

**THE ROLE OF WAREHOUSE RECEIPT SYSTEM IN IMPROVING
CASHEWNUTS MARKETING BY SMALLHOLDER FARMERS
IN MKINGA DISTRICT**

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**A DISSERTATION SUBMITTED IN A PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN
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ABSTRACT

This study was done to determine the role of warehouse receipt system (WRS) in improving cashewnuts marketing by smallholder farmers in Mkinga district. The specific objectives were to assess the operations of WRS in improving cashewnuts marketing, to determine share of consumer price received by smallholder farmer when selling cashewnuts through WRS or through informal marketing channel and to determine factors influencing smallholder marketing choices among WRS and informal market in the district. Both descriptive and quantitative methods of data analysis were used. The marketing margin analysis was employed to determine share of consumer price received by farmer along WRS and informal markets. The binary logistic regression was employed to determine factors influencing smallholder marketing choice. The descriptive results show that most of farmer trade cashewnuts in informal marketing channel (83%). The results of the marketing margins shows that cashew marketing through WRS yields high share of consumer price received by farmer (TSh 300/kg) over share accrued in informal markets (TSh 200/kg). Logistic regression results shows that; distance to WRS centres, transport costs, experience and access to extension services were highly significant at $p \leq 0.05$ while quantity sold, education level and access to training were significant at $p \leq 0.1$. Positive coefficient on experience, quantity sold, transport costs and access to training implies an increase in the likelihood of a farmer changing to WRS. So far, a negative coefficient on distance, education and access to extension indicated less likelihood of the farmer changing to WRS with improvement in these variables. This study calls for improvements in WRS availability, farmer's training, market information and enabling policy framework to enforce laws to enhance regulated WRS.

DECLARATION

I, Tsafu Reginald, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work done within the period of registration and that it has neither been submitted nor being concurrently submitted in any other institution.

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Date

The above declaration is confirmed;

Prof Joseph P. Hella
(Supervisor)

Date

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DEDICATION

To my beloved wife Brigita Iwitay and my sons Joshua and Jovin.

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LIST OF ABBREVIATIONS

AAACP	All ACP Agricultural Commodities Programme
ACE	Agricultural Commodity Exchange for Africa
ACT	Agricultural Council of Tanzania
AGP-AMDe	Agriculture Growth Program-Agribusiness and Market Development
AMCOS	Agricultural Marketing Cooperative Society
ANSAF	Agricultural Non State Actors Forum
BEST-AC	Business Environment Strengthening for Tanzania-Advocacy Component
CBA	Cost Benefit Analysis
CBIC	Component Coordinator for Capacity Building and Institutional Collaboration
CBOT	Chicago Board of Trade
CBT	Cashew Board of Tanzania
CFC	Common Fund for Commodities
CNSL	Cashew Nut Shell Liquid
COSTECH	Commission for Science and Technology
EAGC	East Africa Grain Council
EBRD	European Bank for Reconstruction and Development
EPINAV	Enhancing Pro-poor Innovation for Agricultural Value chain
FAO	Food and Agriculture Organization
IFAD	International Fund for Agricultural Development
KENFAP	Kenya National Federation for Agricultural Producers
KNCU	Kilimanjaro Native Cooperative Union
NARI	Naliendele Agricultural Research Institute
NCPB	National Cereal and Produce Board

NRI	Natural Resource Institute
OIBM	Opportunity International Bank of Malawi
ORCS	Oridoyi Rural Cooperative Society
PCS	Primary Cooperative Society
RAS	Regional Administrative Secretary
SACCOS	Savings and Credit Cooperative Society
SAFEX	South Africa Future Exchange
SNAL	Sokoine National Agricultural Library
SPSS	Statistical Package for Social Sciences
TRA	Tanzania Revenue Authority
TSh	Tanzania Shillings
UCE	Uganda Commodity Exchange
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
URT	United Republic of Tanzania
USAID	United States Aid for International Development
USD	United States Dollar
WRS	Warehouse Receipt System
ZAMACE	Zambia Agricultural Commodity Exchange

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Cashewnuts sub-sector represent a small portion of agricultural production in Tanzania, with an average of 300 000 hectare cultivated (2% of total cultivated area in the country) producing approximately 100 000 tonnes per year (Nkonya and Hurle, 2013). Cashew is an important export crop in Tanzania, following only tobacco, coffee and cotton (UNIDO, 2011). The industry earned the country US\$ 75 million in 2005 (TIC 2005 cited by Akyoo, 2014), US\$ 70 million in the 2008/09 season (UNIDO 2011) and US\$ 140 million in the 2010/11 season (Akyoo, 2014). The 2011/12 season raw cashew output of 158 000 tons (CBT, 2012 cited by Akyoo, 2014).

Export of cashewnuts as one of the main agricultural exports in Tanzania represent an average of ten percent of total agricultural exports (UNIDO, 2011; Kilama, 2013). It ranks 16th in terms of the value it generates to the Tanzania economy (Tarimo *et al.*, 2012). The main producing regions in the country are Mtwara, Lindi, Pwani, Ruvuma and Tanga (UNIDO, 2012). The majority of harvested raw cashewnuts are exported and processed abroad, mainly in India (UNIDO, 2011).

In Mkinga district, the cashewnuts subsector provides an employment to about 80% of Mkinga population where currently, 11 764 hectares in the district are under cashew cultivation (Mkinga, 2014). According to URT (2009) and Mohammed (2014), the average harvest of raw cashewnuts in the district is 887 Metric tones per year and the district become second overall winner in cashew growing countrywise. It planted 20 185 cashew trees during the year 2013 after receiving a large consignment of seedlings

through the financing of Commission for Science and Technology (COSTECH) and Naliendele Agricultural Research Institute (NARI) (Mkinga, 2014; Mohamed, 2014). Moreover, in the season 2013/14 about 301.507 Metric tones of raw cashewnuts has been sold through formal markets in an auction managed by Cashew Board of Tanzania (CBT) (Mkinga, 2014).

However, the cashewnuts sub-sector in the district is dominated by smallholder farmers who have very limited access to markets and lack facilities to store their produce. As a result, they are forced to sell their produce during the harvest season, when farm gate prices are very low. Traders who can afford adequate storage sites often take advantage of smallholders' constraints: they collect raw cashew at very low prices and sell when prices are high. In addition, farmers face enormous difficulty in obtaining credit for their agricultural activities because of the lack of financial services in rural areas. Moreover, banks require collateral that farmers cannot provide as agricultural productivity is uncertain due to weather conditions and other external factors, farm produce cannot be used as safe collateral to obtain a loan. So far, in recent years, several strategies to improve agricultural marketing in the country have been done. Warehouse receipts systems (WRS) are part of a framework of modern agricultural market institutions that countries adopt in different combinations and permutations according to circumstances, to develop their agriculture and render markets more efficient and effective in delivering benefits to consumers and producers (Coulter, 2009). For the case of cashewnuts sub-sector in the United Republic of Tanzania (URT), WRS was introduced with the Warehouse Receipts Act No.10 of 2005, the Tanzania Cashewnut Marketing Board Act No.21 of 1984, the Cashewnut Industry Act No.18 of 2009 and the Cooperative Societies Act No.20 of 2003 (Nkonya and Hurle, 2013; Kilama, 2013). WRS uses securely stored goods as loan collateral (FAO, 1995 cited by Hollinger *et al.*, 2009). It allows clients,

such as farmers, traders, processors and others to deposit commodities in a secure warehouse against a receipt certifying the deposit of goods of a particular quantity, quality and grade. Clients can then use the receipt as a form of portable collateral to request a loan from a financial institution. Moreover, under the WRS scheme, small-scale farmers are able to store their produce in warehouses during harvest, when prices are relatively low, and release them to the market at better prices during periods of low supply. The programme allows farmers to access finance from commercial banks through Savings and Credit Co-operative Societies (SACCOS). The role of the SACCOS is to mediate and provide guarantees to banks on behalf of farmers.

In Mkinga District, since 2008 WRS has been put in place whereby Mabokweni Primary Cooperative Society of Tanga was the main buyer of raw cashewnuts in Mkinga District. However, to facilitate cashewnuts marketing through WRS, the District has registered three Primary Cooperative Societies (PCSs) namely Gezani, Mapatano and Mwanyumba since 2011 to deal with cashew marketing (Mkinga, 2014). Through WRS, PCSs became the main link for farm producers to the warehouse buying system. In the study by UNIDO (2011), the 2007/2008 introduction of WRS has brought some improvements in production quality and farm gate price from under 1USD to 1.5USD per kg.

Moreover, according to Warehouse Receipts Act of 2009, all cashew products have to be auctioned through WRS via cooperatives at an auction managed by the Cashew Board of Tanzania (CBT) (URT, 2009). According to the Cashewnut Industry Act of 2009 Sec 15(4), any person shall not buy, sell, process or export any cashewnuts on commercial basis without a license issued by the Tanzania Cashew Board (URT, 2009). So far, although under WRS, cashew producers are supposed to send their cashew to an approved warehouse and receive payment when their goods had been auctioned as noted by Kilama

(2013), most cashew producers in Mkinga District did not opt cashewnuts marketing through WRS. This study was therefore done to assess the role of WRS in improving cashewnuts marketing by smallholder farmers in the study area.

1.2 Problem Statement and Justification

There is a growing trend towards marketing approaches such as WRS aimed at reducing uncertainty and enhancing efficiency of smallholder farms. WRS is perceived to create credit through inventory or products held in storage (UNIDO, 2012). These receipts, sometimes known as warrants, when backed by legal provisions that guarantee quality, provide a secure system whereby stored agricultural commodities can serve as collateral, to be sold, traded, or used for delivery against financial instruments including futures contracts. These receipts are documents that state the ownership of a specific quantity of products, with specific characteristics and stored in a specific warehouse. In cashew sub-sector in Tanzania, since 2008 a WRS has been put in place which means that all cashew products has to be auctioned via cooperatives at an auction managed by the CBT (UNIDO, 2011).

Despite the benefits associated with cashewnuts sales through WRS most farmers in Mkinga District are still selling their cashewnuts in informal markets including illegal cross border trade. According to Mkinga District cashewnuts annual report of 2014, the total of 3824kg of raw cashewnuts for the season 2013/14 had been found crossing the Kenya border without license (Mkinga, 2014). This was also supported by UNIDO (2011) that there is a problem of illegal cross border trade from Tanga to Kenya. However, many studies have been carried out in the cashew industry in Tanzania. Among the most notable of these studies also include UNIDO (2011) on the cashew value chain diagnostic, UNIDO (2012) on the analysis of incentives and disincentives for cashew nuts

in Tanzania, Fitzpatrick (2012) on regulations, Kilama (2013) comparative study on the Tanzanian and Vietnamese cashew nut industries as well as Nkonya and Hurle (2013) on the market incentives and disincentives for cashewnuts producers in Tanzania.

The study by UNIDO (2011, 2012) has focused on the current status of the cashew value chain and analysis of incentives and disincentives for cashew nuts in Tanzania. The study was aimed to describe the market incentives and disincentives for cashew nut producers in Tanzania and purposely, yearly averages of farm gate and wholesale prices are compared with reference prices calculated on the basis of the commodity price in the international market. The price gaps between the reference prices and the prices along the value chain in this study were purposed to indicate to which extent incentives (positive gaps) or disincentives (negative gaps) are present at the farm gate and wholesale level. Fitzpatrick (2012) concerned himself with structure of roles in the cashew value chain.

However, none of these researchers had investigated why cashewnuts producers in Tanzania are still opting for informal marketing channels instead of WRS which has been in operation since 2008. Therefore, this study was proposed to fill this information gap by assessing the role of WRS in improving cashewnuts marketing by smallholder farmers in Mkinga District. The outcomes of this study can be used by the stakeholders involved in policy making and they can serve as input for evidence based policy dialogue at the national level.

1.3 Research Objectives

1.3.1 General objective

The general objective of this study is to assess the role of warehouse receipt system in improving cashewnuts marketing by smallholder farmers in Mkinga District.

1.3.2 Specific objectives

Specifically the study is sought to:

- i. Examine the operations and functions of the WRS in improving cashewnuts marketing by the smallholder farmers in Mkinga District.
- ii. Determine share of consumer price received by smallholder farmer when selling cashewnuts through WRS or through informal marketing channels.
- iii. Determine factors influencing smallholder marketing choices for WRS and other marketing channels in the study area.

1.4 Research Questions

- i. What are the operations of WRS in improving cashewnuts marketing by smallholder farmers in Mkinga District?
- ii. What is share of consumer price accrued by smallholder farmer when selling cashewnuts through WRS and informal marketing channel in the study area?
- iii. What are the main factors influencing smallholder marketing choice for WRS or informal marketing channels in Mkinga District?

1.5 Organization of the Dissertation

This dissertation is organized into five chapters. Chapter one explains the background information whereby WRS on cashewnuts marketing was described. Also problem statement, justification, objectives and research questions for this study are presented. Chapter two presents a review of literature and the review of methodologies in similar studies. Specifically the chapter reviews literature on cashewnuts production and trade, WRS approaches in different countries, benefits and roles of WRS in improving agricultural marketing and its effect on income, access to credits and markets is also reviewed. Chapter three describes conceptual framework of the study, description of the

study area, sampling procedures, data collection, definitions of dependent and explanatory variables used and the data analyses tools. Chapter four presents the discussion of the results of this study. The chapter starts with presenting information on socio-economic characteristics in relation to WRS and informal market participation and calculation of the marketing margins. It further explains the results of regression analysis on factors influencing smallholder marketing choices. Then, finally chapter five presents conclusions and recommendations of the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Global Cashew nuts Production and Trade

The cashew tree is strictly tropical and its cultivation is largely restricted to latitudes 15 degrees north and south (Jaeger, 1999). It grows in warm climates where the average daily temperature is 25°C, although this can range from 10°C to 40°C (Kilama, 2013). Cashew is drought resistant crop but needs reasonable rainfall and flourishes best in well-drained (sandy) soils (Kilama, 2013). Cashew is widely grown across the tropics where in most countries it remains a smallholder crop. According to URT (2009) smallholder farmer for the case of cashewnuts means any person doing activity of growing cashewnuts with capacity of less than one ton per year.

Cashew trees require great care from the time of planting as they can last for more than 30 years. The first harvest is only in the fourth year, implying low initial investment. Harvesting occurs annually within two months (Kilama, 2013). Raw cashew nuts, kernels and Cashew Nut Shell Liquid (CNSL) are the tradable outputs from cashew plants. This section looks at the global production of raw cashew nuts and kernels.

Cashew consumption and production have been increasing around the world, with producers, processors and traders as the industry's main actors (Kilama, 2013). Only Brazil has a significant production of cashew from plantations. The main producers of cashewnuts are India, Vietnam, Brazil and Tanzania, with further significant harvests in Mozambique, Indonesia and West Africa (Jaeger, 1999, Kilama, 2013). Originally from Brazil, cashews were introduced into India and Africa in the 16th century by Portuguese traders (Azam-Ali *et al.*, 2001 as cited by Kilama, 2013). However, in the mid

1990s Vietnam and India which are the main producers of cashewnuts in the world currently imposed a ban on exports of raw cashew. This becomes an incentive to their farmers to increase production (Figure 1) through increased return per unit of output after processing.

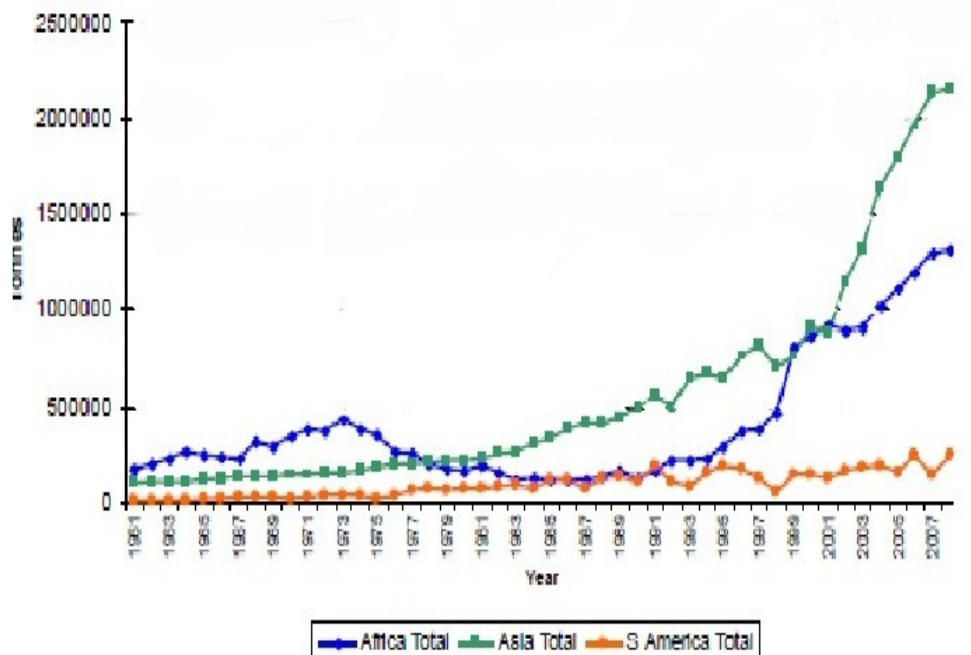


Figure 1: Cashew production for Asia, Africa and South America (1961-2008)

Source: Kilama (2013).

In 1961, the total global production of cashew amounted to about 230 000 tonnes (Figure, 2). Since then, production has expanded rapidly, with more countries starting to grow the crop. India and Brazil have consistently been among the biggest producers of raw cashew since the 1960s and in the last decade, Asian countries have increased their market share significantly after the implementation of imposed a ban on exports of raw cashew in the mid-1990s in Vietnam and India (Kilama, 2013).

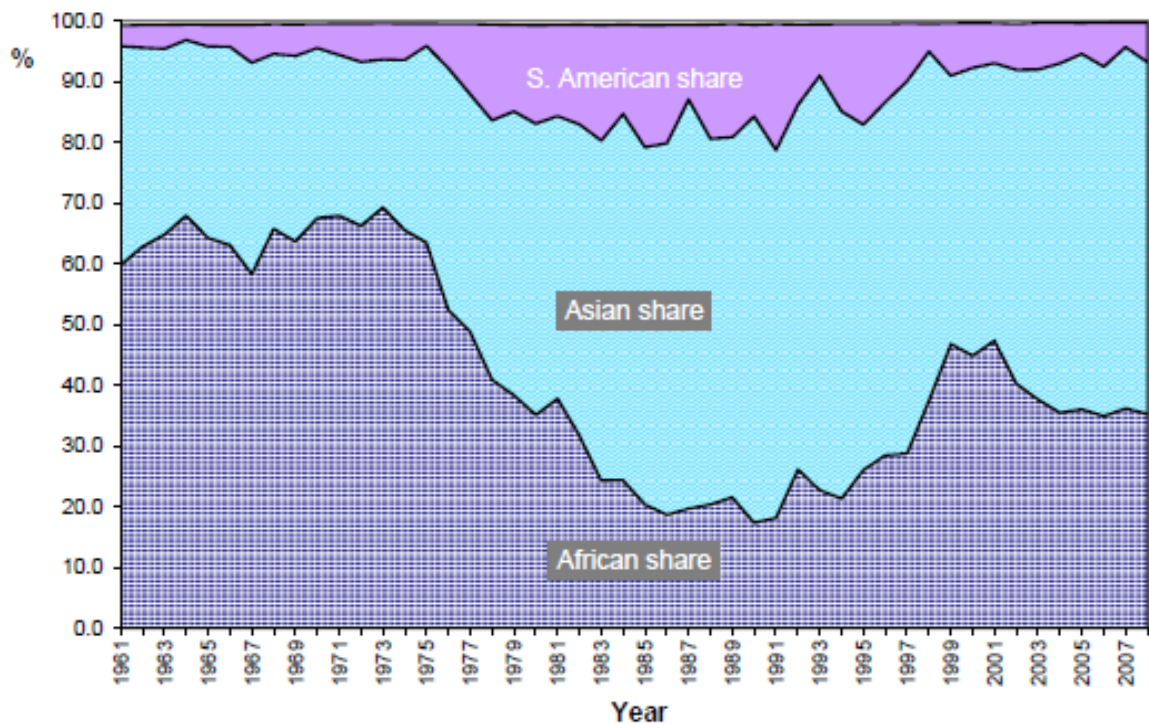


Figure 2: Share of world cashew production

Source: Kilama (2013)

2.2 Cashew Production in Africa

African countries dominated raw cashew production in the 1960s and 1970s, with Mozambique and Tanzania being the main producers up until the early 1980s (Kilama, 2013). The two countries produced more than 60% of the world's raw cashew between 1961 and 1975 (Figure 3) and any fluctuations observed in this period were mainly attributed to production issues in these countries (Kilama, 2013). Nigeria is the second in the league of raw cashew producers today in the world and claim to produce more than twice what was produced globally in the early 1960s (FAO, 2010). Tanzania is presently ranked eighth in the world for raw cashew production, while Mozambique is number ten (FAO, 2010 as cited by Kilama, 2013).

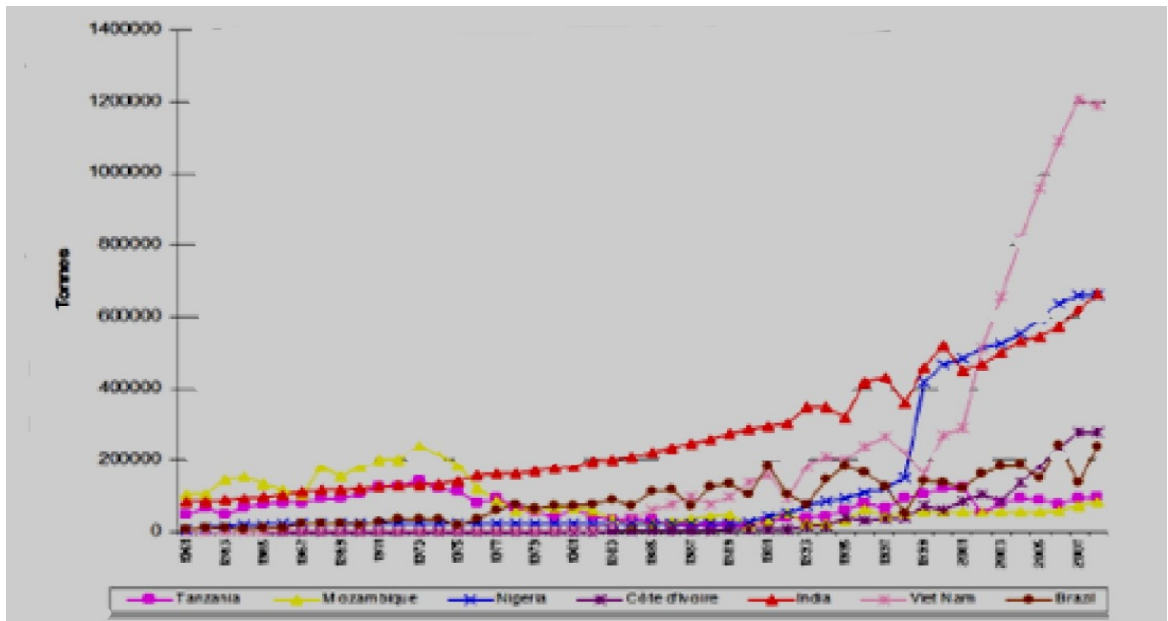


Figure 3: Important raw-cashew-producing countries (1961-2008)

Source: Kilama, 2013

2.3 Cashewnuts production in Tanzania

In Tanzania, cashew is mainly cultivated in the coastal regions of Mtwara and Lindi in southeastern Tanzania (Figure 4). Mtwara accounts for 70% and Lindi for about 20% of the country's total cashew production (Kilama, 2013). Other cashew producing regions are Ruvuma, Pwani and Tanga. In Tanga Region cashew is grown in four districts namely Mkinga, Muheza, Pangani, part of Korogwe and Tanga District. Other crops grown are maize, cassava, beans, leguminous and banana as a food crops while other cash crops cultivated are coconuts, groundnuts, oranges, mangoes, spices and sisal in larger scale plantation investment (RAS, 2012). However, in Tanga Region cashew is mainly grown in Mkinga District with average annual harvest of 887 Metric tonnes (URT, 2009). Currently, Mkinga district is the second overall winner in cashew growing countrywise after receiving a large consignment of seedlings through the financing of COSTECH and NARI (Mohamed, 2014).

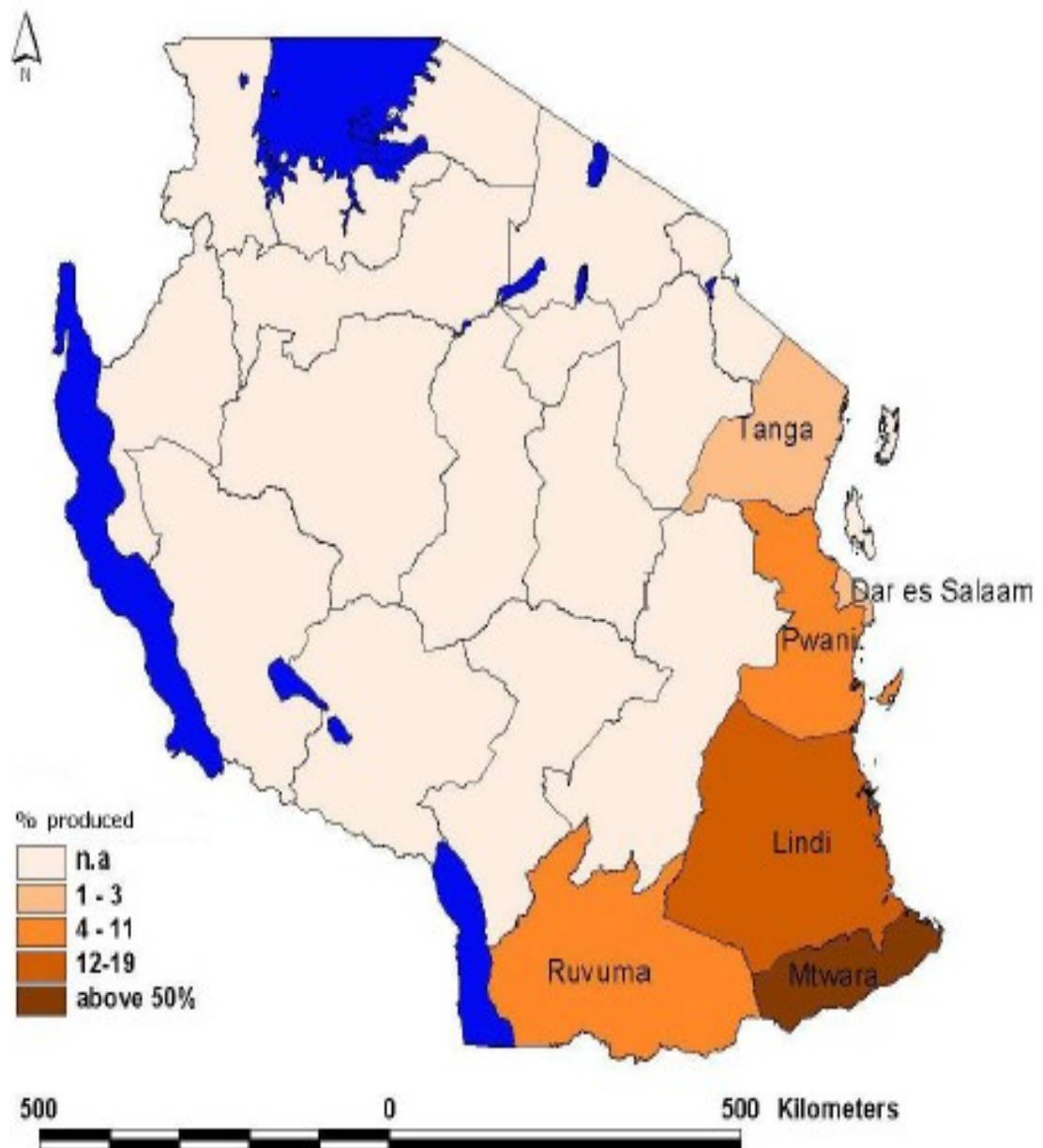


Figure 4: Cashew producing regions in Tanzania

Source: Cashew Board of Tanzania (cited by Kilama, 2013)

According to the analysis for price incentive and disincentive for cashew produce in Tanzania done by UNIDO for the period 2005-2011 (Table 1) and based on the analysis of trade they found that Tanzania is a net exporter of cashew nuts with an average of 85 percent of total production being exported during the studied period (UNIDO, 2012).

Table 1: Production and export of cashew nuts in Tanzania (2005-2011)

Production and Export	2005	2006	2007	2008	2009	2010	2011
Production	71 918	77 446	92 573	99 106	76 068	75 366	121 135
Export	70 667	66 708	69 259	75 888	64 335	63 044	113 374
% of export	98	86	75	77	85	84	94

Source: UNIDO (2012)

2.4 Cross-country Experience in WRS Approaches in Agricultural Marketing

Past studies revealed that warehouse receipt system have been used since 2400 BC during Mesopotamian civilization (Coulter, 2009, KENFAP, 2011). WRS has undergone transformation with huge variation from country to country. The changes include storage at farm level, communal grain bulking, manual warehousing and electronic warehouse receipting to futures market such as commodity exchange (KENFAP, 2011).

2.4.1 WRS in United States of America

In the 18th century, in United States of America (USA), entrepreneurs built steam-powered elevators, multi-storey buildings to receive farmers' and other suppliers 'grain, and store in bulk, prior to sale and onward shipment and issued tradable warehouse receipts against the stock (KENFAP, 2011). The Chicago Board of Trade (CBOT) emerged as a commodity trading floor and grading systems soon had to be established to reward better grain quality (Coulter, 2009). The CBOT became the barometer which elevators used to price grain purchases using a range of different contract types including spot, cash forward, delayed price and minimum price contracts with their positions often hedged on CBOT. In the late 19th century cooperatives in USA started investing in their own elevators, strengthening farmers negotiating power vis-à-vis large-scale corporate operators (Coulter, 2009). However, it was periodically the object of speculative

manipulation and this threatened the credibility of the system and increasingly drew regulatory attention. Companies and entrepreneurs progressively built grain elevators throughout the breadth of the grain producing states and became farmers' normal market outlet. The whole system covering agricultural warehousing, grades and standards and commodity exchanges was brought under a Federal regulatory regime during the second decade of the 20th Century (Coulter, 2009). An important factor motivating this change was difficult in trading across the borders of States whose standards varied from one state to another; hence a voluntary system was introduced whereby warehouse could choose whether or not to be registered at Federal level (Coulter, 2009). Moreover farmers storing in elevators were not protected from unregistered operators, there being no comprehensive system of registration, licensing or regulation. Lastly, there was a severe shortage of credit since farmers had received their land entitlement yet did not have the funds to develop their farmers (Ibid).

The combination of the US Warehousing Act of 1916 and related State Acts have created a regulatory regime which is to all intents and purposes mandatory, as elevators find they must get licensed by the Federal authorities or by State governments. There are consequently thousands of locations where farmers may deposit agricultural commodities in return for a negotiable warehouse receipt which can be used to raise finance or trade the commodity. Of at least equal significance were the steps taken by American monetary authorities which eventually became the Federal Reserve Bank (created in 1913). These established a special discount window for 'eligible bankers' acceptances' backed by warehouse receipts, making them a very liquid instrument (Coulter, 2009).

2.4.2 WRS in Latin America

In Latin America, similar needs emerged in the 19th Century in Argentina and Brazil's agro-exporting economies (KENFAP, 2011). However, the approach to warehouse regulation differed widely from the American model as one by one. Latin American countries followed the typical approach of Civil Law countries of passing General Warehousing Acts regulated by Ministries of Trade or banking authorities (Coulter, 2009). The Acts provided for the licensing of General Warehousing Companies which rather like giant pawnshops would be free to store all sort of commodities (agricultural and non-agricultural) and issue depositors with warehouse receipts in two parts, one a title document and the other a pledge certificate which the depositor can use to raise financing (Coulter, 2009). Unlike the American elevators, they are not normally allowed to trade in commodities concerned as this is deemed to create unacceptable conflict of interest.

For the case of Colombia, there are only five licensed General Warehousing Companies during that time, four belonging to the banks and the other to the State (Coulter, 2009). Each company has its own warehouses and silos, but the most profitable business is field-warehousing, i.e. providing warehousing services in the client's premises to enable the client to access financing. Ownership by wealthy banks has prevented warehouse failure and has reassured depositors that they would be protected from fraud.

The credibility of the Colombian warehousing system as of that in neighboring Venezuela, allowed those countries' respective commodity exchanges to market a system of REPOs, or repurchase contracts, backed by warehouse receipts. The REPO is a warehouse receipt backed security that an owner of warehoused stock can sell to institutional investors like pension funds through the exchange trading mechanism, with a commitment to repurchase it on maturity (60, 90 days etc.). In Colombia, it is the

commodity exchange's clearing house that underwrites the transaction and same is probably the case in Venezuela (Coulter, 2009). The instrument has proved attractive to sellers because it allows them to access funds at rates close to Treasury Bills and much lower than the rates on normal bank loans.

2.4.3 WRS in Eastern Europe and Former Soviet Union

Since the end of the 1980s, a variety of approaches have been used to collateralize stock for lending purposes, including bank surveillance using Soviet era documentation, employment of collateral managers, field warehousing and regulated systems (Coulter, 2009). There has been considerable outside support for the development of WRS from the European Bank for Reconstruction and Development (EBRD), USAID, CFC and others, much of it to establish licensing regimes along North American lines. A recent FAO report (Höllinger *et al.*, 2009) shows that in 12 countries which have sought to develop WRS, the system is most fully developed in three countries; Hungary, Bulgaria and Kazakhstan. All of these countries have special WR laws for grains rather than broad legislation encompassing various commodities and different commercial practices.

The Hungarian system consists of three very large and well capitalized warehousing companies carrying out a lot of field warehousing and with similarities to the above-mentioned Colombian system, while Bulgaria and Kazakhstan are closer to American practice (Coulter, 2009). In some countries like Poland and Slovakia, government intervention was maintained at a high level so that farmers were not interested in storing with warehouse receipts. In the Ukraine, there have been inconsistencies in legislation and weaknesses in the licensing process leading to a lack of trust in the same (Coulter, 2009). In contrast to the South African case (see below), there has been very limited trading of WRs on secondary markets, attributed in part to the immature character of

commodity exchanges and taxation regimes which discourage transfer between successive holders. The FAO report by Höllinger *et al.*, (2009) describes the typical donor approach as being very top-heavy, focusing on changes at the central level rather than working with local banks bottom-up to develop pragmatic WRS schemes. The FAO report ends with a comment that “Although it is essential to introduce all the core components of a WRS to ensure its proper functioning, care should be taken to avoid blueprints and allow for sufficient time for adjustments and consensus building” (Höllinger *et al.*, 2009).

For the case of Bulgarian, WRS is very well developed with 47 licensed public warehouses and over 500 000 tonnes of licensed capacity (Coulter, 2009). Its experience highlights the importance of winning over the banks, it being observed that: (a) once they had developed expertise in WR lending and established efficient internal procedures, the mechanism became quite simple with comparatively low administrative costs, and; (b) lending rates fell from 16% at the beginning of the programme when only two banks were lending to 7-8% in 2008 when 10 banks were in competition (Coulter, 2009).

2.4.4 WRS in Africa

In Africa, the WRS have had a short life span compared to the rest of the developed world. Countries like the USA and in Latin America have used warehouse receipts since the 1800s and Holland is believed to have used them since the 1600s (Coulter, 2009, USAID report, 2011). In Africa, the development of WRS emerged as an important means of improving the performance of agricultural marketing systems in Africa following liberalisation in the 1980s (Onumah, 2010). WRS is among examples of agricultural models that have promoted an improved marketing and pricing system, thus improving the incomes of farmers. WRS have emerged in countries with strong

commercial farming such as the Republic of South Africa and Zimbabwe prior to 2001 (KENFAP, 2011) and later to other countries including Zambia, Malawi, Kenya, Madagascar, Uganda, Ghana and Tanzania.

2.4.4.1 WRS in South Africa

South Africa's grain production (around 12 million tonnes) is dominated by about 30 000 large-scale commercial farmers, who until the early 1990s received state support within the framework of a State-controlled marketing system (Coulter, 2009). The new ANC Government liberalized the trade in grains and abolished commodity boards but at the same time encouraged the private sector to develop alternative institutional structure to support the trade. A range of needs had to be addressed including market information, systems for resolving trade disputes, systems of trade financing, grain pricing and the management of price risks (Coulter, 2009; KENFAP, 2011). These needs were addressed through various institutional devices, starting with the upgrading of the information service, the issue silo certificates (SCs) and the establishment of future and options contracts for white and yellow maize, wheat, soybean and sunflower on the South African Futures Exchange (SAFEX) which later became part of Johannesburg Stock Exchange. Cooperative storage complexes started issuing farmers with negotiable (Coulter, 2009). The farmers could trade these or use them to raise bank financing. However, South Africa has no WR Act (the Act of 1930 was rescinded during the Apartheid era), so SCs are handled under contractual law. SAFEX provided some regulatory oversight for a large part of this system, approving about 160 silo sites as locations where farmers or others could deliver SCs against expiring contracts (Coulter, 2009).

2.4.4.2 WRS in rice in Madagascar

In Madagascar where rice is its dominant food crop, annual paddy production reached 3.5 million tonnes by 2006, and it is produced by many millions of small farmers, the majority of whom do not produce enough for their own requirements (Coulter, 2009). The country regularly imports 150-200 000 tonnes of milled rice to supplement domestic supplies and the international market is therefore key to domestic price formation (Coulter, 2009).

Despite widespread access to irrigation, agricultural productivity remains low and rural populations experience high levels of indebtedness. Conventional banking is unable to directly reach the dispersed farming population, and this has led to the development of mutual microfinance (MF) networks, notably the CECAM (Mutual Agricultural Savings and Credit) network which started in 1993. By 2008, it had 110 000 members grouped into 162 local branches and 9 regional unions (Coulter, 2009). It is a credit-led system (WRS) into which soft loans are injected against member share capital, which serves as partial collateral, with a view to building the level of operations to a level where it can refinance itself with commercial banks (KENFAP, 2011). So far, the system of storage credits has had a highly positive developmental impact in Madagascar and it has certain advantages over other inventory credit/warehouse receipt approaches, notably that it is highly decentralized, it is self-regulating and low-cost (Coulter, 2009, KENFAP, 2011). However, the system has main limitations including that pest control which is more difficult with commodities other than paddy and for which market price movements are less predictable and its success dependency on a highly structured type of micro finance institutions which hardly exists in the other countries.

2.4.4.3 WRS in Kenya

In Kenya where the main food crops are maize, wheat and potatoes, attempts to establish a regulated WRS have focused on maize, which has a less organized market than the main export crops, and is mainly produced by smallholders (Coulter, 2009, KENFAP, 2011). Kenya is in some ways suited to follow South Africa's example in organizing market institutions, having a large urban population, a significant commercial farming sector, an active Cereal Growers Association (CGA) that brings together large-scale producers and a core of commercially-oriented smallholders both large-scale and relatively quality-conscious food processors and a strong and innovative banking sector.

The establishment of the Eastern African Grain Council (EAGC), organised in the aftermath of the first African Grain Summit (held in Nairobi in October 2005), with the support of the US-funded RATES and the Kenya Maize Development Projects, COMESA and the East African Community (EAC) has established a system for certifying warehouses to receive grain deposits and issue transferable warehouse receipts. EAGC certified the first warehouse site in April 2008. This is a 50 000 tonne silo facility in Nakuru, belonging to NCPB and leased to Lesiolo Grain Handlers which acted as operator (Coulter, 2009; KENFAP, 2011). However, Kenya public policy has proved something of a deterrent whereby the government intervenes in the maize market through the parastatal National Cereals and Produce Board (NCPB) and border controls, notably by lowering the rate of duty on imports from countries which are not zero-rated (notably South Africa), the policy which has not encouraged farmers to deposit their grains in public warehouses. Due to the political situation and policy constraints, it is taking much longer than hoped to establish the WRS in Kenya (Coulter, 2009).

2.4.4.4 WRS in Uganda

Uganda gets most of its food from food crops and bananas (*matoke*), which due to their perishability are not easy to use as loan collateral. The food crops of most potential for innovative trade financing are maize, paddy rice, beans, groundnuts and soybeans (Coulter, 2009). In Uganda, the policy environment is generally more favourable to establishing the WRS than in the other (mainland) countries in Africa. This is because cereals in Uganda are not the main pillars of Uganda's food security and Government is less inclined to intervene in their markets for political reasons. The President has declared an open borders policy on the ground that this benefits farmers (Coulter, 2009).

However, in Uganda maize is more of a cash crop than in Kenya and Tanzania, and demand is split between three major markets: domestic manufacture of *posho* meal (hulled and hammer-milled maize) with the waste going for animal feed, exports to Kenya, southern Sudan and Rwanda and the World Food Programme (WFP) which has its largest programme of Local and Regional Purchase (LRP) in Uganda. This currently involves the purchase of close to 200 000 tonnes of commodities a year, consisting of maize grain (the main commodity), beans, maize meal and corn-soya blend (Coulter, 2009).

Ugandans founded the Ugandan Commodity Exchange (UCE) in 1998, but this was unable to gain traction with its trading floor. Notwithstanding it was able to gain Government and EU support to implement a project to develop the WRS and develop the exchange floor (2006-2010), and Government designated it WRS regulator under the WRS Act of 2006 and Regulations of 2007. Under this project, UCE has focused mainly on making the system work with maize and beans, has established grading standards, implemented a system of electronic warehouse receipts (eWRs) linked to the South Africa

provider (ICX), hired and trained licensing staff (chief warehouse examiner), and trained banks to use the system. The electronic system made it easy to encumber the WRS with the bank and access credit on favourable terms (as noted above, EAGC has received similar requests). WFP had purchased around 150 tonnes of this, and by the end of August 2009 it had procured 358 tonnes (Coulter, 2009).

In Uganda, the warehouse receipt system exist until the year 2008, when WFP signed up for the role (USAID, 2012). Now, the agency has established two additional warehouses, including one in northern Uganda to operate a system that helps small-holder farmers earn more. The farmers take their grain to warehouses licensed by the Uganda Commodity Exchange, where the grain is weighed, cleaned, graded, dried, bagged and stored. Every depositor gets a receipt verifying their tonnage and grade. For a small fee, the warehouse guarantees to maintain the grain's quality and quantity until it is transferred to the person who buys the receipt from the depositor or until the depositor decides to withdraw the commodity. WFP's role as a market-maker is of great importance to UCE, as it accounts for most of the demand for maize of standardised quality and moisture content that meets UCE's grading standards and can be safely stored (Coulter, 2009). UCE has also licensed a warehouse for holding in-bond merchandise on behalf of a leading bank. There has also been a successful small-scale pilot with cotton in Kasese, under a CFC funded project, whereby primary societies placed their seed cotton under collateral management while it was stored and toll-ginned prior to the sale of the resulting products (lint and seed). The WRS Regulations of 2007 provided for two types of licensed warehouse (public and private), with the latter category allowing UCE to regulate collateral management.

2.4.4.5 WRS pilot for maize in Zambia

Zambia is a landlocked country with abundant agricultural land, producing maize, cassava, wheat, soybeans, mixed beans and other crops. About 15% of maize, all wheat and most soybeans are accounted for by 900 large-scale commercial farmers (Coulter, 2009). Even within the smallholder sector, production is heavily skewed towards the larger producers with about 2% of producers accounting for 50% of the marketed surplus (Ibid). Collateral management services have been widely use by leading traders and millers. A regulated warehouse receipt system was introduced (for grains) in 2001 under a project funded by the Common Fund for Commodities (CFC) and implemented by the Natural Resources Institute (NRI). Other donors subsequently provided co-funding, and continued supporting when CFC and NRI ceased their involvement in 2004 (Coulter, 2009).

Letter, the Zambia Agricultural Commodity Exchange (ZAMACE) inherited a WRS successfully piloted with support from CFC and other donors including USAID, IFAD (under its SHEMA Project) and the Dutch Government. A warehouse receipt system was piloted in Zambia for grains under a project funded by the Common Fund for Commodities (CFC) and implemented by the NRI (KENFAP, 2011). The project succeeded in creating the foundations for a thriving WRS, which was accessible to both commercial and smallholder farmers. Implementation of the WRS project was launched in 2000 and its pilot use occurred in the 2003/04 season. Its most successful season was the 2004/05 season when four warehouse operators with total storage capacity 105 000 tonnes were certified and 65 000 tonnes of maize was deposited, out of which 3764 tonnes was deposited by smallholder farmer groups (Coulter, 2009 and NRI, 2005 as cited by Onumah, 2010).

2.4.4.6 WRS in Malawi

In Malawi, the main food crop is maize, followed by cassava, while cash crops include tobacco, tea, cotton, sugar cane, macadamia nuts and groundnuts (KENFAP, 2011). Due to food security concerns Government has been heavily subsidizing inputs so that farmers can produce high yielding maize varieties, and this has caused a major increase in annual production. There was a successful pilot WRS in 2005, but the approach had to be abandoned in 2008 (Coulter, 2009), raising questions as to whether such complex technical operations can be institutionalized in a highly politically-charged environment (KENFAP, 2011, ACE, 2012).

However, in 2011 ACE registered the silos (storage facilities) in Kanengo, Lilongwe as the first WRS storage facility. The Kanengo storage facility has a capacity of 12 000 Metric tonnes and it was open to deposits from any interested third party (ACE, 2012). Furthermore, there are various other initiatives to enhance rural storage and local bulking of surpluses, involving hermetic storage technologies, storage by producer organizations (linked to microfinance or banks), and grain bulking by certified trade intermediaries (ACE, 2012).

2.4.4.7 WRS in Tanzania

The warehouse receipt system was introduced in Tanzania in 2005 with the pilot crops of coffee and cotton (USAID, 2012). It enables farmers to receive loans and assure the quality of their produce. The system allows coffee producers (individuals or cooperatives) to store their coffee in a silo. Upon the receipt of the coffee, the producers are issued with two certificates: (1) certificate of title for them to keep and (2) certificate of pledge to provide to third parties. Cooperative or commercial banks are the primary participating lenders in the system. The certificates of deposit promote the confidence of farmers in

financial institutions. They also enable the banks to reach a new set of customers for financial services.

Since 2005, the Agricultural Marketing Systems Development Programme (AMSDP) has piloted a MF-linked WRS for grains, making use of Tanzania's large stock of underutilized rural warehouses. Warehouses must have a minimum capacity of 300 tonnes, there are four participants (farmers, SACCOS, participating commercial banks and collateral managers), stocks must be insured for fire and theft, and collateral managers must have professional indemnity cover. As in Madagascar, farmers deposit their grain (maize or paddy rice) individually and have it stored identity-preserved. Tanzania has most advance regulated WRS that has been developed under a project funded by the Common Fund for Commodities (CFC), initially for the coffee and cotton sub-sectors but subsequently expanded to cover cashew and grains such as maize and rice (Onumah, 2010).

2.4.4.8 WRS in cotton sub-sector in Tanzania

WRS has been practiced with cotton for several years in northern Tanzania, with a producers' cooperative, a small ginnery belonging to the Ministry of Trade and bank funding, helping the farmers to raise output of seed cotton from just over 130 tonnes to 1 100 tonnes in just over four years (Onumah and Temu, 2008 cited by Coulter, 2009). The system is now being piloted in the Western Cotton Zone where almost all Tanzanian cotton is produced (Coulter, 2009). The Warehouse Licensing Board reports that Sibuka ginnery in Shinyanga ginned 400 tonnes of seed cotton supplied by farmer groups in the first season and 1 000 tonnes in the second season and that the operation proved profitable (Coulter, 2009).

In the study by Onumah (2010), a farmer group, the Oridoyi Rural Cooperative Society (ORCS) in Tanzania, which has used the WRS in marketing its cotton since 2002 was able to raise cotton output by its members from just over 130 000 kg of seed cotton to the peak of over 1 100 000 kg of seed cotton over a period of four years. Seed cotton delivered by the members to the ORCS is warehoused and ginned for a fee by the KNCU Cotton Ginnery at Moshi. As noted by Onumah (2010), in the 2005/06, the ORCS was able after ginning to market their lint directly to a UK-based cotton merchant, with the assistance of locally resident broker.

2.4.4.9 WRS in cashewnuts sub-sector in Tanzania

Marketing raw cashew nuts in URT has changed over time, and has included direct sales from farmers to traders and delivery of the raw nuts to the Primary Society for marketing. The Primary Societies were the sole marketer of farmer's cashew nuts from independence until 1991 when marketing was liberalized and farmers were allowed to sell to any buyer. Marketing changed again in 2007 when the private sector was no longer allowed to buy cashews directly from farmers or Primary Societies and all raw cashew nuts were marketed through Primary Societies and Cooperative Unions for sale at auction (UNIDO, 2012). Warehousing of cashew emerged from an initiative in Mtwara region, in 2007, with the objective of enhancing the efficiency of the primary marketing system for raw cashew nuts (Coulter, 2009, UNIDO, 2012). Government was concerned that market liberalisation had not delivered on its promise, that the market was not transparent, and that buyers' agents were paying derisory prices for the raw nuts. The new system is a combination of the WRS, government minimum pricing and an officially-sanctioned cooperative procurement monopsony, involving the same PCS and regional cooperative unions that operated prior to liberalisation, such that the exporters and local processors are not allowed to send their buyers into the field.

The cooperatives deliver raw cashews to designated warehouses where they are sampled and auctioned to the interested exporters and local processors. Banks provide the PCS with funding against WRs issued by designated warehouses, over US\$ 45 million in 2007/08 (Coulter, 2009). As far as could be ascertained during a short visit, the system had been successful in raising prices to farmers, though part of the increase was permitted by favourable world prices in 2007/08. One downside is that it has halted the establishment of outgrower schemes linking buyers and farmers, and which help the latter raise productivity and improve nut quality. The politically-sensitive system of minimum pricing does not sit well with a WRS which seeks to be market-driven, and in 2008/09 this resulted in a costly stand-off with buyers.

When selling to PCS or AMCOS, farmers receive a first payment which is normally financed by credits undertaken by the PCS/AMCOS. The AMCOS in turn sell to buyers via the auction and charge a fee for their services. With the income from the fee in theory AMCOS should build, upgrade and maintain storage facilities and eventually provide additional services (input procurement, investment in irrigation, etc.) Irrigation however is not practiced with cashew currently (CBT, 2012 cited by Akyoo, 2014). Buyers process the nuts (i.e. de-shelling and peeling) or export directly. As mentioned above the latter option covers most of the production currently in URT. Power of exporters is limited by the concentration of purchasers in India; with two main buyers concentrate purchases of cashew nuts (UNIDO, 2011).

However, The CBT has the overall mandate of overseeing and regulating the cashew industry. The marketing of raw cashewnuts has been restructured to operate primarily through the warehouse receipt system according to the Warehouse Receipt Act 2005, Act No 10 of 2005 (UNIDO, 2011). Introduction of WRS has improved access to end market,

although still over 60 per cent of Tanzanian cashewnuts is exported in raw/unprocessed. To facilitate cashewnuts marketing through WRS, Once per year before the start of the cashewnuts marketing season the cashew board brings together all stakeholders to set a indicative (benchmark) price on the basis current local and world market conditions as well as the structure of fees and taxes that have to be paid by and to various institutions in order to get the product from the farmers' fields to the warehouse (UNIDO, 2011).

2.5 Warehouse Receipt Features

The WRS have been recognized as an important tool to provide the agricultural sector with increased flexibility in marketing decisions and also as a mechanism to obtain financing for farm operations (Andrews *et al.*, 2007). The basic features of warehouse receipt finance are relatively simple and straightforward as pointed out by Hollinger *et al.* (2009) in Figure 5. The client deposits a certain amount of goods into a warehouse in exchange for a warehouse receipt. The warehouse receipt conveys the right to withdraw a specified amount and quality of the commodity at any time from the warehouse.

The warehouse manager is liable for guaranteeing the safety and quality of the stored commodity. The warehouse receipt can then be transferred to a bank, which provides a loan equivalent to a certain percentage of the value of the stored commodity. At maturity, the client (e.g. a farmer) sells the commodity to a buyer who then either pays the bank directly, or pays the borrower who then repays the bank. On receipt of the funds or an acceptable payment instrument (e.g., a confirmed Letter of Credit), the bank surrenders the warehouse receipt to either the buyer or the seller (depending on the specifics of the transaction), who then submits the warehouse receipt to the warehouse, which releases the commodity. In case of default on the loan, the bank can use the warehouse receipts in its

possession to take delivery of and sell the commodity stored in the warehouse to offset the amount due.

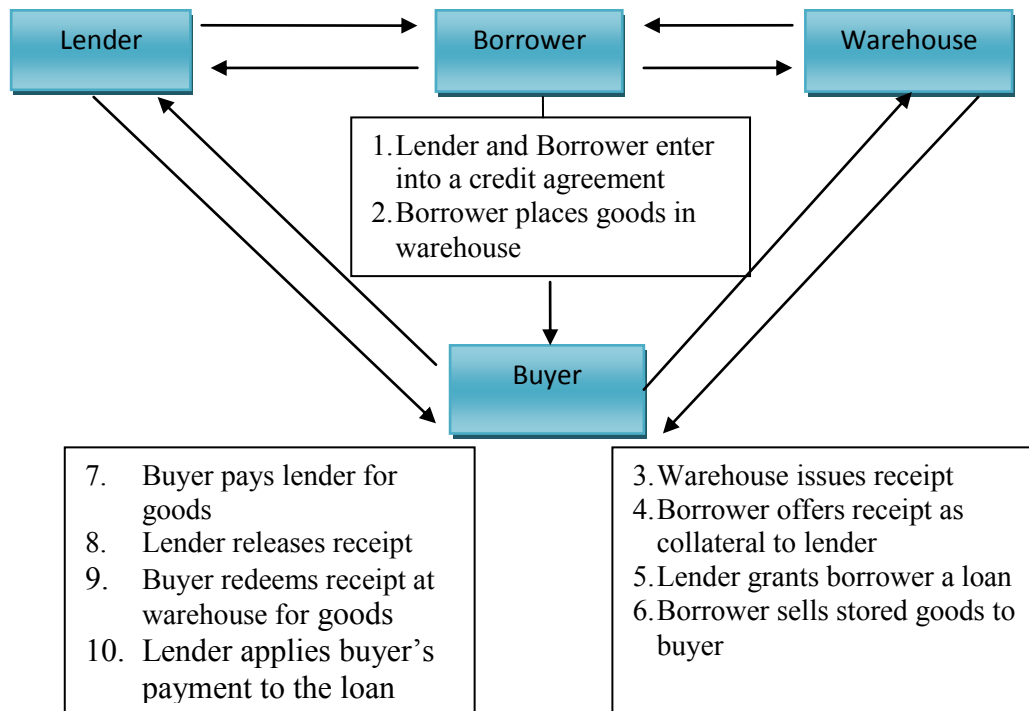


Figure 5: Basic features of a warehouse receipt financing transaction

Source: Höllinger, (2009)

2.6 Warehouse Receipt System and Income to Farmers

Warehouse Receipt Systems (WRS) have a long history of use in facilitating crop trade and finance. Madulu, (2011) argued that, a good marketing setup will increase the farmer's income, which in turn will enlarge scope for more investment in agriculture. The use of WRS system in crop marketing by smallholder farmers would improve farmers' productivity through credit in form of inputs like fertilizers. Onumah (2001) reported that smallholder farmers in Zambia were able to access productivity-enhancing inputs such as fertilizers when they marketed their maize through the warehouse system. Small farmers' income in Zambia increased over 80% when they used WRS in marketing their maize.

In Ghana, WRS users observed increment in income resulting from increase in price of maize about 75% of that at harvest (NRI, 2010). The system has been recognized as an important tool to provide the agricultural sector with increased flexibility in marketing decisions and also as a mechanism to obtain financing for farm operations. A warehouse receipt is a certification of legal ownership of a particular commodity that is stored in a specified location and is of a specified quality and condition, such that when the commodity is sold, the buyer can have the comfort, without physical inspection, that the product they have purchased will be available to them when required, in the condition outlined on the warehouse receipt (Andrews *et al.*, 2007).

In Tanzania WRS participants accrued incremental income of about 45-70% of what non-participants paddy farmers received (NRI, 2010, cited by Madudu, 2011). As noted by Madudu (2011), through WRS, farmers are able to delay sale and use stored commodities as collateral to obtain credit thus satisfy immediate consumption needs. Increased storage by participants in the commodity system will moderate seasonal price variability and reduce trade margins for the benefit of both producers and consumers. WRS facilitates impersonal trade by reducing information asymmetry between trading partners (Coulter and Onumah, 2000).

2.7 Review of Methodologies Suggested for this Study

2.7.1 Marketing margin analysis

Although for this study, cost-benefit analysis and Gross margin could be the best or proper methods to explain the profitability of the WRS and other marketing options for cashewnuts marketing but marketing margin analysis was opted. As pointed out by Madulu (2011), Cost-Benefit Analysis (CBA) is not static because it has time element and interest rate. CBA is a general term which is used to analyze present value and future

costs and benefit of a project. This involves the use of discounted cash flows. Discount Rate to allow for changes in the time value of money, the terms “present value” and “future value” are used (Madulu, 2011).

According to Quaye and Kanda (2004), the term marketing margin is commonly used to refer to the difference between producer and consumer prices of an equivalent quantity and quality of a commodity. There are a great number of empirical studies dealing with marketing margin and asymmetry problems in agricultural markets. Marketing margins analysis are widely used methods to gain insight into the functioning of, and degree of competition in the markets. For this study, marketing margin analysis was employed to determine share of consumer price/shilling received by the cashew smallholder farmers in WRS and in alternative or parallel markets found in the area.

Different researchers have used market margin analysis to compute market performance. For example Ojogho (2012) used the method to determine marketing margin and the nature of price transmission for beef in Benin Metropolis, Madudu (2011) used the method to analyze the effects of transaction costs on incomes and access to credits by farmers, Rehima (2006) used to market margin analysis to calculate profit of pepper marketing and Abay (2006) applied marketing margin analysis for vegetables marketing margin.

2.7.2 Regression analysis

Regression analysis is the main tool to obtain the estimates as a bread and butter tool of econometrics (Gujarat, 2004). Regression analysis has been widely used in many fields, including economics, market research, and transportation engineering to determine the percent of variance in the dependent variable explained by the independent variables and

to rank the relative importance of independent variables (Greene, 2002). Regression analysis is concerned with the study of the dependence of one variable on one or more other variables. There are different regression analysis approaches namely, two variable regression analysis, probit regression analysis and logistic regression analysis.

However, for this study logistic regression seems to be suitable since it is usually used to test for the factors that influence households from using greater depth marketing methods, which have the potential of increasing their incomes (Jari, 2009). It has also been pointed out by Jari (2009) that logistic regression can be used to predict a dependent variable, based on continuous and/or categorical independent variables.

According to Gujarati (1992) and Greene (2002) Logistic regression does not assume linear relationship between the dependent variable and independent variables, but requires that the independent variables be linearly related to the logit of the dependent variable. According to O' Sullivan, Sheffrin and Perez (2006), logistic regression assumed that households make participation choices depending on the option that maximizes their utility. With the given assumption, binary logistic regression was used to relate the decisions to participate either in formal markets or in informal markets and the factors that influence these choices since this study is concerned with only two marketing channels, namely formal and informal channel. Binary logistic regression analysis has also been used Temu *et al.* (2011) to determine the factors that influence adoption decision of improved maize varieties. The model is specified as:

$$\text{Logit}(L_i) = f(\text{AGE}, \text{SEXHH}, \text{DISWR}, \text{EDUHH}, \text{ACCEXT}, \text{ACCTR}, \dots \text{ect}) \dots \dots \dots (1)$$

The econometric model specification of the marketing choice in matrix notation is estimated by the following typical logistic regression model;

$$\log it(L_i) = \ln\left(\frac{P_i}{1-P_i}\right) = \alpha + \beta_1 X_1 + \dots + \beta_n X_n + U_t \dots \dots \dots (2)$$

Where: $\ln(L_i / 1 - P_i)$ = logit for market participation choices

P_i = not participating in formal markets, $1-P_i$ = participating in formal markets
whereby for this study formal market means WRS.

β = coefficient, X represents covariates and U_t = error term

The model is based on the plausible assumption that each decision maker (cashew farmer) selects formal (WRS) or informal marketing decision only if it maximizes its perceived utility. Utility in this case is, however, latent and only the decision variable (formal or informal marketing option) is observed. The decision of the respondent “y” takes on one of two values, 1 (opting formal market) or 0 (not-opting for format market). The probability that the farmer prefers one marketing channel compared to the other is restricted to lie between zero and one ($0 \leq P_i \leq 1$).

However, the empirical analysis of the determinant of farmers on decision to participate in the marketing option is typically estimated using some measure of response to the decision to participate in the market question as the dependent variable which is a function of variable expected or assumed to be determinant of decision to participate in the market.

2.7.3 Social factors influencing smallholder marketing choice

Factors like education level, marital status, access to extension services, age of the farmers, distance to the market centres, market sales prices and transaction costs have been suggested by different scholar as the factors that can influence farmers decision whether to participate particular marketing option or not. The marital status of households

is usually used to determine the stability of a household in African families (Jari, 2009, Temu *et al.*, 2011). It is normally believed that married household heads tend to be more stable in farming activities than unmarried heads. If this holds true, the marital status of household heads will affect agricultural production and hence, marketing.

Moreover, age of the farmer is an important aspect in agriculture because it determines experience one has in a certain type of farming and marketing activities. It is argued that higher age have more experience in farming and develop skills to participate in the market (Madulu, 2011; Temu *et al.*, 2011). Likewise, education level of the farmers and accessibility to the extension services enhances the skill and ability to better utilize market information, which may reduce marketing costs and make it profitable to participate in the market (Jari, 2009).

2.7.4 Institutional factors

Institutional aspects in marketing and economic development include transaction costs, market information flows and the institutional environment (Jari, 2009). Smallholder farmers in less developed rural economies lack adequate market information and contractual arrangements, lack lobbies in the legal environment and are not easily receptive to changes. These factors tend to result in high transaction costs and, hence, difficulties in formal market participation. According to Dorward *et al.* (2009), the role of effective institutions in facilitation has three components:

- Institutions facilitate *coordinated* exchange and resource management. Coordination is needed at several levels. At its most basic level, coordinated exchange involves the reliable bringing together of buyers and sellers.
- Institutions facilitate *low-cost* exchange and resource management and encourage trust. This set of institutions includes contracts and enforcement mechanisms,

commercial norms and rules, and habits and beliefs favoring shared values and the accumulation of human capital.

- Institutions *provide incentives* for exchange and resource management in that they create profitable opportunities for investment and exchange. In so doing, they encourage entrepreneurs and society more broadly to look for and invest in these opportunities and in particular to invest in infrastructure development and technical and institutional innovation.

Moreover, access to extension services and farmers training were considered the most crucial source of information among farmers. Extension services and farmer training are important for the promotion of agricultural production in terms of technology dissemination (new varieties, input use, farm implements and technical knowhow) (Temu *et al.* (2011). Farmer training workshops can also be used to educate farmers on farming practices. These are functional and practical techniques for educating the older farmers on the advanced methods of production and marketing.

Moreover, availability of market information to farmers boosts confidence of households who are willing to market their produce. Thus, farmers who are more informed are more likely to participate in marketing. Likewise, those farmers located closer to market centers experience lower costs since they can get information more easily (Jari, 2009). Moreover, Madulu (2011) argued that; farmers who are located closer to market centres are more likely to market their produce compared to those who are located far away.

2.7.5 Markets and institutions

Markets can be grouped into informal and formal (Jari, 2009). In the agricultural context, informal markets embrace unofficial transactions between farmers and from farmers

directly to consumers. On the other hand, formal markets have clearly defined grades, quality standards and safety regulations and prices are formally set. So far, smallholder farmers find it difficult to penetrate the formal markets, due to high transaction costs, high risks, missing markets and lack of collective action (Mangisoni, 2006 cited by Jari, 2009). Transaction costs are observable and non-observable costs associated with enforcing and transferring property rights from one person to another (Eggertson, 1990). These include the costs of searching for a trading partner with whom to exchange with, the costs of screening partners, of bargaining, monitoring, enforcement and, eventually, transferring the product to its destination. These high transaction costs result from individual produce transportation and selling, difficulties in getting trading partners and poor bargaining power. When transaction costs are high, smallholder farmers may cease produce marketing. In other words, with high transaction costs, markets fail in their role of allocating scarce resources to alternative ends.

According to Jari (2009) market information is vital to market participation behaviour of smallholder farmers. Normally, market information allows farmers to take informed marketing decisions that are related to supplying necessary goods, searching for potential buyers, negotiating, enforcing contracts and monitoring. In agricultural context, necessary information includes information on consumer preferences, quantity demanded, prices, produce quality, market requirements and opportunities (Ruijs, 2002 cited by Jari, 2009). However, it is the source of market information that determines accuracy of the information.

According to FAO (2004 cited by Kilama, 2013), Smallholder farmers normally rely on informal networks (traders, friends and relatives) for market information due to weak public information systems. However, such individuals may not have up to date and

reliable market information, making the usefulness of the information doubtful. Additionally, farmers relying on informal networks for market information are at risk of getting biased information due to opportunistic behaviour of the more informed group. Montshwe (2006 cited by Jari, 2009) argued that, smallholder farmers have difficulties in accessing market information, exposing them to a marketing disadvantage. They usually accept low prices for their crops when the broker informs them that their produce is of poor quality.

2.7.6 Organization in markets

Smallholder farmers tend not to be organized in the markets as they usually sell their few agricultural produce surpluses individually and directly to the consumers without linking with other market actors (Key and Runsten, 1999 cited by Jari, 2009). In other words, smallholder farmers lack collective action in markets. According to Kherallah and Minot, (2001), individual marketing of small quantities of produce weakens the smallholder farmers' bargaining positions and often exposes them to price exploitation by traders. They also do not benefit from economies of scale.

However, in a globalised world, there is increasing vertical integration and alliance formation in the agricultural marketing channels and markets, in an effort to meet consumer needs. Such alliances include contract farming, cooperatives and farmer organizations (Menard, 2004). Agribusiness firms favour contracts with medium to large-scale farmers, such that individual smallholder farmers cannot be part of these contracting arrangements (Kherallah and Kirsten, 2001, Jari, 2009). Lack of facilitation in the formation of producers associations or other partnership arrangements makes it more difficult for smallholder producers to participate in formal markets. The greater the degree of organization in the market, the smaller the transaction costs are likely to be and the

easier it is to benefit from the exchange opportunity. Lack of collective action among smallholder farmers denies them entry into formal market channels (Frank and Henderson, 1992 cited by Jari, 2009).

2.7.7 Legal environment

Legal institutions influence the activities performed on the market and the costs of exchange. Minot and Goletti (1997) affirm that the formal institutional development of a society has a considerable influence on transaction costs. Thus, if trade laws are transparent then agreements can be legally enforced, leading to information accessibility and lower costs. In other words, effective legal institutions may improve the organisation of the marketing channels and decrease marketing costs. In many developing countries, laws are not always executed and enforced correctly, bribery and cheating are often not penalised, courts are out of reach for the majority of the population, and market rules are often not transparent to the producers and traders (Ruijs, 2002). It is even worse for the smallholder farmers because they lack lobbies in the legal environment. As a result, rural trade prospers where trust has been developed based on repeated transactions or informal relationships (Randela, 2005). Thus, unfavorable legal environment creates a significant barrier to entry into formal trade and limits participation by smallholders in the modern marketing system.

2.7.8 Technical factors

Since market liberalization, some often overlooked technical factors have become increasingly important. Technical factors contribute towards providing good quality products to the consumers. In this section, these factors will be discussed and how they influence smallholder farmers' decisions in marketing. Technical changes in marketing

can be viewed as those transformations that allow goods to be available on the market at lower costs and in a more diversified set of markets (Carre` and Drouot, 2002).

Technical changes are usually influenced by factors in the organization itself, public regulation and general advances in technology. In agricultural production and marketing, smallholder farmers tend to be lagging in the use of improved technology (Carre` and Drouot, 2002). Most small producers in Africa including Tanzania lacks appropriate transportation facilities and road infrastructure, communication links and storage. Further, smallholder farmers have limited ability to add value to their produce. Lack of such facilities usually constrains farmers' supply response to any incentives in both agricultural production and marketing (Dorward *et al.*, 2003).

2.7.9 Physical infrastructure constraints

Physical infrastructures, as noted by Machethe (2004 cited by Jari, 2009), include communication links, electricity, storage facilities, transportation facilities and roads. Good roads, transportation and communication links are prerequisites to market access, particularly to those potential market participants who reside in rural areas because of the relatively longer distances between them and the markets. So far, in Tanzania, smallholder farmers are mostly found in areas remote from market places where there is a serious lack of the aforementioned facilities, resulting in high transaction costs. Sometimes transaction costs are too high for farmers and traders to get any meaningful benefits from potential trading activities, discouraging farmers to participate in marketing activities. Jari (2009) pointed out the importance of developing and maintaining the physical infrastructure after recognizing high transaction costs as one of the major factors constraining the growth of smallholder agriculture in African countries. It can be concluded that inadequate physical infrastructure in rural areas, particularly in the former

homeland areas of South Africa remains a major obstacle to smallholder agricultural growth.

2.7.10 Storage facilities

The ability to deliver a quality product to the market and ultimately to the consumer, commands buyer attention and gives the grower a competitive edge (Bachmann and Earles, 2000). Proper post harvest handling and storage contribute in ensuring quality maintenance for perishable agricultural produce. Moreover, agricultural commodities have to be harvested at a specific point in time, but are consumed year-round, thus necessitating proper storage facilities (Sasseville, 1988). If crops are to be available for consumption throughout the year, proper storage facilities have to be implemented by both farmers and traders. Amongst farmers, storage may have some added advantages because it increases market flexibility. Households with proper storage facilities do not need to market their produce immediately after harvest when prices tend to be low. They can store their produce and sell when prices are higher. Most smallholder farmers do not have access to adequate storage infrastructure and end up selling their produce soon after harvest, also because they need the money involved. Smallholder farmers often rely on open-air storage (Gabre-Madhin, 2001). Due to lack of storage facilities, most smallholder producers are keen to sell produce almost immediately after harvest in order to ease congestion, leading them to sell their produce at lower prices. In studies carried out in Malawi and Benin, Gabre-Madhin (2001) explained that storage practices are relatively limited in both countries.

2.7.11 Road infrastructure

Agricultural commodities must move from the farms where they are grown to the retail outlets where they are bought. Road infrastructure and transport availability have an

influence on smallholder market participation, especially if they are located distant from the consumption centres (Gabre-Madhin, 2001). One of the most important constraints facing agricultural markets throughout sub-Saharan Africa is transport infrastructure and the need to reduce transport (Bachmann and Earles, 2000 cited by Jari, 2009). As transport generally marks the passage from one stage of the postharvest system to the next, if the roads are poorly developed, it becomes difficult to move produce from one stage to another (Goletti and Wolff, 1998).

2.7.12 Value adding

Prices of primary agricultural produce have fallen steeply, but retail prices for the same packaged, cut and processed products in industrial countries, have increased (Robbins, 2005). This means that value adding activities can earn farmers additional income. Value adding can be in the form of grading, sorting, cutting, packaging in standard weights and processing of produce (Mather, 2005). Lack of value adding and agro-processing is part of missing markets amongst smallholder farmers in marketing.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Conceptual Framework

This conceptual framework presents the role of warehouse receipt system in improving cashewnuts marketing by smallholder farmers to improve their income. It has been noted that, the capacity of smallholder farmers, support services and enabling environment as the key factors that determine the operation and functioning of WRS (KENFAP, 2011). Quality standards and grades of inputs and outputs are necessary to increase yields, guide trading, facilitate efficient use of storage space, determine the price of the stored products and facilitate business transaction.

Information flow is also essential for decision-making (Figure 6). This allows farmers to assess the best time to sell their produce. The degree of organization of smallholder farmers for collective action is crucial to obtain quantities of output to earn a warehouse receipt and other support services. Support services such as research, extension, financial and insurance services are critical for the success of the WRS. Enabling environment facilitates interaction of actors and defines the context of doing business. The policy gives direction, regulation through licensing and inspection of warehouse facilities and operations guarantee credibility of the system. Sound management creates confidence and reliability for the stocks to be used as collateral to secure credit hence increase economic returns to the farmer and hence enhanced livelihoods of the rural and urban poor.

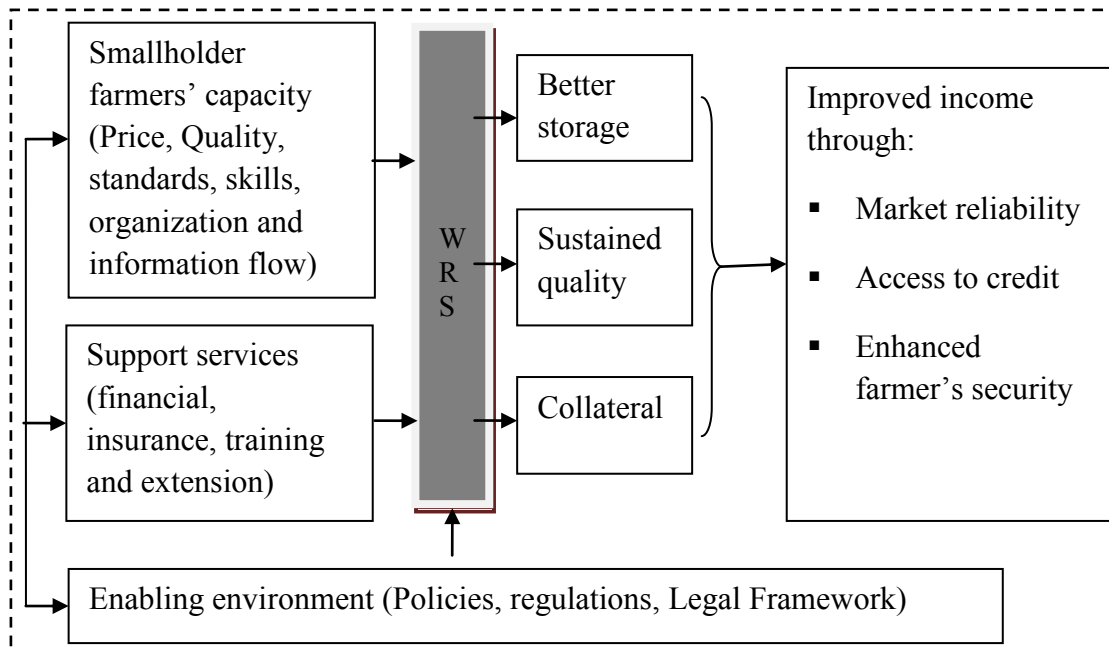


Figure 6: Conceptual framework of the study

Source: Modified from KENFAP (2011).

3.2 Description of the Study Area

3.2.1 Location and population

This study was done in Mkinga district located between latitudes 5° and $5^{\circ}08'$ South and longitudes $38^{\circ}35'$ and $39^{\circ}10'$ East (Figure 7). Mkinga District is among the Cashewnuts producing district in Tanzania and the leading District in Cashewnuts production in Tanga region. The district is one of the eight districts in Tanga Region borders with Muheza and Tanga Districts in the south, Korogwe and Lushoto districts in the west, The Republic of Kenya in the north and the Indian Ocean in the east. The district has an area of 2 948 square kilometers of which a significant part is occupied with Uмба game reserve (Mkinga, 2012). According to 2012 Census, the District had a total population of 118 065 out of which 57 760 were males (49%) and 60 214 were females (51%) with an average annual growth rate of 1.27%.

Source: Mkinga, (2011)

Weather condition and topography are very important and major determinant factors of livelihood of the people particularly where agriculture is the major economic activity. Mkinga District has a variety of topographic features and climatic condition. The coastal lowland extends about 20 to 30 kilometers inland from the India Ocean and rises to about 100 meters above sea level. The rest of the District rises gradually from the east towards

the northern and mid-southern areas to about 400 meters above sea level. The northern areas rise gradually towards the Uмба hills (about 800 meters) that extend into Kenya.

The district has semi-arid climate marked with differences in the amount of rainfall, landforms, soil types and land use potentials. Rainfall is usually sufficient to allow the growth of a variety of crops. The district receives bimodal rainfall of between 450mm and 1 000 mm with an average of 750 mm. The average temperature is 16°C. Likewise, the district has 18km² area that forms a distinct ecological zone with fishing and marine culture among the main sources of livelihood for the population.

3.2.3 Economic activity

Agriculture is the engine of Mkinga economy where by more than 80% of people living in the district depends on agriculture for their living. Only 20% of total population is engaged in other economic activities such as livestock keeping, fishing, business and mining. Among total area of square km 2 948 (294 800ha) of the district, about 85% of total land is suitable for crop cultivation and livestock keeping which is equivalent to 250 580ha. Food crops cultivated are maize, cassava, beans, leguminous and banana while cash crops cultivated are cashew nuts, coconuts, groundnuts, oranges, mangoes, spices and sisal in larger scale plantation investment.

3.3 Design of the Research

Cross section study design was used because it allows data on different groups of respondents to be collected at a single point of time without repetition.

3.3.1 Sample size and sampling procedures

Since the data obtained from a sample was generalized to the whole population, the manner in which the sample units are selected was important. According to Gupta (2002), a sample should be representative; therefore, the sample size should be large enough to conduct reliable statistical analysis. Gupta continues suggesting that, an optimum sample size was the one that fulfills requirements of efficiency, reliability and flexibility. According to Bless and Smith (2000) cited by Jari (2009), in order to get reliable statistics, a sample should have at least 30 units.

In this study cluster sampling was used to obtain four cashewnuts producing villages (Cluster 1: list of all villages involving in cashewnuts production adjacent or along the Kenya border, Cluster 2: list of all other villages involving in cashewnuts production in the district). However, visiting all the cashew-producing villages in the two clusters would have added little benefit and would have been logistically and financially unfeasible in the time allowed. Two most producing villages from each cluster were selected purposely then random sampling of the respondent followed. The use of random sampling in selecting villages was ignored in order to learn from better performers. From each village, 25 household farmers were randomly sampled from the register of cashew farmers available in the village. According to 2012 Population and Housing Censuses, the total number of households in the study area was 4 696 (URT, 2012). Therefore, a total of 100 sample respondents for the whole study were established using the formula proposed by Gupta (2002) as shown below:

$$S = \frac{N}{1 + N(e)^2} = \frac{4696}{1 + 4696(0.1)^2} = 97.91493 \approx 98$$

Where; S= sample size, N= household population and e= level of precision or error.

The recommended level of precision, “e” for social science research is 5% because it gives the confidence interval of 95%. However, if there is a resource limitation, investigators or researcher may use a larger e (i.e; $e > 5\%$) (Naing *et al.*, 2006 cited by Wikedzi 2013). Therefore, this study suggested $e = 10\%$ since the population was assumed to be homogeneous in most aspects with respect to farming practices, level of technology used and breeds/variety of cashewnuts tree grown. To increase data validity and reliability, farmers were interviewed by researchers, trained enumerators and experienced extension officers using a structured questionnaire.

3.3.2 Data collection

To achieve the objectives of the study, both primary and secondary data were collected using structured questionnaire.

3.3.2.1 Primary data

Primary data were collected using structured questionnaire. The questionnaire was then administered to respondents through face-to-face interviews. The heads of the households chosen to be part of the sample were interviewed. In the absence of the head, the spouse or any family member who is directly involved in the cashewnuts farming activities was interviewed. The questionnaire was designed to capture data on factors that influence market participation. The data that was collected included: demographic data (age, sex, educational level and marital status), infrastructure development (roads, storage facilities and transport availability), amount of crop (cashewnuts) at the market, market proximity, market institutional arrangements (legal support, grade and standard arrangements) and difficulties involved in market exchange and Market information accessibility by farmers. Moreover, information from individual farmers was complemented with information from key informants’ interviews with key informants.

3.3.2.2 Secondary data

Secondary data was obtained from district agriculture, cooperative and irrigation department of Mkinga District, Primary Cooperative Societies (PCSs) office, from the internet and from Sokoine National Agricultural Library (SNAL). The secondary data required include data on global cashew trade, Africa and Tanzania share on global cashew trade, raw cashew trade in the district and information on warehouse receipt approach in cashewnuts trade.

3.3.3 Data analysis

Descriptive statistics were employed to characterize the socioeconomic and biophysical features of the households. Marketing margins analysis and logistic regression analysis were used to generate the share of consumer price received by smallholder farmer and to determine the factors that influence smallholder decision on marketing channels respectively.

3.3.3.1 Descriptive analysis

Descriptive analysis; means, frequencies and percentages were calculated to analyze the roles of WRS to smallholder farmers, marketing initiatives and community awareness on WRS, accessibility to marketing information as well as risks and challenges for cashew marketing through formal markets.

3.3.3.2 Analysis of marketing margin

Market margin analysis seems to be appropriate as data for this analysis was collected during the survey such as farm gate price and sale price (in both formal and informal marketing channels) as used by Rehima (2006) and Abay (2006 cited by Madudu, 2011). Estimating marketing margins for formal and informal marketing approaches was

employed to notice the marketing channel that gives higher share of the consumer price to smallholder farmer.

Mathematically is presented as:

$$MM = SP - FGP,$$

Where; MM = market margin (Share of the consumer price),

SP = selling price and,

FGP = farm gate price (price at harvest or deposit)

3.3.3.3 Logistic regression

The data analysis also included logistic regression to determine the factors that influence farmers' decision to opt for formal or informal marketing channel. The logit model is based on the plausible assumption that each farmer's decide to selects WRS or informal marketing channel only if it maximizes its perceived utility. Utility is, however, latent and only the decision variable (WRS or informal) is observed. The decision of the respondent "y" takes on one of two values, 1 (WRS) or 0 (otherwise). The model used by Temu *et al.*, (2011) was adopted and modified. The model is useful to capture factors influencing smallholder decision to participate in the marketing channel he/she opt.

The Model is specified as:

$$\text{logit}(L_i) = \ln\left(\frac{P_i}{1 - P_i}\right) = \alpha + \beta_1 X_1 + \dots + \beta_n X_n + U_i \dots \dots \dots (1)$$

Where:

$\ln(P_i / 1 - P_i)$ = logit for market participation choices

P_i = not participating in formal market,

$1 - P_i$ = participating in formal market.

β s= coefficients and U_i =the error term.

By fitting the variables into the model, the model is presented as:

$$\text{Logit}(L_i) = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_o + \delta_1 D_1 + \delta_2 D_2 + \delta_3 D_3 + \delta_4 D_4 + \delta_5 D_5 + \delta_6 D_6 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu_i \dots \dots \dots (2)$$

Where:

D_1 =Dummy sex (1 if household head is male=1, 0 otherwise),

D_2 =Dummy marital (1 if household head is married, 0= otherwise),

D_3 =Dummy training (1 if have access to farmer training, 0 otherwise),

D_4 = Dummy extension (1 if have access to extension services, 0 otherwise),

D_5 =Dummy education (1 if have formal education, 0 otherwise),

D_6 =Dummy village location (1 if located along the border, 0 otherwise)

X_1 = Distance to WRS center (km),

X_2 = Age of household head (years),

X_3 =Transaction costs (TC) (Tshs),

X_4 =Number of cashew trees owned by the household,

X_5 =Quantity of cashewnuts marketed (kg) and

X_6 =Experience of farmer in cashew farming (years).

3.3.4 Description of the independent variables used in the model

3.3.4.1 Dependent variable

Marketing channel: It is a dummy variable that represents the dependent variable; 1 if the farmer used the WRS, 0 otherwise.

3.3.4.2 Independent variables

The explanatory variables expected to influence the dependent variable are the following:

Quantity of cashewnuts sold: It is a continuous variable measured in kilograms. The variable is expected to have positive contribution to the choice of marketing channel. Farmers who produce more output are expected to opt for formal market than those with less produce.

Distance to WR centers: It is a continuous variable and is measured in kilometers which farmers spend time to sell their product to the market. If the farmer is located in a village far from the WR centre, then s/he is weakly accessible to the market. The closer to the market the lesser would be the transportation cost and time spent. An influence of this variable was assessed by Abebe (2009) on market chain analysis of honey production in Atsbi Wembrta District in Ethiopia, Holloway *et al.* (1999 cited by Abebe, 2009) milk-market development in the Ethiopian highlands. His result indicates that distance-to market causes market surplus to decline. Similar issue was studied by Wolday (1994) on food grain market in the case study of Alaba indicated negative relationship between distance from the household residence to grain market and volume of marketed food grain. Furthermore, study conducted by Rehima (2006) indicated similar results.

Age of the household head: Age is demographic variable and is measured in years. The expected influence of age is assumed positive since it is a proxy measure of farming experience of household. Aged households are believed to be wise and acquire skills in farming and marketing (Abebe, 2009).

Sex of the household head: This is dummy variable that takes a value of one if the household head is male and zero otherwise. The variable was expected to have positive influence in the choice of WRS. Both men and women participate in cashewnuts production and marketing. However, male households have been observed to have a

better tendency than female household in decision making in Africa families including decision on what and where to sell as observed by Abebe (2009), Jari (2009), Wikedzi (2013) and so many other scholars.

Access to extension service: This variable is measured as a dummy variable taking a value of one if the beekeeping household has access to extension service and zero otherwise. It is expected that extension service widens the household's knowledge with regard to the use of marketing options available in the area. Farmers that have frequently contact with extension services will have better access to information and could adopt more profitable market. Abebe (2009) argued that the better information farmers had out is likely to supply more cashewnuts to the formal market.

Access to farmers training: It is a dummy variable which takes the value of one if the farmer had accessed farmer training on warehouse receipt system and the use of formal marketing channel or zero otherwise. It is crucial for the success of warehouse receipt system. The variable is expected to have positive influence on the choice of WRS over informal marketing channel.

Education level of the household head: It is a dummy variable and refers to the formal education of a household head during the survey period. It takes the value of one if the household have accessed formal education and zero otherwise. The variable is expected to have positive influence in opting WRS since those household heads who had formal education determines the readiness to accept new ideas and innovations and easy to get price information. Abebe (2009) observed that education of the household head had significant and positive effect on marketing of agricultural products through formal markets in Ethiopian highlands.

Marital status of the household head: It is dummy variable taking value of one if household head is married, zero otherwise. The marital status of households is usually used to determine the stability of a household in African families (Jari, 2009, Temu *et al.*, 2011). It is normally believed that married household heads tend to be more stable in farming activities than unmarried heads. If this holds true, the marital status of household heads will affect agricultural production (increase) and hence, opting for more formal market.

Transaction costs: Reductions in transport costs, cost of searching information and risks are achieved by technical change, infrastructural investment and institutional changes for instance standardized weights and measures, enforcement of business laws and the relationships between producers, consumers, and market chain intermediaries. These can make it easier, cheaper and less risky for buyers and sellers to communicate and trade with one another over longer distances. Since many transaction costs are fixed per transaction, thus, increasing traded volumes can also reduce transaction costs per unit good or service transacted (Johann *et al.*, 2009). Therefore, it is expected to have negative effect with the choice of marketing channels. If the transaction costs of doing business through formal market is high, the farmers are expected not to opt for the formal system of marketing.

Location of the village: This is a dummy variable that if the village is located near to the border take the value of one, zero otherwise. It is expected that those farmers located nearer to the Kenya border will opt for informal marketing channel (cross border trade) than those residing away from the border. The fact is that, it has been pointed out in various reports including UNIDO (2011) and Mkinga (2014) that problem of illegal cross border trade is very prone in the area. Thus these farmers residing nearer to the border are

expected to take this opportunity of ready available market than collecting their produce to the warehouse centre then searching for potential buyers. This is expected to have negative effects with formal marketing channel.

3.4 Limitation of the Study methodology

Majority of respondents in the study area do not keep records especially on quantity harvested and sold for the previous seasons and transaction costs. Therefore, this posed challenges during data collection whereby collection of data/information mainly depended on the memory or recall of respondents, which the majority. On the other hand, some respondents, particularly farmers opting for cross border trade were very suspicious fearing that data obtained might be given to the government for legal action. However, after discussion most of them were convinced to cooperate after being assured that the information needed was meant for research only and not otherwise and that their privacy would be respected. Moreover, data collection was done during heavy rain season where some of the villages proposed for the study were not easily accessible. However, most farmers were engaged in the farming activities for the long rain season (March-May).

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Socio-Economic Characteristics of Respondents

4.1.1 Age distribution

Age of the household head is an important aspect in agriculture because it determines experience one has in a certain type of farming. In addition, to a certain extent, age indicates the position of the household in the life cycle. Ngqangweni and Delgado (2003 cited by Jari, 2009) argued that household head's experience influences household members' farming activities since they usually get guidance from the head. For this study, age of sampled farmers was classified into different groups where each farmer belonged to one group (Table 2). However, there are generally few young farmers (< 30 years) among the sampled households, as compared to the older farmers. This is probably because younger people view other forms of employment as better sources of income as compared to farming.

Table 2: Age of the respondents

Age group	Percent		Total Percent
	WRS	Informal	
<30 (Years)	1	6	7
30-39 (Years)	3	13	16
40-49 (Years)	5	26	31
50-59 (Years)	8	15	23
60+ (Years)	2	21	23
Total	17	83	100

4.1.2 Sex of the respondents (cross tabulation)

Findings of the study shows that out of 100 sample respondents 60% were males while 40% were females. This implies that most of smallholder farmers' households are headed by males. High involvement of men could be due to importance that cashewnuts sector commands in the economy of the household in this area which links with the arguments of Wikedzi (2013) that as in the other parts of Tanzania, men in most cases are the controllers of resources and decision makers.

Table 3: Sex of the respondents irrespective with the marketing channel

Sex	Marketing channels (%)					Total percent
	Through WRS	To the middlemen	Road side	Across the border	To the nearest town	
Male	14	35	1	8	2	60
Female	3	29	1	7	0	40
Total	17	64	2	15	2	100

4.1.3 Level of education attained by the respondent

Findings in Table 4 show that 31% had no formal education, 64% had primary education, 4% had secondary education while only 1% had tertiary education. This implies that majority of the smallholder farmers of cashewnuts had at least basic formal education which can help them to understand and utilize better and profitable marketing option. This results links with the arguments of Jari, (2009) that education level of the farmers enhances the skill and ability to better utilize market information, which may reduce marketing costs and make it profitable to participate in the market. Mkongo, (2007 cited by Wikedzi 2013) reported that household heads with relatively higher education are more likely to have skills, higher agricultural productivity as well as higher ability to utilize market opportunities.

Table 4: Highest education level of the household head and place of sale

Education	Marketing channels (%)					Total percent
	Through WRS	To the middlemen	Road side	Cross border	Nearest town	
No formal education	2	21	0	7	1	31
Primary Education	15	39	2	7	1	64
Secondary education	0	3	0	1	0	4
Tertiary education	0	1	0	0	0	1
Total	17	64	2	15	2	100

4.1.4 Marital status of the respondents

The findings in Table 5 reveals that 87% of the sample respondents interviewed are married, 7% are widow, 5% divorced and only 1% is single. This implies that household with couples living together are more stable in agriculture than single headed households. Marital status of households is usually used to determine the stability of a household in African families. This results links with the arguments of Jari (2009) that married household heads tend to be more stable in farming activities than unmarried heads. If this holds true, the marital status of household heads affects agricultural production and hence, marketing decision.

Table 5: Marital status of the respondents

Marital Status	Marketing channels (%)					Total percent
	Through WRS	To the middlemen	Road side	Cross border	Nearest town	
Single	0	1	0	0	0	1
Married	15	55	1	14	2	87
Widow	1	5	0	1	0	7
Divorced	1	3	1	0	0	5
Total	17	64	2	15	2	100

4.2 Operations of Warehouse Receipt System

4.2.1 Farmers awareness on WRS

During the survey each respondent was asked if s/he is aware of WRS. The result shows that 94.06% of the sample respondents have heard about WRS (Table 6). However, what was discovered during the survey is that there is mistrust between farmers and leaders of primary societies and between leaders of primary societies and CBT. There is little understanding about the roles and operation of WRS to farmers. The farmers knows that PCs are the buyers of their cashew nuts, so they claimed that why they are not getting the whole payment of their crop once they brought cashew nuts to the WR centres for trade. This observation is also supported by ANSAF (2013) that the Tanzanian cashew nut industry suffers from a lack of good quality information. According to ANSAF (2013) this is due to myth, rumors and adversarial relationships which often times create responses, both in the institutional and commercial spheres based on inaccurate perceptions of the market and market actors.

According to Cooperative Act No. 20 of 2003, the role of the PCs and AMCOS is to mediate between sellers (who are cashew farmers in this case) and buyers (URT, 2009). When selling to PCs or AMCOS, farmers receive a first payment which is normally financed by credits undertaken by the PCs/AMCOS. The PCs/AMCOS in turn sell to buyers via the auction and charge a fee for their services, and then the farmers were paid with the second payment amount depending on prevailing situation in the market.

Table 6: Farmers awareness on WRS

Response	Frequency	Percent
Yes	95	94.06
No	5	4.95
Total	100	100

4.2.2 Grading of cashewnuts

Among the functions of WRS is to assure grades and standards of raw cashewnuts traded through WRS. According to The Cashewnuts Act No. 18 of 2009” Article 19, all cashewnuts brought at the buying centres for sale shall be kept in grades depending on the quality of the cashewnuts (URT, 2009). Moreover, Article 5(b) of the same Act demands CBT who is the supervisor of all auctions done in the WR centres to regulate and control the quality of cashewnuts, kernels and cashewnuts by-products (URT, 2009).

However, the results from this study shows that only 20% of all sample respondents managed to grade their cashew nuts before sell (Table 7). The situation is very worse in Horohoro village which is adjacent with the Kenya border whereby only 1% of 25 sample respondents have managed to grade their cashew nuts prior to sell. This is an indication of high presence of informal marketing option since the demand of WRS is grades of cashew nuts. The price of cashew nuts in WRS is offered according to grades basing on indicative price given by the government which are \geq TSh 1200 for standard grade (Grade I) and \geq TSh 900 for under grade (Grade II) for the season 3013/2014. Therefore, automatically those farmers who didn’t manage to grade their raw cashew nuts will not benefit from this market. Only 20% of the farmers interviewed managing to grade the cashew nuts implies that most of the smallholder farmers in the district cannot benefit

from trade liberalization which demands for strict quality control, grades and standards as a necessary certification for their goods as required by WRS too.

Moreover, it has been pointed out by various scholars that the ability to add value exerts a positive impact on market participation. Among the studies are done by Kherallah and Kirsten, (2001) and Jari (2009) that value addition in raw crops (including grading) has a positive relationship is because households with the ability to add value can sell their produce in an improved state, which can be more appealing to customers. In other word, in a formalized market operation consumers normally demands for high quality goods. In addition, they will not buy food products unless there is a guarantee that they are safe to eat. In other words, consumers make purchasing decisions depending on quality, standards and packaging consistency as well as uniformity of goods.

However, currently in Tanzania the trading of cashewnuts is done through the so called “auction” famously known as “gulio” managed by the CBT. This was opt after serious crisis developed in the marketing of cashew nuts from Tanzania in the cashew season 2011/12 (ANSAF, 2013). The farmers were supposed to brought their cashewnuts kept on grades depending on quality of cashewnuts to the auction centres, the same condition with that in WRS. In the Mkinga six auction centres were specified (i.e. Bwagamacho, Totovu, Gezani, Mwanyumba, Daluni and Mapatano). Though these auction centres were specified in the district, but some of them were not active (including Daluni and Mwanyumba) by time of this study, the situation which forced most smallholder farmers in some of the villages to remains with only one option of selling their cashew produce the unlicensed traders (middlemen/ brokers) roaming around the homesteads.

Table 7: Response on cashewnuts grading before sells

Response	Response per village (%)				Total percent
	Mwanyumba	Gezani	Horohoro kijijini	Duga Maforoni	
Yes	7	6	1	6	20
No	18	19	24	19	80
Total	25	25	25	25	100

4.2.3 Famers organization in markets

Findings of this study reveal that it is only 47 respondents out 100 total respondents interviewed belong to the farmers' organization (Table 8). Among the reasons why they are not joining hands together through farmers' organizations like AMCOS is that they didn't see the contributions of those organizations. Lack of collective action among smallholder farmers denies their entry into formal market channels. According to Jari (2009), Smallholder farmers tend not to be organized in the markets as they usually sell their few agricultural produce surpluses individually and directly to the consumers without linking with to other market actors. In other words, smallholder farmers lack collective action in markets. Individual marketing of small quantities of produce weakens the smallholder farmers' bargaining positions and often exposes them to price exploitation by traders. They also do not benefit from economies of scale (Kherallah and Minot, 2001).

Moreover, as suggested by Mernard (2004) in his article "Economics of Hybrid Organization" that, in a globalised world, there must be increasing vertical integration and alliance formation in the agricultural marketing channels and markets in order to meet consumer needs. Such alliances must include contract farming, cooperatives and farmer organizations. The greater the degree of organization in the market, the smaller the

transaction costs are likely to be and the easier it is to benefit from the exchange opportunity.

Table 8: Membership to farmers association

Response	Response within villages (%)				Total percent
	Mwanyumba	Gezani	Horohoro kijijini	Duga Maforoni	
Yes	19	5	15	8	47
No	6	20	10	17	53
Total	25	25	25	25	100

4.2.4 Legal environment and contracts enforcement

The study found that enforcement of regulation in the WRS is challenged in many ways. During discussion with informants they raised poor understanding of the system as one major challenge. It was noted that almost all of the stakeholders in the cashew nut industry have varying understanding of the WRS. Politicians and CBT consider the system as mandatory through the farmers unions only, farmers take it as a final market and traders conceive it as a deliberate move to eradicate them from the chain. So far, among the farmers who had used WRS in the previous seasons, only 45% of them respond that they had contract with the warehouse operators (Table 9). However, what was discovered during the survey was that even those 45%, who said that they had a contract, actually was not contract but just a receipt showing the amount cashew deposited in the warehouse. In failure of getting second payment, the farmers have no power to enforce the payment. As noted by Akyoo (2014), a common understanding is an urgent requirement for the WRS's smooth and sustainable operation.

Table 9: Contract enforcement during sales

Response	Frequency	Percent
Yes	9	45.0
No	11	55.0
Total	20	20

4.3 Analysis of Marketing Margins for WRS and Informal Marketing Channels

4.3.1 Marketing channels for raw cashew nuts

The analysis of marketing channels is intended to provide a systematic knowledge of the flow of the goods and services from their origin (producer) to the final destination (consumer). According to Mbiha (2008), the way marketing actors transfer the produce from production to where it can be used as a final product is referred to as a marketing channel. The complexity of these channels depends upon the distance between the producers and the consumers, the availability of marketing facilities, the quantity of harvest and the time available for the actors to do business. So far, the findings show that 64% of the sample respondents trade their cashewnuts to the middlemen who are unlicensed while only 19% and 17% trade across the border and through WRS centres respectively.

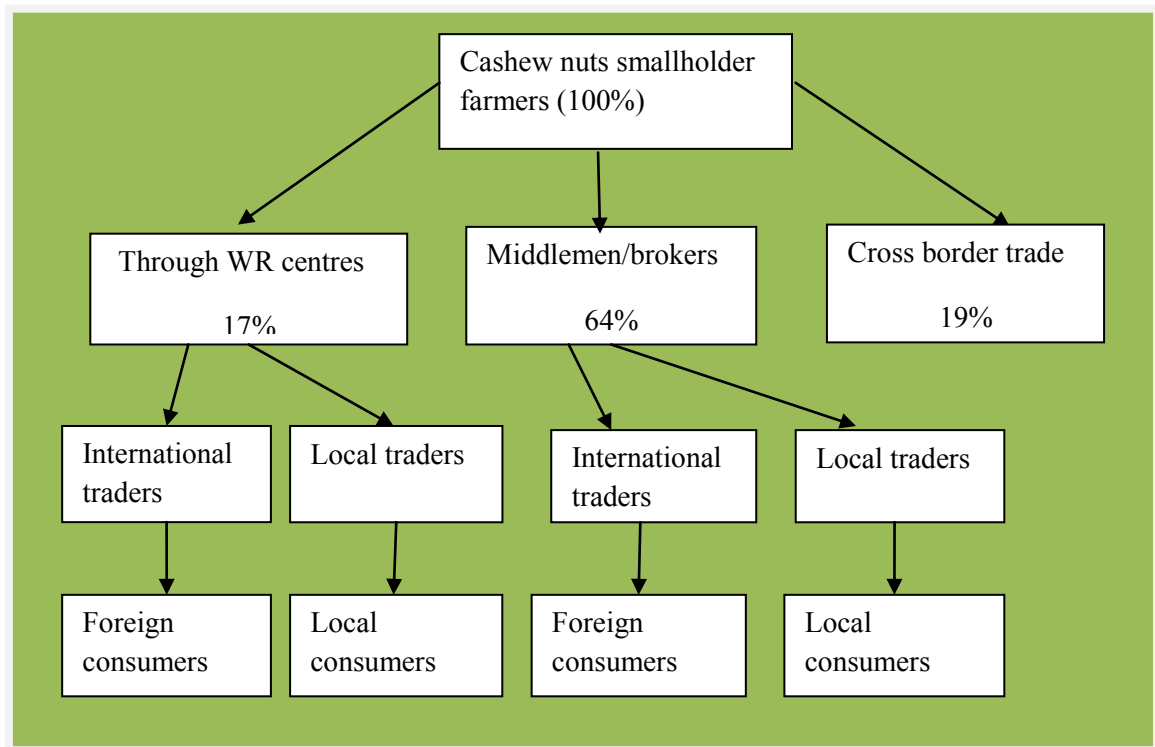


Figure 8: Cashewnuts marketing channels for smallholder farmers

Channel I: *Producers* \Rightarrow *Middlemen* \Rightarrow *International / Localtraders* \Rightarrow *Foreign / LocalConsumers*

Channel II: *Producers* \Rightarrow *WRcentres* \Rightarrow *International / Localtraders* \Rightarrow *Foreign / LocalConsumers*

Channel III : *Producers* \Rightarrow *Crossborder*

This implies that majority of the cashewnuts smallholder farmers (83%) are opting for the informal marketing channels inspite of the factor that Warehouse Receipts Act No.10 of 2005, the Tanzania Cashewnut Marketing Board Act No.21 of 1984, the Cashewnut Industry Act No.18 of 2009 and the Cooperative Societies Act No.20 of 2003 need all cashew products have to be auctioned through WRS via cooperatives at an auction managed by the CBT (URT, 2009; Kilama, 2013; Nkonya and Hurle, 2013).

The farmers were also asked for this sale behavior while they can earn better prices when trading through WRS. The results on this question show that most farmers opt for

informal market due to immediate need for cash (77.1% and 14.3% for Middlemen and Cross border respectively), short distance (20% and 28.6% for middlemen and cross border trade respectively) while 57.1% responded that they can fetch high prices (Table 10). Another reason for this sales behavior as observed during the survey is little understanding about the roles and operation of WRS among farmers. The farmers know that PCs are the buyers of their cashew nuts, so there is lack of trust to PCs leaders by farmers as supported by ANSAF (2013) that the Tanzanian cashew nut industry suffers from a lack of good quality information.

Table 10: Marketing channel usually used by the respondent (Cross tabulation)

Reasons opting	Response for each channel (percent)		
	WR centres	Middlemen	Cross border
Bargaining	0.0	1.4	0.0
Immediate need for cash	0.0	77.1	14.3
Credit	0.0	1.4	0.0
Nearer	18.8	20.0	28.6
High price	81.2	0.0	57.1

4.3.2 Marketing margin for WRS and informal marketing channel

Estimating marketing margins (share of consumer price received by smallholder farmer) for WRS and informal marketing approaches was employed to notice the marketing channel that gives higher share of the consumer price to a farmer. According to ANSAF (2013), the marketing costs during 2012/2013 harvesting season at cooperative union/WRS level are estimated by the cooperatives themselves at TSh 286/kg and the onward logistical costs are estimated at USD 60 (TSh 100 000) per tonne. However, since currently the system is working as auction made once a week, the most of the costs like storage costs, operation costs and all levy including Union levy, District levy and CBT levy does not fall to smallholder farmer. These costs fall on shoulder of the buyers. The

farmers remain with transport costs estimated to about TSh 30/kg which is also the same with those opting for informal marketing channel. The finding shows that 64% of respondent for the time of study sold their cashew nuts to the middlemen while 19% of them sold across the Kenya border. The main reason found for this trade behaviour while there is WRS is that, they need immediate cash (Table 10) to finance day to day obligations.

According to ANSAF (2013), there are two grades for cashew nuts in Tanzania though in the World there is only 1 grade. So far, during the study it was found that most of cashew nuts traded in the district falls under under grade (grade II). For instance for the season 2013/2014, among the cashew nuts traded through formal marketing (through auctions managed by CBT), 298.848 tones were under grade (grade II) while only 2.656 tones falls in standard grade (Mkinga, 2014) and the indicative price (TSh/kg) was TSh 1200 for standard grade and TSh 900 for under grade. Basing on the fact that most of cashew nuts traded are under grade (grade II), then, computation, discussion and conclusion on share of consumer price (marketing margin) received by smallholder farmers was made on under grade (Grade II), the grade were most of the smallholder cashewnuts falls.

Recall that,

$$MM = SP - FGP$$

Then, $MM = 900 - 600 = 300$ (TSh/kg).

4.3.3 Marketing margin in informal marketing channels

For the informal marketing channels the average price per kg was estimated at TSh 800/kg after computing the average price per kg.

$$\text{Recall, } MM = SP - FGP,$$

$$\text{Then, } MM = 800 - 600 = 200 \text{ (TSh/kg).}$$

The average marketing margin for smallholder cashew farmers was TSh 300/kg while trading through WRS and TSh 200 when trade was done through informal marketing channel. This show that Producers selling through informal channel received low share of consumer price (TSh 200/kg) compared to those trading through WRS (TSh 300/kg). Trading through these informal buyers although illegal, is the only possibility for cash-constrained farmers because by selling their produce this way they can access immediately the cash they need for current expenditures.

Table 11: Summary for marketing margins in formal and informal markets

Particulars (Tsh/kg)	Formal market (WRS)		Informal market (un graded)
	Standard Grade	Under Grade	Not graded
a) Average SP	1 200	900	800
b) Average FGP	600	600	600
c) MM (a-b)	600	300	200

Key: SP=Selling price, FGP=Farm gate price, MM=Marketing margin, a-b=the difference between average selling price and average farm gate price.

However, some arguments have been made by different scholars concerning WRS as applied in cashew sector in Tanzania. Among these scholars is Kilama (2012) who argued that the WRS to cashew sector gives traders a monopoly. A monopoly situation tends to create dependency among the excluded and this in turn creates an interlocking market whereby farmers find themselves with less control on the market. Moreover, during data collection it was observed that those buyers with license from CBT to buy the cashewnuts in the district have either never reached most of the producing villages including *Mwanyumba* village which is among the high producing village and among the sampled village for the study or they go to buy cashewnuts very late mostly at the end of the

harvest season. Buyers in informal market (both middlemen and buyers across the border) are found for the whole period of harvest and most cashewnuts in the district is sold through unlicensed/informal traders.

4.4 Factors Influencing Marketing Choices by Smallholder Farmers in the Area

Marketing choice and decisions to opt for either formal or informal marketing channels is influenced by a variety of factors, including information accessibility (important sources of information were agricultural extension staff, extension bulletins, news papers and radio), credit accessibility, membership to an association access to extension services, access to farmers training, village location in respect to the border, marketing costs (including transport and grading costs), distance to WRS centres, quantity of crop (cashewnuts) traded, age of the household head, sex of the household head, marital status of the household head and educational level of the household head.

4.4.1 Logistic regression results

This section presents the results of the binary logistic regression model and discusses the results of the significant variables that determine market participation choices in Mkinga district. The variables that were discussed in the methodology section were considered for the model and tested for their significance. However, for the purpose of the study, the dependent variable was whether the cashewnuts farmers (smallholder) had opted for WRS in marketing cashewnuts or not. The results reveal that, out of twelve explanatory variables tested, seven were significant. The variables distance to the warehouse receipt centres (X_1), transport costs (X_3), experience on cashew farming (X_6) and access to extension services (D_4) were highly significant at $p \leq 0.05$. This implies that there is enough evidence to support the claim presented by the coefficient value of these variable as discussed below. Furthermore, the variables quantity of cashewnuts sold (X_5), access to

farmers training (D_3) and education level of household head (D_5) were significant at $p \leq 0.1$. The table 12 shows the estimated coefficients, standard error, significance values and odd ratio of independent variables tested. The significance values (also known as p-values) show whether a change in the independent variable significantly influences the logit at a given level. The odds ratio indicates the extent of the effect on the dependent variable caused by the predictor variables. A value greater than one implies greater probability of variable influence on the logit and a value less than one indicates that the variable is less likely to influence the logit. The standard error measures the standard deviation of the error in the value of a given variable (Jari, 2009; Gujarati, 2003).

The sign of the coefficient shows the direction of influence of the variable on the logit. It follows that a positive value indicates an increase in the likelihood that a household will change to the alternative option from the baseline group. On the other hand, a negative value shows that it is less likely that a household will consider the alternative (Gujarati, 2003). Therefore, in this study, a positive value implies an increase in the likelihood of changing from not opting WRS to WRS market participation choice.

Table 12: Binary Logistic results for smallholder market choice

Variables	Odds-ratio	Coefficient	Robust Std. Err	z	Significance ($p > z $)
Distance to WR (X_1)	0.503423	-0.6863245	0.2934849	-2.34	0.019**
Age of hh (X_2)	0.9767114	-0.023564	0.0429043	-0.55	0.583
Transport costs (X_3)	1.001449	0.0014475	0.0004678	3.09	0.002**
Number of trees (X_4)	0.9985662	-0.0014348	0.0039034	-0.37	0.713
Quantity sold (X_5)	1.003245	0.0032399	0.0018147	1.79	0.074*
Experience (X_6)	1.142511	0.1332284	0.0549855	22.42	0.015**
Dummy sex (D_1)	1.552921	0.4401374	1.190777	0.37	0.712
Dummy marital (D_2)	0.1495485	-1.900135	1.633265	-1.16	0.245
Dummy training (D_3)	8.113703	2.093554	1.184801	1.77	0.077*
Dummy extension(D_4)	0.0131421	-4.331936	2.116517	-2.05	0.041**
Dummy education(D_5)	0.171167	-1.765115	1.072833	-1.65	0.100*
Dummy location (D_6)	1.560202	0.444815	1.487286	0.30	0.765

Prob>chi²=0.0417, Pseudo R²=0.4960, Log pseudo likelihood = -17.991424

*Statistically significant at 10% significant level, **statistically significant at 5%.

4.4.2 Explanation of the significant variables

The variable experience of the cashewnuts farmer is significant for WRS marketing choice with a significant value of 0.015. A positive sign of 0.1332284 on its coefficient indicates that a farmer tend to increase WRS market participation with experience. This relationship is most likely due to the influence of the more experienced farmers in market decision. The value of 1.142511 on the odds ratio supports the higher probability of the variable influence on the WRS marketing choice.

The variable Transport cost is also significant for WRS marketing choice with a significant value of 0.002. A positive sign (0.0014475) on its coefficient implies an increase in the likelihood of a famers changing from informal marketing channels to WRS marketing option. The greater odd ratio (1.001449) shows the higher probability influence of the transport costs on WRS marketing choice.

Access to farmer's training and WRS marketing choice was found to have significant relationship with a significant value of 0.077. A positive value 2.093554 on its coefficient indicates an increase in the likelihood of a farmer changing from participating in informal marketing channels to WRS marketing option when access to farmers training is improved. The greater odd ratio of 8.113703 implies the higher probability influence of farmers training to WRS marketing choice.

Moreover, the variable quantity of cashewnuts sold is significant for WRS marketing choice with a significant value of 0.074. The positive sign of 0.0032399 on its coefficient implies an increase in the likelihood of a farmer changing from informal marketing channels to WRS marketing option as amount of cashewnuts to be sold increases. The greater odd ratio of 1.003245 indicated the higher probability influence of quantity of cashewnuts traded to WRS marketing choice.

Variable distance to the nearest WRS centre is significant for WRS marketing choice with a significant value of 0.019. However, it was expected the variable distance to have positive influence on farmers WRS marketing choice. So far, coefficient of the variable has negative sign of -0.6863245. A negative sign on its coefficient indicates the less likelihood of a farmer changing from informal marketing channel to WRS marketing choice as distance to the nearest WRS decreases. Moreover, less than 1 odd ratio (0.503423) implies that distance from the farmers homestead to the nearest warehouse centre has less probability in influencing WRS marketing choice by the smallholder farmer.

Variable access to extension by the smallholder farmer is significant for WRS marketing choice with a significant value of 0.041. However, the variable has less likelihood and

less probability of influencing farmers to opt for WRS marketing channel. This is shown by the by negative sign on its coefficient value of -4.331936 and less odd ratio of 0.0131421.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMENTATIONS

5.1 Conclusions

The main objective of this study was to assess the roles of warehouse receipt system (WRS) in improving cashewnuts marketing by the smallholder farmers in Mkinga district. The study was focused on examining the operations and functions of WRS in improving cashewnuts marketing by smallholder farmers, determining share of consumer price accrued by the smallholder farmers by trading through WRS or through informal marketing channels and finally determining various factors influencing smallholder marketing choice among WRS and informal marketing channels. From the results of this study and review on various studies on the use of WRS, there is enough evidence at 90% to conclude that the WRS has been successful in improving producer prices over the entire period of its existence. WRS provides guaranteed storage, quality as well as better farm gate prices leading to an immediate and positive impact on farmers' income.

WRS is however, plagued with many challenges including poor enforcement of regulations, out-selling due to smuggling, overdependence on a single Indian market, poor flow of information leading to poor understanding of WRS operation and poor utilization of the market window following belated season start due to untimely bank loan funds' disbursement as observed by this study. However, in the light of some marketing challenges identified and observed, the suggestions on how to improve smallholder farmers' participation in WRS are proposed.

5.2 Recommendations

With regard to the WRS marketing challenges revealed by the empirical results, policy recommendations can be suggested. This section gives a series of options that can be considered by the responsible organs including Tanzania government in an effort to help cashew smallholder farmers reach their full potential.

Encourage farmers' organizations: The empirical results of this study has shown that smallholder farmers have problems in accessing the WRS marketing option because of relatively small marketable amount of cashewnuts and high transport costs. Given such information, it is important to establish the suitability of collective action as an institutional vehicle for linking smallholder farmers to agribusiness supply and marketing chains. Collective action through farmer's organizations is encouraged because it strengthens smallholders' market position, bargaining power and lobbying power. In addition, fixed transport costs can be spread, resulting in a decrease in individual costs.

Increase access to farmers training: It has been highlighted in the study that access to timely market information is still a problem among the smallholder farmers. The binary logistic results in this study show a positive and significant relationship between access to farmers training and WRS marketing choice. As such, market information should be consistently supplied to the farmers through farmers training and extension services. This can be done by both private and governmental organizations. In an effort to ensure farmers training, it is important to know the types of market information that is necessary for different markets, such as specific rules, pricing, grades and standards; and educate the farmers on how to use the information.

Build the capacity of primary cooperatives: Research results revealed that there is lack of reliable buyers in the course of operations of WRS limiting sustainability of WRS, therefore follow-ups on how the system operates is needed. Among the reasons identified by this study why smallholders opt for informal marketing channels is lack of reliable buyers in WRS. PCS/AMCOS were proposed in the Cashewnuts Industry Act of 2009 to replace the role of middlemen in cashewnuts marketing so that farmers could remain with big share of profit. So far, though some AMCOS have been registered to buy cashewnuts from the farmers, but they failed to perform their role due to financial incapability. Therefore, the capacity of these farmers unions need to be built so that they can be able to make a better payment to farmers as first payment to all the cashewnuts harvested while searching for buyers.

Enhanced regulated systems: In order to achieve very widespread provision of such services, it is necessary establish uniform performance guarantees to protect depositors (who are smallholder farmers in this case) against warehouse failure or bankruptcy. It is also necessary to establish some form of accreditation or licensing with a view to building up the confidence in the industry. Such systems will assure standardized documentation, particularly electronic documentation. The existence of these systems and safeguards will give comfort to the financing banks, and lower their transaction costs in dealing with the WRS.

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APPENDICES

Appendix 1: Questionnaire administered to the sample households

BACKGROUND INFORMATION

Date

Interviewer

Questionnaire No.....

Name of village

Name of respondent (Optional).....

Section A: Demographic Details

(Fill in the relevant information):

1. Sex of respondent (Tick as appropriate) 1= Male [] 2= Female []
2. Age of respondent (Years).....
3. Marital status of the respondent 1=Single [] 2= Married [] 3= Widow []
4=Divorced [] 5= others (specify).....
4. What is the highest education level attained by the household head? Tick as appropriate.

No formal education []	Primary school []	Secondary school []	Tertiary education []	Other [] (specify)
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5. What is the size of your household? (state number

Children below 18 years...	Adults between 18-64 years...	Adults above 64 years...
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Section B: Information on Cashewnuts And Marketing

6. For how long have you been in cashew farming?Years.
7. What is the main source of labour used in cashewnuts activities in your household?
(Tick as appropriate) 1=Family labour [] 2=Hired labour [] 3=Both family and hired labour []
8. Did you acquire any training/workshop concerning cashewnuts? (Tick as appropriate). 1=Yes [] 2= No [] (*If answer is No go to question 11*).
9. If yes in 10 above, please indicate how often
10. What specific training did you acquired concerning cashewnuts?

Kind of training	Where did get it	Who facilitate it
Proper storage		
Grading		
Packaging		
Other (Specify)		

11. Are you aware of WRS on cashewnuts marketing? 1=Yes [] 2=No []
12. What are other cashewnuts marketing systems available in your area?
1.....2.....3.....
13. In which marketing channel do you usually use for selling your cashew produce?
1=Formal market (WRS) [] 2=Informal markets [] (specify).....
14. How is the price set during the sales in the marketing system you participate?

I set the price []	Through negotiation[]	Market driven []	Dictated by buyers []	Other (specify) []
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15. Do you perform price survey before selling your cashewnuts? (Tick as appropriate).

1= Yes [] 2= No []

16. In terms of the markets channels you use regularly, what are the main benefits? (tick as appropriate)

High prices[]	Provide inputs[]	Nearer[]	Acquire credit []	Can bargain[]	Can store[]	Others (Specify)
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17. Do you have regular customers who always buy your cashewnuts? (Tick as appropriate). 1= Yes [] 2= No []

18. If Yes, for how long have you been trading with them? ... years.

19. Do you have any contractual agreement with those buyers you always trade with them? (Tick the appropriate). 1= Yes [] 2=No []

20. How do you rank the performance of marketing channel you usually use? (Tick as appropriate). 1= Good [] 2= Fair [] 3= Bad []

Section C: Marketing Margins

21. What is the price per kg in the marketing system you're participating?Tshs.

22. What is the price per kg suppose you sold cashewnuts at farm level?Tshs.

23. How do the prices that the buyers are willing to offer differ from your expectations? (Tick as appropriate). 1=Lower than expected[] 2=Equal to expectation [] 3=High than expected[]

Section D: Factors for Participation in Marketing Options

24. Indicate the number of tree you use for Cashew cultivation

25. Indicate where do you get capital and other inputs (seeds and pesticides) invested in cashew farming?

Source	Borrowing from bank	Borrowing from friends	Credit from WRS	Own saving	State aid	Other (specify
Value (TZS)						

26. Approximately, how much cashewnuts did you sell in the previous season?.....Kg

27. When do you sell your cashewnuts? (Tick as appropriate).

Sold in a farm before harvest[]	Immediately after harvest []	Store and wait for a better price []	Already had a deal before harvest []
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28. If you store and wait for a better price, please indicate where you normally store your cashews harvest (Tick as appropriate). 1=At WRS center [] 2= At your own storage at home [] 3= Others (Specify)

29. Where do you normally sell most of your cashewnuts? (Tick as appropriate).

1= Farm gate[] 2= Through the WRS[] 3=To the middlemen[] 4=Road side[]
5=Across the border [] 6=To the nearest town (specify) [].

30. Do you always find a market for all your cashewnuts? 1=Yes [] 2=No [].

31. If No, what happens to the unsold cashewnuts? (Tick as appropriate).

Lose to spoilage []	Eat(Family and relatives) []	Sell at low prices []	Store and sell later []	Process it []
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32. How difficult is it to look for buyers? (Tick as appropriate). 1=Easy [] 2=Fair [] 3=Difficult []

33. How far is the nearest certified WR center from your farm/house place? Km.

34. How far is the nearest other marketing points (informal market)?Km.

35. Complete the table below for payments.

Name of marketing channel	Mode of payment			Time takes to receive payment
	Cash	Cheque	Other (specify)	

36. Is your produce added value before selling to the market? (Tick as appropriate).

1=Yes [] 2=No []

37. If Yes what value adding activities do you perform? (Tick as appropriate).

1=Grading [] 2= Processing [] 3= Packing [] 4=Others (specify) []

38. If No what happen to ungraded cashewnuts? (Tick as appropriate).1= Sold with

poor price through WRS [] 2= Sold to other markets [] 5= Others (specify)[]

39. How much do you pay for a single trip per unit (specify) to send your cashewnuts to the market or to WR centre? Tsh.

40. Are you satisfied with the roads that link you to the market? 1=Yes[] 2=No[]

41. What type of road do you use to the market? (Tick as appropriate).

1=Gravel only [] 2= Tarmac road only [] 3=Both 1and2 [] 4=Others (specify)[].

42. Do you have access to market information?(Tick as appropriate).1=Yes[] 2=No[]

43. If yes, what type of marketing information you usually receive?

Sources	Type Of Information					
	Market price	Farm gate price	Market opportunities	Produce quality	Info. on Credit	Others
Administrators						
Media						
Ext. officers						
Co-farmers						
Buyers						
Other(Specify)						

44. Do you receive market information prior to sales? 1=Yes [] 2=No []

45. Are extension officers available in your village? (Tick as appropriate). 1=Never available [] 2=Available sometimes [] 3=Always available []

46. Do you usually contact extension officers during marketing period? (Tick as appropriate). 1=Yes [] 2=No []

47. How do you rate the services provided by extension officers in your area? (Tick as appropriate). 1=Not helpful [] 2=Somehow helpful [] 3=Helpful enough []

48. Are you a member of any farmers organization (Union) ? (Tick as appropriate).

1=Yes [] (give name)..... 2=No [] (why).....

49. If you are a member of any, how does the organization help you with cashewnuts marketing? (Tick as appropriate).

Provide market information []	Provide life insurance []	Help to lobby with policy makers []	Setting farmers objective []	Other (specify)[]
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50. What do you consider to be the main problems facing the cashew sector in your area? (Tick as appropriate).

Market searching[]	Low price []	Lack of trust by bank []	Lack of support[]	Lack of property right[]	Others (specify)[]
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51. What do you think the government would do to improve the cashewnuts market?

Raise the price floor for cashewnuts []	Rise export subsidies []	Remove trade barriers []	Others (specify) []
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THANK YOU

Appendix 2: Checklist for the Focused Group Discussions with the informants

1. What are the roles of warehouse receipt system in supporting smallholder cashew farmers in production?
2. What is the support of the Warehouse system in supporting cashewnuts marketing by smallholder farmers?
3. How about community (farmers) awareness on the functions and roles of the system?
Are they aware?
4. What are the benefits of smallholder trading cashewnuts through the WR system?
5. What are the possible costs and chargers suppose farmers opt for the WR system in selling their cashewnuts?
6. What can be considered as the strengths of WRS in improving cashewnuts marketing in the area?
7. If any! What are the weaknesses (failures) of selling cashewnuts through WRS and why?
8.
 - a. What are the challenges facing WRS?
 - b. What do you propose to be done in order to cashewnuts marketing through WRS or through any other channels?

THANK YOU