

**CONTRIBUTION OF SUNFLOWER FARMING TO THE
WELLBEING OF SMALL SCALE FARMERS: A CASE OF
CHEMBA DISTRICT, DODOMA REGION, TANZANIA**

By

Samson Akyoo

A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree of
Master of Arts in Development Studies at the University of Dodoma, Tanzania

The University of Dodoma

October, 2016

CERTIFICATION

The undersigned certifies that She has read and hereby recommends for acceptance by the University of Dodoma a dissertation entitled “*Contribution of Sunflower farming to the wellbeing of small scale farmers: A Case of Chemba District, Dodoma Region, Tanzania*” in partial fulfilment of the requirements for the degree of master of Arts in Development studies of the University of Dodoma.

.....

Dr. Okuli W. Swai.

(SUPERVISOR)

Date.....

DECLARATION

AND

COPYRIGHT

I, **Samson Akyoo** declare that this Dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature.....

No part of this dissertation may be reproduced, stored in any retrieval system, or transmitted in any form or by any means without prior written permission of the author or the University of Dodoma.

ACKNOWLEDGEMENT

First and foremost, I thank Almighty God for his guidance to this point. Through his grace I managed to finish this work.

My special appreciation should go to my supervisor, Dr. Okuli Swai for her tireless support from the beginning of the research proposal, during data collection, analysis and final write up. Her support and advice contributed a lot to this work. Thank you very much.

I am indebted to my parents; Mr and Mrs Silvanus Akyoo for their support and love that were inspirational to my life. I also acknowledge the support received from my brothers and sister. Special thanks are extended to my beloved wife, Agnes Chamy and our lovely son, Brighton Samson for their love and patience during my absences; I managed to accomplish my studies without difficulties because of their support.

I would like to extend my thanks to small-holder farmers from Mondo, Dalai, Tandala and Daki villages to whom questionnaires were administered, for their co-operation when I were soliciting information required for the present study.

It is not easy to mention all who contributed in one way or another in making this work done, but I say to you all thank you very much. May the almighty God grant you with his glory, peace and blessings.

DEDICATION

This valuable work is dedicated to my beloved Wife Agnes Chamy, my Son Brighton and my one and only sister Happiness Akyoo whose encouragement, compassion and love were the source of inspiration for this work.

ABSTRACT

This study investigated contribution of sunflower farming to the wellbeing of small scale farmers in Dalai and Mondo wards, Chemba district, Dodoma region, Tanzania. Specifically the study identified the sunflower farming activities adopted by farmers, examined the challenges faced by small scale farmers in the sunflower production and examined how sunflower production contributes to smallholder farmers' wellbeing (that is food security, ability of farmers to access health services and ability to pay children school fees).

Methods for Data collection were key informant interviews, focus group discussions, and survey. The data were collected from 7 key informants using checklist questions, 16 focus group members (i.e. 2 groups of 8 members each) using interview guide and 77 respondents using questionnaires. The study involved a cross sectional research design and both qualitative and quantitative data were collected. The qualitative data was analysed using the content analysis and Statistical Package for Social Sciences (SPSS) Version 20 software was used to analyse quantitative data.

The study revealed that different sunflower production activities were practised by farmers including land preparation planting, harvesting and processing as well as marketing. Challenges faced by the farmers were; inadequate farming tools, manpower, land size funds to buy inputs, processing machines, and they were facing price fluctuation. The sunflower contributed positively to the farmers well-being whereby the farmers' food security status, ability to access health services and to pay school fees for their children had increased after been engaged in sunflower production. This implies that sunflower is an important crop in improving farmer's wellbeing in the study area. The study recommends farmers to be provided with

adequate improved tools including machines for sunflower processing, enough land, and facilities for credit acquisition and irrigation schemes in order to improve sunflower production.

TABLE OF CONTENTS

CERTIFICATION	i
DECLARATION AND COPYRIGHT	ii
ACKNOWLEDGEMENT	iii
DEDICATION	iv
ABSTRACT	v
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xii
LIST OF APPENDICES	xiii
CHAPTER ONE INTRODUCTION	1
1.1 Background of the study	1
1.2 Statement of the Problem and Justification	3
1.3 Objectives of the Study	4
1.3.1. Main objective	4
1.3.2 Specific Objectives	4
1.3.3 Research Questions	4
1.3.4 Significance of the Study	5
CHAPTER TWO LITERATURE REVIEW	6
2.1 Introduction.....	6
2.1.1 Definition of terms	6
2.1.1.1 Sunflower.....	6
2.1.1.2 Small Scale Farmers	7
2.1.1.3 Wellbeing.....	7
2.2 Theoretical literature review	8
2.2.1 Sustainable livelihoods Framework Model	8
2.3 Empirical Literature Review	10
2.3.1 Importance of Sunflower	10
2.3.2 Diverse literature works on sunflower production	11
2.4 Research Gap	12
2.5 Conceptual Framework.....	13
CHAPTER THREE RESEARCH METHODOLOGY	15
3. 1 Introduction.....	15
3.1.1 Study area	15
3.1.2 Targeted population	17
3.1.3 Research approach	17
3.1.4 Research design	17
3.1.5 Sample design	17
3.1.6 Sampling frame.....	18
3.1.7 Sampling unit.....	18
3.1.8 Sampling size.....	18

3.1.9 Parameters of interest.....	20
3.2 Source of Data	20
3.2.1 Interview	21
3.2.2 Survey	22
3.2.3 Focus group discussion.....	22
3.2.4 Pilot study	23
3.2.5 Documentary Review	24
3.3 Reliability and validity of Data.....	24
3.3.1 Reliability of the study.....	24
3.3.2 Validity of the study	24
3.4 Data processing and analysis	25
3.4.1 Data processing.....	25
3.4.2 Analysis of Quantitative Data.....	25
3.4.3 Analysis of qualitative data.....	25
3.5 Ethical Consideration.....	26

CHAPTER FOUR DATA PRESENTATION, ANALYSIS AND DISCUSSION27

4.0 Introduction.....	27
4.1 Background information of Respondents	27
4.1.1 Distribution of Respondents by Villages	28
4.1.2 Distribution of Respondents by wards.....	28
4.1.3 Distribution of Respondents by sex	29
4.1.4 Distribution of Respondents by age.....	29
4.1.5 Distribution of Respondents by Occupation.....	30
4.1.6 Distribution of Respondents by Marital status	31
4.1.7 Distribution of Respondents by education level	31
4.1.8 Experience of respondents in sunflower farming	32
4.2 Results and discussions by research objectives	32
4.2.1 Specific objective I:	33
4.2.2 Land acquisition in the study area	33
4.2.3 Land size	33
4.2.4 Fertilizer application	34
4.2.5 Tools used in sunflower production.....	35
4.2.7 Use of irrigation	37
4.2.8 Contract farming	38
4.2.9 Marketing practices for sunflower products	38
4.3 Specific objective II:	39
4.3.1 Land preparation Challenges	39
4.3.2 Planting Challenges	40
4.3.3 Input Challenges	41
4.3.4 Harvesting Challenges	42
4.3.5 Processing Challenges	43
4.3.6 Marketing Challenges	43
4.4 Specific objective III:.....	44
4.4.1 Sunflower production trend for the past five years.....	44
4.4.2 Reasons for decreased production of sunflower	45

4.4.3 Market accessibility	46
4.4.5 Spending of income obtained from sunflower farming	47
4.4.6 Wellbeing of the respondents after been engaged in sunflower production	48
4.4.6.2 Access to health service	49
4.4.6.3 Ability to pay school fees	51
4.4.6.4 Suggestions to improve sunflower production	52
CHAPTER FIVE SUMMARY, CONCLUSION AND RECOMMENDATIONS	54
5.1 Summary of the Study	54
5.2 Conclusion by Objectives	54
5.3 Theoretical Implication of the study	56
5.4 Recommendations for Actions.....	57
5.5 Policy implications	58
5.6 Limitation of the study.....	58
5.7 Area for further research.....	59
REFERENCES	60
APPENDICES	63

LIST OF TABLES

Table 1: Respondents' Category And Distribution.....	20
Table 2: Villages Of Study, Names And The Number Of Respondents.....	28
Table 3: Wards Of The Respondents	28
Table 4: Sex Of Respondents	29
Table 5: Age Of Respondents	30
Table 6: Respondents' Occupation	30
Table 7: Respondents' Marital Status	31
Table 8: Education Level Of Respondents	32
Table 9: Years Of Sunflower Farming.....	32
Table 10 Land Acquisition In The Study Area	33
Table: 11 Land Size Owned By Smallholder Farmers.....	34
Table 12: Fertilizer Application	35
Table 13: Type Of Tools Used In Land Preparation.....	36
Table 14: Respondents' Source Of Fund	37
Table 15: Irrigation Of Sunflower Farming.....	38
Table 16: Contract Farming Practices.....	38
Table 17: Marketing Practices For Sunflower Products.	39
Table 18: Land Preparation Challenges	40
Table 19: Planting Challenges	41
Table 20: Input Challenges	42
Table 21: Harvesting Challenges	42
Table 22: Processing Challenges	43
Table 23: Marketing Challenges	43
Table 24: Production Trend Of Sunflower For The Past Five Years In 2010-2014..	45
Years	45
Table 25: Responses On The Reasons For Less Production Of Sunflower For The Past Five Years	45
Table 26: Market Accessibility	46
Table 27: Total Income Received From Sunflower In 2014/2015 Season	47
Table 28: Respondents Income Spending.....	48
Table 29 Food Security Status	49
Table 30 Ability To Pay School Fees	52

Table 31: Farmers Suggestions On Sunflower Production 53

LIST OF FIGURES

Figure 1: Sustainable livelihood framework model	9
Figure 2: Conceptual framework.	14
Figure 3: A map of Dodoma Region showing study area.....	16
Figure 4: Ability of respondents to access health services.....	58

LIST OF APPENDICES

Appendix 1: Questionnaire	63
Appendix 2: Checklist Questions.....	67
Appendix 3: Focus Group Interview Guide.....	68

LIST OF ABBREVIATIONS

CEZOSOPA	Central zone sunflower processing Association
DFID	Department for International Development
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
Ha	Hectare
IFAD	International Fund for Agricultural Development
MT	Metric tone
PADEP	Participatory agricultural Development and Empowerment Project
RLDC	Rural livelihood Development Company
SPSS	Statistical Package for Social Sciences
TAS	Tanzania shilling
TASUPA	Tanzania sunflower production Association
TEOSA	Tanzania edible oilseeds Association
VEO	Village Executive Officer
WEO	Ward Executive Officer

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Sunflower farming has been practiced for a long time in many parts of the world. It is among the oil crops grown in developed as well as developing countries. The largest producers of sunflower worldwide are the Russia and Ukraine that together produce almost half of all sunflower globally (Food and Agriculture Organization [FAO] 2004). According to FAO (2004) statistics, it has been observed that sunflower was grown in about 21.39 million hectares of land with production of 26.21 million tonnes during 2004 in the world. Currently sunflower oil makes about 13% of the world edible oil production (Wambura and Kapinga, 2007).

In Africa the growers of sunflower include South Africa, Zambia, Uganda and Tanzania just to mention few. For example, in Zambia Sunflower is grown in nearly all parts of Zambia. Although production levels vary from 2001 to 2010, over 40% of all sunflower produced by Zambian smallholders is grown in the Eastern Province. Other provinces with substantial production include Central, Northern and Southern Provinces (Lubungu, 2014). In the case of Tanzania, over 50% of sunflower is planted in four regions of Dodoma, Kilimanjaro, Manyara, and Singida (Rural livelihood Development Company) (RLDC, 2008). Other major growing areas are Mbeya, Mtwara, and Rufiji. The crop grows well in the dry weather conditions of the central corridor compared to other crops like Maize and wheat.

The main aim of producing sunflower is to increase oil production. In central corridor sunflower is grown as a cash crop due to the quality of its oil which is free from cholesterol and the fact that the crop is drought resistant and requires low

investment (Ugulumu, 2013). Thus, it has become an important livelihood and the source of income to poor small scale farmers. The crop contributes about 40% of national edible oil requirement and the remaining 60% is imported. Though there is a large production of other oilseeds such as groundnuts and sesame, there has been no substantial oil production from these seeds, thus making sunflower oil the most important vegetable oil produced in Tanzania (RLDC) 2008).

Dodoma region which is among the regions in the central corridor of Tanzania is one of the regions where sunflower production is a popular economic activity practiced especially in Kondoa, Chemba and Kongwa. Most of the farmers in these areas are the small scale farmers who use local way of production to sustain their life (Regional commissioner's office report for the years 2011-2015). In Chemba district the total of 47,142 farmers out of 188,568 engage in sunflower production, which is equal to 24% of all farmers in the district. This is a small percentage of farmers considering that the crop has been grown as a cash crop to increase income of farmers.

In the effort to promote production of sunflower the RLDC has joined the rural sunflower producers and sunflower oil processors as well as the sector apex associations such as central zone sunflower processing Association (CEZOSOPA), Tanzania sunflower production Association (TASUPA) and Tanzania edible oilseeds Association (TEOSA). The RLDC has linked sunflower farmers direct to their market by linking them with sunflower oil processors who are partnering in implementing contract farming (RLDC Report, 2013). With all these efforts still there was no evidence showing how farmers were benefiting from sunflower farming. It was then important to analyse sunflower farming in order to understand

the way this crop is contributing to the wellbeing of small scale farmers in Chemba district.

1.2 Statement of the Problem and Justification

Although sunflower is a cash crop involving more than 438,153 farmers in Tanzania, there is not enough information on how this cash crop contributes to the wellbeing of small scale farmers in Chemba district. Sunflower production is one of the rising crops which have gained significance in the recent years especially in the central zone where it is grown as a cash crop (Ugulumu, 2008). It ranks as one of the most important vegetable oil with high value on international market.

In Tanzania oil extracted from sunflower by local producers contribute 40% of the national cooking oil requirements. In central zone especially Dodoma and Chemba in specific the crop is grown by small scale farmers who depend on it as a source of income. Apart from earning income sunflower is used for both domestic and foreign consumption. Various efforts have been done to promote the crop marketing and processing with the aim of improving sunflower production in the study area. However, there is inadequate information on how sunflower farming contributes to the of small scale farmers' well-being (i.e., increased food security, ability to access health services and to pay children school fees).

Most of the studies have been done on sunflower production to analyse various issues, for example Ugulumu (2008) identified the challenges that affect sunflower growers both in Tanzania and Kenya. Baloyi (2010) conducted a study on analysis of constraints facing smallholder farmers in the agribusiness value chain, and Damian (2010) examined the sunflower production in the central corridor of Tanzania. However, these studies did not tackle the specific contribution of sunflower to the

wellbeing of small scale farmers especially in the study area and were too broad (e.g. Damian 2010). Therefore this study was designed to fill the gap of information and determine how sunflower production is contributing to the wellbeing of small scale farmers in Chemba district.

1.3 Objectives of the Study

1.3.1. Main objective

The general objective of this study was to assess contribution of sunflower production to the wellbeing of small scale farmers in Chemba District, Dodoma region, Tanzania.

1.3.2 Specific Objectives

Specifically, the study aimed at achieving the following objectives;

- To analyse activities practised by farmers in sunflower production
- To examine the challenges faced by small scale farmers in sunflower production.
- To examine how sunflower production contributes to smallholder farmers' wellbeing (that is food security, ability to access health services and ability to pay children school fees).

1.3.3 Research Questions

- What activities did farmers undertake in sunflower production?
- What problems were faced in sunflower production?
- How did sunflower production contribute to the farmers' wellbeing (that is food security, ability to access health services and ability to pay children school fees)?

1.3.4 Significance of the Study

This study has relevance and impact to various academic discipline and similar studies can be done to other district which have the same opportunity as Chemba to see if sunflower production helps small scale famers economically. The study has revealed sunflower production activities undertaken by farmers, challenges involved in sunflower production and the status of farmers food security, access to health services, and ability to pay school fees whereby food security, ability to access health services and. ability to pay school fees has improved after farmer's been involved in sunflower production, indicating that sunflower is an important crop for improving farmers wellbeing. This information is important to policy makers, development practitioners, local Government, agricultural sector, NGO'S in promoting sunflower production and encouraging farmers to produce more.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This part presents the review of literature in order to understand what is already known about the problem under study. The literature was obtained from the internet, books, journals and previous studies as well as different reports. The part includes both theoretical and empirical literature review. It is divided into different parts. The first part presents the definition of various concepts and the theoretical explanations which include sustainable livelihood model. The second part presents empirical studies relevant to the problem under study and the third part presents a conceptual framework and the research gap.

2.1.1 Definition of terms

2.1.1.1 Sunflower

Sunflower is one of the most important oil seed crop grown in temperate countries. It is a major source of vegetable oil in the world. Sunflower is thought to have originated in Mexico and Peru and it is one of the first plants to be cultivated in the United States. It has been used for more than 5,000 years by the Native Americans, who not only used the seeds as food and an oil source, but also used the flowers, roots and stems for a variety of purposes including a dye pigment (The George Mateljan Foundation, 2001-2010). Sunflower is a crop which compared to other crops performs well under drought conditions; this is probably the main reason for the crop's popularity in many areas in central zone (Baloyi, 2010).

However, the crop is very susceptible to bird's damage and for this reason it cannot be cultivated at all in some areas. On the positive side, however, the drought tolerance ability and the low input cost incurred for sunflower production are major advantages (Mpagalile, 2008). The short growth season of the crop, which has the consequence that it can be planted over a period of at least three months, renders it extremely suitable for producers who make use of adaptable crop rotation and/or fallow systems (Department of Agriculture and environmental Affairs South Africa). Sunflower production is one of the economic activities that if properly managed during production, processing and marketing can contribute so much to the wellbeing of small scale farmers (Hawassi, 2011).

2.1.1.2 Small Scale Farmers

There is no single and clear definition of smallholder farmers. Different indicators have been identified in order to define small-scale farmers. Land ownership is one of them while limited access to land is the common identification feature when the term smallholder is mentioned in the literature or elsewhere. For example, households with less than a threshold land size of two hectares may be characterized as smallholders. According to 2012 census the national average of land size is 2.0 ha. Small scale farmers constitute about half of world's hungry people and include three quarters of Africa's malnourished children (Mugenda, 2008). Thus, this study was important as it analysed how sunflower production contributes to the wellbeing of small scale farmers.

2.1.1.3 Wellbeing

Wellbeing is the general term for the condition of an individual or groups; it can be social, economic, or psychological. A high level of wellbeing means in some sense the individual or group's condition is positive meaning that his/her condition has

improved from poor condition to a better one (International Fund for Agricultural Development (IFAD), 2013). The study found out how the sunflower production provides an income to the people, which enables them to improve food security, ability to access health services and access to education for their children. In this study wellbeing was assessed based on positive changes in food security, access to health services and ability to pay fees for children.

2.2 Theoretical literature review

Just as there is a lack of consensus on a single definition for small scale farmers, there is contradiction on what theory will fit in explaining the concept of sunflower farming and improved wellbeing in relation to small scale farmers. In this case sunflower being among the livelihood strategies, livelihood model was selected to be used to explain the wellbeing of small scale farmers.

2.2.1 Sustainable livelihoods Framework Model

The livelihoods framework is a tool to improve our understanding of livelihoods, particularly the livelihoods of the poor. It was developed by the sustainable Rural livelihoods Advisory Committee, building on early work by the institute of Development studies (among others) (Kollmair, 2002). The sustainable livelihoods framework presents the main factors that affect people's livelihoods. It can be used in both planning new development activities and assessing the contribution to livelihood sustainability made by existing activities (Murray 1999). In particular, the framework: (i) provides a checklist of important issues and sketches out the way these link to each other (ii) draws attention to core influences and processes and (iii) emphasises the multiple interactions between the various factors which affect livelihoods. The frame is centred on people, it does not work in a linear manner and

does not try to present a model of reality. Its aim is to help stakeholders with different perspectives to engage in structured and coherent debate about the many factors that affect livelihoods (Carney, 1999).

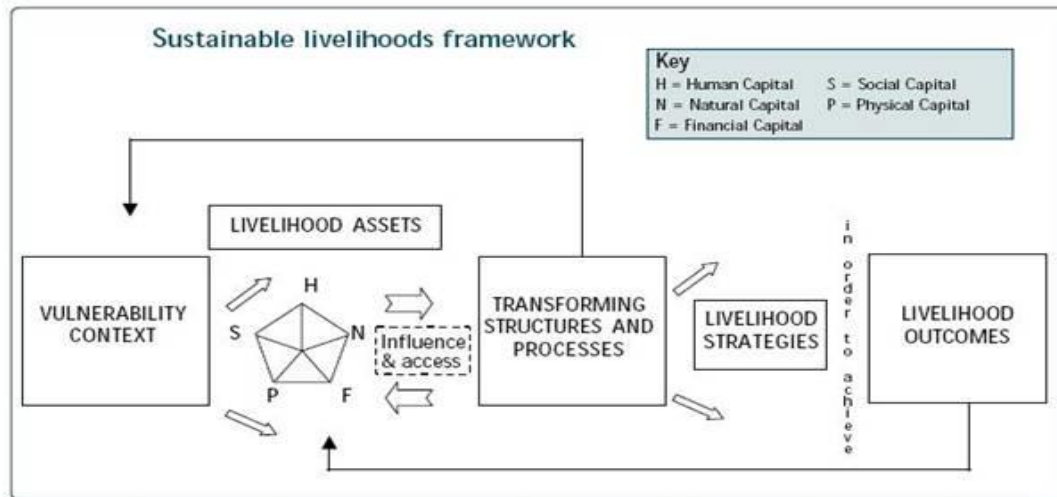


Figure 1: Sustainable livelihood framework model (Carney, 1999).

The sustainable livelihood framework model consists of transforming structures which are policies, institutions and processes. The policies, institutions and processes operate at all levels, from the household to the international arena, and in all spheres, from the most private to the most public. They effectively determine access (to various types of capital, to livelihood strategies and to decision-making bodies and source of influence), terms of exchange between different types of capitals, and returns to any given livelihood strategy (Department for International Development [DFID], 2000).

In this research, the transforming structures and processes aspect are government organizations and non-government organizations that were taken to see how they assist the small scale farmers through livelihood assets to attain the livelihood outcomes. This was taken because the transforming structures have the great power to help the lower class societies like the small scale farmers through loans or

education which can help them to meet livelihood outcomes. In the study there was no any organization which supported the farmers in sunflower farming rather only extension officer plays the role of helping the farmers in terms of advices.

The framework also consist of livelihood outcomes which are the achievements or outputs of livelihood strategies, such as more income, increased wellbeing, reduce vulnerability, improved food security and more sustainable use of natural resources. When thinking about livelihood outcomes, the aims of a particular group as well as the extent to which these are already being achieved has to be understood (Kollmair et al., 2002). In this study the expected livelihood outcomes that was analysed includes positive changes in food security, ability to access health services as well as education (ability to pay children school fees).

2.3 Empirical Literature Review

2.3.1 Importance of Sunflower

Currently, sunflower oil is one of the most popular oil in the world. The leading commercial producers of sunflower seeds include Russia, Peru, Argentina, Spain, France and China (The George Mateljan Foundation, 2001-2010). Sunflower seeds have very high oil content; they are one of the main sources of polyunsaturated oil. Sunflower seeds are an excellent source of vitamin E, the body's primary fat-soluble antioxidant. Vitamin E travels throughout the body neutralizing free radicals that would otherwise damage fat-containing structures and molecules such as cell membranes, brain cells, and cholesterol (Ogutu, 2014). By protecting these cellular and molecular components, vitamin E has significant anti-inflammatory effects that result in the reduction of symptoms in asthma, osteoarthritis and rheumatoid arthritis. Vitamin E has also been shown to reduce the risk of colon cancer, help decrease the

severity and frequency of hot flashes in women going through menopause, and help reduce the development of diabetic complications (The George Mateljan Foundation, 2001-2010). Also sunflower production contributes to income where by the farmers can be able to access health services, paying school fees and solve the problem of food shortage.

2.3.2 Diverse literature works on sunflower production

Various studies had been carried on to analyse sunflower farming, these include Ugulumu, (2008) that identified the challenges that affect sunflower growers both in Tanzania and Kenya. Some of the challenges mentioned were erratic rainfall patterns, lack of farming equipment, diseases, lack of knowledge by farmers, fluctuating market prices of sunflower seeds, lack of seeds and other essential inputs, increased competition levels both locally and internationally, poor infrastructure and linkage as well as lack of market information. The study which was done by Ugulumu (2008) based on identifying the challenges that affect the sunflower growers in general while this study analysed the contribution of sunflower farming to the wellbeing of small scale farmers.

Baloyi, (2010) conducted a study on analysis of constraints facing smallholder farmers in the agribusiness value chain, the study discussed the factors such as; lack of human capital, high transaction cost, lack of information on markets, transport problems, technological barriers. The study discovered that many smallholder farmers were illiterate, with poor technological skills, which were seemed to be obstacles in accessing useful formal institutions that could disseminate technological knowledge. The study was too broad since Baloyi (2010) based on the agribusiness value chain and the challenges faced by the small holder farmers.

Damian (2010) examined the sunflower production in the central corridor of Tanzania. Seven districts in five regions of Morogoro, Dodoma, Singida, Tabora and Manyara, were studied in which a number of issues were examined. Data on issues of quality seed varieties, support services to smallholder farmers, perception of producers on contract farming and opportunities and challenges in sunflower production. Focused Group Discussions complemented with interviews with the households were the main methods used in data collection. Damian (2010) examined the sunflower production in general and the study was done in more than one region (central zone) while this study was looking on the contribution of sunflower farming in Chemba district only.

Lekunze et al. (2011) examined the socio-economic constraints to sunflower production in Bojanala farming community in the North-West province of South Africa. Results of the analysis showed that, very few young people below 30 years of age are engaged in sunflower production. Significant determinant of the socio-economic constraints included the number of plantings per year, storage costs, price, and income, access to market and farm size. The study which was done by Lekunze et al. (2011) examined the socio-economic constraints to sunflower in Bojanala farming community in South Africa. This differs with this study due to geographical location whereby the constraints in South Africa can differ from the constraints in Tanzania and also the study based on constraints while this study was assessing the contributions of sunflower farming to the wellbeing of small scale farmers.

2.4 Research Gap

Most of the empirical studies reviewed above have concentrated on research factors affecting production of sunflower in both developed and developing countries. Some

of them are broad and from the literature reviewed the contribution of sunflower production to the wellbeing of small scale farmers has not been well discussed specifically in the study area. Some studies on sunflower production were done in Dodoma but did not assess the contribution of sunflower to farmers in rural areas specifically in Chemba District while others were done outside the country like Lekunze (2011) in South Africa. This study intended to assess the contribution of sunflower production to the wellbeing of small scale farmers in Chemba District and provide insight to both government and non-government organization to invest more to this sector so as to improve the wellbeing of small scale farmers.

2.5 Conceptual Framework

Figure 1 presents conceptual framework of the study. Conceptual framework shows the relationships existing between independent, intermediate and the dependent variables. In this study conceptualization of study variables was based on the Sustainable Livelihood Framework Model. Thus, conceptual framework Figure 1 is showing the relationship that exists between sunflower production - farming practices which is independent variables and challenges faced by small scale farmers in production as intermediate variables (livelihood strategies); household characteristics as things that have influence on independent, intermediate and also dependent variables; whereas dependent variable is the contribution of sunflower production to the wellbeing of small scale farmers (livelihood outcomes). The relationship between variables is demonstrated and summarized in the diagram below where the direction of arrows shows the relationship between dependant and independent variables.

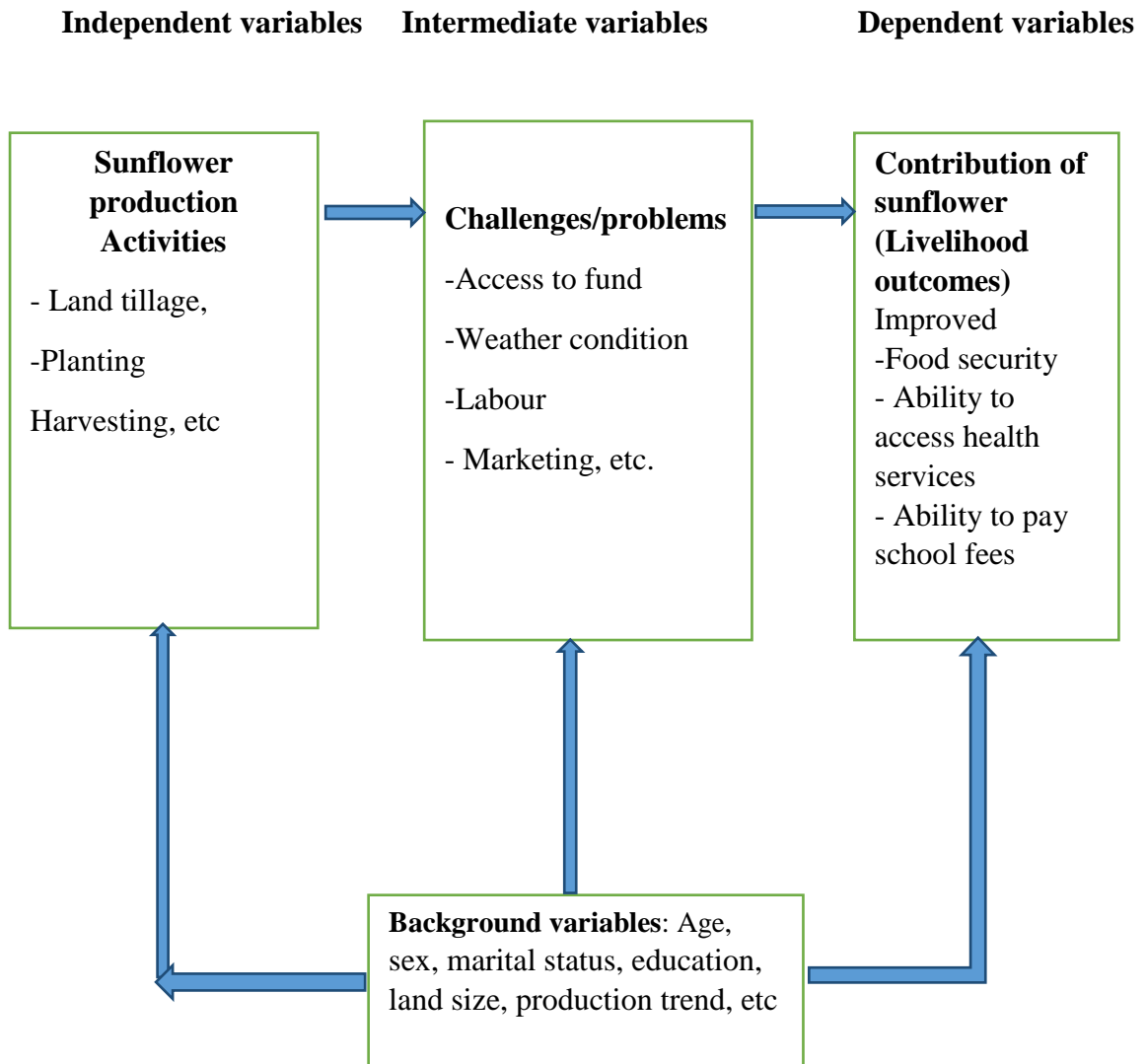


Figure 2: Conceptual framework.

Source: Own construct.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This part discusses the methodologies that were used in collecting data for the accomplishment of the study. Different techniques were applied for this purpose. Some of these important parts of methodologies included, study area, study population, research design, sample size, data collection methods and data analysis. The methodology that was applied by the study was chosen in order to acquire information and deduce conclusions about sunflower and its contribution to the wellbeing of small scale farmers in Chemba district.

3.1.1 Study area

This research was done at Chemba district in Dodoma region, in two wards of Mondo and Dalai. Chemba District is one of the seven districts of the Dodoma Region of Tanzania. It was formed after 2010, when it was split off from Kondoa District. Chemba District is bordered to the north by Kondoa District, to the east by Manyara Region, to the south by Chamwino District and Bahi District, and to the west by Singida Region. Its administrative seat is the town of Chemba. According to the 2012 Tanzania National Census, the population of Chemba District was 235,711. The logo of the district includes Cow, Sunflower and Bee, to communicate the dominant economic products available in their district. The area was selected because most of its people depend on agriculture and they produce sunflower as a cash crop and one of the drought resistant crops. The crop has become one of the major cash crops mostly depended by many smallholder farmers.

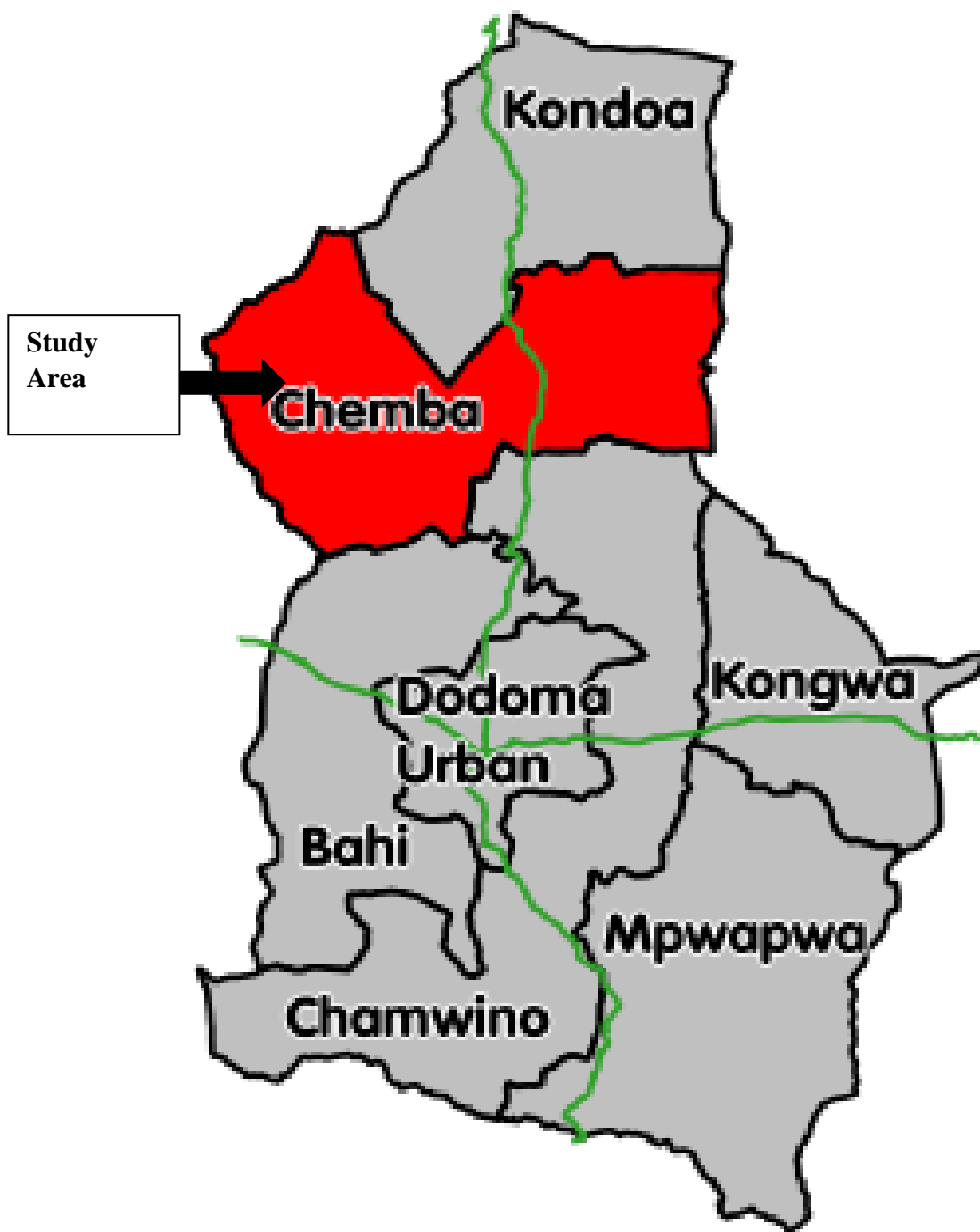


Figure 3: A map of Dodoma Region showing study area.

Source: Dodoma Region profile, 2016.

3.1.2 Targeted population

According to Kombo and Tromp (2006) population refers to a group of individuals, objects or items from which samples are taken for measurement. Mugenda (1999) also defines population as a complete set of individuals, cases or objects with some common observable characteristics. The study population comprised of sunflower farmers, village and ward extension officers and village leaders.

3.1.3 Research approach

This study adopted a mixed strategy research approach since it involved both qualitative and quantitative data. Quantitative approach involves the generation of data in quantitative form like age, etc., while qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behaviour (Kothari, 2004). The qualitative approach was selected based on the fact that it gives a chance to capture responses from the respondents in order to get clear understanding of the problem under study.

3.1.4 Research design

This study adopted a cross-sectional research design. This design is best suited to studies aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or other issues, by taking a cross-section of the population. Cross-sectional studies allow a researcher to examine various issues in one single study since it is taken once a time compared to longitudinal which takes a long time to study.

3.1.5 Sample design

Sampling design refers to the part of the research plan that indicates how respondents are to be selected for the study (Kothari, 2004). This study used both simple random and purposive sampling techniques in selecting sample that represented the local

people in the study area. Simple random sampling was used to select the sample from the population of the study. This method was used because it removes biasness in selecting respondents and it makes every member in the study area to have a chance to be selected. This study also used purposive sampling to select key informants in the study area including WEO, VEO, and Extension officers.

3.1.6 Sampling frame

The sampling frame defines a set of elements from which a researcher can select a sample of the target population (Douglas, 2004). In this research, the sampling frame was the list of small scale farmers. It also involved the key officials in Chemba district and the selected wards.

3.1.7 Sampling unit

A decision has to be taken concerning a sampling unit before selecting sample. Sampling unit may be a geographical one such as state, district, village, etc., or a construction unit such as house, etc., or it may be a social unit such as family, club, school, etc., or it may be an individual (Kothari 2004). In this study, the sampling unit was individual farmer.

3.1.8 Sampling size

The sample size was drawn by using the formula $n = N / (1+N) (e)^2$ quoted from Yamane (1967) by Kothari (2004). Yamane provides simplified formula for calculating sample size and a Table that contains estimated population sizes and the required sample size for each population size. For example, the Mondo ward had the total population of 9815 and Dalai the total population of 17088 which is equal to 26903 farmers (Census, 2012). Using his formula it is easy to calculate a required sample size if the population size is known. The formula is; $n = N / (1+N) (e)^2$.

Whereby;

- N = Total Population
- e = precision level (error detection) 1-10%
- n = sample size to be included in the study
- 1 constant

Therefore; using Yamane formula to calculate a sample size from a total population of 26903 from the study area, this was;

$$n = \frac{N}{1 + N(e^2)} \dots \dots \dots (1)$$

$$n = \frac{26903}{1 + 26903(0.1^2)} \dots \dots \dots (1)$$

$$n = \frac{26903}{269.04} = 99.996283 \approx 100$$

$$n = 100$$

Using the above formula the researcher engaged 100 respondents in the study.

Table 1: Respondents' Category and Distribution

Category	Sample size Distribution
Individual farmers (respondents)	77
Key Informants	
Ward Extension Officers	2
Ward Executive Officers	2
Village Executive Officers	2
Representative from district agricultural officers	1
Focus group discussion (2 groups, one group per ward with 8 members)	16
Total	100

3.1.9 Parameters of interest

While conducting this study, the researcher studied the key issues related to contributions of sunflower to the wellbeing of small scale farmers particularly in the selected villages in Chemba District. The parameters of interest in this study were sunflower farming and its contribution to the wellbeing of small scale farmers. Therefore, respondents were able to respond to various questions related to those issues.

3.2 Source of Data

For the purpose of this research, and in order to achieve objectives of the study, both primary and secondary data were used. The secondary data contributed toward the formation of background information and other parts of the report. This was collected from different existing relevant documents and literature related to the study like reports, text books, journals, internet sources, newspapers, libraries, government offices, non- governmental organization offices and internet. Primary

data was gathered directly from the respondents. The data was collected in two ways. Firstly, a survey was conducted with individual farmers. Secondly, interviews were carried out with some of the elites like extension officer, Village executive officer to get the information about the trend of production in the area and the elderly gave the experience of production from some years back and the current years. The use of more than one method in data collection helped to have information that complemented each other. Also there was some information that could not be found in a single method.

3.2.1 Interview

According to Kothari (2004), interviews involve a set of questions intended to collect information through oral or verbal communication in a face-to-face contact between the researcher and respondents. In this study the interview was face to face although the researcher prepared the open-ended questions and gave them to the interviewees in advance in order to give them enough time to be familiar with questions. The Checklist questions were prepared and employed to collect data from the key informants who were chosen depending on their work and knowledge on sunflower production. These were; the ward Executive Officers, Village executive officers, representative from district agricultural officers and the agricultural extension officers. The key informants were interviewed separately for confidentiality and to avoid influences of consultation with each other. The key informants clarified some of the aspects collected through the questionnaire. Some of the questions asked during key informants' interview include; an overview of sunflower farming in the study area, contract farming, challenges faced by the farmers in sunflower production and suggestions to improve sunflower farming.

3.2.2 Survey

Survey method is the sampling of individual units from a population and the associated survey data collection techniques, such as questionnaire construction and methods for improving the number and accuracy of responses to surveys. This is often used to assess thoughts, opinions, and feelings. Survey research can be specific and limited, or it can have more global, widespread goals, (Kothari, 2004). Survey method is used by a variety of different groups. In this study, this method was used to collect data from the targeted population which included the selected household representatives so as to get relevant data concerning the contribution of sunflower to the wellbeing of small scale farmers in Chemba District.

A questionnaire was prepared and employed to collect data from the household representatives. It is a tool used in survey method to collect data from a given sample. A questionnaire provides ability to the researcher to collect data from large sample and hence save time. It consisted of structured open and close ended questions whereby in open ended questions, respondents had freedom to write or give their detailed opinions and suggestions. In the closed ended questions it was employed to gather quantitative data. The use of this tool helped to obtain required information within a short time and there was a possibility of reaching distant respondents.

3.2.3 Focus group discussion

Kothari (2004) describes Focus Group Discussion (FGD) as one of the data collection method which is used in qualitative research to collect information regarding to perceptions, beliefs, opinions and attitudes of people on certain product or idea. Kothari (2004) suggests that a manageable number of respondents that will

be included in FGD should range 8 to 10 members. Focus group discussion involved both men and women with best knowledge on sunflower farming. The number of discussant were 8 each group. The FGD participant's (discussants) ranged in the number mentioned because it is neither big nor small so it was easy to manage and it ensured the balanced ideas from the members. If the population was too small the information gathered would be inadequate and if the population was too big it would be difficult to control discussion and fail to get the required data.

The aim was to collect information on the contribution of sunflower farming to the wellbeing of small scale farmers in Chemba district. Therefore, two focus groups with eight members each were conducted in Dalai and Mondo wards that is, one focus group per ward. A focus group interview guide was prepared to guide the discussion. It enhanced enrichment of the information through discussion and clarification of the sunflower production. The researcher intervened only where necessary to keep the focus of the study. Some of the discussed questions in focus group discussion were; evolution of sunflower production in the area, contract farming practice, as well as common challenges encountered in sunflower production.

3.2.4 Pilot study

According to McNabb (2006), pilot study is an exploratory study. A pilot study is defined as small scale design used primarily for gaining insights and ideas about the research problems and variables and other issues associated with those problems. Before the actual data collection, a pilot study was conducted by administering the questionnaire to the selected respondents, so as to test the validity of instrument (questionnaire). All missing and necessary information were noted and incorporated

into the questionnaire to increase its validity and reliability. The pilot study was carried out in Mondo Ward in Chemba District and it involved 10 respondents.

3.2.5 Documentary Review

Best and Kahn, 1992 define documentary review as data collection method, which involves deriving information by studying written documents. The documents reviewed included data from the library, newspaper, booklets, journals and various literature reviews related to this study from reports and other resources.

3.3 Reliability and validity of Data

3.3.1 Reliability of the study

Reliability refers to the consistency with which repeated measures produce the same results across time and observers (Trochin 2002). In order to improve reliability, the researcher observed the length of the instrument (the longer the instrument, the greater is its reliability), heterogeneity of the subject (the more the heterogeneous the subject is, the more likely reliability will increase), and the clarity of instructions (the clearer the instructions, the higher the reliability).

3.3.2 Validity of the study

Mugenda, (1999) asserts that, validity estimates how accurately the data obtained in the study represents a given variable in the study. To ensure the validity of the study different methods of data collection were used, the objectives were clearly explained, and free and friendship environment was created between the researcher and the respondents. All these created favourable environment for respondents to respond to the study questions.

3.4 Data processing and analysis

3.4.1 Data processing

Technically processing implies editing, coding, classifications and tabulations of collected data so that they are amendable to analysis (Kothari, 2004). Editing was done before coding so as to omit errors then data was stored electronically by using Statistical Package for Social Sciences (SPSS) version 20. This increased accuracy of the collected data. Data analysis is the process for gathering, sorting, organizing and structuring data (Magigi, 2012). This study used both qualitative and quantitative method of data analysis.

3.4.2 Analysis of Quantitative Data

The quantitative data was verified, compiled, coded and summarized before carrying out statistical analysis based on the objectives of the study. Responses for each question in each questionnaire were clearly screened to ensure clarity, then Statistical Package for Social Sciences (SPSS) Version 20 computer program was employed as a tool for data coding and analysis. Descriptive statistics that is frequency distribution and percentages were used to describe and summarize the data. Inferential analysis was done by using chi-square test at $P < 0.05$ level of significance to determine association between sunflower farming and wellbeing of respondents i.e. food security, ability to access health services and ability to pay school fees.

3.4.3 Analysis of qualitative data

Content analysis was used in the analysis of qualitative data whereby the data was summarized into themes basing on the objectives of the study.

3.4 Ethical Consideration

Data collection was conducted after the approval of proposal and getting letter of introduction from the Graduate Directorate. In the study area, data was collected after getting consent of the respondents. The respondents were informed on the aim of the research prior to the collection of research information and were ensured that, the data which was collected would be kept in privacy and be used only for academic purposes.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter presents research findings collected from the survey which examined the contribution of sunflower farming to the wellbeing of small scale farmers in Chemba district, Dodoma region. The data were gathered from the four villages which are Dalai, Mondo, Daki and Tandala. The findings are organized and presented according to the research objectives guiding the study, which are activities undertaken in sunflower farming by the farmers, challenges faced by small scale farmers and contribution of sunflower farming to the farmers' well-being i.e. food security, ability of the farmers to access health services and their ability to pay school fees. The data are presented in two components, which include background information of respondents (descriptive statistics highlighting the distribution of the respondents according to their socio-economic characteristics) and treated data organized according to the research objectives of the study.

4.1 Background information of Respondents

This sub-section presents respondents' characteristics, namely village, ward, sex, age, occupation, marital status, education level and the experience of respondents in sunflower farming. The researcher examined the characteristic of respondents in terms of social and economic because they have influence on the sunflower production. Age is an important factor in the analysis of sunflower production due to the fact that an individual's age has multiplier effects on both economic activities and gender influences of a particular human being. Marital status and level of education equally portray some reflections of behaviour of a person or an individual.

4.1.1 Distribution of Respondents by Villages

The distribution of respondents by villages is presented in Table 2 where it shows that the large number of the respondent about 30% were from Dalai village while 20% of the respondents were from Mondo.

Table 2: Villages of study, names and the number of respondents

Village	n	%
Tandala	18	23
Dalai	23	30
Mondo	15	20
Daki	21	27
Total	77	100

Source: Field data, 2016

4.1.2 Distribution of Respondents by wards

Table 3 depicts respondent's respective wards where by 53% of the respondents were from Dalai ward and 47% from Mondo ward. The variation of the number of respondents basing on their wards was due to the fact that the population of Dalai ward is bigger than that of the Mondo.

Table 3: Wards of the respondents

Ward	n	%
Dalai	41	53
Mondo	36	47
Total	77	100

Source: Field data, 2016

4.1.3 Distribution of Respondents by sex

This study involved both males and females as shown in Table 4. According to the data, the majority (56%) of respondents were females. These findings comply with that of Stephens (1992) who argued that though most technologies are considered gender neutral, they are often gender biased during their introduction and use by societies.

Table 4: Sex of respondents

Sex	n	%
Male	34	44
Female	43	56
Total	77	100

Source: Field data, 2016

4.1.4 Distribution of Respondents by age

Table 5 depicts respondents' age categories. The Table, shows that majority (47%) of the respondents were between 25 and 35 years of age, while 10% of the respondents were between 58 and above years. The results indicate that most of the respondents were adults (ie. 25-57 years of age) while very few were above 58 years of age. This implies that most of the respondents engaged in sunflower production were in the group of active people. The findings were also supported by Nanai (1993) that Younger and energetic farmers have proved to be active and ready to try new innovations. Sunflower was promoted to be a business crop of a kind of innovation that has encouraged youth and adults to participate in production.

Table 5: Age of respondents

Age of respondents	n	%
Age categories of respondents by years		
25-35	36	47
36-46	16	21
47-57	17	22
58- and above	8	10
Total	77	100

Source: Field data, 2016

4.1.5 Distribution of Respondents by Occupation

Findings in Table 6 show the occupations of respondents whereby about 81% of the respondents practiced farming, 9% were teachers apart from farming, while about 4% and 7% were pastoralists and business persons respectively apart from farming. These results indicate that about 81% of the respondents depended on sunflower farming as their major cash crop in the study area. These findings comply with that of PADEP (2010) which states that agriculture is the source of food and provides employment opportunities to about 80% of Tanzanians.

Table 6: Respondents' occupation

Occupation	n	%
Farming	62	80.5
Teaching	7	9.1
Pastoralist	3	3.9
Business man	5	6.5
Total	77	100

Source: Field data, 2016

4.1.6 Distribution of Respondents by Marital status

Findings in Table 7 show that about 77% of the respondents were married, while 5% of the respondents were single. The findings revealed that majority of the respondent were married. This means that sunflower farming was mostly done by the adults who had families.

Table 7: Respondents' marital status

Marital status	n	%
Married	59	77
Widow	12	16
Widower	2	3
Single	4	5
Total	77	100

Source: Field data, 2016

4.1.7 Distribution of Respondents by education level

Table 8 presents the analysis of education level of respondents whereby about 48% of the respondents had attained primary education, 25% secondary education, 10% tertiary education, and 9% were illiterate while 8% of the respondents had attained vocational training. The results indicate that majority (48%) of the smallholder sunflower producers had attained primary school education. According to Weir (1999), education may have effects upon labour productivity. Education also produces changes in attitudes, beliefs and habits. Increasing literacy may help farmers to acquire and understand information necessary to apply appropriate farming methods like proper application of fertilizers, use of improved seeds, and other technological applications, indicating the importance of improving education level of the farmers.

Table 8: Education level of respondents

Educational level	n	%
None	7	9
Primary	37	48
Secondary	19	25
Tertiary	8	10
Vocational trainings	6	8
Total	77	100

Source: Field data, 2016

4.1.8 Experience of respondents in sunflower farming

This part investigated years in which respondents have been involved in sunflower farming. Table 9 shows the years of sunflower farming by respondents. The results show that the majority (48%) of respondents had been involved in sunflower farming for 11 to 15 years whereby only 8% of the respondents had been farming for 16 to 20 years. Those (8% of respondents) who had experience of farming for 16 to 20 years were old farmers who had resided in the study area for a long period. While the rest were employees who have been employed some few years back and the native youth.

Table 9: Years of sunflower farming

Years	n	%
5-10	34	44
11-15	37	48
16-20	6	8
Total	77	100

Source: Field data, 2016

4.2 Results and discussions by research objectives

This part presents results and discussion of specific objectives. Whereby results for each objective are presented and discussed.

4.2.1 Specific objective I: This objective identified production activities undertaken by the farmers in sunflower production. The objective collected information about the following aspects; the mode of land acquisition, land size, application of fertilizer, tools used in land preparation, weeding frequency, source of fund for sunflower production, use of irrigation, contract farming as well as marketing practices.

4.2.2 Land acquisition in the study area

Table 10 shows the land acquisition for sunflower farmers. According to the data 56% of the respondents inherited land from their relatives while 44% of respondents rented the land. In Tanzania all land is publicity owned and vested in the state but individual have user right (MAC 1999). This implies that in the study, the majority of farmers owned land through communal system as 56% of the respondents had inherited land from their relatives.

Table 10 land acquisition in the study area

The mode of accessing land	n	%
Rented	35	44
Inherited	42	56
Total	77	100

Source: Field data, 2016

4.2.3 Land size

The respondents were asked about the size of their land. Results in Table 11 show that majority (44%) had 0.4-2 ha while the rest 20% had 6.5-8 ha. The findings revealed that very few farmers 20% had the farm size of more than 4 ha. According to 2012 National census the national average land size for small-scale farmers is 2.0 ha, but the study showed that some of the respondents had land size less than 2.0 ha

which is small and cannot sustain their life. Consequently, having small land size might be one of the reasons for the decline in sunflower production in some seasons, signifying the need for land size of the farmers to be increased in order to enhance sunflower production

Table: 11 Land size owned by smallholder farmers

Land size (Ha)	n	%
0.4-2	34	44
2-4	28	36
6.5-8	15	20
Total	77	100

Source: Field data, 2016

4.2.4 Fertilizer application

This part collected information on the aspect of fertilizer application. Respondents were asked to write **Yes** if they apply fertilizer in their farms and **No** if they do not use. They were also required to indicate the type of fertilizer used for those who applied it and reasons for not using fertilizers for those who reacted no.

Table 12: Fertilizer application

Fertilizer application.	n	%
Whether respondents apply fertilizer		
Yes	59	77
No	18	23
Total	77	100
Type of fertilizer used		
Not using	18	20
Manure	35	46
Industrial fertilizers	24	34
Total	77	100
Reasons for not applying fertilizers		
Too expensive	19	25
Difficult to access	51	66
Natural fertility	7	9
Total	77	100

Source: Field data, 2016

Table 12 show that 77% of the respondents applied fertilizer in sunflower farming while 23% did not use fertilizer. Reasons given for not applying fertilizer were difficulties involved in accessing fertilizer and the soil being fertile naturally. The respondents who used fertilizer applied both farm yard manure and industrial fertilizers.

4.2.5 Tools used in sunflower production

Here the investigation aimed at knowing the kind of tools used by the farmers in sunflower farming. Findings in Table 13 indicate that majority (46%) of the respondents used animal power during land preparation for production of sunflower, instead of tractors due to low income of the respondents that could not allow them to hire tractors. The animals used occasionally were cow and donkeys while 22% of

them used hand hoes. This implies that farmers are improving in farming technology, as the number of farmers using hand hoes is decreasing it shows further that if they will be supported it is possible to move from where they are to motorized tools use.

Table 13: Type of Tools used in land preparation

Type of tools	n	%
Hand hoes	17	22
Animal power	35	46
Motorized tools	25	32
Total	77	100

Source: Field data, 2016

4.2.6 Source of fund for sunflower production

The study wanted to know the respondents' source of funds for sunflower production. Findings in Table 14 show that 99% of the respondents had sources of fund for their farming activities. Among the 99% of the respondents who were having the source of fund, only 19.5% had access to credits. The majority (79.2%) of the respondents' source of fund were from other sources like salary, livestock and agricultural produce sales. Only one (1.3%) respondent had no access to any source of fund for farming activities. These results imply that majority of respondents were using funds from their earnings to buy fertilizers and other inputs, while only 19.5% of the respondents accessed credits from credit institutions. Nkonoki (2010) found that many times it is farmers with more resources in terms of capital, land and labour that are able to take advantage of new technologies and practices. Thus, credit has a big role in improving the financial capital of farmers since majority of the farmers had low income as they were depending on their salary for those who were employed, livestock and agricultural sales only.

Table 14: Respondents' source of fund

Source of fund	n	%
Whether respondents had the source of funds		
Yes	76	99
No	1	1
Total	77	100
Institution from which respondents borrowed		
Credits	15	19.5
Others	61	72.9
None	1	1.3
Total	77	100

Source: Field data, 2016

4.2.7 Use of irrigation

Table 15 shows whether respondents used irrigation in sunflower farming. The results show that majority (86%) of the respondents did not use irrigation as a source of water for sunflower production but depended on rainfall. The findings mean that there is a need to consider facilitating use of irrigation in the study area to promote sunflower production, especially due to the rainfall variation partly induced by climate change.

Table 15: Irrigation of sunflower farming

Irrigation	n	%
Yes	11	14
No	66	86
Total	77	100

Source: Field data, 2016

4.2.8 Contract farming

Farmers were asked if they practice contract farming. The findings in Table 16 show that 83% of the respondents did not practice contract farming and had no any knowledge about contract farming, while 17% of the respondents practiced contract farming. During the key informant's interview, one of the farmers stated that;

‘I cannot practice contract farming to benefit someone else’ Indicating that the contract farming had no benefit to farmers.

Table 16: Contract farming practices

Contract farming practices	n	%
Whether farmers practiced contract farming		
Yes	13	17
No	64	83
Total	77	100

Source: Field data, 2016

4.2.9 Marketing practices for sunflower products

Table 17 shows the marketing practices done by the farmers to sell sunflower products. The findings indicated that about 55% of the respondents sold raw sunflower while 16% sold sunflower through contract and about 30% of the respondents sold sunflower oil. Majority of the respondents sold sunflower as raw sunflower because of the less complications involved in selling raw sunflower,

compared to selling in contract. During the FGDs it was revealed that sometimes farmers harvested less than what was expected. In such a situation they failed to return the cost to the one who they contracted with. Moreover, some of the farmers had no knowledge about contract farming, so it was difficult for them to sell through contract. In Table 17, about 30% of the respondents argued that selling sunflower oil is much beneficial because 1 bag of sunflower produces 20 litres, whereby 20 litres cost TAS 60 000, but a bag of raw sunflower costs only TAS 30 000.

Table 17: Marketing practices for sunflower products.

Mode of selling sunflower products	n	%
Selling by contract	12	16
Selling by raw sunflower	42	54.5
Selling sunflower oil	23	29.9
Total	77	100

Source: Field data, 2016

4.3 Specific objective II: This objective examined the challenges faced by small scale farmers in the sunflower production. It intended to explore different challenges faced by small scale farmers in the sunflower production. Various aspects explored including land preparation challenges, planting, input access, harvesting, processing as well as marketing challenges.

4.3.1 Land preparation Challenges

Table 18 presents land preparation challenges. The findings show that farmers experienced different challenges during land preparation like inadequate farming tools and manpower, land conflict, injury as well as attack by wild animals. The inadequate farming tools seemed to be the great challenge faced by the farmers

whereby 67% of the respondents had the same problem. During the key informants' interview, one of the respondents stated that;

'Quarrels are unavoidable during land preparation period due to border extension. Some people do extend farm borders to increase their land size''

This comment indicated that during land preparation people extended their land to have big areas for cultivation due to small land size they occupied, the action that caused quarrels among the farmers. This also signifies the importance of increasing land size of the farmers in the study area.

Table 18: Land preparation Challenges

Challenges	n	%
Inadequate farming tools	49	67.0
Inadequate manpower (labours)	13	17.0
Extension of land borders	5	7.0
Injury	6	8.0
Attacked by wild animals (when clearing thick forest)	4	5.0
Total	77	100

Source: Field data, 2016

4.3.2 Planting Challenges

In Table 19 the findings came out with different challenges encountered by farmers during planting period whereby the problem of inadequate manpower seemed to be the common problem as 38% of the respondents reported the problem. Moreover, 26% of respondents had inadequate planting tools like tractors, which is very fast tools in planting. Climate change was also mentioned as a challenge whereby 26% of the respondents said that some years they experienced high rainfall during planting which led to floods or sometime inadequate rainfall or drought. Respondents (10%)

also mentioned inadequate improved seeds as another challenge that was faced. Many farmers used local seeds which took more than six months to mature compared to modern seeds [record] which takes only 3-4 months i.e. 100-130 days.

Table 19: Planting challenges

Planting challenges	n	%
Challenges faced by respondents during planting period		
Inadequate planting tools	20	26
Inadequate manpower	29	38
Climate change	20	26
Inadequate inputs (improved seeds)	8	10
Total	77	100

Source: Field data, 2016

4.3.3 Input Challenges

Input challenges are presented in Table 20. The results show that 44% of the respondents had inadequate funds to buy inputs, while 12% of the respondents had inadequate knowledge on how to use and the type of inputs to be used. The inadequate knowledge on how to use and type of fertilizer to apply show the need of providing knowledge to the farmers by creating awareness on those knowledge deficits.

Table 20: Input challenges

Input Challenges	n	%
Inadequate fund to buy inputs	34	44
Shortage of fertilizers	34	44
Inadequate knowledge on better input	9	12
Total	77	100

Source: Field data, 2016

4.3.4 Harvesting Challenges

The study sought to know the challenges experienced by farmers during harvesting. The findings from Table 21 show that 30% of the respondents faced labour shortage problem while only 4% faced poor means of transport to transfer sunflower produce. In most cases in rural settings farmers use family labour therefore they sometimes fail to employ labourers from outside because of various reasons including inadequate capital, implying that it is important to improve farmers' capital.

Table 21: Harvesting challenges

Harvesting Challenges	n	%
Harvesting Challenges faced by farmers during harvesting period		
Theft	21	27
Labour problem	23	30
Poor tools for harvesting	17	22
Pests and Insects	13	17
Poor infrastructure for transporting harvest	3	4
Total	77	100

Source: Field data, 2016

4.3.5 Processing Challenges

The findings in Table 22 show that the major (95%) processing challenge faced by the farmers during processing of sunflower was inadequate machines in their villages, while only 5% of the respondents said it was expensive to process sunflower. These caused farmers to sell raw sunflower or leaving the sunflower waste to the processors after processing sunflower instead of selling them as the payment.

Table 22: Processing Challenges

Processing Challenges	n	%
Few processing machines	73	95
High cost for processing	4	5
Total	77	100

Source: Field data, 2016

4.3.6 Marketing Challenges

Table 23 presents the analysis of marketing challenges. The findings reveal that majority (55%) of the respondents experienced price fluctuation while 1% of the respondents reported that infrastructure to marketing place was poor. This shows that there should be a fair mechanism on setting the price of produce in order to improve farmers' wellbeing.

Table 23: Marketing Challenges

Marketing challenges	n	%
Price fluctuation	42	54.5
No specific market infrastructure in the village	34	44.2
Poor infrastructure to marketing place	1	1.3
Total	77	100

Source: Field data, 2016

4.4 Specific objective III: This objective examined how sunflower production contributes to smallholder farmer's wellbeing (that is, food security, ability to access health services and ability to pay children school fees).

The data collected for this objective included the following; sunflower production trend for five seasons from 2010/2011-2014/2015, the nature of trend and its reasons, market for sunflower in the area, total income received from sunflower farming in 2014/2015 and how it was spent; the contribution of sunflower to the respondents', food security status, ability to access health services and ability to pay children school fees; and finally suggestions on what to be done to improve sunflower production.

4.4.1 Sunflower production trend for the past five years

The production trend of sunflower had a tendency of falling and rising. In 2010 the production was 480 tons in Dalai ward and 345 tons in Mondo. In 2011 the production declined in both wards whereby in Dalai ward it was 360 tons and 250 tons in Mondo. Such production was maintained up to 2012. However, in 2013 there was a slight decrease of production in Dalai to 258 and Mondo to 242 tons. In 2014 the sunflower production started to rise in both wards, it rose to 260 tons in Dalai and 250 tons in Mondo. The trend of sunflower seemed to vary from one season to another in both wards, but from 2012 to 2014 the trend was rising. This implies that there was an effort which had been taken by the farmers. Therefore, the government and non-governmental organisations should support the farmers to raise production to sustain their life.

Table 24: The production trend of sunflower for the past five years in 2010-2014

Years	Sunflower production trend in Tons	
	Dalai ward	Mondo ward
2010	480	345
2011	360	250
2012	360	250
2013	258	242
2014	260	250
Total	1718	1337

Source: Field data, 2016

4.4.2 Reasons for decreased production of sunflower

Table 25 presents results for reasons for decreased production of sunflower in Dalai and Mondo wards. The results indicate that majority (29%) of the respondents reported poor farming practices as the reasons for the decreased production, while 7% of the respondents said drought was the reason for decreased production. This revealed that sunflower farmers had inadequate knowledge on the proper farming methods although drought cannot be ignored due to climate change.

Table 25: Responses on the reasons for less production of sunflower for the past five years

Reasons	n	%
Pest and diseases	15	20
Poor farming methods	22	29
Inadequate fertilizers	10	13
Small land size cultivated	15	20
Drought	05	7
Inadequate improve seeds	10	12
Total	77	100

Source: Field data, 2016

4.4.3 Market accessibility

Table 26 presents results of analysis on farmers' access to sunflower market. The findings reveal that majority (82%) of the farmers had access to sunflower market. Simtowe *et al.* (2013) argued that the livelihoods of rural farmers are most often constrained by poor access to market. However, in this study area majority of the farmers had access to the market.

Table 26: Market accessibility

Market accessibility	n	%
Whether respondents had access to sunflower market		
Yes	63	82
No	14	18
Total	77	100

Source: Field data, 2016

4.4.4 Total income received from sunflower farming in 2014/2015 Season.

Table 27 shows the findings of the total income respondents received from sunflower farming in 2014/2015. The findings show that majority (65%) of the respondents earned annual income between TAS 50000 to 2050000. This low income was due to the low produce which they got, also low price of the agricultural products which they traded with middle traders who set price of their choice. Government should intervene to make sure that farmers are not exploited by the middlemen.

Table 27: Total income received from sunflower in 2014/2015 season

income received	n	%
Total income received from sunflower in 2014/2015 season in TAS		
50,000-2050000	50	64.9
2060000-4060000	21	27.3
6080000-8080000	6	7.8
Total	77	100.0

Source: Field data, 2016

4.4.5 Spending of income obtained from sunflower farming

Table 28 presents the information on how respondents spend the income obtained from sunflower. The data show that respondents used the income to pay school fees to their children, health services, food purchasing, renting more land, attending family needs, constructing houses as well as buying inputs for the next season. About 20% of the respondents used their income obtained from sunflower farming to pay school fees for their children, buying family needs and constructing houses while minority of the respondents 5.2% preserved their income to purchase inputs including fertilizers and seeds for the next season. This implies that farmers consider much education, caring their family through buying family needs and constructing houses. Also access to health services was considered as it was mentioned by 12.9% of the respondents. However, having only 4 individuals who save their money as a capital for the next season indicates the need to improve farmers' capital.

Table 28: Respondents income spending

Income spending	n	%
Spending on school fees	15	19.5
Health services	10	12.9
Food purchasing	13	16.9
Renting more land	5	6.5
Other family needs	15	19.5
Constructing houses	15	19.5
Buying input for next season	4	5.2
Total	77	100.0

Source: Field data, 2016

4.4.6 Wellbeing of the respondents after been engaged in sunflower production

The study aimed at knowing the status of wellbeing of the farmers as it was defined in three aspects which were food security status before and after engaging in sunflower farming, access to health service as well as ability to pay school fees before and after been engaging in sunflower farming. Food security was indicated by the number of months of food shortage and the number of meals before and after been engaged in sunflower farming.

4.4.6.1 Food security Status

Table 29 shows food security status of the respondents. According to the table, 59.7% of the respondents said that food security status had increased whereby the number of months of food shortage had decreased after been involved in sunflower farming. According to them, they could buy food when the production was small. Other respondents that is 13% said the number of months of food shortage had remained the same or there were no changes while 27.3% argued that food status had decrease i.e. the number of months of food shortage had increased. The percentage of respondents who said that the number of months of food shortage had decreased is

big compared to the other two groups. The chi-square (X^2) test at $p < 0.05$ level of significance showed that there is significance associations between sunflower farming and food security (X^2) 9.687; $p = 0.046$. This indicates that there is an association between sunflower farming and increased food security. The findings prove that sunflower has the great importance to farmers since it supports food security during the period of food shortage.

According to the key informants and focus group discussion members the months of food shortage in the area are from October to February for the majority where sunflower is sold in high price to rescue food shortage. The food shortage is seen through various indicators, in addition to increased or decreased number of the months of food shortage and the number of meals per day, price of commodities are higher, criminal offence increases and supply of commodities are low. After the harvest there is food stability and the price and, criminal offences decline while supply increases. Sunflower is one of the drought resistant crop in Chemba district, when food crops like maize fail due to drought, farmers sell sunflower to buy food.

Table 29 Food security Status

Food security status	n	%
Increased	46	59.7
Declined	21	27.3
Remained the same	10	13.0
Total	77	100.0

Source: Field data, 2016

4.4.6.2 Access to health service

Figure 4 shows the respondent's ability to access health services whereby 59.7% of the respondents said that their ability to access health services had increased, 24.7% argued that their ability to access health services had declined while 15.6% of the

respondents said that their ability to access health services had not changed. After been engaged in sunflower farming findings show that the ability to access health services for the majority (59.7%) of the respondents when sick or family member is sick had increased. The large number of farmers attained health services after harvesting while before producing sunflower the number of those who attended health centres was small. After the harvest there is health stability and the ability to attend health centres when sick instead of using traditional medicine. One of the respondents explained that;

“Before sunflower harvesting period in case of any illness we use traditional medicine to cure ourselves due to the shortage of money, but after the harvest it becomes easy to consult professional doctors for check-up and treatment.”

The chi-square (X^2) test at $p < 0.05$ level of significance showed that there is significance associations between sunflower farming and access to health services (X^2) 12.990; $p = 0.011$. This indicates that there is an association between sunflower farming and improved access to health services.

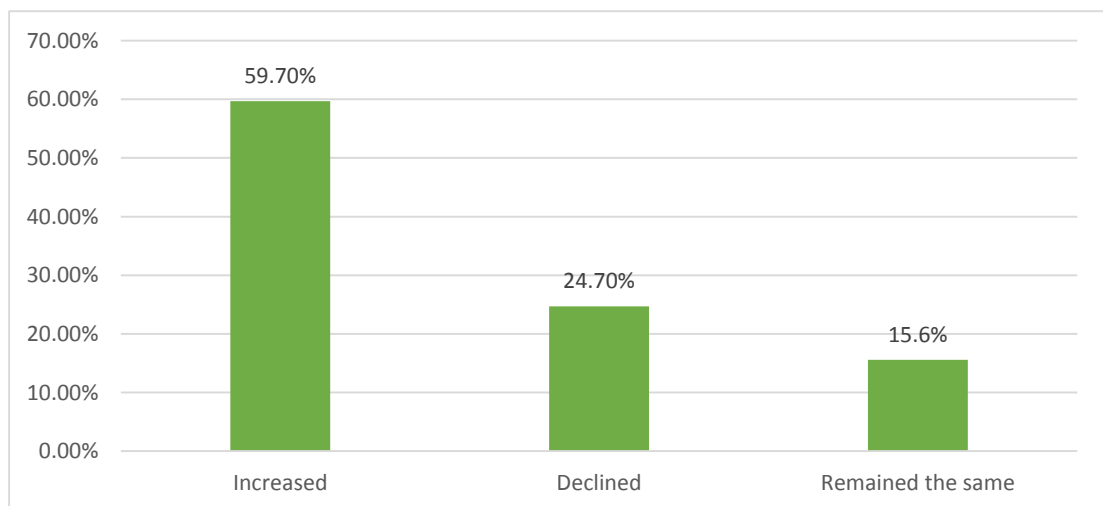


Figure 4: Ability of respondents to access health services

Source: Field data, 2016

4.4.6.3 Ability to pay school fees

The study also investigated the ability of respondents to pay school fees after been involved in sunflower farming whereby the findings in Table 30 show that 59.7% of the respondents said the ability to pay school fees had increased while 15.6% of the respondent said it had remained the same and 24.7% said that it had declined. Most of the farmers depended on sunflower as the source of income to pay school fees because it is the crop, which tolerates the nature of climate in the area. When the production dropped the number of enrolment in school also declined. Before the harvest, the ability to pay school fees declined because the little amount of money obtained were used to accommodate the basic needs i.e. food, clothes and shelter. After harvesting, the ability to pay school fees becomes stable because produce are sold to obtain money for paying school fees. The role of sunflower toward education was seen since the respondents argued that some of sunflower bags were preserved purposely in order to be sold to get the money to pay school fees. One of the respondents stated that;

“Suppose I harvest ten sunflower bags, four of them are used to pay school fees and the rest are for other duties”

The chi-square (X^2) test at $p < 0.05$ level of significance showed that there is significance associations between sunflower farming and ability of farmers to pay children school fees (X^2) 12.990; $p = 0.011$. This indicates that there is an association between sunflower farming and ability of farmers to pay children school fees.

Table 30 Ability to pay school fees

School fees payment	n	%
Increased	46	59.7
Declined	19	24.7
Remained the same	12	15.6
Total	77	100.0

Source: Field data, 2016

4.4.6.4 Suggestions to improve sunflower production

Findings in Table 31 show suggestions given by farmers to improve sunflower production whereby 31.2% of the respondents reported that financial assistance such as credit should be provided to the farmers to enable them to buy agricultural inputs and cultivate large farms. About 20% of the respondents reported that market for sunflower products should be improved so as to enable farmers to sell their products at the price which will benefit them. In addition, 16.9% of the respondents reported that, knowledge on improved agricultural practices should be provided to enable farmers to increase production. Others, 14.3% of the respondents reported that improved seeds should be provided to the farmers on the right time of the season and at affordable price. Moreover, 10.4% of respondents suggested the number of extension officers to be increased to have at least one Extension Officer per village, and 7.8% of the respondents suggested that village leaders should promote sunflower production in their respective villages during village meetings.

Table 31: Farmers Suggestions on Sunflower Production

Suggestions	n	%
Increasing market for sunflower	15	19.5
Increasing extension officers at least one extension officer per village	8	10.4
Provision of loans to farmers	24	31.2
Provision of agricultural knowledge	13	16.9
Availability of seeds at affordable price and in the right time	11	14.3
Encourage farmers to increase production	6	7.8
Total	77	100.0

Source: Field data, 2016

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents summary, conclusion and recommendations revealed from the findings obtained in this study.

5.1 Summary of the Study

The aim of this study was to assess the contribution of sunflower farming to the wellbeing of small scale farmers in Chemba District. Specifically the study aimed at identifying activities undertaken in sunflower farming by farmers, examining the challenges faced by small scale farmers in sunflower production and examining how sunflower production contributes to smallholder farmers' wellbeing (that is, food security, ability to access health services and ability to pay school fees for their children).

Basing on the study, the farming activities challenges identified by respondents were the use of local methods of sunflower farming due to inadequate funds and knowledge on improved methods of sunflower farming that resulted into low produce; inadequate market and extension services. Due to the obstacles identified, the respondents proposed the ways to improve the sunflower farming that included; increasing market for sunflower, allocating at least an extension officer per village, provision of loans and agricultural knowledge to farmers, availability of seeds in the village in the right time and village leaders to encourage farmers to increase sunflower production.

5.2 Conclusion by Objectives

Objective I: identified activities undertaken in sunflower farming by farmers where it was found that, land was acquired through parents/relatives, however the land size

for the majority was small, majority of the respondents applied fertilizer but afforded to use farm yard manure because industrial fertilizers were expensive. The majority of farmers were using animal power and motorized tools. They had source of fund mainly from salary for employees, livestock and crop sales while few respondents managed to secure funds from credit institutions. Few respondents practiced contract farming as the farmers claimed the practice to have no benefit to them. The findings have implied that majority of the farmers have small land, ability to access industrial fertilizer was low and inadequate credit institutions.

Objective II: Examined the challenges faced by small scale farmers in the sunflower production. Some of the challenges that farmers encountered in sunflower production were manpower shortage, drought due to climate change, sunflower crop was attacked by birds and pests, inadequate improved seeds, impassable infrastructure during the rainy season, inadequate market and processing machines.

Objective III: Examined how sunflower production contributes to smallholder farmer's wellbeing (that is food security, ability to access health services and ability to pay children school fees). It was found that production trend of sunflower for the past five years was increasing and decreasing. Some of the reasons for the decreasing were mentioned including; pests and diseases attack, inadequate fertilizers and poor farming methods. Although production trend of sunflower was decreasing, food security status, ability to access health services and ability to pay school fees for children for the farmers involved in sunflower production had increased than before and they were selling sunflower to buy food during months of food shortage.

However, the farmers gave suggestions on what to be done to improve sunflower production whereby they mentioned; financial assistance such as credit should be provided to farmers to enable them to buy agricultural inputs and cultivate large farms, market for sunflower product should be improved so as to enable farmers to sell their products at the price which will benefit them, knowledge on proper agricultural practices should be provided to enable farmers to practice new farming methods in order to increase production, improved seeds should be provided to the farmers on the right time of the season and at affordable price, the number of extension officers to be increased to have the at least one extension officer per village.

5.3 Theoretical Implication of the study

This study was guided by the sustainable livelihood framework model which is a tool to improve our understanding of livelihoods, particularly the livelihoods of the poor. This present the main factors that affects people's livelihoods (Kollmair, 2002). The model corresponds with the findings of this study, as it has been seen that the livelihood outcomes like improved food security, improved access to health services etc. which are the achievements of livelihood strategy has been met whereby farmers' vulnerability has been reduced by improved food security, increased access to health services as well as the ability of farmers' to pay school fees for their children.

5.4 Recommendations for Actions

Objective I

In correspondence to the findings and conclusions the following were recommended; Local government should find a mechanism to make sure all people are given land for agricultural activities especially sunflower farming; and should establish irrigation scheme which will help farmers to produce sunflower throughout the season. Government and other development agencies should make sure that smallholder farmers are getting agricultural tools such as tractors and irrigating machines at affordable prices, as well as increasing agricultural subsidies such as fertilizers, establishment of rural financial institutions to address farmers' credit needs on loan terms with low interest rate. The Agricultural sector should make sure that seed agencies responsible for seed production produce quality seeds and the Local Government Authority (LGA) should make sure that seeds are provided to the farmers in time.

Objective II

The following were recommended so as to increase the production of sunflower in the study area.

To solve the issue of inadequate labour the LGA and other development practitioners should facilitate farmer with the means to increase capital including credit institutions and SACCOs, also encourage people to work communally to overcome the shortage of manpower since in rural areas they mostly use family labour. Plant protection department should help farmers in alleviating birds and pests problems by suggesting proper methods and techniques for the control of pests and birds to avoid yield losses. Government should make sure rural transportation and infrastructure are improved to make them passable in all seasons in order to make many producing

areas accessible to input and output market and contribute to timely input delivery. LGA should intervene to assist the farmers not to be exploited by middle men in marketing.

Objective III

To ensure the contribution of sunflower farming to the wellbeing of small scale farmers the Local government and agricultural extension workers should create awareness to the farmers on how to control pests and diseases, proper agricultural practices to enable farmers to practice modern farming methods in order to increase production. The LGA should intervene to make sure that agents of fertilizer and other inputs set a fair price of inputs.

5.5 Policy implications

Policy makers and planners should find a good mechanism to improve awareness of land policy in rural areas and provide knowledge on how farmers can implement the policy to acquire land. Planners should make sure that climate change is among the priority issues in Tanzania five year and even one year development plans.

5.6 Limitation of the study

Data collection was done in June and August, 2016 when the farmers were busy with agricultural activities like harvesting not only on sunflower farms but also in other farms where farmers proceeded with farming activities. What was the effect of such a situation? What did you do to offset the problem/limitation? This situation limited the researcher to obtain information in a short time as it compelled him to visit farmers repeatedly in the morning and evening hours. Another limitation was a language barrier during data collection, whereby the questionnaires were translated into Kiswahili and for those who could not communicate through Kiswahili an interpreter from Kiswahili to Kigogo and vice versa was used to offset this limitation.

5.7 Area for further research

This study identified Contribution of sunflower production to the wellbeing of small scale farmers in Chemba district, Dodoma region, there is a need for further research to analyse contract farming in order to understand if it benefits farmers.

REFERENCES

- Baloyi, K. J. (2010), Analysis of Constraints facing smallholder farmers in the Agribusiness Value Chain-Pretoria.
- Carney, D. (1999), Sustainable livelihoods approaches: progress and possibilities for change, Department for international development, Toronto Canada.
- Carney, D. et al. (2000), Livelihoods approached compared. In: Forum on Operationalizing Sustainable Livelihoods Approaches.
- Chemba District Agricultural Department report 2015.
- Damiani, M. G. and George, V. (2010), Sunflower Production in the Central Corridor of Tanzania.
- DFID (2000), Sustainable Livelihoods Guidance Sheets, Department for International Development.http://www.livelihoods.org/info/info_guidancesheets.html (accessed: 23.07.2014).
- FAO (2004), Promoting the growth and development of smallholder seed enterprises for food Security crops: Case studies from Brazil, Côte d'Ivoire and India. AGP Series 201.Rome: Food and Agriculture Organization of the United Nations. The George Mateljan Foundation, (2001-2010), World healthiest food. [<http://www.whfoods.com/genpage.php>] site visited on 25/6/ 2015.
- Hawassi, F.G.H (2011), Analysis of Processing, Marketing and Demand for Processed Fruits and Vegetables in Tanzania: Unpublished Thesis Submitted In Fulfilment of the Requirements for The Degree of Doctor of Philosophy of Sokoine University of Agriculture, Morogoro, Tanzania: 285pp.
- IFAD (2013), The adoption of organic agriculture among small farmers in Latin America and the Caribbean: Thematic evaluation, April 2003. Report No. 1337. Rome: International Fund for Agricultural Development.
- Kollmair, M. and Gamper, S. (2002), The Sustainable Livelihood Approach, Input Paper for the Integrated Training Course of NCCR North-South Development Study Group, University of Zurich.
- Kombo, D. and Tromp, D. (2006), An introduction to Proposal and Thesis Writing.

- Kothar C. (2004), Research methodology, Methods and techniques, New Age International Publisher New Delhi.
- Lekunze, J., Antwi, M.A and Oladele O.I. (2011), Socio-economic constraints to sunflower production in Bojanala Pretoria.
- Lubungu M., et al (2014), Analysis of the sunflower value chain in Zambia's Eastern province, Lusaka, Zambia.
- Magigi, W. (2012), Methodological tools for researching and scientific writing in Emerging Economics, Thrust Publications Ltd Dar es Salaam, Tanzania.
- Management: Qualitative and Quantitative Approach. M. E. Sharpe Inc. New York.
- McNabb D.E (2006), Research Methods in public Administration and Non profits
- Ministry of Agriculture and co-operative, (2010), National Seed Industry Development Program a Draft Report, Government Printer, South Africa.
- Mpagalile, (2008), Agribusiness Innovation in Six African Countries, the Tanzania Experience, Sokoine University of Agriculture, Morogoro.
- Mugenda M.O. and Mugenda A. (1999), Research methods: Qualitative and Quantitive Approaches, African Centre for Technological Studies, Nairobi, Kenya.
- Murray, J. and Mary (1999), Department for International Development, Sustainable Livelihoods Guidance Sheet: Introduction http://www.livelihoods.org/info/info_guidancesheets.html #1.
- Nanai, (1993), Kids and Environmental Youth alliance, Vancouver.
- Nkonoki E. (2010), what are the factors limiting the success and growth of small business in Tanzania? An empirical study on small business growth.
- Ogutu, C. (2014), Local Investment Climate Sunflower Value Chain for Dodoma and Kigoma regions (MRA Management Associates Ltd).
- Participatory Agricultural Development and Empowerment Project 2010 Report (PADEP)

- Rural Livelihood Development Company (RLDC), (2008), Sunflower Production Situation in the Central Corridor of Tanzania.
- Rural Livelihood Development Company (RLDC). (2010), Sunflower Production Situation in the Central Corridor of Tanzania.
- Rural livelihood Development Company report (2013).
- Simtowe F. (2013), the economic effects of land redistribution; the case of community based rural land development project in Malawi.
- Stephens J. (1992), ways of being males: Representing masculinities in children's literature and films. New York: Routledge.
- The George Mateljan Foundation, (2001-2010), World healthiest food.
- Ugulumu, E.S. (2008), Sunflower Value Chain in Tanzania, Round Table Africa, Doctor of Business Administration at Eastern and Southern African Management Institute, Expert Centre and Maastricht School of Management.
- Ugulumu, E.S. (2013), Market access and sunflower marketing, Challenges and prospects to small scale farmers in Tanzania, International Journal of Social Sciences and Entrepreneurship, 1 (10), 247-259.
- United Republic of Tanzania National Sample Census of Agriculture 2012, Volume VIII- Regional report, Dodoma Region.
- Wambura, R.M. and Kapinga, D. (2007), The Experience of Farmers' Organizations in Promoting Rural Development in Tanzania: A Case of Small Farmers Groups in Selected Villages of Morogoro Regions. Rural Planning Journal 7(1): 13-24.
- Weir S. (1994), The effect of education on farmer productivity in rural Ethiopia, department of Economics, University of Oxford.

APPENDICES

Appendix 1: Questionnaire

Dear Sir/Madam,

The questionnaire is meant to collect data on contribution of sunflower Farming to the wellbeing of small scale farmers in Chemba District, Dodoma Region. The data are meant only for academic report writing which is a partial requirement for an award of Master Degree in Development Studies awarded by the University of Dodoma. Therefore, you are requested to feel free in answering the questions and secrecy is granted. Thank you

Date of interview.....

Name of village

Name of ward

District.....

Part A: Respondent's Preliminary Information

(Please choose the relevant choice)

A1. Sex (a) Male (b) Female ()

A2. Can you please tell what your age

A3. What is your main occupation?

A4. Respondent's Marital Status

(a) Married (b) Widow (c) Widower (d) Single (e) Divorced (f) others (specify ()

A5. Respondent's education level (a) none (b) Informal education (c) Primary (d)

Secondary (e) Tertiary (f) Vocational Trainings (f) Others (*specify*) _____

Part B: Farming activities practices adopted by farmers

B1. How did you acquire the land? (i) Purchased (ii) rented (iii) inherited ()

B2. How big is your land area.....? (Ha)

B3. Do you apply any fertilizer in your farm? (Tick appropriate) (i) Yes (ii) No ()

B4. If Yes to B6 what kind of fertilizers.....

B5. If No to B 6 why.....

B6 How do you get fertilizer for sunflower farming?.....()

B7. What tools do you use in doing farming activities? (Tick appropriate)

(i) Hand hoes (ii) Animal power (iii) Motorized tools ()

B8. Do you have any source of fund? (Tick one) (i) Yes (ii) No ()

B9. If Yes to B 17, what is your source of fund? (Tick appropriate)

(i) Loan from Bank (ii) Savings and Credit Association (iii) Any other

(Specify)

B10. Do you use irrigation in sunflower farming? (Tick one)

(i) Yes (ii) No ()

B11. For how long (years) have you been farming sunflower?

B12. Have you ever practiced contract farming? (Tick one)(i) Yes (ii) No ()

B13. Which practice is more beneficial between selling by contract or raw sunflower?..... Why?.....

B14. Which marketing practice do you use to sell raw sunflower or sunflower oil..... Why?.....

Part C: Challenges faced by small scale farmers in the sunflower production

C1. What are the possible challenges do you encounter in sunflower farming during;

- (i) Land preparation.....
- (ii) Planting.....
- (iii) Input access.....
- (iv)Harvesting.....
- (v) Processing.....
- (vi) Marketing.....
- (vii) Contract farming.....

C2. Do you get assistance from any organization to combat the challenges related to sunflower Farming? (i)Yes (ii) No ()

C3. If yes in C2 what is/are those institutions?.....

C4. If Yes what kind of assistance and how.....

.....

Part D: Contribution of sunflower crop to smallholder farmers.

D1. How many ha of sunflower did you cultivate in the years, 2014/15, 2013/14, 2012/13, 2011/12, 2010/11?

Sunflower production trend per season.

Years	Sunflower production trend in tons	
	Dalai ward	Mondo Ward
2010		
2011		
2012		
2013		
2014		
Total		

D2. Do you have market for sunflower in your area? (i) Yes (ii) No ()

D3. What is the total income received from sunflower farming in 2014/2015?

D4. How do you spend your income acquired from Sunflower farming?.....

D5. Food security status (months of food shortage before and sunflower production)

(i) Increased (ii) Declined (iii) Remained the same ()

D6. Ability to access health services before and after sunflower production

(i)Increased (ii) Declined (iii) remained the same ()

D7. Ability to pay children fees before cultivating sunflower as a cash crop

(i) Increased (ii) Declined (iii)Remained the same ()

D8. What can be done to improve sunflower production? (Give your opinions)

Appendix 2: Checklist Questions

Contribution of sunflower farming to wellbeing of small scale farmers

1. An overview/evolution of sunflower farming in the study area.
2. Contract farming.
3. Sunflower processing and marketing.
4. The role of your office in sunflower production.
5. Various important institution/organization in sunflower production.
6. Challenges faced by the farmers in sunflower.
7. Suggestions about sunflower farming?

Appendix 3: Focus Group Interview Guide

Thank you for giving your time and concur to meet with me. This work intends to collect information on contribution of sunflower farming to the wellbeing of small scale farmers. Your responses are valuable and necessary to this study. The information produced will be treated confidentially and will be used in report writing especially on how to improve sunflower farming.

1. When did sunflower production started in this area?
2. When did sunflower crop started to be grown as a cash crop in this area?
3. How contract farming is practiced in this area?
4. How is the market of sunflower crop in this area?
5. What are the common problems/ Challenges encountered in sunflower production?
6. How can sunflower production be improved to increase farmer's wellbeing?