instruction for the enumerator

Ward.....
Village.....

- a) Identify yourself and explain the purpose of the survey, how the household was selected and assure confidentiality of information provided as follows:

Conscientise the respondents on the fact that participation in the study is voluntary and if at any time during the interview they feel uncomfortable for whatever reason, they are entitled to withdraw from the research. Tell them that all relevant information about the study will be disclosed and the researcher will answer all questions and queries from the respondents honestly. Results from the research will be principally for academic purposes. However, feedback of research results will be given to relevant key stakeholder institutions and also to respondents if these request such. The identity of the respondents will only be disclosed if the information does not pose any risk to the respondents and only with the permission of the respondent. Tell them that their household was selected randomly; your households together with other selected households in your area will help paint a picture of how an average household in your area view conservation farming. Tell them the information they will share with you will be held in strict confidence; names and addresses will be not be revealed or associated with their responses Your participation in this very important exercise is voluntary.

- b) Write down the responses clearly

- c) Allow respondent to ask any questions s/he may have concerning the survey before, during and after the interviews



Section B: Household Demographics

Name of Respondent.....

Household Type

1=Widow/widower 2= polygamous
3= Female headed 4= Child headed 5=married

	B1	B2	B3	B4	B5	B6	B7	B8
	first name of each HH member starting with the head	What is the marital status of the head 1. Married 2.Divorced/ Seperated 3 Widowed 4.Never married	Male/Female Male= 1 Female= 2	What is the relationship of name to HHH	Name Age (Yrs) Don't know 999	What is the highest level of school [Name] has attended or attending? See codes below	Has [Name] been very sick for at least 3 mos during the last 12 months? By very sick, I mean that [Name] was too sick to work or do normal activities around the house for at least 3 of the past 12 mos. 1 = yes 2 = no	a.If Name is below 17years, is he or she an orphan 0=No 1=Both parents deceased 2=single parent deceased 3=Don't know
						a		
01	Head					a		
02						a		
03						a		
04						a		
05						a		
06						a		
07						a		
08						a		
09						a		

B9 Do you have any relative outside the country who sometimes assists you (Y/N)

B4 – Relationship	B6 -School Level
1 = Head, 2 = Head spouse 3 = child, 4 = father/mother 5 = brother/sister, 6 = other relative 7 = no relation 8 = adopted/foster or step child 9 = worker 10 = niece or nephew 11=Son /daughter in law 12 =Grand child	1 = Preschool 2 = Primary School 3 = Secondary School 4 = Other college or training institute 5= none 98=don't know



Section C: Agriculture- Conservation Farming

First introduce Conservation Farming as it is commonly known as basin farming. Go on to define CA principles as other means of conserving soil and moisture such as minimum soil disturbances, mulching (live/dead), crop rotations/interactions

C1 What is the main cereal grown by the household

1 Maize	2 Sorghum	3 millets	4 rapoko	5 other crops
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C2 Does the household practice any form of soil or water conservation

1=yes	2=No
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C2 Does any member of the household know about Conservation farming

1=Yes	2=No
-------	------

C3 From whom did the member learn it

1=Local Extension worker	2= NGO	3= Neighbours	4= Radio/TV	5= Passed on tradition	6= Other specify
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C4 Does the household practice Conservation Farming (Y/N)

1=Yes	2=No
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If no go to C11

C5 For what crops

1 Maize	2 Sorghum	3 millets	4 rapoko	5 other crops
---------	-----------	-----------	----------	------------------

C6 How much labour is available for Conservation farming in the household

1=More than adequate		2=Adequate		3=Not adequate	
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C7 When did the household start practicing Conservation farming

1=2007	2=2006	3=2005	4=2004	5=2004
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C8 What made you start practicing

1=Passed on tradition	2=input incentives	3=Convinced by extension worker	4=Saw someone practicing
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C9 Who made the decision to start practicing

1= Male	2=female
---------	----------

C10 In the past season, 2007/8 how many ha did the household put under Conservation Farming and for what crops

1=0-0.2ha	2=0.2-0.5ha	3= 0.5-1ha	4=>1ha
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C11 In the past season, 2007/8 how many ha did the household plant their main cereal

1=0-0.2ha	2= 0.2-0.5ha	3=0.5-1ha	4=>1ha
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C12What was the main cereal production from all fields in the past season 2007/2008

1=0-0.1t	2=0.2-0.5t	3=0.6-1t	4=>1t
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C13 What was the average production from the Conservation Farming in the past season 2007/2008

1=0-0.1t	2=0.2-0.5t	3=0.6-1t	4=>1t
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C14 Do you plan to practice conservation farming in the next season (2008/2009)

1=Yes	2=No
-------	------

If you are not practicing CA skip C15

C15 If yes do you plan to increase or decrease area under Conservation Farming

1=Increase	2=Decrease
------------	------------

C16 How much arable land does the household have

1=more than 1ha		2=less than 1ha	
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Section D: Household Resource Management

Who mostly does the following household Activities/Resources?

D1 Land Preparation

1= Men	2=Women	3= Both
--------	---------	---------

D2 Ploughing

1= men	2= Women	3= Both
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D3 Weeding

1= Men	2= Women	3=Both
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D4 Harvesting

1= Men	2=Women	3=Both
--------	---------	--------

Who is responsible for the following

D5 Purchases of seed and other agricultural inputs

1=Men	2=Women	3=Both
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D6 Daily purchases of other goods

1=Men	2=Women	3=Both
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D7 Production of Food crops

1=Men	2=Women	3=Both
-------	---------	--------

D8 Production of Cash Crops

1=Men	2=Women	3=Both
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D9 Large Livestock production (*If you have any*)

1=Men	2=Women	3=Both
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E Who makes Decisions about the Management of the following Resources/Activities?

E1 Land Preparation

1=Men	2=Women	3=Both
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E2 Ploughing

1=Men	2=Women	3=Both
-------	---------	--------

E3 Weeding

1=Men	2=Women	3=Both
-------	---------	--------

E4 Harvesting

1=Men	2=Women	3=Both
-------	---------	--------

E5 Purchases of seed and other agricultural inputs

1=Men	2=Women	3=Both
-------	---------	--------

E6 Daily purchases of other goods

1=Men	2=Women	3=Both
-------	---------	--------

E7 Food crops (what crop to grow and when)

1=Men	2=Women	3=Both
-------	---------	--------

E8 Who manages harvest from these crops

1=Men	2= Women	3=Both
-------	----------	--------

E9 Cash Crops (what crop to grow and when)

1=Men	2=Women	3=Both
-------	---------	--------

E10 Who manages proceeds from these crops

1=Men	2=Women	3=Both
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Section F: Perception Statements

Perception Statements

F1. Conventional Agriculture production has decreased over the last years

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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If household is not practising CA go to F15

F2. Conservation Farming is appropriate to Zimbabwean agriculture

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F3. Conservation Farming is appropriate to your area agriculture

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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4. Conservation farming is beneficial to women headed households who may not have labour and draught power

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F5. Conservation farming is appropriate to households with chronic illnesses

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F6 Some of the problems encountered in conventional agriculture (e.g. draught power, pest and weed problem) can be eliminated Are overcome by conservation farming?

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F7. As a farmer you are concerned about labour requirements in Conservation farming

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F8 As a farmer you are satisfied with the benefits of conservation farming

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F9, Farmers in general have sufficient knowledge on conservation farming

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F10 I am well informed about conservation farming

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F11. Relevant information on conservation farming is easily obtainable

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree	
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F12 Conservation farming is more yielding than conventional farming

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F13 Conservation farming is applicable to maize only

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F14 Conservation farming is applicable to all crops

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F15. Soil degradation and moisture stress are the major cause of crop failure in your area

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F16. There is need to be concerned about soil and water conservation

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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F17 Labour concerns have affected my decision to adopt/not to adopt

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
--------------------------	----------------	------------------	-------------------	----------------------------

F18 Chronic illness in the household have affected my decision to adopt/not to adopt

1= Strongly agree	2=Agree	3=Neutral	4=Disagree	5=Strongly disagree
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Section G: Household Assets

GI. Does your household own **any of the following items?**

Asset	No. Owned	Did you dispose any of these assets in the last 12 months(Y/N)
Scotch Cart		
Plough		
Tractor		
Cultivator		
Hoe		
Wheel Barrow		
Bicycle		
harrow		
Radio/TV		

Livestock

Livestock	Total Number owned	Number kept	No of draught animals	Did you acquire any of these assets in the last 12 months	Did you dispose any of these assets in the last 12 months
Cattle					
Donkeys					
Goats			Not applicable		
Sheep			Not applicable		

Does your household keep chickens (Y/N)

Section H: INCOME

What are the major income generating activities for your household?
(Include all members in the household residing with you – rank the 3 major activities from 1 to 3, with 1 highest income, 2 second and 3 lowest)

6.2.1.1.1 Activity Code	6.2.1.1.2 Activity	6.2.1.1.3 Rank
6.2.1.1.4 H1	6.2.1.1.5 Formal employment	6.2.1.1.6
6.2.1.1.7 H2	6.2.1.1.8 Non –formal employment	6.2.1.1.9
6.2.1.1.10 H3	6.2.1.1.11 Both formal/non-formal	6.2.1.1.12
6.2.1.1.13 H4	6.2.1.1.14 Remittances	6.2.1.1.15
6.2.1.1.16 H5	6.2.1.1.17 Other (Specify)	6.2.1.1.18