A STUDY OF THE SOCIAL ECONOMIC FACTORS AFFECTING THE ADOPTION OF THE PRINCIPLES OF ORGANIC AGRICULTURE BY SMALL SCALE FARMERS IN THE CHONGWE AREA.

A Research Report presented to the Department of Agricultural Economics and Extension Education of the University of Zambia

By

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS i

ABSTRACT vi

LIST OF ABBREVIATIONS vii

CHAPTER ONE: INTRODUCTION 1

1.1 Introduction and Background 1

1.2 Problem statement 2

1.3 Objectives 2

1.3.1 General objective 2

1.3.2 Specific objectives 2

1.4 Conceptual framework 3

1.5 Structure of the Report 4

CHAPTER TWO: LITERATURE REVIEW 6

2.1 Introduction 6

2.2 Definition of terms 6

2.3 Research conducted outside Zambia 8

CHAPTER THREE: RESEARCH METHODOLOGY 9

3.1 Introduction 9

3.2 Study Area 9

3.3 Sampling design and procedure 9

3.4 Research design and Data Collection Procedures 10

3.5 Data analysis 10

CHAPTER FOUR: STUDY FINDINGS AND DISCUSSION 12

4.1 Introduction 12

4.2 Demographic characteristics of the sample 12

4.3 Perceptions of the Farmers about OA 14

4.4 Tobit Regression 17

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS 19

5.1 Conclusion..... 19

5.2 Recommendations. 19

REFERENCES..... 21

APPENDIX 23

Appendix 1: Questionnaire 23

LIST OF TABLES

Table 1: Demographic characteristics of the sample: Age and Household size 12

Table 2: Demographic characteristics of the sample: Sex of household head, marital status and level of formal education. 13

Table 3: Tobit Regression Parameter estimates for adoption of OA (Dependent variable: Area Cultivated by OA practices) 17

LIST OF FIGURES

Figure 1: Sex Proportion of Farmers 13

Figure 2: General attitudes of adopters about OA 14

Figure 3: Non adopters' reasons for not adopting OA 15

Figure 4: Farmers recommendations 16

ABSTRACT

A Study of the Social Economic Factors Affecting the Adoption of the Principles of Organic Agriculture by Small Scale Farmers in the Chongwe Area.

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University of Zambia, 2014. **Mr M. Likulunga.**

The main objective of this study was to assess the factors affecting the adoption of the principles of organic farmers in Chongwe district in Lusaka province of Zambia. The study was based on the sample survey data from the district. A Tobit analysis was used to identify the factors affecting the level and intensity of adoption of organic agricultural practices in the district. The article considers explanatory variables like the level of education of the household head, the sex of the household head, the age of the household head, the marital status of the household head, access to markets and what training in the principles of organic agriculture they have received, for example in crop rotation.

The results showed that adoption of organic agricultural practices in the district is explained by the household size and training in crop rotation. The findings revealed that a households decision to adopt organic agriculture practices is significantly responsive to household size (*$p<0.1$) and training in crop rotation (***$p<0.01$). These are the factors that the extension agents ought to consider as they diffuse the information about the adoption of organic agriculture.

Organic agriculture practices are essential to the improving the food security of small scale farmers as well as providing a sustainable way to earn income. Extension education and training must emphasize the importance of these practices by explaining the several agronomic and economic benefits to the farmers. Farmers introduced to these practices my provided with adequate access to water, manure and more extension services to increase the use intensity of organic agriculture.

LIST OF ABBREVIATIONS

CA	Conservation agriculture
FAO	*Food and Agriculture Organization*
IFOAM	International Federation of Organic Agriculture Movements
KATC	Kasisi Agricultural Training Centre
MT	Metric tonnes
OA	Organic agriculture
OLS	Ordinary least squares
OPPAZ	Organic Producers and Processors Association of Zambia
SSA	Sub Saharan Africa

CHAPTER ONE: INTRODUCTION

1.1 Introduction and Background

Scientists have estimated that by 2030, the world's population would have increased by 2 billion and much of this population growth will occur in Sub Saharan Africa (SSA), Asia and South America. Taking into account that land is a resource that is diminishing rapidly relative to population growth and food insecurity is becoming more rampant. Different researchers in the field of agriculture have been doing research on sustainable means of agriculture. These can be used to improve the health of the already available land resource that can be used to improve world food security by increasing land productivity and reduce poverty and malnutrition by empowering people through agriculture. One such method is organic agriculture.

Organic agriculture (OA) is the production system that sustains the health of agro-ecosystems and people (IFOAM, *2009*). Organic operations can contribute to a sustainable food production system (Azadi *et al, 2011*), improve employment opportunities for women (IFOAM, Franworth and Hutchings, *2009*), improve household food security (FAO, Scialabba, *2007*), enhance biodiversity (Mahmoudi *et al, 2009*), and contribute to agricultural development (Darnhofer, Schemer and Schneeberger, *2008*).

Many countries promote OA to avoid facing problems with food supplies that are free from harmful chemicals, health problems, unsustainable agri-rural development and environmental degradation among other (Partap, *2010*). However, despite the rapid growth of OA in much of the developed world (Sadati *et al, 2010*), the expansion of OA in the developing countries, including Zambia, has been much slower than in the developing world. Zambia's share of the worlds OA lands is only 187,694 hectares (ha) which part of the third of the organic agriculture land that all the developing countries which is a total of 12.5 million ha have a share of. (Willer, Yussefi-Menzlerand and Sorensen's, *2008*) In these countries, certified organic food production is generally limited. The bulk of Zambia's organic production area is virgin land for wild harvesting of products like honey, mushrooms and indigenous tree seed oil. The rest is commercial land, which is used for the production of export vegetables, herbs, spices, medical plants, groundnuts, sesame, green manures, soya beans and maize (IFOAM, *2003*). All these exports are destined for Europe.

1.2 Problem statement

The issue of population growth, land degradation and increasing food insecurity in Zambia is a very big one. The majority of the farmers in the country are small-scale farmers and are badly affected by the above issue which puts them in the losing end. 65% of agricultural land in Sub Saharan Africa including Zambia were subject to soil depletion (Giller *et al, 2009;* Rock storm *et al, 2008*) The adoption of a monoculture type system that was introduced to us by our formal colonial master were farmers were encouraged to grow crops like maize which were not indigenous to the region, has put gradually put great strain on the soils and due to frequent and over or miss use of chemicals like pesticides, herbicides and fertilizers and over use of land. Some systems of organic agriculture like permaculture are systems of land renewal and help to bring back a balance in nature's ecosystems by working with nature as opposed to working against it. Most conventional farming systems work against nature which in has led to poor soil health and reduced yields of crops and unhealthy livestock.

Since the formal concept of organic agriculture it is relatively new in Zambia, the factors affecting its adoption is still not very apparent. It could be argued, however, that traditional agricultural methods could be considered as organic because most small scale farmers do not have access to synthetic agricultural chemicals. The research will concentrate on the farmers who have been exposed to formal training and knowledge on the proper execution of organic technologies. The research will also try to fill in these gaps to fully understand if organic agriculture could be a viable enough solution to help small-scale farmers be self-sufficient financially and improve food security while not distorting their way of life.

1.3 Objectives

1.3.1 General objective

To identify the factors that affect the adoption of organic agriculture among small scale farmers in Chongwe.

1.3.2 Specific objectives

The specific objectives of the study are;

- To determine the probability of farmers adopting organic agriculture.

- To determine the extent of adoption of organic agriculture methods among small scale farmers in Chongwe
- To identify the factors that affect the adoption of organic agriculture among small scale farmers in Chongwe

1.4 Conceptual framework

Batz et al (1999) identifies two conceptual models used to explain the decision of farmers to adopt technologies. These are the innovation-diffusion model and the economic constraints model. According to the innovation-diffusion model, a technology is transferred from the source to the intended end users by extension workers. Diffusion of this technology depends on the personal characteristics of the potential users. The model assumes that a technology is ready for use unless it is hindered by lack of effective communication. The economic constraint model assumes that the adoption of technology is determined by the distribution of resource endowments among end users. Negatu and Parikh (1999) present a technology characteristics-user's context model that integrates approaches which assume that agro-ecological, socioeconomic and institutional characteristics of the technology's intended end users have a central role to play in the adoption decision and diffusion process. This model looks at all aspects included in the innovation-diffusion and the economic constraints models and characteristics of the technology being introduced. The technology characteristics-user's context model will be used in this study because it is comprehensive and allows the farmer's decision process to be analysed by looking at all the factors that can be identified.

According to Baidu-Forson (1999) and Shapiro et al (1992), a farmer's decision to adopt a technology is based on the assumption of utility maximization. Subjective utility coming from survey respondents can be used to measure perceived differences in adoption of technology, in this case organic agriculture. Empirical models that have been used to study adoption include Probit, Logit and Tobit. Probit and Logit models use a binary variable that takes a value of one if the decision maker has adopted the technology in question, and zero otherwise. While these two models have wide empirical application in adoption studies, they have been criticized for their failure to measure and account for the extent of adoption. This loss of information is prevented by using the Tobit model (Baidu–Forson, 1999; Shapiro et al. 2002). The Tobit model was used for the analysis (Mc Donald and Moffat; Maddala 1983), which test factors affecting the incidence and intensity of adoption, can be specified as

$$y_i = \begin{cases} y_i * & \text{if } y_i * > 0 \\ 0 & \text{otherwise,} \end{cases} \quad (1)$$

where y_i is the area that is used for OA, and the latent variable $y_i^* = \beta x + \mu_i$, where x is a vector of explanatory variables postulated to explain the variation in the OA area, β is a vector of parameters to be estimated, and μ_i is the independent normally distributed random error term with zero mean and constant variance σ, that is $\mu_i \sim N\left(0, \hat{\sigma}^2\right)$.

The total change in y_i associated with a change in the explanatory variable can be decomposed into the change in the probability of being above zero and the changes in the values of y, if it is above zero.

The relationship between the expected value of all observations, E_y and the expected conditional value above the limit E_{y^*} is given by

$E_y = F(z)E_{y^*}$ (2)

Where $F(z)$ is the cumulative density normal distribution function and $Z = x\beta/\sigma$. Consideration of the effect of the K^{th} variable of x, for example age, can be decomposed as follows,

$$\frac{\delta E_y}{\delta X_k} = F(z)\left(\frac{\delta E_{y^*}}{\delta X_k}\right) + E_{y^*}\left(\frac{\delta F(z)}{\delta X_k}\right) \quad (3)$$

Thus the total change in E_y is made up of two components; (1) the change in the expected value of Y for those observations above the limit of zero, weighted by the probability of being above the limit, and (2) the change in the probability of being above zero, weighted by the expected value of Y, if above zero.

1.5 Structure of the Report

This report is divided into five (5) chapters and is laid out as follows. After presenting the introduction and the background, statement of the problem, study objectives and conceptual framework in chapter one, chapter two presents a discussion on the literature; chapter three

presents the research methodology. Study findings are discussed in chapter four and the report ends with chapter five which contains the conclusion and recommendations.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This section reviews the relevant literature on organic agriculture including its principles and the factors that have been found to affect its adoption in Zambia and around the world.

2.2 Definition of terms

Adoption is defined as a decision to make full use of an innovation as the best course of action once the individual has known and assessed the attributes of the innovation. (Rogers, *2003*).

Organic agriculture, OA, is defined in each of the 60 countries in which organic regulations (at the stage of development), as well as by the Codex Alimentarius Commission, as a holistic production management system that avoids the use of synthetic fertilizers, pesticides and genetically modified organisms, minimizes pollution of the air, water and soil, and optimizes the health and productivity of the interdependent communities of plants, animals and people (Third World Network (TWN), Ching, *2007*)

It can also be described as "neo-Traditional food system" because it uses scientific investigation to improve traditional farming practices. Traditional farming principles involved multicroppoing techniques, natural methods of food preservation and storage like drying and salting and measures that reduce risks.

OA is governed by detailed standards and lists of allowed and prohibited substances. The OA community had adopted four overriding principles for OA (TWN, Ching, *2007*)

- Principle of health: OA should sustain and enhance the health of soil, plant, animal and human as one and indivisible.
- Principle of ecology: OA should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- Principle of fairness: OA should build on relationships that ensure fairness with regard to the common environment and life opportunities.
- Principle of care: OA should be managed in a precautionary and responsible manner to protect the health and well being of current and future generations and the environment.

This is achieved through a combination of techniques including intercropping with nitrogen-fixing legumes (or with other crops that produce synergies), crops rotation, biological pest control, use of locally adapted seeds/breeds and the re-integration of animals on farms (TWN, Ching, *2007*). In the process, the stability and resilience of the surrounding ecosystem is improved rather than depleted as may be the case when high levels of artificial input are used. An ecological balance that maximizes nutrient and energy cycling is established between soil, plants, animals- and humans.

There are three basic types of Organic agriculture (TARAhaat, *2007*):

1. Pure organic: It includes use of organic manures, and bio-pesticides with complete avoidance of inorganic chemicals and pesticides.
2. Integrated Farming: it involves integrated nutrient management and Integrated Pest Management.
3. Integrated Farming Systems: In this type, local resources are effectively recycled by involving the components such as poultry, fishpond, mushroom, goat rearing etc apart from crop components. It is a low input organic farming.

Not much research on the factors affecting the adoption of OA in Zambia has been carried out. Organic Producers and Processors Association of Zambia (OPPAZ), has spearheaded the development of the organic sector in Zambia was founded in 1999 by farmers. At the time, only 3 producers in Zambia were certified for export. It currently has a membership base of more than 19,000 producers all over the country. OPPAZ members export more than 500 metric tons (MT) of fresh vegetables, 500MT of honey, 30MT of groundnuts, and 0.5MT of mushrooms and 1.5MT of essential oils per annum to the European Union (EU), United States of America (USA) and South Africa. They increased the number of certified organic enterprises from 3 in 1999 to 17 in 2006.

Another institution that is leading in promotion OA in Zambia is the Kasisi Agricultural Training Centre (KATC). Established in 1974, the institution shifted from conventional agriculture (CA) to OA in 1999 and is now a recognised organic agricultural centre in Africa. A Canadian Jesuit, Br. Paul Desmarais SJ, runs a team of ten agronomists, a biologist, an animal specialist, an agri-business specialist, an agricultural engineer, a forester, three blacksmiths, two VSO volunteers and four administrative staff. They offer courses in the principles of organic agriculture that range from three days to two weeks.

2.3 Research conducted outside Zambia

In a research conducted by Soltani, Azadi, Mahmoudi and Witlox (2013) to investigate the barriers to and factors influencing adoption of OA in Iran. The research investigated factors that influenced the adoption of OA such as age, gender, experience, level of education, knowledge of OA, income, yield, land area, government support extension services and farmers involvement in cooperatives. The study also looked at the barriers to adoption such as attitudes of the farmers, market for produce, knowledge and information of OA, workload and cost and certification. It was found that certification, market, access to knowledge and information, labour and cost were the main barriers to adoption of OA with certification being the most serious. The factors influencing the adoption were found to be experience and age of the farmer, gender; where women were found to be better adopters, knowledge of all types, income, land area and productivity and availability of extension services. Farmers with positive attitudes towards OA were found to be members of cooperatives and were supported by government.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the methods and procedures used to achieve the stated objectives. It gives information on the study sites, data collection and data analysis tools that were used in the study.

3.2 Study Area

The study was conducted in Chongwe district which is located in Lusaka province in Zambia. The farmers who go from training in the principles OA at KATC come from all over Zambia and some neighbouring countries but for convenience the study will be carried out in the above mentioned area. The area is divided in to several camps and visited by extension officers from KATC regularly. The farmers sampled will consist of certified organic farmers, non certified organic farmers and conventional farmers who have received some training from KATC and are located in five camps; Kasenga, Kanakantapa, Shelleni, Chainda and Chinkuli, out of a total of thirteen camps in total.

3.3 Sampling Design And Procedure

Stratified random sampling was used to select the farmers to interview. This involved listing all the farmers in Chongwe main area practicing OA, both certified and non-certified, and those who are not practicing OA. The list of the farmers was obtained from the head extension officer at KATC. From the list, an equal number of adopters and non adopters, were randomly selected to avoid any over representation of the sample and therefore, leading to erroneous interpretation of data. Thus, the sample of 68 farmers in total will be randomly selected. The formula to determine the sample size is below;

$$N = t^2 \times p(1-p)/\varepsilon^2$$

Where:

N is the sample size

t is the critical value (1.645) at 90% confidence level

ε is the margin error, 10% (0.1)

p is the probability of adopting OA (0.5)

Although a sample size of 68 was to be used, only 50 questionnaires were processed. This was still representative of the total farmer population of 186 farmers from all the 13 camps.

3.4 Research design and Data Collection Procedures

The research design to be used in this study is a case study. A case study will be used so as to have a deeper understanding of the factors affecting the adoption of OA and the intensity of the adoption among the small scale farmers in Chongwe.

This study will use both primary and secondary data but mostly primary data due to the fairly new nature of the study in the area. The secondary data used will be to gain a greater understanding of the topic and identify the gaps in previous researches. The secondary data will be collected from KATC, OPPAZ, and non published and published data from the various internet sites. However, for the purpose of analysis in the research, will be the primary data collected from the farmers in Chongwe. Structured questionnaires will be used to collect this primary data.

3.5 Data analysis

The coded data that will be collected from the households will be entered into Microsoft Excel. The data was tested using the Breusch-Pagan Godfrey/ Cook-Weisberg test for potential heteroskesdasticity which may present across households due to the use of cross sectional data. The null hypothesis to say that there was constant variance was accepted because the computed chi square value of 8.26 was less than the actual chi square value of 37.09. The mean VIF was 1.20 showing low multicollinearity in the variables. The coefficients of the variables were estimated using Tobit model in STATA.

Under Tobit model, the preference of the *i* th farmer for OA, y, can be represented by the equation;

$$y_i = \begin{cases} y_i^* & \text{if } y_i^* > 0 \\ 0 & \text{otherwise,} \end{cases}$$

Where;

$y_i * = \beta x + \mu_i$, and

y_i = total area cultivated using OA practices for farmer *I*,

β = vector of parameters to be estimated,

μ_i = standard error term,

x = vector of independent variables to be included in the model. The variables specified were: sex of household head, age of household head, household size, level of formal education, which markets they sell to, potion of household income that comes from the sale of farm produce and the dummy variables include; sex of household head, marital status: married and training in crop rotation practices.

CHAPTER FOUR: STUDY FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the study findings. It begins with a discussion of the demographic characteristics of the respondents and the presentation of the perception of the farmers about OA practices. It goes on to present the OLS and Tobit regression estimates with a discussion of the resulting outputs.

4.2 Demographic characteristics of the sample

The adoption of OA is grouped into adopters both certified and non-certified and non-adopters. The extent of adoption id determined by the proportion of their farm land they cultivated using principles of OA they were trained in at KATC. The percentage of adopters was found to be 74% and non-adopters was 26%.

Table 1: Demographic characteristics of the sample: Age and Household size

Variable	Observations	Mean	Standard deviation	Min	Max
Age	50	48.34	8.037184	29	71
Household size	50	7.02	2.874874	3	15

Source: Own survey (2014)

The average of the farmers interviewed was found to be 48 years and the minimum 29 years while the maximum was found to be 71 years. Most farmers lived in household of average size of 7 people and the minimum was found to be 3 while the maximum was found to be 15 people in a household.

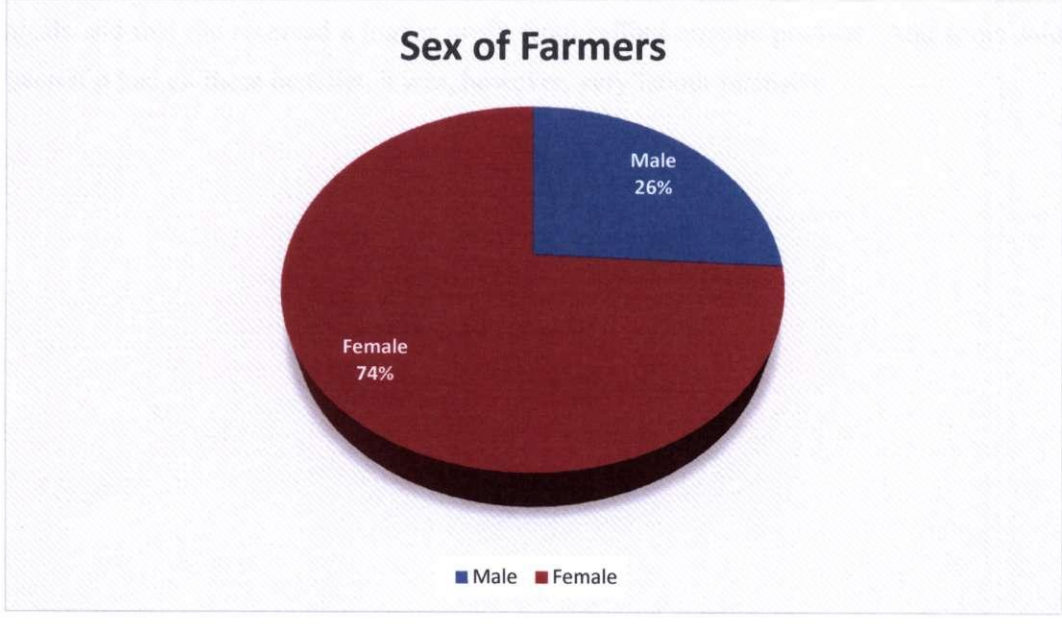
Table 2: Demographic characteristics of the sample: Sex of household head, marital status and level of formal education.

Characteristics	Male farmer	Female farmer
Marital status		
Single (%)	0.00	100.00
Married (%)	31.03	68.97
Widowed (%)	14.29	85.71
Divorced (%)	40.00	85.71
Level of formal education		
Primary (%)	16.13	83.87
Secondary (%)	50.00	50.00
No formal education (%)	28.57	71.43

Source: Own survey (2014)

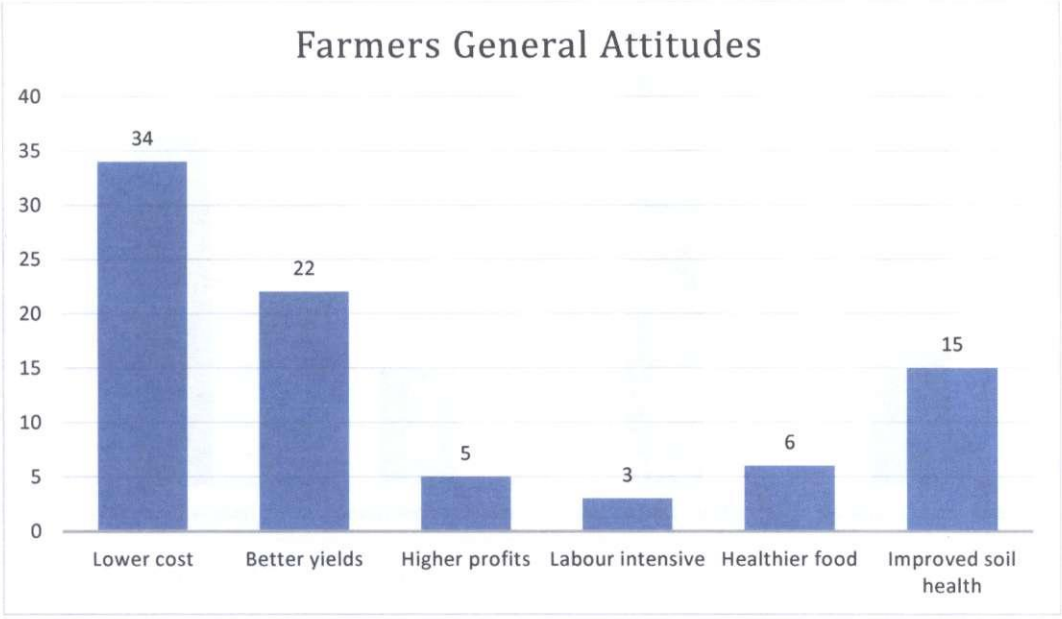
From the data collected from the randomly selected farmers who had re3ceived training from KATC using the structured questionnaires, the majority of the farmers were found to be females farmers as shown in figure 1 below.

Figure 1: Sex Proportion of Farmers



4.3 Perceptions of the Farmers about OA

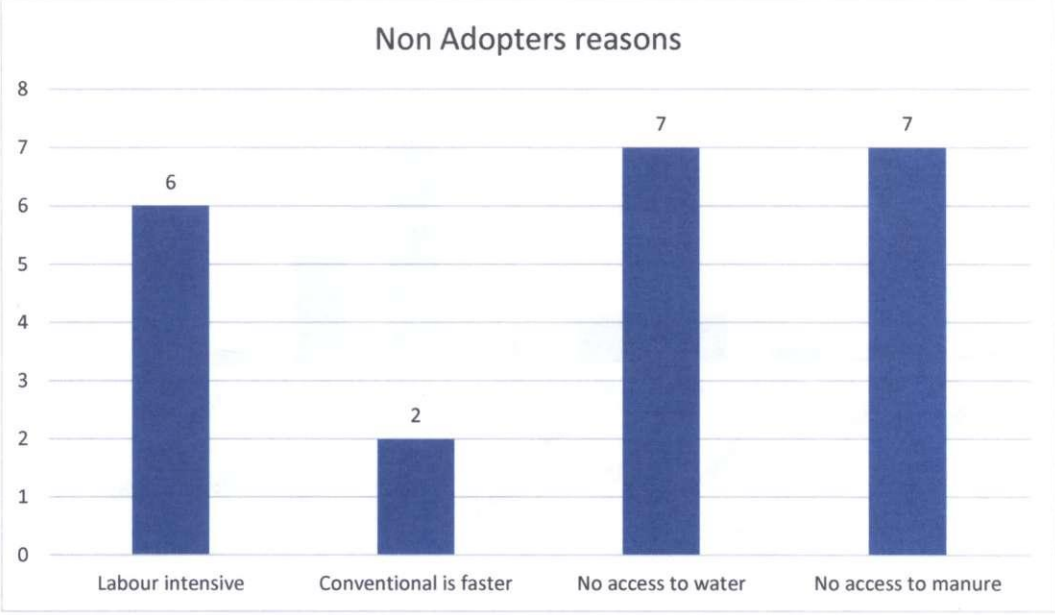
Figure 2: General attitudes of adopters about OA



Source: Own survey (2014)

Most of the farmers interviewed shared the belief that OA required less capital because it used readily available material that naturally occur. They also acknowledged that OA improved their yields and improved the health of the soil in their fields. Others said that the food was healthier from OA rather than from conventional which used a lot of inorganic and synthetic chemicals and that the received a higher profit from selling organic produce. And some said that even if it had all these benefits, it was, however, very labour intensive.

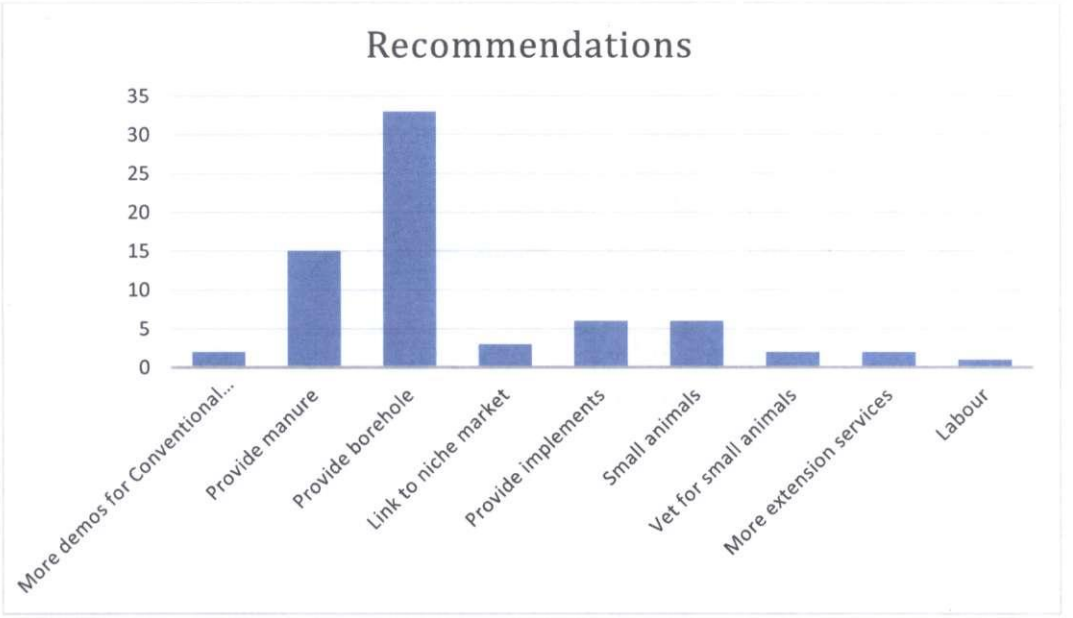
Figure 3: Non adopters' reasons for not adopting OA



Source: Own survey (2014)

Most non adopters attributed their reluctance to adopt OA to lack of access to adequate water and manure as OA requires a lot of water to dissolve the minerals present in the manure that is used to prevent the crop from getting scorched by the said minerals and compounds. Others also argued that it was too labour intensive and took longer to produce than conventional agriculture.

Figure 4: Farmers recommendations



Source: Own survey (2014)

It was found that the most common compliant by farmers was the lack of access to adequate water and manure which are the two very vital inputs required for OA. Others said that they had no market for their organic produce where they would be able to charge a premium price and earn extra. Some conventional farmers suggested that more demonstration be carried out to prove the benefits of OA compared to conventional agriculture.

4.4 Tobit Regression

Table 3: Tobit Regression Parameter estimates for adoption of OA (Dependent variable: Area Cultivated by OA practices)

			Marginal analysis	
Variable	**Parameter estimates**	**Standard error**	**Probability of adoption**	**Expected use intensity**
Male farmer	-0.0245	0.154	-0.0117	-0.0140
Age	-0.00755	0.00866	-0.00361	-0.00432
Married farmer	0.111	0.146	0.0529	0.0633
Household size	-0.0482*	0.0231	-0.0230*	-0.0276*
Education of farmer	-0.0231	0.0590	-0.00110	-0.0132
Trained in crop rotation	0.0907***	0.0183	0.0434***	0.0519***
Access to markets	-0.0127	0.0568	-0.0606	-0.00724
50-100% of total household profit	-0.0280	0.164	-0.0134	-0.0160
Constant	0.250	0.491		
sigma	0.387***	0.0566		

Source: Own survey (2014)

Note: Significance level: *p<0.1, ***p<0.01

From the table above, it come be seen that the adoption of OA practices is significantly explained by household size and training in crop rotation methods. A 1% change in the household size is associated with a lower probability of adoption of 0.0230 and for those who have already adopted it, the expected use intensity will drop by 0.0276. This is indicated by the negative sign on the coefficient. The research also found out that the probability of a farmer adopting OA increased by 0.0434 if they had received formal training in crop rotation methods. It was also found that the extent to which a farmer adopted OA increased by 0.0519 if they had received this formal training in crop rotation. This is indicated by the sign on the coefficient of the variable.

Other variables such as the farmer being male, the age of the farmer, level if formal education, markets and proportion of profits from sale of produce, were not statistically significant but were found to have a negative effect on the probability of adoption and the expected use

intensity by the farmer. Marital status of a farmer if the farmer was married, was seen to have positive effect on the probability and use intensity.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The use of more sustainable and environmentally friendly farming practices such as OA practices are essential to improving food security of smallholder farmers as well as a sustainable way of earning a steady income. These practices allow constrained farmers to benefit from the advantages of these practices.

This study was designed to determine the factors affecting the small-scale farmers in the Chongwe area's decisions to adopt OA practices. The field data was analysed and organized to produce descriptive statistics and output in Microsoft Excel. OLS and Tobit analyses were employed to analyse and discuss the individual factors hypothesized to affect the adoption of OA. The factors studied included sex of the farmer, age of the farmer, marital status, household size, level of formal education, and training in different OA practices like crop rotation, market access and profits from sales. The factors that were identified as significant were household size negatively and formal training in crop rotation which had a positive effect.

5.2 Recommendations.

Institutions that deal with training farmers in OA practices must incorporate more trainings that involve crop rotation and other farming practices that are familiar but improved to the farmers which they will easily understand and reach out to more sceptic conventional farmers with demonstrations that will emphasize the benefits of OA.

Extension officers spreading the knowledge and training in OA practices must help the farmers acquire access to adequate water sources such as communal boreholes and hand pumps for them to be able to irrigate their fields and gardens.

Concerned organizations must provide farmers with small farm animals like chickens, donkeys and goat that will be able to produce manure for the farmers to use in their fields and gardens and also provide veterinary extension services for these small animals. The farmers can also be linked firms that rear animals where they can buy manure at subsidized prices.

A suggestion future studies to carry out a similar research with an emphasis on the effective household size to correct the mistake of this study and improve upon this fair new study in the country so that a greater understanding of what factors affect the adoption of these beneficial practices.

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APPENDIX

Appendix 1: Questionnaire

No.	Question	Coding category		For official use
Q1	Gender of respondent	1. Male 2. Female	[ ] [ ]	
Q2	How old were you at your last birthday?			
Q3	Marital status	1. Single 2. Married 3. Widowed 4. Divorced	[ ] [ ] [ ] [ ]	
Q4	Size of household; Number of females: Number of males:	....		
Q5	Level of education	1. Primary 2. Secondary 3. University 4. Other Tertiary 5. No formal education	[ ] [ ] [ ] [ ] [ ]	

Q6	How long have you been a farmer?	1. Less than 2 years 2. 2 – 5 years 3. 6 – 10 years 4. More than 10 years	[ ] [ ] [ ] [ ]	

Section II: Land use and social economic factors

Q7	What is the total hectarage of your farm?	....		
Q8	Are you practicing organic agriculture?	1. Yes 2. No	[ ] [ ]	
Q9	What organic agriculture practices are carried out on the portion of land you use for organic agriculture?	1. Recycling local resources 2. Use of organic manures 3. Integrated pest management (IPM) 4. Integrated nutrient management 5. Bio pesticides 6. Tree fertilizers 7. Green manures 8. Compost 9. Pot holes/planting basins 10. Ripping	[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	

		11. Crop rotation 12. Disease and pest resistant varieties	[ ] [ ]	
Q10	Which ones were you trained in? (indicate corresponding number)	....		
Q11	What portion of your total hectarage is for organic agriculture?	....		
Q12	Do you also practice conventional agriculture?	1. Yes 2. No	[ ] [ ]	
Q13	What portion of the total area of the farm is used for conventional agriculture?	....		
Q14	Are you a certified organic farmer?	1. Yes 2. No	[ ] [ ]	
Q15	How long have you been certified?	1. Less than 2 years 2. 2 – 5 years	[ ] [ ]	

		3. 6 – 10 years 4. More than 10 years	[ ] [ ]	
Q16	Who is your market for the produce?	1. Local markets 2. Export markets 3. Both	[ ] [ ] [ ]	
Q17	What portion of the profits accrued contributes to your household income?	1. 100% 2. Between 50% and 100% 3. 50% or less	[ ] [ ] [ ]	

Section III: Institutional factors and attitudes

Q18	Have you received any formal education on organic agriculture?	1. Yes 2. No	[ ] [ ]	
Q19	Where did you receive it from?	1. KATC 2. Other(specify).....	[ ]	
Q20	How would you rate this training?	1. Poor 2. Fair 3. Good	[ ] [ ] [ ]	

Q21	Do you receive extension services from the institutions you received your training from?	1. Yes 2. No	[ ] [ ]	
Q22	How often?	1. Daily 2. Weekly 3. Monthly 4. Quarterly	[ ] [ ] [ ] [ ]	
Q23	How helpful are the extension services?	1.Poor 3. Fair 4. Good	[ ] [ ] [ ]	
Q24	What are your general attitudes to organic agriculture?	....		
Q25	Why did you decide to not adopt organic agriculture?	....		

		.....		
Q26	What recommendations would you make?	.....		