

**THE ECONOMICS OF WAREHOUSE RECEIPT SYSTEM: A CASE OF
SMALLHOLDER COTTON PRODUCERS IN MASWA DISTRICT,
SHINYANGA-REGION**

**BY
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**A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE
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ABSTRACT

Producers in most developing countries lack the means to mitigate price risk, and this affect their income and ability to repay loans. Warehouse Receipt System facilitate development of simple mechanism by which producers, lenders and traders can secure a floor price by looking in a fixed future price. The general objective of this study was to assess the performance of WRS by describing the WRS operating in cotton sector, analyzing profitability of the WRS to cotton production, identifying challenges and constraints facing its key players and identifying factors contributing to the profitability differences among cotton farmers. Simple random sampling techniques were employed in selecting farmers. Descriptive and quantitative techniques were employed to meet the objectives of the study. Description of WRS seems to be the same as other places operating the system and three main key players were identified (farmers, warehouse operators and finance institutions). The roles of each key player relied on the Tanzania warehouse receipt regulations. It has been observed that, with presence of WRS, the profits to cotton farmers are able to increase. Insufficient information systems, poor knowledge about the system, unimproved infrastructure were among the challenges mentioned. It has also revealed that household size and cotton field size contribute to the differences in profit among cotton farmers. Basing on the results of this study, WRS should be adopted in other crops because, apart from credit facilities provision, it assists traders to pool financial resources, and form networks for consolidating cotton marketing; also the system will help farmers to organize themselves into AMCOs for the purpose of bulking and marketing cotton together.

DECLARATION

I, SHABAN KAPALA MILLAO do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is the result of my own original work and has neither been submitted nor being concurrently submitted for a degree award in any other institution.

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(MSc. Student)

Date

The declaration is confirmed.

Dr. Damas Philip

(Supervisor)

Date

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TABLE OF CONTENTS

ABSTRACT.....	ii
DECLARATION.....	iii
COPYRIGHT.....	iv
ACKNOWLEDGEMENT.....	v
DEDICATION.....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	xi
LIST OF FIGURES.....	xii
LIST OF APPENDICES.....	xiii
LIST OF ABBREVIATIONS AND ACRONYMS.....	xiv
CHAPTER ONE.....	1
1.0 INTRODUCTION.....	1
1.1 Background.....	1
1.1.1 Who are the Users?.....	2
1.1.2 The WRS in Tanzania.....	3
1.2 Problem Statement and Justification of the study.....	5
1.3 Objectives of the study.....	8
1.3.1 General objective.....	8
1.3.2 Specific objectives.....	9
1.4 Research hypothesis.....	9
1.5 Organization of the dissertation.....	9
CHAPTER TWO.....	10
2.0 LITERATURE REVIEW.....	10

2.1	Warehouse Receipt System.....	10
2.1.1	Overview.....	10
2.1.2	Meaning of WRS.....	10
2.1.3	Key players of WRS and their roles.....	11
2.1.4	Mode of payments under the WRS.....	15
2.1.5	Benefits of WRS.....	16
2.1.6	Key requirements to ensure a successful WRS.....	16
2.1.7	Preconditions for viability.....	18
2.2	Empirical Studies on WRS.....	20
2.2.1	Studies on profitability.....	20
2.2.2	Studies on constraints and challenges.....	21
2.2.3	Studies on successful functioning of WRS.....	21
2.3	Analytical Tools.....	22
2.3.1	Gross margin analysis.....	22
2.3.2	Multiple regression.....	22
	CHAPTER THREE.....	24
	3.0 METHODOLOGY.....	24
3.1	Overview.....	24
3.2	Conceptual/Analytical Framework.....	24
3.3	Study Area.....	27
3.4	Sampling Techniques and Sample Size.....	28
3.5	Data Collection.....	28
3.5.1	Primary data and Questionnaire administration.....	28
3.5.2	Research design.....	29
3.6	Data Analysis.....	29

3.6.1	Gross margin analysis.....	29
3.6.2	Multiple regression.....	30
CHAPTER FOUR.....		32
4.0	RESULTS AND DISCUSSION.....	32
4.1	Overview.....	32
4.2	Farmers' General Characteristics.....	32
4.2.1	Sampled farmers per ward.....	32
4.2.2	Sex of the farmer.....	32
4.2.3	Marital status.....	33
4.2.4	Age of the farmer.....	34
4.2.5	Farms ownership.....	35
4.2.6	Household composition.....	37
4.2.7	Production of other crops.....	38
4.3	Description of WRS as it Operates in Cotton Sector and the Role Played by Key Stakeholders.....	41
4.3.1	Description of WRS in cotton.....	41
4.3.2	The role of the Government to the operation of the system.....	42
4.3.3	The role of farmers/depositors in WRS.....	43
4.3.4	The role of warehouse operator.....	44
4.3.5	The role of financial institution.....	44
4.4	Problems Facing Cotton Production.....	44
4.5	Marketing of Cotton.....	45
4.6	Profitability of Cotton to Farmers.....	46
4.6.1	Profitability of WRS to cotton farmers.....	46
4.7	Contribution of Independent Variables to the Profit.....	47

4.8	WRS as a Means to the Access of Credit.....	52
4.9	Challenges and Constraints Facing WRS.....	54
	CHAPTER FIVE.....	56
5.0	CONCLUSION AND RECOMMENDATIONS.....	56
5.1	Conclusion.....	56
5.2	Recommendations.....	59
5.3	Areas for Future Research.....	60
	REFERENCES.....	61
	APPENDICES.....	67

LIST OF TABLES

Table 1:	Sex of the farmer.....	33
Table 2:	Marital status of the farmer.....	34
Table 3:	Age group of the farmer.....	35
Table 4:	Farms ownership.....	37
Table 5:	Household composition of farmers.....	38
Table 6:	Problems affecting cotton production.....	45
Table 7:	Profitability of WRS.....	47
Table 8:	Contribution of other variables to the profit.....	52
Table 9:	Challenges and constraints facing WRS.....	55

LIST OF FIGURES

Figure 1: Conceptual framework for analyzing the cotton Warehouse Receipt System.....26

Figure 2: (a) Area used to grow crops (b) Income accrued from grown crops..40

Figure 3: Description of the WRS operation in Shinyanga region.....42

LIST OF APPENDICES

Appendix 1: Questionnaire for cotton farmers.....	66
Appendix 2: Some output results.....	76

LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	-	Analysis of Variance
AMCOs	-	Agricultural Marketing Cooperatives
BC	-	Before Christ
CI	-	Confidence Interval
CP	-	Certificate of Pledge
CT	-	Certificate of Title
GMA	-	Gross Margin Analysis
MCM	-	Ministry of Cooperatives and Marketing
MDG	-	Millennium Development Goal
MFI	-	Micro Finance Institutions
NGOs	-	Non Governmental Organizations
NMB	-	National Micro-finance Bank
NRI	-	Natural Resource Institute
NSGRP	-	National Strategy for economic Growth and Reduction of Poverty
OLS	-	Ordinary Least Square
SACAs	-	Savings and Credit Associations
SACCOS	-	Savings and Credit Cooperative Societies
SPSS	-	Statistical Package for Social Sciences
TCB	-	Tanzania Cotton Board
TZS	-	Tanzania Shillings
VIF	-	Variance Inflation Factor
UK	-	United Kingdom

UN	-	United Nations
UNCTAD	-	United Nations Conference on Trade and Development
UNOPS	-	United Nations Office for Project Services
URT	-	United Republic of Tanzania
WCGA	-	Western Cotton Growing Areas
WIC	-	Warehouse Inventory and Credit
WR	-	Warehouse Receipt
WRS	-	Warehouse Receipt System

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Producers in most developing countries lack the means to mitigate price risk, and this affects their income and ability to repay loans. WRS facilitate development of simple mechanisms by which producers, lenders and traders can secure a floor price by locking in a fixed future price. Forward contracts and over-the-counter put options can be used for the purpose, but the former entails substantial performance risks. This is mainly because producers have strong incentives to renege on forward contracts if prices rise significantly above the fixed future price or they may simply fail to deliver according to the specification. Warehouse operators can mitigate such risks by guaranteeing delivery against forward contracts (Coulter and Onumah, 2002).

According to Coulter and Onumah (2002), grain warehouse receipts were first used in Mesopotamia in 2400 BC and the first form of paper money used in UK were negotiable silver WR (Budd, 2001) cited by Coulter and Onumah (2002). Port warehousing companies and freight forwarders have for long been involved in a relatively simple system, typically found in Africa, under which they offer warehouse without any regulatory authority. In recent years, the local subsidiaries of international inspection companies have increased their involvement, taking advantage of opportunities created by liberalization of African commodity trade (Coulter and Onumah, 2002).

The use of warehouse receipts makes the transfer of ownership between the seller and buyer easier and quicker, avoiding the need for physical reallocation of the commodity. The financial institutions, which accept warehouse receipts as collateral, are able to reach a higher level of liquidity of the pledge and gain the right to claim this collateral before other creditors.

Collateralized financing is quite new in Africa, and the most common model has been developed around local subsidiaries of international inspection companies (Onumah, 2002). The inspection company set up collateral management agreement involving banks, borrowers and collateral manager (*i.e.* the inspection company acting as a warehouse operator); which allow depositors to secure bank credit. The warehouse receipts are issued directly to the financing bank and not to the depositor, they are non-negotiable and non-transferable. This model rests on the credibility of the collateral manager, which is the inspection company acting as a warehouse operator. This model set out the essential guidelines and critical conditions for its success.

USAID defined a warehouse receipts system as a way to securitize a crop, and defer immediate sale, so that a farmer or small processor can realize a higher price later. It is not used to finance inputs – crop is already harvested.

1.1.1 Who are the Users?

Warehouse Receipts Systems (WRS) were generally perceived as a means of improving access to credit, hence the descriptive title "inventory credit system". However, following the pilot, and in part due to the outcome from it and other WRS

pilots, the role of the system is increasingly being seen as an essential institutional component in programmes to modernise and improve the efficiency of agricultural marketing systems. There is growing recognition of its importance in ensuring that smallholder farmers can participate in and benefit from the development of modern and efficient agricultural marketing systems RIU (2008).

1.1.2 The WRS in Tanzania

The WRS in Tanzania was introduced as a direct outcome of two related projects that are implemented together under the Ministry of Industry, Trade and Marketing: a) the Coffee Marketing Development and Trade Promotion; and b) Improvement of Cotton Marketing and Trade System in Eastern and Southern Africa. The inauguration workshop for the two projects was done in September 2000 in Arusha and the project activities started immediately. The project agreements that were signed between the Ministry of Agriculture and Cooperatives and the United Nations Office for Project Services (UNOPS) agreed to implement the warehouse receipt system in Tanzania as a pilot country and use two main cash crops (coffee and cotton) as pilot crops for a period of 36 months. Since the cotton WRS pilot begun in Tanzania in 2001/02, the major depositor has been one farmer cooperative, the Oridoyi Rural Cooperative Society which is in Manyara region, showed the increase in the deliveries from 103 273 kg in 2002/03 to 1 200 000 kg in 2005/06 (NRI, 2006).

According to Oridoyi Primary Society report of 2006, despite ginning with dilapidated gin stands, which caused many delays, the group remained committed to the WRS. Following consultations by the Project Team, the Ministry of Cooperative

and Marketing (MCM) provided funds for procuring four new ginning stands which were installed in October 2005. As a result ginning efficiency has improved dramatically, reducing ginning time to 3 months from 12 months (NRI, 2006). The group is expected to make substantial savings in terms of loan servicing costs. The quality of the lint has also improved. The group was able to market their lint directly to a UK-based merchant, with transaction assistance from a locally-based broker. The group receives inventory finance from CRDB bank.

In June 2006, coffee farmers were accessing millions of TZS from Bank Finance under the WRS. According to the Project report 2005, there were over 50 coffee farmer groups using the WRS. Since 2002, the amount of coffee parchment deposited under the WRS has been increasing from 8 269 507 kg in 2002/03 to 12 022 717 kg in 2005/06.

The success of this project in those pilot crops led on to the development of the WRS Act in Tanzania. The Tanzania Agricultural Commodity Warehouse Receipt System operates under the Warehouse Receipt Act No. 10 of 2005. Under this system commodity banks are now accepting agricultural commodities as collateral for accessing credit. The Tanzania Warehouse Licensing Board (TWLB), established under Section 4 of the Act, is vested with the responsibility to promote establishment, operation and management of WR and commodity exchange markets. The WR Act No. 10 of 2005 was first gazetted on 14th Jan 2005 (URT, 2005) and assented by the President of URT in June 2005. The Act introduces and governs the commodity Warehouse Receipt System in order to facilitate participation of smallholder products in agricultural commodities trade, accessibility to bank credits

and reduction of post harvest losses. Thus, the WRS is a sustainable mechanism for ensuring increase in agricultural production, availability of good quality commodities and financial services and hence, improving agricultural commodity marketing.

The WRS has also been introduced in cotton growing regions of Tanzania and proved to be successful because it has removed middlemen from the marketing system who appeared to add little value to the value chain. Moreover, the WRS has increased the amount farmers are paid for their crops. According to the statement made by Prime Minister of URT, the system proved to be a success in Mtwara region and the Government of Tanzania is insisting the use of the system in other crops and regions (Mwandishi wetu, 2008). The WRS in cotton is financed by the NMB with a guarantee from the Government.

1.2 Problem Statement and Justification of the study

Shinyanga region is the best cotton grower in Tanzania and it is among the Western Cotton Growing Areas (WCGA); others are Mwanza, Mara, Kagera, Tabora, Kigoma and Singida. According to the data obtained from TCB, the region produces about 60% of the total production of the country in the last ten years. There are several problems which face cotton producers in the country; one of the main problems is increasing cost of production. Over the years the costs of production to farmers has been increasing at a rate that is higher than the increase in selling price. And this low price has caused the cotton productivity to be low despite its importance to the economy of the country at large.

Low productivity among smallholders in Tanzania is said to be a result of poor farming techniques (*ceteris paribus*). The general feeling is that credit facilities are paramount in improving smallholders' productivity (Kashuliza and Kiddy, 1996). Various factors have been identified that led to the shortage of rural financial services in Tanzania, including the financial sector reforms (1990s) that encouraged urban concentration for both public and private financial institutions. On the other hand, semi-formal and formal rural financial institutions have had a limited outreach due to shortage of capital funds, experienced staffs, and low participatory level of local communities (Due, 1993).

Transaction costs in rural trade are high because of the costs of assembling produce, and uncertainty about the quantity and quality attributes of goods being exchanged; the result of the absence of effective systems of standards and measures, buyers have limited information about inventories held by rural producers and smallholders lack access to price information from local or original markets, and are often unable to process complex price-sensitive information when it is available. Formal contract enforcement mechanisms are also weak (Coulter and Onumah, 2002).

WRS emerged out of a growing concern regarding a perceived power imbalance between poor rural cotton farmers and buyers and exporters of cotton and that there was widespread exploitation of farmers in the sector apparently involving misinformation to farmers about prices, global demand and quality as a method of forcing down prices, fraud in weighing cotton. The presence of WRS allows farmers and traders to form groups which will give them power in negotiations of prices and transporting products in bulky can reduce costs.

Insurance markets are virtually non-existent in rural areas (Beyon, *et al.*, 1992); leaving smallholders facing substantial price variability with little or no access to risk management instruments. This situation increases the credit risk of rural borrowers in an economy where the traditional screening devices adapted by banks are ineffective because most transactions are informal. Valuation and foreclosure difficulties also make it difficult for rural borrowers to provide assets acceptable to formal lenders as suitable collateral (Goodland *et al.*, 1999). Traditional commercial banks typically have no interest in lending to poor rural households because they lack viable collaterals and because transactions costs associated with small loans are high, innovative credit delivery systems which minimize the risks of default payments are being promoted as a more efficient way of improving rural households' access to formal credit with no or with minimal government involvement (Chijoriga and Cassimon, 1999).

In Shinyanga region, the WRS is not well introduced but some business people have introduced this system in Maswa, Meatu and Kishapu districts and there are only four Agricultural Marketing Cooperatives which operate the WRS. The AMCOs are in Seng'wa and Ipililo all are in Maswa, Witamhilya in Meatu district and Mwamadilanha in Kishapu.

WRS is new system to cotton producers in Shinyanga and even its operation is not well adopted. Producers in Shinyanga are not well informed about the benefits accrued using WRS but politicians are insisting the use of the system without detailed survey. The system was first introduced under trial to cotton producers in Manyara region and the Oridoyi cooperative society was selected to operate the

WRS. And according to their report there was an increase in volume of production from 103 273 kg in 2002/03 to 781 211 kg in 2005/06 after the introduction of WRS and due to this positive result some farmers have accepted the system but others are still relying in their traditional system of selling to traders.

Farmers and other key players face a stuck on knowing if cotton under WRS is economically worthwhile or not, because the farm gate price depends on the world market price. The profitability of cotton with and without WRS needs to be analyzed since there has been no study which tried to estimate the benefit/profitability of cotton production under the WRS.

The aim of this study is to assess the performance of the WRS using a cotton sector as a case study in Maswa district by describing the WRS operating in Shinyanga and scrutinizing the profitability of the system to farmers and what are the challenges and constraints facing the operation of the system.

The findings from this study will contribute to the body of knowledge regarding the WRS and its potential benefits to cotton producers. The study will also provide guidelines to planners and policy makers with regard to services provision to WRS players.

1.3 Objectives of the study

1.3.1 General objective

The main objective of the present study is to assess the performance of Warehouse Receipt System in Maswa district.

1.3.2 Specific objectives

- (i) To describe the WRS operating in cotton sector by identifying the role played by each player in Maswa district,
- (ii) To analyse the profitability of the WRS to cotton producers in Maswa district,
- (iii) To identify factors contributing to the profitability differences among cotton farmers in Maswa district.
- (iv) To identify challenges and constraints facing the players of the WRS in Maswa district,

1.4 Research hypothesis

WRS has a negative influence on profit of cotton. This is by looking on the factors contributing to the profitability, access to credit to WRS operators, areas cultivated and costs involved in production.

1.5 Organization of the dissertation

The study is organized into five chapters. The first chapter gives a general background of the study where among other things; it presents the problem statement, study objectives and hypothesis. The second chapter gives a critical review of the literature relevant to the study, while the third chapter gives a detailed description of the methodology employed for this study. The fourth chapter presents results and discussion and the last chapter provides the conclusions and recommendations of the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Warehouse Receipt System

2.1.1 Overview

Most smallholder farmers need cash immediately after harvest to prepare for the next crop. This necessitates immediate sale of the new crop since the situation of nearly every farmer is the same. The new crop floods the local market shortly after harvest dropping the price. As the result, most smallholder farmers have no choice but to sell into the poorest market (WIC project, 2005).

The use of a warehouse receipt allows a farmer to deposit his crop in a warehouse and to meet his short term need for cash by borrowing from a bank or other lending institution. This allows the farmer to avoid selling his crop immediately at harvest when the supply of the commodity is usually highest and therefore prices lowest (WIC project, 2005).

2.1.2 Meaning of WRS

Warehouse receipts (WR) are documents issued by warehouse operators as evidence that depositors have deposited specified commodities of stated quantity and quality, at particular location by named depositor (Coulter and Onumah, 2002).

In WRS, the small farmers are assured of the market, input, credits, and price of the commodities as prices, quality and volumes to be purchased are negotiated in advance of planting period (Onumah, 2002). And according to free online law dictionary, a warehouse receipt is a written document given by a warehouseman for

items received for storage in his or her warehouse, which serves as evidence of title to the stored goods.

The general rule is that warehouse receipts need not be in any particular form. They must, however, contain the following information: the location of the warehouse and the place where the goods are stored; the date when the receipt was issued; the consecutive number of the receipts; terms indicating whether the goods are to be delivered to the bearer of the receipt, to a particular individual, or to a particular individual on his or her order; the storage rate or handling charges; a statement describing the goods or the manner in which they are packed; the signature of the warehouseman or his or her agent; the amount of advance payment made, if any; and any other terms that do not impair the warehouseman's duty. In situations where a warehouse receipt does not contain these provisions, the warehouseman can be held liable in damages to anyone who sustains financial injury because of the omission.

2.1.3 Key players of WRS and their roles

The WRS has three main players, which are the depositor, warehouse operator and the finance institution (Kwadjo, 2000). In order for these players to work properly, the Government must make sure that the working environment to be of good quality by preparing good policies and other regulations.

The depositor may be a producer, farmer group, trader, exporter, processor or indeed any individual or body corporate. The warehouse operator holds the stored commodity by way of safe custody; implying he is legally liable to make good any value lost through theft or damage by fire and other catastrophes but has no legal or

beneficial interest in it (Onumah, 2002). The receipts may be transferable, allowing transfer to a new holder - a lender (where the stored commodity is pledged as security for a loan) or trade counter-party - which entitles the holder to take delivery of the commodity upon presentation of the WR at the warehouse.

According to Tanzania Warehouse Act No 10 of 2005, a warehouse operator is “any person engaged in the business of operating a warehouse for receiving, storing, shipping or handling of commodities for compensation”. This includes both agents and employees “whose actual or apparent authority renders such person to exercise rights or become liable under the Act”.

For the warehouse receipt system to perform properly, collateral management of the commodity is a must (WIC project, 2005). In Tanzania, the Warehouse Receipt Act requires the involvement of Warehouse Operators to provide collateral management (on a fee-for-service basis) in conjunction with their storage and other business operations. This approach enables small and medium sized farmers and traders to benefit from this new window of trade financing.

According to WR Act, a licensed warehouse operator must:

- (a) Receive a commodity for storage, shipment, conditioning, or handling, without discrimination, so far as the capacity and facilities of the warehouse will permit.
- (b) Issue an advice statement on obtaining a loan or selling the commodity to the commodity depositor, immediately after issuing the warehouse receipt.

- (c) Unless stated otherwise, a licensed warehouse operator must store separately the commodity covered by each receipt.
- (d) Follow the rules of the Tanzanian Warehouse Licensing Board (TWLB) and those requirements that cover stacking and storage of commodities.
- (e) Keep in a conspicuous place in the warehouse operations office the approved schedule of charges for services.
- (f) Ensure that the grade of the commodity received conforms to established official standards adopted by the regulatory body.
- (g) Preserve the identity of the commodity in a stack or special bin or otherwise. The identifying mark of an identity preserved commodity shall appear on the face of the stack.
- (h) Ensure that delivery is made at the warehouse or station where the commodity was received unless otherwise agreed to in writing.
- (i) Ensure that delivery is made on demand to the depositor after all payments have been made and all required documents submitted.
- (j) Keep complete and accurate records and accounts of all transactions pertaining to all commodities received and withdrawn in a safe place.
- (k) Ensure that records and accounts are kept in numerical sequence, separate and distinct from records and accounts of any other business.

Financial institutions are key players in the implementation of the WRS in Tanzania. The main purpose for the WRS is to enable Commercial Banks, Community and Regional Banks, Savings and Credit Cooperative Societies, Rural Financial Support NGOs, Farmer's Organizations, Primary co-operative societies, Co-operative unions

and Private traders to participate in the business of agricultural commodity marketing with minimum fear of loss:

The Tanzania Warehouse Receipt Act No 10 of 2005 provides the following protection to lenders:

- (a) A requirement for the warehouses and the stored goods to be insured against fire and other risks and that all insurance policies shall ensure banks have a first right of recovery in case of loss.
- (b) A requirement for the warehouse operators to execute a performance guarantee on the operationalization of the warehouse receipt system.
- (c) A requirement on the quality assurance of the goods/commodities stored in the licensed warehouses.
- (d) A requirement for warehouse operators to provide access to information for lenders on deposited goods as and when required by the lender
- (e) A Recognition of agreements entered into between a depositor and a lender on the goods kept in the warehouse.

According to WIC project, obligations of Lenders include providing special attention in the commodity to be financed, the warehouse operator and the borrower. The lender must also provide guidance and occasional training on preparing financial statements and financial records to the borrower at early stages of the business. They should also provide training to their responsible officials on loan opportunities created by the WRS.

2.1.4 Mode of payments under the WRS

According to Kwadjo (2000), there are two modes of payment in warehouse receipt system. The first mode of payment is when the farmer identifies a warehouse and takes his/her goods to the warehouse for deposit. The warehouse operator grades and classifies the goods and gives a receipt for storage of said goods to the farmer. The farmer then takes the receipt to the MFI and, based on projections of the goods' market value, the MFI gives the farmer a loan. The loan is extremely flexible as it allows the farmer to spend it to finance expansion activities, pay off debts, or use it for any other reason. When the goods at the warehouse are sold then, the loan is instantly recovered. Second mode of payment is when the farmer takes his/her goods to the warehouse whereby the warehouse pays cash directly to the farmer. Then, the farmer is still allowed to take the receipt to the Financial Institution for accessing agricultural input credit for the subsequent season. Another mode of payment studied by Coulter and Poulton (2001) is the pre-payment financing. This modality is structured as a purchase of goods with payment made in advance. It allows the buyer ("off taker") to raise a loan from a bank and use it to effect pre-payment to the farmer basing on the previous season's price. When the commodity is exported, the additional payments are made to farmers provided the export price (world market price) exceeds the first payment made to farmers.

In Tanzania the system uses a combination of the modalities where farmers deposit products and uses receipts to acquire loan from the financial institutions and when the products are sold then they receive the second payments depending on the world market price. If the price is higher than the farm gate price then they will receive the difference minus costs.

2.1.5 Benefits of WRS

According to Bass and Hunderson (2000), the benefits from WRS can be explained into two sides, for the MFIs and for depositors (Farmers and traders). For the MFIs, the benefits are decreased risk; reduced seasonal price variability and higher level of liquidity: And for the depositors the benefits include improved farm income and smooth domestic prices, mobilization of credit to agriculture, can create cash and forward markets and hence price discovery and competition, provide a way to gradually reduce the role of government in agricultural commercialization and combined with price hedging instruments to predetermine the cost of future purchase. A further benefits of WRS, is that it offers stable prices, linking the small farm sector to sources of extension advice, mechanization, seeds, fertilizer and credit, and to guaranteed and profitable markets for produce. Thus efficiently organized and managed WRS, reduces risk and uncertainty for both parties (Onumah, 2002). He continued by saying that the prospective benefits of this system, include facilitating trade, enhancing market efficiency, easing access to rural finance, mitigating price risks, and enabling cost-effective management of public food reserves.

2.1.6 Key requirements to ensure a successful WRS

According to Bass and Henderson (2000), implementing a successful warehouse receipt program can be done easily if a few key factors are in place. These are lessons learned from the experience of MFIs in Ghana, South Africa, and other African countries.

- (a) **Build discipline and trust in the warehouse:** If the warehouse operator is trustworthy, MFIs can rely on the receipt with confidence as loan collateral. Trust in the warehouse also provides the entrepreneur with a sense of security.
- (b) **Operate on a large scale:** The cost of warehouse receipt administration and oversight decreases with scale. The more warehouses available, the lower the cost of monitoring the system.
- (c) **Understand that appropriate product pricing is critical for the MFI:** On average, the cost a farmer is expected to carry - that is, the interest on the loan plus warehouse storage fees - typically averages around 25% of estimated total profits at the beginning of the harvest season. This is a very high percentage for MFIs to pass on to their customers. MFIs do need to charge what is necessary to cover their costs, but successful MFIs will look for ways to cut costs. One way is to work in a region where there are already established and trustworthy warehouses. Warehouse oversight and management are extremely costly and almost never sustainable when the MFI manages the process.
- (d) **Advocate for appropriate regulation and supervision of the sector:** Regulation is critical to the success of warehouse receipts, and government must be committed to finding the correct balance of regulatory oversight. There are two main approaches to regulation: the minimalist approach, which involves low regulatory oversight, and the maximum approach, which involves high regulatory oversight.

The minimalist approach allows banks to individually screen and oversee warehouse operators without government oversight. It is typically an efficient process, but it usually works when there are large clients in ports or other urban areas. Because of the high cost of maintaining and overseeing this system, MFIs cannot sustain the system. Very rarely does this system reach into rural areas.

The maximum approach advocates for national government oversight to oversee warehouses and institute a national grading system. This system takes the oversight burden off the MFI and often allows for the spread of inventory credit into rural areas. This system, however, needs an efficient and non-corrupt governing body to provide appropriate oversight.

2.1.7 Preconditions for viability

According to Richard and Valangis (1996), in order for a WRS to be viable, the economy within which it operates must meet certain conditions: The legal system must support pledge instruments, such as warehouse receipts, as secure collateral. The pertinent legislation must meet several conditions:

- (a) Warehouse receipts must be functionally equivalent to stored commodities;
- (b) The rights, liabilities, and duties of each party to a warehouse receipt (for example a farmer, a bank, or a warehouseman) must be clearly defined;
- (c) Warehouse receipts must be freely transferable by delivery and endorsement;

- (d) The holder of a warehouse receipt must be first in line to receive the stored goods or their fungible equivalent on liquidation or default of the warehouse;
- (e) The prospective recipient of a warehouse receipt should be able to determine, before acceptance, if there is a competing claim on the collateral underlying the receipt. The lack of an appropriate legal environment is probably the single most important constraint on the creation and acceptance of warehouse receipts in many developing countries and in most countries in transition.

Operational conditions must be conducive to the creation of a warehouse receipt system and include the following:

- (a) Reliable warehouse certification, guaranteeing basic physical and financial standards;
- (b) The existence of independent determination and verification of the quantity and the quality of stored commodities, based on a national grading system (with inspection of warehouses and stored commodities performed, in most cases, by the private sector under license from a government body-for agricultural goods, usually the ministry of agriculture); and
- (c) The availability of property and casualty insurance.

The integrity of the system must be assured through performance guarantees. A key prerequisite for the acceptability of warehouse receipts by the trade and by banks is the existence of a performance guarantee for warehouses, assuring that the quantities of goods stored match those specified by the warehouse receipt and that their quality

is the same as, or better than, that stated on the receipt. Without this guarantee, farmers and traders will be reluctant to store their crops, and banks will be hesitant to accept warehouse receipts as secure collateral for financing agricultural inventories.

2.2 Empirical Studies on WRS

2.2.1 Studies on profitability

Warehouse receipt financing can be profitable for both MFIs and farmers. Experience has shown that MFIs can enjoy a high repayment rate on warehouse receipt loans. Farmers can increase their possible selling price by as much as 230%, in some cases. That is a sizable impact in light of the risks involved in agricultural microenterprises (Bass and Henderson, 2000). But experience has shown that a program can be too successful. Although this sounds counterintuitive, Techno Serve Ghana has been so successful in its inventory credit program that other institutions, including the Ghanaian government, have reentered the market.

Very few studies have been done on WRS especially in Tanzania. One of them is the study by Mukwenda (2005) on Potential for using WRS for financing maize marketing. The study revealed that profitability under WRS financing is not the same for all crops, it depends on the crop type and size of the farm or enterprise. Gross margin calculated per hectare was highest to coffee followed by cotton and lastly maize. Another study that was done by UNCTAD (2004) on improving the trade poverty relationship through national development strategies in Mozambique, using descriptive statistics they revealed that, profitability in the cashew industry

through WRS relies heavily on the quality of the final product (*i.e.* grade A, for raw cashews). To achieve this, requires improving the input procurement process by identifying big cashew enterprise areas; improving access to credit/loan provision facilities; adequate training on the WRS to all cashew stakeholders.

However the present study adopted the tool of gross margin but with modifications. The study uses with/without situation in calculated gross margin per acre and not per hectare and paired t-test was used to test whether there is significant difference in the profitability among two situations. The confidence limits were used in 95% Confidence Interval (CI).

2.2.2 Studies on constraints and challenges

A study which was done by Rich (2007) on rural speed warehouse receipt using descriptive statistics revealed that, financing agricultural marketing is possible and prudent but there are some prerequisites such as; a need for it, adequate production volumes by smallholder farmers to cover fixed collateral management costs, sound warehouse facilities, reliable market to off take the commodity, trusted organization to operate with producer confidence, and efficient banking to discount receipts. All these prerequisites, the author concluded as challenges and constraints toward financing agricultural marketing. This study also used descriptive statistics to identify challenges and constraints facing the WRS in Shinyanga.

2.2.3 Studies on successful functioning of WRS

According to a study by Sanjay (2008) on modernizing spot markets through a robust WRS in India, for WRS to be successful it is preferable first to propose a

Warehouse Receipt Act that enables establishment of a negotiable WRS for all commodities. The Act lays down the requirements for WRS to become valid instruments. On the other hand, the Act makes warehouse receipts a proper tool of trade and facilitates finance against it throughout the country. The Act also allows banks to improve the quality of their lending portfolio and enhance lending with respect to goods deposited in warehouses. This study used the descriptive statistics to scrutinize challenges and constraints facing WRS in Shinyanga.

2.3 Analytical Tools

2.3.1 Gross margin analysis

GMA was used to determine the profitability of the WRS to small scale cotton producers in two situations, the situations with and without WRS. The tool has been used by many researchers; one of them is Mukwenda, (2005), who applied the tool to measure the profitability of the WRS for cotton, coffee and maize. The system observed to be more profitable to coffee followed by cotton and lastly was maize (Mukwenda, 2005). Therefore this study adopted the tool to look for the profitability of WRS to cotton farmers. In this research there was an extension of the results from gross margin where, the gross margin with WRS was compared to gross margin without WRS and the paired t-test was used to compare the means of profits from situations with and without WRS.

2.3.2 Multiple regression

Multiple regression model was used to determine the contribution of independent variables to the dependent variables. The independent variables were household size, size of cotton field, education level and size of other grown crops. The tool is mostly

used in estimating the relationship between variables in the model. Mukwenda (2005) applied the tool in looking for the factors contributing to demand for loan at farm level. This study was adopted the tool in scrutinizing the contribution of education level, size of cotton field, size of other crops grown and household size to the profit of cotton.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Overview

This chapter describes the methodology that has been used in conducting the study. It is divided into four sections; section one presents the conceptual framework of the study, section two describes location of the study, while section three presents the types and sources of data. The final section presents various analytical methods that have been employed in the present study.

3.2 Conceptual/Analytical Framework

A conceptual or analytical framework of WRS's performance is essential as guidelines for identifying important variables and for effective and efficient data collection, to be identified. According to Scarborough and Kydd (1992), cited by Ashimogo (1995), such frameworks should help to indicate the most useful areas in which to focus limited research resources, and ensure that data collected is relevant to the objectives of the research. To meet the information needs of the study objectives and identify the variables for data collection, a conceptual framework for selecting variables in cotton was developed (Fig.1).

Access to production technology in terms of fertilizer, improved seeds, pesticides and credit facilities will determine the usage of various factors of production and marketing. Access to credit facilities may also ease off rural household capital constraint (Ashimogo, 1995). In order to access credits individual households have to incur some transaction costs.

Transaction costs in credit delivery can be conceptualized as non- financial costs incurred by borrowers during pre-loan disbursement, loan disbursement, and post loan disbursement activities. Transaction costs for borrowers may includes costs associated with screening potential group members, group formation, agreeing on formal or informal group rules, negotiating with lender, filling out necessary paper work, transport to and from the lender, time spent on group activities relating to attaining access to credit and enforcing group rules.

Farmers and traders can access credit from financial/credit institutions through their traders associations, farmers groups or primary cooperative societies financed by WRS. The credits are invested in either farm activities or crop trading activities where improved technologies can be obtained. Credits act as input (capital) where the improved technologies do improve farm productivity and access to market and expands the working capital for traders. The improved farm productivity, access to market and expanded working capital would results into obtaining of high profit margin hence high income.

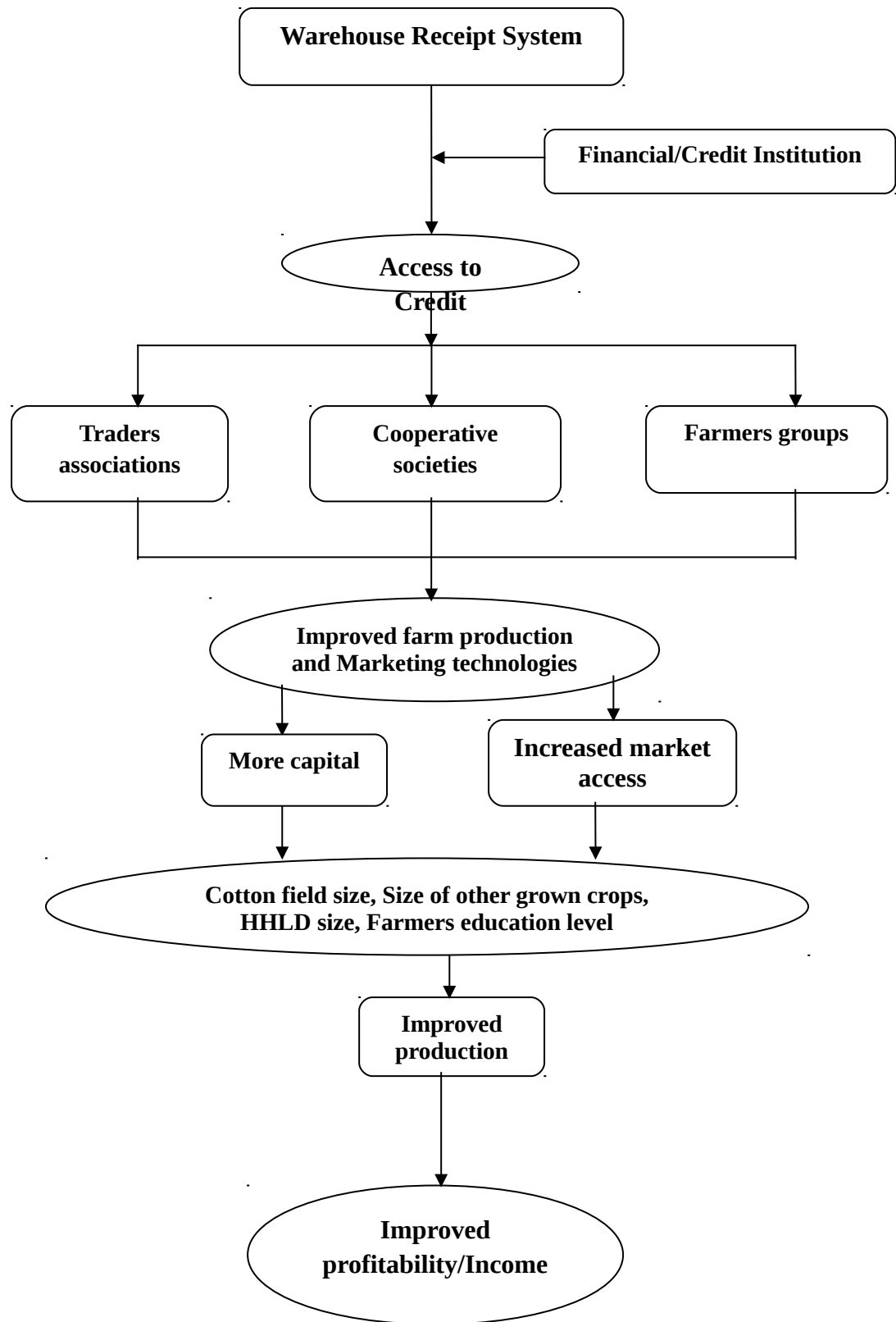


Figure 1: Conceptual framework for analyzing the cotton Warehouse Receipt System

3.3 Study Area

The present study was conducted in Masela and Ipililo wards in Maswa district in Shinyanga region. These wards were selected for the study because they are the only wards that operate WRS to cotton farmers in the district. Maswa is one of the eight districts of Shinyanga Region; others are Kahama, Bariadi, Meatu, Kishapu, Shinyanga rural, Shinyanga urban and Bukombe. It shares borders with Meatu district to the east, Bariadi district to the north and north-west. South and south-west is bordered with Kishapu district and to the west is bordered with Kwimba district in Mwanza region. The district covers an area of about 3398 km² of which 2375 km² is arable land, 177km² is forest, and the rest is mountains and covered with stunted shrubs and bushes. Deforestation accompanied by soil erosion is causing environmental degradation problems.

Maswa district lies between latitudes 2.45° and 3.15° south of the equator and longitudes 33.0° and 34.7° east of the Greenwich. Altitude is about 1200–1300 m above sea level and rainfall between 450 and 1000 mm per year. The district is semi-arid and has a unimodal rainfall pattern starting in October and ends in May. The district is divided into three administrative divisions with 18 wards and 99 villages. The 2002 census registered 304 402 people and a growth rate of 2.3% per year. But due to increase in economic activities and other factors the growth rate has increased to 3.4% and that has led to an estimation of 386 198 people in the year 2008, this is according to Maswa district profile. Most of the people belong to the Sukuma tribe. Agriculture and livestock keeping are the main occupations. The main food crops are sorghum, maize, rice, sweet potatoes and groundnuts, with smaller amounts of millet, cowpeas and cassava. Cotton and rice are the major cash crops. The total

bovine population is about 400 000 livestock units with a growth rate of 2.5%. The capital reserve of the rural population is in general stored as cattle.

3.4 Sampling Techniques and Sample Size

The first stage was to select wards and two wards, Masela and Ipililo were selected because they are the only wards operating the warehouse receipt system in the district. The second stage was to select respondents from each of the wards and the list was obtained from Seng'wa and Ipililo AMCOs. But since there were few members participating in WRS then all available members were interviewed. A size of 74 farmers was obtained for interview, 38 from Ipililo and 36 from Masela.

3.5 Data Collection

3.5.1 Primary data and Questionnaire administration

A structured questionnaire was used to collect data from the farmers (Appendix 1). The questionnaire was meant to obtain information on quantitative data on farmers. It was pre-coded and had five sections. The first section was meant to capture general characteristics of farmers. Section two was aimed at collecting information about cotton production; section three was designed to capture information about marketing of cotton. Section four was collecting information about credit availability and the last section was prepared purposely for collecting information about producer associations and extension services availability. The structured questionnaire was administered to farmers with the help from three enumerators and the interview was conducted in December 2008 and January 2009.

3.5.2 Research design

The present study is cross-sectional. In such studies data are collected at a single point in time using survey methods and data used in descriptive analysis and for determination of relationships between variables (Bailey, 1998). The design is systematic, economical and provides relevant information to address research objectives because it employs well-thought instrument for data collection (Kothari, 1990). This minimizes bias and maximizes the reliability of the data and make manipulation of data and information easy.

3.6 Data Analysis

Data were analyzed using Statistical Package for Social Science (SPSS). Objective number (i) involves description of the WRS operation in Maswa therefore there was no analysis to be involved.

3.6.1 Gross margin analysis

Objective number (ii) was addressed by using the gross margin. GM was used as a proxy for the profit obtained by farmers who participate and those who don't participate in the WRS and followed by paired t-test (single – tailed test) to see the influence of the WRS on profitability of cotton.

The formula used was;-

$$GM = TR - TVC$$

Where;

GM = Gross margin obtained from cotton sales per acre (with and without the WRS)

TR = Total revenue obtained from cotton sales per acre (with and without the WRS)

TVC = Total Variable Costs of producing cotton per acre.

Paired t-test was also used to calculate the significance of the profits but since it shows the significant only without showing the magnitude of the effect then eta-squared has been adopted to look for the effect size of the impact of change. And the 95% confidence limit was used.

3.6.2 Multiple regression

Multiple linear regression models were used to test the contribution of independent variables in explaining the dependent variable. In this model Profit from cotton was used as the dependent variable and independent variables were education level of the farmer, household size, cotton field size and area size of other grown crops.

The model was as follows:

$$\pi = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Π = Profit of cotton

β = Coefficients

X_1, X_2, X_3 and X_4 are Independent variables

ε is error term

And β_0 is intercept.

In estimating linear and non-linear regression models, Ordinary Least Squares (OLS) estimation technique is commonly used. This technique is appropriate for single equation models (Gujarati, 1995). According to Mukras (1993), Ordinary Least Squares Estimate method makes use of the Least Square criterion that has two

main parts. The first part of criterion requires that the regression line be drawn through the scatter of sample observation such that the positive and negative deviation of observations cancels out.

On the other hand, the second criterion requires the sum of squares of the deviations of the sample observations be minimized. The OLS estimation technique is simple to use, eloquent and gives the best estimator and it does not require the knowledge of the probability distribution of the underlying population being studied. Of all estimation rules, Ordinary Least Squares leads to best linear unbiased estimator and hence its popularity in applied econometrics (Gujarati, 1995).

According to Mukras (1993), there are three limitation of using OLS in estimating econometric models;

- Parameter estimates of econometric models estimated by OLS are generally biased.
- Variances of the parameter estimates of non-linear model cannot be obtained easily and the estimates do not have well behaved statistical properties that led themselves to statistical theory.
- The sampling distributions of the parameter estimates are in most cases unknown; hence testing of the parameter is not possible.

Objective number (iii) and (iv) were tested using descriptive analysis. This analysis was mainly exploratory, whereby means, range, standard deviation and percentages were estimated.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents results and discussion. It is divided into seven main sections where the first section discusses the farmers' characteristics in the study area and the second section provides a brief discussion about the WRS as it operates in the study area. Section three presents a detailed discussion about the problems facing cotton farmers; section four presents the discussion on the marketing of cotton; section five presents discussion about the profitability of cotton with and without WRS in the surveyed district; and section six provides information related to WRS as a means to access credit and section seven provides information related to challenges and constraints facing the WRS in the study area.

4.2 Farmers' General Characteristics

4.2.1 Sampled farmers per ward

Farmers were interviewed from two wards (Masela and Ipililo) located in Maswa district in Shinyanga region. 36 respondents were from Masela and 38 from Ipililo wards. The reason of selecting 36 and 38 from Masela and Ipililo wards respectively is due to their availability and their participation in WRS. There are very few farmers participating in WRS and this study tried to contact all farmers.

4.2.2 Sex of the farmer

The results (Table 1) show that there were more male than female cotton farmers in the study area. Ward-wise, Masela had the larger proportion of males (86.1%) than Ipililo (55.3%). The large number of male respondents is due to the fact that Sukuma

people are more of the patriarchy system and most of the economic activities that earn more money are owned by male. This reiterates findings from other studies which show that women in Africa operate low return enterprises, which are also less risky, often located at, or near, their homes (Gachira, 1998; Griffith *et al.*, 1999). Therefore since cotton has high return and farms are very far from home places then most of the farms are owned by men. The enterprises have to be at home or nearby to allow women to perform their household roles. Participation of female is high in Ipililo (44.7%) compared to Masela which is (13.9%) and this is due to the fact that Ipililo is more urbanized than Masela ward. The participation of female seems to be high in suburban to urban areas than rural areas. This is because in most of urban areas females have more access to associations that empower them economically and morally.

Table 1: Sex of the farmer

Gender	Ipililo		Masela		Total	
	N	%	N	%	N	%
Male	21	55.3	31	86.1	52	70.3
Female	17	44.7	5	13.9	22	29.7
Total	38	100.0	36	100.0	74	100.0

4.2.3 Marital status

Survey findings (Table 2) reveal that a large proportion of sampled farmers were married. Percentage wise, 89.2% of the sampled farmers were married, 5.4% single, 4.1% widowed and 1.4% was divorced. The proportions of married sampled farmers in wards were 88.9% in Masela and 89.5% in Ipililo. This means that most of the farmers have stable families and consequently, their involvement in farm activities is high. Furthermore, the findings show that Ipililo ward had 2.6% divorced farmers

compared to 0% in Masela ward. The same findings have been reported by Elias (2003) who found a high percentage of divorces in urban areas than rural areas.

The findings also show that the percentage of widow is high in Masela ward (8.3%) compared to Ipililo (0%). This implies that Masela which is less urban than Ipililo can have insufficient health services than Ipililo ward and hence can contribute to high number of deaths.

Table 2: Marital status of the farmer

Marital status	Ipililo		Masela		Total	
	N	%	N	%	N	%
Single	3	7.9	1	2.8	4	5.4
Married	34	89.5	32	88.9	66	89.2
Divorced	1	2.6	0	0.0	1	1.4
Widow	0	0.0	3	8.3	3	4.1
Total	38	100.0	36	100.0	74	100.0

4.2.4 Age of the farmer

The findings from survey (Table 3) show that the majority of the farmers' age in the study area was ranging from 28 to 57 years and this can be due to family responsibilities. More than half of the sampled farmers' age ranges from 28 to 47 years which comprise of 66.2%. The findings also show that only 4.1% of the farmers' age range from 18 to 27 years which is the young active group. The proportions of age category in wards show that, age group of 18 to 27 years in Masela is 2.8% and that of Ipililo is 5.3% and the rest are of the age above 27 years, which is 94.7% for Ipililo and 97.2% from Masela wards. Low participation of young group can be caused by negligence of young group to participate in agricultural activities as it does not have high pay, emigration to town to look for

highly paying activities and the presence of mining companies in Shinyanga region. This result is supported by Smith (2000), who found that, the younger household members tend to migrate in search of income earning opportunities.

Table 3: Age group of the farmer

Age group	Ipililo		Masela		Total	
	N	%	N	%	N	%
18-27	2	5.3	1	2.8	3	4.1
28-37	8	21.1	12	33.3	20	27.0
38-47	18	47.4	11	30.6	29	39.2
48-57	6	15.8	7	19.4	13	17.6
58-67	4	10.5	5	13.9	9	12.2
Total	38	100.0	36	100.0	74	100.0

4.2.5 Farms ownership

With respect to the farms ownership, the findings from the study (Table 4) reveals that around half of the cotton farmers own farms (48.6%) and another half were hired plots (51.4%). Classification also is almost the same as in ward wise where 50% and 47.2% of farmers owns farms in Ipililo and Masela wards respectively. This means that the half of the farmers has access to land and hence they don't have to incur cost of hiring the land that will reduce their profit. This result implies that half of the farmers can have access to credit when it comes to the use of land as a security as the URT now are processing the title deeds for lands. The result also show that around 32% of the total cotton grown area is the only part that was hired for cotton production and the rest of 68% of the cotton grown area was owned by the farmers themselves. Out of 435.5 acres owned by the farmers themselves, 106.5 acres belongs to farmers who also have hired farms. This means that farmers are not satisfied with the current size of the cotton land and hence look for extra peaces of

land. And due to that demand for land, the cost of hiring farms also seems to be a problem. The results found that the cost of hiring one acre of land ranges from 10 000 to 25 000 TZS which is very expensive to small-scale farmers to afford and that is why even their sizes of growing cotton remain low. The results found that the sizes of cotton fields range from a minimum of two to a maximum of 25 acres with a majority having between 5 and 11 acres (Appendix 2).

The same results also found that about 58% of the farmers have more than one plot of cotton farms that can affect them in managing the fields due to wastage of time in moving from one plot to another. Farmers have plots ranging from one to four. Having more than one plot can be caused by scarcity of land and willingness of land owners to offer those lands. The results show that about 83.8% of the farmers are not satisfied by their current farm sizes and when asked if they want to expand their farms about 79.7% said they want to expand but the main constraints were hiring expenses and land scarcity having 60.8% and 18.9% respectively while only 2.7% said both reasons. This means that there is high need for land in Shinyanga region and some measures like land redistribution, title deeds and costs of hiring land are required to be scrutinized to make it useful and productive.

Table 4: Farms ownership

Belonging of the plots	Ipililo		Masela		Total	
	N	%	N	%	N	%
Own farmers	19	50.0	17	47.2	36	48.6
Hired farmers	19	50.0	19	52.8	38	51.4
Total	38	100.0	36	100.0	74	100.0
Area owned in acres	225.5	73	210	63.4	435.5	68.0
Area hired in acres	83.5	27	121	36.5	204.5	32.0
Total	309.0	100	331	100.0	640	100.0
Land owned by farmers who have hired land (acres)	57.5	54.0	49	46.0	106.5	100.0
					Min	Max
Size of cotton field					2	25
Size of hired acres					0.5	15
Cost of hiring one acre (TZS)					10 000	25 000

4.2.6 Household composition

Household composition gives the working force and the dependent size in the family. From the results (Table 5) indicate that about 39.5 % are the group of dependents that include children of the age between zero and 14 years and the elders of the age above 64 years which is only 2%. And 19.8% is the group that includes young and energetic group that when utilized careful will help increase productivity, but most of them tend to move into other income generating activities like mining sector and hence making agricultural sector not to improve. The average household size in wards is almost the same since it was 4.2 and 3.8 for Ipililo and Masela wards respectively and that means each household was having around four household sizes.

According to CIA (2008), life expectancy in Tanzania is around 52.88 years for females and 50.06 years for males and this means the agricultural sector is in danger because that group that participate in agriculture has almost reached to an end. But

when good efforts are kept to agriculture then about 60.5% of the respondents can be used as the workforce. However, this depends on the labor force participation rate of the household members *i.e.* ratio of the working age and labor force participation of the working group in a household.

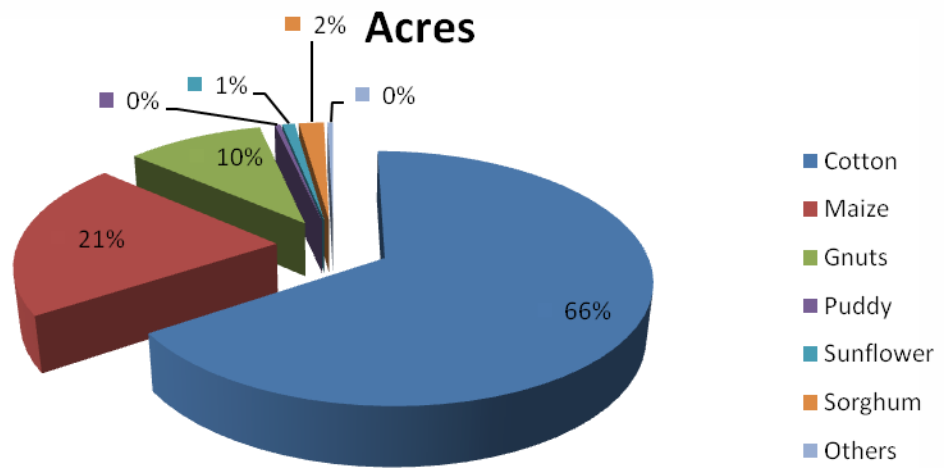
Table 5: Household composition of farmers

HHL D composition	Ipililo		Masela		Total	
	N	%	N	%	N	%
0 - 8	34	21.1	19	14.0	53	17.9
9 - 14	31	19.2	27	19.9	58	19.6
15 - 25	28	17.4	31	22.8	59	19.8
26 - 45	36	22.4	36	26.5	72	24.2
46 - 64	30	18.6	19	14.0	49	16.5
> 64	2	1.2	4	2.9	6	2.0
Total	161	100.0	136	100.0	297	100.0
Average HHL D size	4.2		3.8		4	

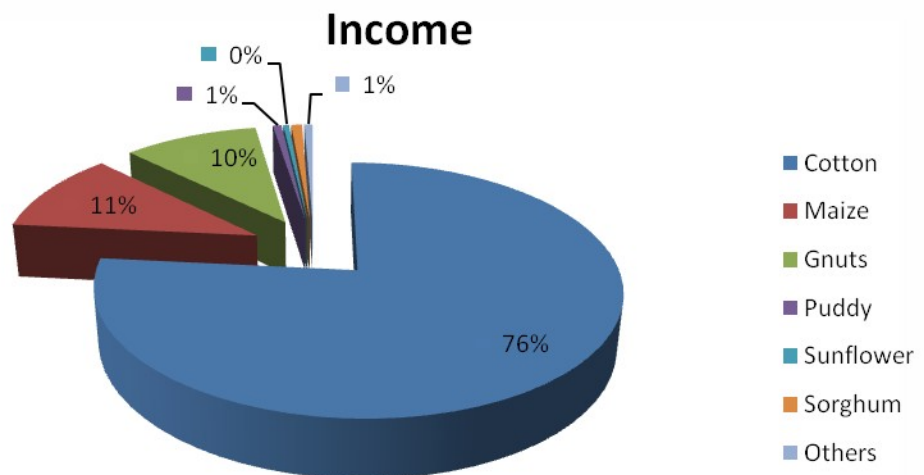
4.2.7 Production of other crops

The study found that apart from growing cotton, farmers are also participating in growing other crops that can help them acquire food and other services. The result found that 44% of the grown land is used to grow other crops apart from cotton. The crops include Maize 21% groundnuts 10% and others (Fig. 2 a) and the remaining 66% is used for cotton production. This indicates that food crops are not given high priority. In investigating the income accrued from crops, the result in Fig. 2 (b) found that 76% of the income is from cotton and only 36% are from other crops. This means the region is highly depending on cotton as one of the major source of income to its people otherwise for those with livestock. This is not good indicator because when the world market price for cotton goes down then the whole region may be affected and the Government has to feed this region.

The effort made by the Government in attaining MDG number one of eradicating poverty and hunger by halving the proportion of people whose income is less than 1\$ by 2015 will be affected. According to UN (2008) on MDG report, the recent increases in the price of food have had a direct and adverse effect on the poor. Poor people who do not produce their own food are the most severely hurt because a larger proportion of their expenditure is allocated to food. Higher food prices limit their ability to obtain not only food but also other essential goods and services, including education and health care. Most of the urban poor and the landless rural poor are in this position. Poor farmers, on the other hand, can benefit from higher food prices if they are able to produce more than they consume. But many lack the resources to do so, in part because higher oil prices have raised the cost of fertilizer. Overall, higher food prices are expected to push many more people into absolute poverty, with estimates suggesting that the increase will be as many as 100 million. Most of the increase will occur in sub-Saharan Africa and Southern Asia, already the regions with the largest numbers of people living in extreme poverty.



(a)



(b)

Figure 2: (a) Area used to grow crops (b) Income accrued from grown crops

4.3 Description of WRS as it Operates in Cotton Sector and the Role Played by Key Stakeholders

4.3.1 Description of WRS in cotton

In the WRS, the Government through the Ministry of Industries, trade and Marketing nominate reputable WR operators in the area to run the business in the targeted area using WR Act number 10 of 2005 and WR regulations, 2006. In order to qualify to run the system, the selected companies must first meet minimum set criteria. These include possession of a certified valid business license, having warehouse to store products in major collection centers and the proven ability and experience to carry out the activity. The nominated WR operator must then be approved by Cotton Board of Tanzania. Warehouses to be used must also have licenses; there should also be a finance institution that is ready to finance the system.

Shinyanga region has SIBUKA FM LTD as the WR operator with support from CRDB bank that provides finance to the system. A detailed description of how the WRS operates in Shinyanga region is provided in Fig. 2.



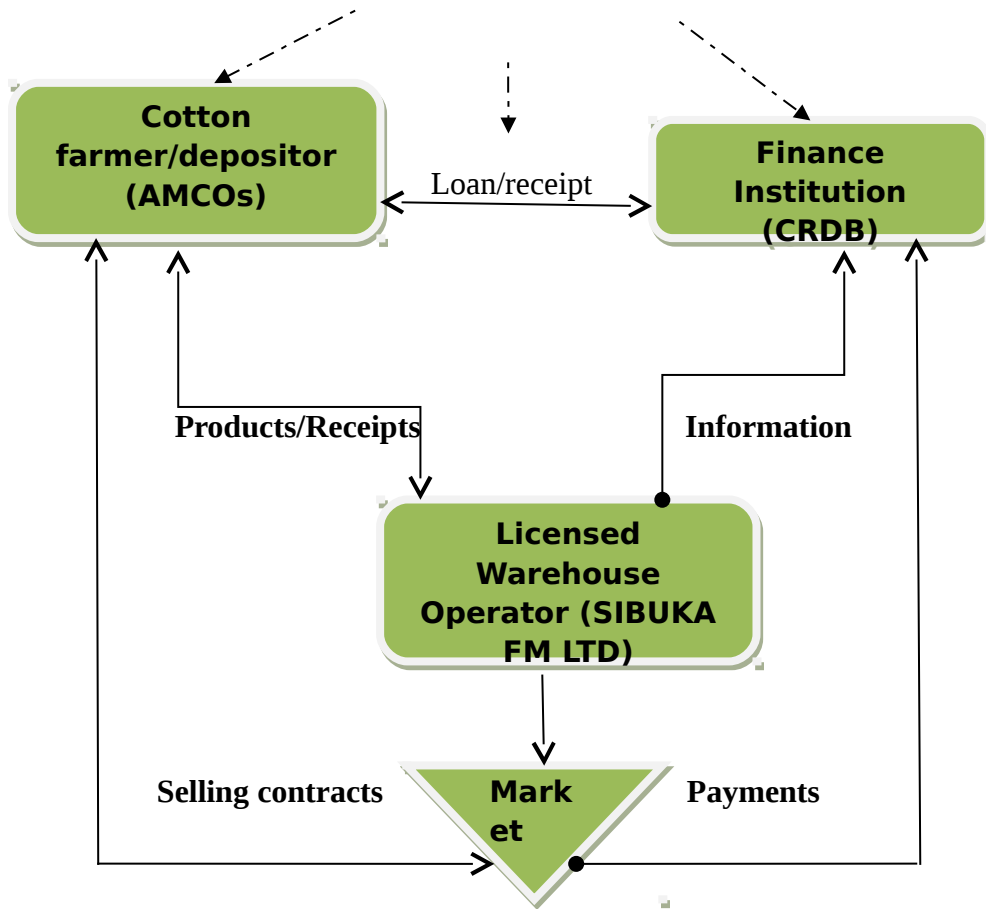


Figure 3: Description of the WRS operation in Shinyanga region

4.3.2 The role of the Government to the operation of the system

The present study found that the role of the Government warehousing corporation play a leading role in the development of warehousing. However, they only cover part of the field, which should be opened up to private operators, particularly those who already provide storage services. The Government also institutes a Task Force responsible for designing and implementing the system. The Task Force will be representative of the different stakeholders, including those with practical experience of trading in the commodities concerned and financing of trade.

The Government will act promptly to remove any constraints in the form of restrictive legal codes, taxes or duties which seriously discourage firms from making use of warehouse receipts with designated priority commodities. The policy of non-intervention in the trade in these commodities will be enshrined in law, except under emergency situations approved by vote in Parliament, with a view to reducing the likelihood of ad hoc interventions which upset private trade calculations and undermine collateral values.

4.3.3 The role of farmers/depositors in WRS

Farmers are required to sell their cotton through the primary cooperatives (AMCOs) where the cotton is collected in local warehouses and the farmers are provided with the receipts verifying that the cotton of a certain weight has been delivered to the AMCOs warehouse. The farm gate price at the time of data collection was TZS 500/kg and farmers were provided with 90% payment (TZS 450/kg) on delivery of cotton to the primary cooperatives. The farmer or depositor of cotton was provided with two copies of receipts, one was Certificate of Title (CT) and the second one was Certificate of Pledge (CP).

The farmer/depositor may use one of the copies to borrow money from CRDB bank. The depositor may decide to take the stored products by submitting all two copies of receipts (CT and CP) and release letter from CRDB bank. The money is collected at CRDB bank where farmers are required to open an account to be used by the bank for payments.

4.3.4 The role of warehouse operator

Warehouse operator, that is SIBUKA FM LTD, is incurring costs of transporting cotton from collection centers (AMCOs) to the main warehouse where the measurements (Weights and standards) are verified before storage. After collection of cotton, the warehouse operator provides receipts to the primary cooperative society or depositor and at the same time informs CRDB bank about the receipt of cotton and so that CRDB bank can process payments to the depositor. Warehouse operator also has a task of providing information regarding WRS to cotton board.

4.3.5 The role of financial institution

The role of financial institution which is CRDB bank in Shinyanga is to provide loan to AMCOs' members who have delivered their cotton to warehouses and that they have all required receipts and after the receipt of approval information from warehouse operator. The CRDB bank LTD uses its normal loan procedures by providing loan immediately after clearance of the procedures required. The other task of the bank is the provision of loan education to their customers on how to repay loan in time.

4.4 Problems Facing Cotton Production

In assessing the problems facing cotton farmers in the production process the study (Table 6) found that most of the farmers are facing the climatic problems especially in the timing of rain season. About 60.9 % of the cases are due to climate which has been mentioned by 38.5% of the responses. The second problem affecting cotton production mentioned was shortage of inputs which was mentioned by 34.9% of responses and that lack of inputs affect each farmer by 55.1%. The last problem

mentioned was the problem of pests and diseases which was mentioned by 26.6% of the responses and that it comprises of 42% of the cases. This means that each farmer is affected by the problem of pests and diseases by 42%. The percentages add up to 158%. This implies that on average a respondent faces at least one and a half of the problems in cotton production. This result means that when these problems are controlled then there could be an increase in cotton production.

Table 6: Problems affecting cotton production

Problems	Count	% of responses	% of cases
Climatic	42	38.5	60.9
Pest and diseases	29	26.6	42.0
Shortage of inputs	38	34.9	55.1
Total	109	100.0	158.0

4.5 Marketing of Cotton

In attempting to look in the existing marketing system in the study area the result found that most farmers about 94.6% said they are not satisfied with the marketing system (Appendix 2). This means that farmers are not happy with the existing marketing system and that big effort is required to improve the marketing system. Most of the farmers, about 93%, were claiming that low price is the reason of unsatisfied with the system and that means when the price will be controlled then the marketing system will not be a problem. This is limited much because of the situation of the market of cotton because the price of cotton depends on the world market. When the world market price goes down the buying price for cotton from farmers also is affected.

4.6 Profitability of Cotton to Farmers

4.6.1 Profitability of WRS to cotton farmers

Gross margin was calculated for both situations, situation with WRS and without WRS and their results were used in a paired-samples t-test to evaluate the influence of the WRS on the profitability of cotton production for small-scale farmers. In the paired samples t-test it is assumed that the differences, calculated for each pair, have an approximately [normal distribution](#). There was a statistically significant (Table 7) difference in cotton profit by TZS 6660/acre from the situation with and without WRS.

The [computer output](#) (Table 7) from performing a paired samples t-test on the profit without WRS and profit with WRS, data gives a [p-value](#) of 0.001. Thus the probability of getting a difference of TZS 6660/acre by chance between the mean profits is 0.1%. This means a 0.001 (0.1%) probability that a cotton profit of 6660/acre could occur just by chance when WRS is used, i.e. the probability of a false positive is 0.001.

This is sufficiently low to conclude that WRS does affect mean profit of cotton. Therefore, we have enough evidence to reject the [null hypothesis](#) with this data, and conclude that profits, on average, in the situation with and without WRS are different and that profit of cotton with WRS is greater than profit without WRS.

From the results (Table 7), it seems that there is the difference of TZS 6660/acre in a situation with and without WRS. However the difference is not big enough to convince farmers to use the WRS but this has been contributed much on the cotton

world market price. In the year 2007/08 the World market price of cotton went very far down compared to other years and hence if the price could be good enough, then farmers can benefit more with WRS than without WRS. Mukwenda (2005) on his study on potential for warehouse receipt system in financing maize marketing in Tanzania under market liberalization found that the WRS is profitable to coffee, cotton and maize.

Table 7: Profitability of WRS

Profit	N	Mean (TZS)	STD deviation	SE Mean
Profit obtained from one acre without WRS	74	167 164.4	58 958.6	6 853.8
Profit obtained from one acre with WRS	74	173 830.2	56 185.8	6 531.5
Difference	74	6 665.8	9 886.3	1 149.3

t= -5.800; Df = 73; Significance = 0.000; CI = 95% C Limits: Lower = 8 956.2
Higher = 4 375.3

4.7 Contribution of Independent Variables to the Profit

In attempting to investigate the contribution of independent variables (education level, household size, size of other crops and size of cotton field) to the dependent variable (profit of cotton), multiple regression model was employed. Multiple regression is one of the fussier of the statistical techniques. It makes a number of assumptions about the data, and it is not all that forgiving if they are violated. Before conducting it, it was first checked if it meets the assumption required. The assumptions are multicollinearity and singularity, normality, linearity, homoscedasticity and independence of residuals. Failure to meet these assumptions then the estimated values may mislead the results.

Multicollinearity is a high degree of correlation (linear dependency) among several independent variables. It commonly occurs when a large number of independent variables are incorporated in a regression model. It is because some of them may measure the same concepts or phenomena. According to the independent variables used, there is a possibility that education level can influence household size because, those with high education may have low household size. Education level also may influence size of the cotton field to be grown because as level of education increases, then possibility of having improved income level also increases, and when level of income increases, possibility of having large farms increases because labor can be hired.

In checking if multicollinearity assumption was violated, the output shows that all independent variables had some relationship with dependent variable. In this case all independent variables (education level, household size, size of other crops and size of cotton field) correlate substantially with profit of cotton (-0.311, 0.44, 0.74 and 0.31 respectively). At the same time the correlations between independent variables were too low (less than 0.7). Variance Inflation Factor (VIF) and Tolerance also proved that the assumption was not violated (VIF were all less than 10 and Tolerance were all above 10). Singularity occurs when one independent variable is a combination of other independent variables. For the purpose of having a good model then it was necessary to check all these kind of problems. Outliers are extreme data points that have the potential to influence statistical analyses. Outlier identification is important in regression analysis because outliers can influence the model used to such an extent that they seriously distort the conclusions drawn from the data. In checking for outliers, the scatter plot proved that there were no outliers that can

affect the results. There were no major deviations from normality according to normal probability plot and there were very few outliers that even after removing them there was no effect on the model. Histograms for the residuals as well as normal probability plots were used to inspect the distribution of the residual values.

In regression analysis, homoscedasticity means a situation in which the variance of the dependent variable is the same for all the data. Homoscedasticity facilitates analysis because most methods are based on the assumption of equal variance. Therefore the data also did not violate this assumption. Residuals scatterplots were employed as part of multiple regression procedure to investigate the linearity assumption and there was no curvature in the relationships, therefore it was good model. Normality, linearity and homoscedasticity uses residuals scatterplots and normal probability plots in investigation of the problems. And independence of residuals was also checked and it was fine for analysis.

In evaluating the model, the value of R square was 60.6%. This tells us how much of the variance in the dependent variable (cotton profit) is explained by the model (education level, household size, size of other crops and size of cotton field). In this case the model explains 60.6% of the variance in cotton profit and the remaining 39.4 are the variables outside the model. The variables omitted may be production costs, terms of trade, quality of cotton, access to market and world market price. These data were omitted because of the reliability, nature of the study and limitation of the study. In other words when these data were to be obtained, then the percentage could have gone higher.

In assessing the statistical significance of the result, the ANOVA table was used to test the assumption that multiple regression in the population equal zero. The model in the output reaches statistical significance (Sig. = 0.000, this really means $p < 0.05$) and so indicates that the level of significance is high in terms of the variables included.

In examining which variable in the model contributed to the prediction of the dependent variable, standardized coefficients were used. The aim here was to examine the contribution of each variable to the profit of cotton obtained therefore Beta values were used. The results (Table 8) show that the largest Beta coefficient was 0.726, which is for size of cotton field. This means that this variable makes the strongest unique contribution to explaining the dependent variable, when the variance explained by all other variables in the model is controlled for. The second Beta value was of total household size (0.264), followed by total size of other crops (-0.15) and the last was of education level which was -0.03.

In examining whether each of the variable is making a statistically significant unique contribution to the equation, only two of the variables (Size of the cotton field and household size) were making a significant unique contribution to the prediction of the dependent variable which is cotton profit ($p < 0.05$).

Total household size and size of cotton field have positive signs implying that increase in them brings a positive effect to profit ($P < 0.05$) and this can be contributed by the fact that the size of the household increases the possibility of having more labor-force and hence their participation in farm activities is high that leads on to high level of production since the cotton production is labor intensive.

And in the issue of labor market, the opportunity costs of family labor is low in Shinyanga this limits them to move into other activities and concentrate most of their time in family activities which is cotton production. In Shinyanga hired labor is very expensive in some circumstances because most of the activities are required to be done within a very short period of time where other people also need to do the same, therefore limits the supply of labor force and making the price for them to be high. Having your own labor-force is a benefit to the production of cotton. This result is supported by that of Udry (1996) on Efficiency and Market Structure: Testing for Profit Maximization in African Agriculture which found that if households can choose the quality of the land that they cultivate (by choosing which plots to cultivate), then household size will be positively correlated with profit. In the same study, it was observed that when household size increases then allocation of resources can be spread more on other areas of the field and hence more profit will be obtained.

The increase of the size of cotton field increases profit of cotton as more yields can be harvested. When the size expands means resources can be spread more and used efficiently. The farmer is going to benefit the economies of scale where more areas will be utilized and leading to the increase in production per area that leads to the buying inputs, transportation of products in bulky. In doing this then costs will be minimized and increase in profit. The result is supported by the study from Terry *et al.* (1999) which found that technology adoption is often correlated with farm size (larger farms tend to be those that adopt new technologies) and a 10-acre increase in farm size is associated with a USD 0.27-per-acre profit increase. Another study from

MacDonald *et al.* (2006) on *Growing Farm Size and the Distribution of Farm Payments* found that, larger farms realize higher profits, on average, than smaller farms. Kevane (1996) in Sudan found that larger farms have higher yields than smaller farms.

Table 8: Contribution of other variables to the profit

Variables	Beta	Std error	t-value	Tolerance	VIF
(Constant)		350 135.8	-0.664		
Education level	-0.030	142 133.9	-0.383	0.963	1.038
Total hhld size	0.264	27 033.6	3.164**	0.822	1.216
Size of other crops	-0.150	27 565.7	-1.640	0.714	1.400
Size of cotton field	0.726	20 508.7	8.136**	0.685	1.460
R ² = 60.6%		F = 26.631** (**significant at 5%)			

4.8 WRS as a Means to the Access of Credit

According to Financial Sector Deepening Trust (2006), it has been revealed that majority of people in Tanzania have no access to formal financial services. Regarding reasons of having access to formal financial services results obtained by Seluhinga (2007), access to formal financial services are due to job conditions and placement of deposit. Theories suggest that people are obliged to have access due to nature of services required, for instance savings, money transfer, payments and loans.

According to Anjali (2005), access to finance can be measured in terms of access to certain institutions such as banks, insurance companies, or micro finance institutions or in terms of access to the functions that such institutions perform or the services that they provide such as payments services, savings or loans and credit. It was observed from the field that formal financial institutions are very few and that there

is only one bank (NMB) that operates. This bank provides loan to few large farmers because of their ability to provide collaterals.

The participation in the WRS helps small-scale farmers to access credit and help financing immediate needs. Small-scale farmers who participate in WRS can access short term loans to finance inputs, family health costs, education and even pay for labors at a cheaper cost compared to those loans offered by the bank. The need for money in all the farmers seems to be high but the constraint is what can be offered as collateral.

Borrowers of loan are normally incurring costs when they are in need for it. The costs are incurred during pre-loan disbursement, loan disbursement, and post loan disbursement activities. Transaction costs is low for those who participate in WRS compared to those who do not participate. Transaction costs for borrowers in WRS may includes costs associated with screening potential group members, group formation, agreeing on formal or informal group rules, negotiating with lender, filling out necessary paper work, transport to and from the lender, time spent on group activities relating to attaining access to credit and enforcing group rules. These activities seems to be many but they occur just at the beginning and when the task is over then costs goes further down. Farmers and traders can access credit from financial/credit institutions through their traders associations, farmers groups or primary cooperative societies financed by WRS. This shows the difference with those who do not participate where the only thing that will be required by the bank is collateral which most of the rural dwellers do not have.

The credits are invested in either farm activities or crop trading activities. Credits act as input (capital) and do improve farm productivity, access to market and farm income to farmers, in other side it improves access to the market and expands the working capital for traders. The improved farm productivity, access to market, improved farm income and expanded working capital would results into improved household livelihood.

According to the results (Appendix 2) obtained from the study, all farmers (100%), interviewed said there is a need for credit in the production of cotton. And this is contributed by the fact that cotton production involves many activities like hiring land, hiring labor, buying of seeds and other necessary inputs. Farmers need to have money in cash to have access to necessary materials failure to have money means production can be hindered.

The same result reveal that all farmers had access to credit for the production of cotton and this is according to the nature of the WRS because when you participate in the system the money farmers receive when depositing their products is the loan and the products deposited act as a collateral. There were only two sources of credit which was SACCOs and bank. The results found that about 97.3% got credit from SACCOs and 2.7% from bank. But in fact the source for credit was only one, which is CRDB bank and the SACCOs are just used as the agent for the Bank.

4.9 Challenges and Constraints Facing WRS

Results (Table 9) show that 70.3% of all cases reported are lack of education as it has been reported by 29.9% of the responses. And that means education is needed to

farmers, warehouse operators and other stakeholders operating WRS. Since the system is new to them and there are very few people who know this system. About 48.6% of all cases are due to poor infrastructure. Infrastructures are not enough to make WRS to operate smoothly. Infrastructure which have been mentioned include road to transport products from production sites to warehouses, most of them are not passable during rain seasons, and another infrastructure mentioned was poor quality of warehouses which are nearby villages. It has also been observed that means of communications are also not enough.

The study also revealed that about 77.0% of the cases are due to insufficient information about prices, data and relevant information. The case was reported by 32.8% of all responses and that players need to be up-to-date about what is going on in the system. This analysis indicates that there is a need to improve information system as it plays a bigger role in smooth operation of WRS. On the other side, about 20.3% and 18.9% of the cases are due to negligence of farmers and poor quality of cotton respectively. These cases were reported by 14% and 15% of the responses. The percentages add up to 235.1 %. This implies that on average a respondent faces two and one third of the challenges in WRS.

Table 9: Challenges and constraints facing WRS

Challenges and constraints of WRS	Count	% of responses	% of cases
Lack of Education	52	29.9	70.3
Poor infrastructure	36	20.7	48.6
Insufficient information system	57	32.8	77.0
Poor quality of cotton	14	8.0	18.9
Negligence of farmers	15	8.6	20.3
Total	174	100.0	235.1

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In attempting to describe the WRS operating in the cotton sector in Maswa district, it has been observed that the system involves three main players. The players are cotton farmers, warehouse operators, and finance institution (which in Shinyanga region is CRDB bank). Cotton farmers are the producers of cotton that needs to be stored in the warehouse; warehouse operators are those who store cotton in warehouses. Finance institution is there purposely for provision of loan to cotton depositors. Cotton farmers are advised to join in AMCOs so that it could be easy to bargain in the business, though individuals are also allowed to store cotton in warehouses.

The role played by farmers in the WRS apart from production of cotton includes delivering of cotton to the nearby mini warehouse, find market for the stored products, making sure that the quality and standards are maintained for the stored produce. Roles of warehouse operators, SIBUKA FM LTD, include obtaining the business license to operate the WRS, to take insurance of the goods stored with him, inspection, sampling, weighment and grading. The warehouse operator also provides receipts immediately when the depositor deposits the products, informs the finance institution and WR boards about the stored products. The warehouse operator is required to have qualified and professional workers and finally must have enough finance capacity and lastly they can find market for the stored products. Finance institution may be commercial banks, community banks, SACCOs/SACAs, and NGOs. The roles played by finance institution include the provision of loan to the

depositor or any person entitled with a receipt, to prepare procedures for loan repayment, to make sure that the amount to be repaid favors both sides i.e. the lender and the creditor and the last task of the finance institution is the provision of education to creditors on how to use and repay loan. The FI can also find market for the stored products.

In attempting to determine the profitability of the WRS to cotton farmers, it has been found that the WRS has got a positive contribution to the profit obtained in cotton. The results from GMA and paired t-test found that there is statistically significant positive difference of profit to cotton producers at $p < 0.05$ and which shows that WRS is important to cotton farmers. And this level of profit could have gone even higher if the world market price for cotton was good. Hence the results foretells us that, introduction of WRS to cotton sector has got a positive impact to the profit of farmers.

In examining the contribution of variables to the profit of cotton, it was observed that the contribution of the size of cotton field and household size is higher (size of cotton field Beta was 0.726 and household size beta was 0.264) compared to the contribution of education level and size of other crops fields (education Beta was -0.030 and size of other crops areas was -0.150). And that size of cotton field and household size had a positive impact on profit, which means as the size of cotton field and household size increase, profit will also tend to increase. In identifying the challenges and constraints facing key players in the WRS, descriptive evidence show that insufficient information system was one of the main challenges facing farmers in WRS operation. Insufficient information was the leading challenge that

occupied about 77% of all cases. The challenge was reported by 32.8% of the responses. Farmers fail to get information on when to go and ask for loan or as to when will they get the second payment. All these claims could have been solved if information regarding sales, transport, price and other relevant information regarding cotton production and marketing could be properly in place.

The second major challenge reported was lack of education or knowledge about the operation of WRS to stakeholders. The results show that about 70% of all cases are caused by lack of education to players and this challenge was reported by 29.9% of all responses. WRS is the system that involves many stakeholders including warehouse operators, finance institutions and depositors. There are few people with WRS knowledge and the majority is unaware about the operation of the system.

The third challenge reported in the study was poor infrastructure that reported by 36% of all responses and that the challenge faces the system by 48.6% of all cases. People mentioned poor roads, poor quality of warehouses and bad means of communication as obstacles to the WRS.

Other challenges reported include negligence of farmers to use the system and poor quality of cotton to meet the standards required. Of all cases reported 20.3% were due to negligence of farmers and 18.9% were reported as caused by poor quality of cotton.

5.2 Recommendations

Based on the conclusion drawn from the study, the following are the recommendations.

- (i) WRS is good and seems to be a solution to small-scale farmers' problems, but this will only materialize if all players play their part well. The problems concerning lack of education, poor infrastructure, and poor information system, poor quality of products and poor quality of warehouses if they will be well addressed then the intended outcome for the WRS can be achieved. Therefore there is a need for the Government, NGOs and others stakeholders to cooperate in resolving these challenges.
- (ii) In order for the system to work properly, there must be warehouses of good quality; therefore it is recommended that warehouses of high quality be built around villages to reduce transportation cost to farmers.
- (iii) Since the price of cotton depends on World market price which is fluctuating frequently, then farmers should be advised through their cooperatives to insure their products for price before or when stored in warehouses.
- (iv) Stakeholders need to get knowledge about the operation of the WRS. The majority who are the farmers need to be educated on the benefits of the system so that they can participate in the system. The knowledge on production, storage in warehouses, receipts, quality controllers and warehouse inspectors should be provided.
- (v) Donors and governments should look for one-time interventions they can support - e.g., establishment of standards, inspection and certification

services. Some of these functions may be more appropriately performed by private companies or industry associations rather than government.

- (vi) The government should encourage more finance institutions to allow the provision of loan through WRS. As this could encourage more farmers to participate in the system.
- (vii) More business persons and traders should be encouraged to participate in this system, because the system does not only help farmers but also traders and other business entities.

5.3 Areas for Future Research

Further research concerning WRS should be carried on as this system is new in Tanzania. This study proposes the following areas to be studied in future to make this WRS known and applicable in many areas.

- (i) To investigate the importance of the system to other crops.

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APPENDICES

Appendix 1: Questionnaire for cotton farmers.

THE ECONOMICS OF WAREHOUSE RECEIPT SYSTEM. A CASE OF COTTON SMALL SCALE PRODUCERS IN MASWA – SHINYANGA.

Questionnaire No.....Date of interview.....

Interviewer's name.....

Name of the respondent.....

District..... Ward..... Village.....

Module 1: Farmers characteristics

1.1. Age of the farmerYears

1.2. Gender of the respondent

1= Male

2= Female

1.3. Marital status

1=Married

2=Single

3=Widowed

4=Divorced

1.4. Educational level of the respondent

1=No formal education

2=Primary education

3=Secondary education

4=post secondary education

5=Adult education

1.5. Main occupation

1=Self employed

2=Farming

3=Employed

4=Others (specify)

1.6. Household composition

Age group	Number (size of age category)
0-8	
9-14	
15-25	
26-45	
46-64	
+64	

Module 2: Cotton production

- 1.1. When did you start cultivating Cotton?
- 1.2. Who persuaded you to cultivate Cotton?
 - 1=Neighbor
 - 2=Extension officer
 - 3=Relative
 - 4=Companies
 - 5=Others (specify).
- 1.3. How big is your Cotton field? (acres)
- 1.4. How many Cotton plots do you have? (Plots)
- 1.5. Are the plots belonging to you or you have hired?
 - 1= Own
 - 2= Hired
- 1.6. How many plots are hired.....
- 1.7. What is the size of hired plots? acres
- 1.8. What is the cost of hiring a plot per acre/per year? In TZS.....
- 1.9. If you have more than one plot, how are they located? (walking time)

Plot	< 5min	5min-30min	30min-1hour	> 1 hour
Plot 1 from home				
Plot 2 from plot 1				
Plot 3 from plot 2				
Plot 4 from plot 3				
Plot 5 from plot 4				

- 1.10. Are you satisfied with the current farm size? 1= Yes 2= No
- 1.11. Would you like to expand it?
 - 1=Yes
 - 2=No
- 1.12. If yes why not expanded yet?
 - 1= Land scarcity
 - 2= Hiring expenses
 - 3= Others (Specify).....
- 1.13. If yes at what size? (acres)
- 1.14. Why at that size
 - 1= Land scarcity
 - 2= Hiring expenses
 - 3= Others (Specify).....
- 1.15. If you don't want to expand, why?
 - 1= Land scarcity
 - 2= Hiring expenses
 - 3= Others (Specify).....

1.16. Apart from Cotton which other crops do you grow?

Crop grown	Area under each crop

1.17. Could you please estimate how much money you get from each of the above crops (Fill in the table below)

Crop grown	Outputs	Price per unit	Revenue

1.18. Referring to the above mentioned crops please help to fill in the following table below

Inputs	Crop	Crop	Crop
Fertilizer			
Amount (Kg)			
Cost (TAS/Kg)			
Seeds			
Amount (Specified unit)			
Cost TAS/unit specified			
Pesticides			
Cost per unit			
Animal manure			
Amount			
Cost per unit			
Table continued			
Hired labor			
Amount			
Cost per laborer			
Other inputs			
Type			
Amount			
Cost			
Others			
Total Costs			

1.19. Please help to fill in the following table concerning cotton production (for Own)

Farm size			
Production(Kg)			
Producers price(TAS)			
Revenue (TAS)			
	Own Man-days per acre	Per hour/per day/per month/per acre	Payments
Labor (Man-days)			
Land preparation(Man-days)			
Weeding(Man-days)			
Harvesting(Man-days)			
Parking(Man-days)			
Transporting(Man-days)			
Storage(Man-days)			
Security(Man-days)			
Fertilizer(Man-days)			
Herbicides(Man-days)			
Pesticides(Man-days)			
Others			
TOTAL			

1.20. Fill in the following table concerning Cotton production for hired labor

	Hired Man-days per acre	Per hour/per day/per month/per acre	Payments
Labor (Man-days)			
Land preparation(Man-days)			
Weeding(Man-days)			
Harvesting(Man-days)			
Parking(Man-days)			
Transporting(Man-days)			
Storage(Man-days)			
Security(Man-days)			
Fertilizer(Man-days)			
Table continue			
Herbicides(Man-days)			
Pesticides(Man-days)			

Others			
TOTAL COSTS			

1.21. What are the costs of obtaining the following

	Amount	Cost per unit	Total costs
Fertilizer			
Herbicides			
Pesticides			
Transporting			
Storage			
Marketing			
Others			
TOTAL COSTS			

1.22. What are the major problems facing you in Cotton production?

- (i)
-
- (ii)
-
- (iii)
-
- (iv)
-

1.23. What future plans do you have concerning Cotton production?

- 1= To expand production
- 2= To reduce production
- 3= To continue producing at the same level
- 4= others (specify).....

1.24. What should be done to improve Cotton production

-
-

Module 3: Cotton marketing:

3.1. What factors do you consider when deciding to sell your Cotton?

- 1= The price offered
- 2= Personal ties with the trader
- 3= Household cash need
- 4= Need to repay back the loan
- 5= Others (specify)

3.2. To whom do you sell your Cotton?

- 1= Middlemen
- 2= Cotton traders
- 3= Warehouse from cooperative union
- 4= Warehouse from others
- 5= Others (specify).....

3.3. If you sell Cotton in warehouse, what are the benefits you get?

- (i)
- (ii)
- (iii)
- 3.4. What are the costs you incur when using the warehouse receipt system? In TZS
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
- 3.5. What are the challenges you face when using the WRS?
 - (i)
 - (ii)
 - (iii)
 - (iv)
 - (v)
- 3.6. What do you think should be done to make warehouse receipt system good?
 - (i)
 - (ii)
 - (iii)
- 3.7. Did you find difficulties in selling your Cotton?
 - 1= Yes
 - 2= No
- 3.8. If yes, why?
 - 1= The market is very far from home
 - 2= Few customers
 - 3= Low demand
 - 4= Low farm-gate price
 - 5= Lack of transport facilities
 - 6= Others (specify)
- 3.9. At what price did you sell your Cotton last season?
 - Grade ATZS/Kg
 - Grade BTZS/Kg
- 3.10. Are you satisfied with that price?
 - 1=Yes
 - 2= No
- 3.11. If no why?
- 3.12. How are the prices determined?
 - 1= Size of Cotton
 - 2= shape of Cotton
 - 3= grade of Cotton
 - 4= others (specify)
- 3.13. What are the conditions for sale?
 - 1= Cash
 - 2= Credit
 - 3= Cash and credit
 - 4= Others (specify).....
- 3.14. How far from the marketing centre from your home?Kms

3.15. Where do you normally contact buyers?

- 1= At home
- 2= At the cooperative society
- 3= At the buyers collection centre
- 4= Others (specify)

3.16. Do you know who will buy your Cotton before the crop is harvested?

- 1= Yes
- 2= No

3.17. Are you free to sale your Cotton to any buyer?

- 1= Yes
- 2= No

3.18. If no, explain why?

.....

3.19. When do buyers announce the price they will offer for your Cotton?

- 1= At the start of the buying season
- 2= Before the buying season
- 3= Mid way between 1 and 2

3.20. Do you know different buyers of Cotton in your area?

- 1= Yes
- 2= No

3.21. If yes, mention them.

- (i)
- (ii)
- (iii)
- (iv)

3.22. Mention the price each buyer was willing to offer during the last season?

Cotton buyer	Price offered (TZS/Kg) for grade A	Price offered (TZS/Kg) for grade B

3.23. Are you satisfied with the current Cotton marketing system?

- 1= Yes
- 2= No

3.24. If no, explain why?

3.25. What are major Cotton marketing problems?

- (i)
- (ii)
- (iii)
- (iv)

3.26. What problems do you encounter in marketing other crops?

- (i)
- (ii)

- (iii)
- (iv)

3.27. Suggest any change that you think will rectify the current situation.

- (i)
- (ii)
- (iii)

Module 4: Credit availability and uses

4.1. Do you think there is a need for credit?

- 1= Yes
- 2= No

4.2. If no, why?
... ..
.....

4.3. If yes, did you take credit for Cotton production during the last season?

- 1= Yes
- 2= No (if no go to question 4.17)

4.4. If yes, what was the source of credit that you received?

- 1= Bank
- 2= Trader
- 3= Other farmers
- 4= Cooperative union
- 5= SACCOs
- 6= Others (Specify)

4.5. What was the amount of credit did you request?

4.6. Did you receive the amount of credit that you requested for?

- 1=Yes
- 2= No (if no go to question 4.10)

4.7. How long did it take from applying to get the loan?(days)

4.8. At what interest were you required to pay for that loan you received?
.....

4.9. What was the type of collateral for the credit?

4.10. From question 4.6, if no, what were the reasons for provision of the small amount?
.....

4.11. Did you return the credit?

- 1= Yes
- 2= No

4.12. If no, why?
.....

4.13. If yes, what was the repayment procedure?

- 1= In cash
- 2= In kind
- 3= cash and in kind
- 4= Others (specify)

4.14. If in cash, what was the amount per year/month?(TZS)

- 4.15. What was the repayment period?
- 4.16. What is the distance from your area of residence to the credit provision institution? (Kms)
- 4.17. From question 4.3 if no, why?
 - 1= Lack of credit facilities
 - 2= High interest rate
 - 3= Not aware of credit availability
 - 4= High risk
 - 5= Low income obtained from crops
- 4.18. In your own opinion do you think that credit is helpful?
 - 1= Yes
 - 2= No
- 4.19. If yes, why?
 - (i)
 - (ii)
 - (iii)
 - (iv)
- 4.20. If no, why?
 - (i)
 - (ii)
 - (iii)
 - (iv)

Module 5: Producers associations and extension service availability.

- 5.1. Is there any association for cotton producers in this area?
 - 1= Yes
 - 2= No (if no, go to question 5.4)
- 5.2. If yes, are you a member?
 - 1= Yes
 - 2= No (if no, go to question 5.5)
- 5.3. What are the benefits of being a member?
 - 1= Easy to market produce
 - 2= Easy to acquire inputs
 - 3= Easy to negotiate for better price
 - 4= Others (specify)
- 5.4. If no, what prevents you from being a member?
 - (i)
 - (ii)
 - (iii)
- 5.5. Have you received any advice on cotton production from extension agent?
 - 1= Yes
 - 2= No
- 5.6. What are the major kind of extension services received?
 - 1= Growing of cotton
 - 2= Marketing of cotton
 - 3= Others (specify)
- 5.7. How frequently did you receive the extension services? times a year.

5.8. When did you receive the advice for the last time?

5.9. How did you find the advice?

1= Adequate

2= Not adequate

5.10. Where do extension agents come from?

1= Non Government Organisation

2= Government staff

3= Others (specify)

5.11. What specific aspect do extension service covers? Explain

.....
.....
.....

THANK YOU FOR YOUR COOPERATION

Appendix 2: Some output results

Cotton fields

		Size of cotton field	Number of cotton plots	Hired or own plots
N	Valid	74	74	74
	Missing	0	0	0
Range		24	3	
Minimum		2	1	
Maximum		25	4	

Frequency Table

Size of cotton field

Number of acres	frequency	Percent
2	1	1.4
3	2	2.7
4	5	6.8
5	6	8.1
6	6	8.1
7	14	18.9
8	10	13.5
9	6	8.1
10	9	12.2
11	4	5.4
12	3	4.1
14	1	1.4
15	3	4.1
20	3	4.1
25	1	1.4
Total	74	100

Number of cotton plots

1	31	41.9
2	28	37.8
3	12	16.2
4	3	4.1
Total	74	100

Farm size

		Ipililo		Masela		Total	
		N	%	N	%	N	%
Satisfied with current farm size	Yes	5	13.2	7	19.4	12	16.2
	No	33	86.8	29	80.6	62	83.8
Total		38	100	36	100	74	100
Like to expand the farm size	Yes	31	81.6	28	77.8	49	66.2
	No	7	18.4	8	22.2	15	43.8
Total		38	100	36	100	74	100
Reason for not expanded yet							
Land scarcity		9	23.7	5	13.9	14	18.9
Hiring expenses		22	57.9	23	63.9	45	60.8
Land scarcity and hiring expenses		1	2.6	1	2.8	2	2.7
No response		6	15.8	7	19.4	13	17.6
Total		38	100	36	100	74	100

Size of cotton field (acres)	Number of cotton plots	Number of plots hired	Size of acres hired	Cost of hiring one acre					
Mean	8.65	Mean	1.82	Mean	1.7	Mean	5.38	Mean	21 973.68
Range	23	Range	3	Range	2	Range	14.5	Range	15 000
Min	2	Min	1	Min	1	Min	0.5	Min	10 000
Max	25	Max	4	Max	3	Max	15	Max	25 000
Sum	640	Sum	135	Sum	66	Sum	204.50	Sum	835 000
Count	74	Count	74	Count	38	Count	38	Count	38

Cotton marketing system

		Ipililo		Masela		Total	
		N	%	N	%	N	%
Satisfied with current Marketing system	Yes	4	10.5	0	0	4	5.4
	No	34	889.4	36	100	70	94.6
Total		38	100	36	100	74	100
Reason for not satisfied							
Low price		33	86.8	36	100	69	93.2
No reason		5	13.2	0	0	5	6.8
Total		38	100	36	100	74	100

Need for a credit

		Ipililo		Masela		Total	
		N	%	N	%	N	%
Need for credit	Yes	38	100	36	100	74	100
	No	0	0	0	0	0	0
Total		38	100	36	100	74	100
Got loan for cotton production last season	Yes	38	100	36	100	74	100
	No	0	0	0	0	0	0
Total		38	100	36	100	74	100
Sources of loans							
Bank		1	2.6	1	2.8	2	2.8
Cooperatives		34	89.5	34	94.4	68	91.9
Others		3	7.9	1	2.8	4	5.4
Total		38	100	36	100	74	100