SOCIAL NETWORKS, GOVERNANCE AND TRANSACTION COSTS EFFECTS ON ORGANIC TOMATO AND SWEET PEPPER TOURIST HOTELS MARKET IN ARUSHA AND UNGUJA

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EXTENDED ABSTRACT

The objectives of this study were to (i) determine the social networks of the main actors in the organic food value chain in the tourism sector (ii) determine governance in the value chain of organic tomatoes and sweet peppers for the tourism sector in Arusha and Unguja and (iii) to evaluate production and transaction costs of actors in the organic tomatoes and sweet peppers value chain in Arusha and Unguja. The study was conducted in Arusha and Unguja. A preliminary survey was conducted in 2014. Then a stratified sampling procedure was used to select a sample of producers, tourist hoteliers and traders/suppliers. Key informants interviews and snowballing sampling procedures were also used. The results indicated that producers were close to other actors by closeness centrality of 2.12 in Arusha and 3.12 in Unguja. Suppliers/traders were central in the marketing of tomatoes and sweet peppers by betweenness centrality of 91 in Arusha while in Unguja producers' organization was central by betweenness of 533. Producers' organizations had many actors connected to them by a degree of 17 in Arusha and 28 in Unguja. The density of networks was low 0.01 due to fewer supporting institutions and lack of organic input suppliers. About four forms of governance structures were prominent in organic tomato and pepper value chain: market, modular, rational and captive. The probit results from the Heckman's two-stage process show that ownership of assets such as storage facilities, transportation assets and being under contract farming increased the probability of market participation, while experience in marketing increased the quantities of tomatoes and sweet peppers marketed. High marketing costs such as market levy, brokers and mobile phones costs decreased the quantities of tomatoes and sweet peppers marketed. Institutional arrangements (contract farming) were the possible solutions to reduce transaction costs effect, improve access to the tourist hotels market, increasing shelf life by having collective storage facilities and transport. Producers' cooperatives and

companies enabled the promotion and production of organic tomatoes and peppers. The choice of captive and modular governance structure by lead actors ensured access to organic input and market.

DECLARATION

I, Shadrack Jacob Mbapila, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my 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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DEDICATION

This work is dedicated to my beloved parents Dr. J. C. Mbapila and Mrs. I. L. Mbapila who laid the foundation for my education.

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LIST OF ABBREVIATIONS AND ACRONYMS

BTC	Belgium Technical Cooperation
CF	Contract Farming
CSD	Cross-sectional Study Design
DBT	Doing Business in Tanzania
EPOPA	Export Promotion of Organic Products from Africa
FFVs	Fresh Fruits and Vegetables
GDP	Gross Domestic Products
GVA	Global Value Chain Analysis
IFOAM	International Federation for Organic Agriculture Movement
MESULA	Meru Sustainable Land
MM	Marketing Margin
NA	Network Analysis
NGOs	Non-Governmental Organizations
NSSA	National Sample Census of Agriculture
PCA	Principal Component Analysis
PGs	Producers Groups
PGS	Participatory Guarantee System
ProGrOV	Productivity and Growth in Organic Value Chain
SLU	Swedish University of Agricultural Science
SN	Social Network
SNA	Social Network Analysis
SSA	Sub-Saharan African
SUA	Sokoine University of Agriculture
TanCert	Tanzania Organic Certification Association

TCE	Transaction Cost Economics
TCs	Transaction Costs
TNAP	Tanzania National Agricultural Policy
TOAM	Tanzania Organic Agriculture Movement
TTSS	Tanzania Tourism Sector Survey
TZS	Tanzanian Shillings
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
URT	United Republic of Tanzania
USD	United States of America Dollar
UWAMWEMA	Union of Organic Vegetable Producers in Western Unguja
VCA	Value Chain Analysis
WB	World Bank
WTTC	World Travel and Tourism Council

THESIS STRUCTURE

This thesis is presented in the format of publishable manuscripts consisting of five chapters. Chapter one consists of the general introduction which presents the background information on the tourism sector, organic market and social network, problem statement and justification, objectives and conceptual model which shows the link between the objectives and the variables on the influence of social network, governance and transaction costs on market access. Chapter two presents the first publishable paper manuscript. The paper manuscript determines the social networks of the main actors in the organic food value chain in the tourism sector. Chapter three consists of the second publishable paper manuscript. This paper manuscript determines governance in the value chain of organic tomatoes and sweet peppers for the tourism sector in Arusha and Unguja. Chapter four presents the third publishable paper manuscript. This paper manuscript evaluates production and transaction costs of actors in the organic tomatoes and sweet peppers value chain in Arusha and Unguja. The paper manuscript also determines the effect of transaction costs on the tourist hotels market access using a Heckman selection model. Chapter five presents the key contributions of the study, general conclusions, and specific recommendations for policy in support of the organic sector in Tanzania and an area for further study.

CHAPTER ONE

GENERAL INTRODUCTION, PROBLEM STATEMENT, JUSTIFICATION AND
OBJECTIVES

1.1 General Introduction

The consumption of organic products has increased rapidly due to health and
environmental concerns (Sangkumchaliang and Huang, 2012). This has resulted in a
growing interest on organic production all over the world and the global demand for
organic food products shows an increase in the sale of over five billions US dollars per
year (Sangkumchaliang and Huang, 2012).

In Tanzania, the National Agricultural Policy recognizes organic production as a window
of opportunity that can be exploited towards enhancing national and farm incomes (the
United Republic of Tanzania, 2013). However, there have been challenges in
coordination, certification costs, regulation and accessibility of organic inputs. Thus, these
challenges are being addressed with the focus on facilitating coordination which is done
by the Tanzania Organic Agriculture Movement (TOAM). The reduction of certification
costs is done by the introduction of Participatory Guarantee Systems (PGS) and promoting
regulation on organic products and registration of organic inputs (ibd). In Tanzania
currently, there are some institutions that support organic production and certification
including Tanzania Organic Certification Association (TanCert), and the Tanzania
Organic Agriculture Movement (TOAM). TanCert was founded in 2004 with the aim of
providing affordable certification services to facilitate competitive markets of organic
products locally and worldwide. The formation of TanCert led to the establishment of

TOAM in June 2005. TOAM aims at providing leadership and coordination in developing and promoting the organic sector in Tanzania. It also facilitates research, training and extension, cooperation and networking among stakeholders, and the development of the local market (Mella *et al.,* 2007).

Research indicates that about 90% of consumers of organic products in Tanzania are expatriates, tourists and visitors in hotels (EPOPA, 2004; Mwasha, 2007). In Tanzania the tourism sector is growing rapidly, rising from US dollars 1.74 billion in 2004 to US dollars 4.48 billion in 2013 (World Travel and Tourism Council, 2014). This implies that smallholder organic producers can benefit from the fast-growing tourism sector by focusing on the tourist hotels market.

The tourism sector was a major sector in the economy during the 1990s (Kweka *et al.,* 2003). In 2010, the tourism sector accounted for 14% of the Gross Domestic Product (GDP). This implies that the tourism sector has been one of the important sectors in the Tanzanian economy (Doing Business in Tanzania, 2011).

1.1.1 Tourism employment and contribution to the economy

There are different ways in which the tourism sector can contribute to development both at the macro and micro level. At the macro level, the tourism sector generates foreign exchange and thus contributes positively to the national balance of payments (Beser, 2012). At the micro level, the tourism sector contributes to the household economy through among other things creation of employment opportunities. Employment opportunities are for both unskilled and semi-skilled labour. This makes it an important source of employment for poor people for both urban as well as rural areas (Ashley *et al.,* 2007). Besides employment opportunities, the tourism sector can contribute to

development through the creation of market opportunities of both industrial as well as agricultural products. Through the value chain, the tourism sector provides a market for agricultural products (for example, food and beverage from the agriculture sector). In Namibia and Laos for example about one third or one half of the income of the poor comes through markets for agricultural products in the tourism sector (Ashley *et al.,* 2007).

1.1.2 Tourism and agriculture linkage

The agriculture sector has the potential to link with many sectors of an economy including the tourism sector. The tourism sector can link with the agriculture sector mainly through the utilization of agricultural output by the tourism sector. This is because about one-third of tourist expenditure constitutes food and beverages (Christian, 2012; Telfer and Wall, 1996; Torres, 2004). Basically, linking tourism demand for local food products is the way to boost agricultural production, channelling tourism benefits to the local rural poor people and improving the livelihood of rural people (Torres, 2004). However, tourism and agriculture have been said to compete for resources such as land, labour, domestic capital and water (Telfer and Wall, 2000; Telfer and Wall, 1996; Torres, 2003, 2004).

1.1.3 Challenges for linking agriculture and tourism

Besides the importance of linkages between tourism and agriculture sectors, there have been quite a number of challenges affecting the linkage. Evidence from previous studies by Telfer and Wall (1996), Torres (2003) and Anderson and Juma (2014) show challenges both from the supply side (agriculture) as well as from the demand side (tourism sector). Supply of local food products from the agriculture sector to meet the food demand in the tourism sector is one example of the possible linkages between tourism and agriculture sector. Among the challenges for the linkage identified are poor quality of locally supplied

products, business informalities, high transaction costs and violation of agreements by local suppliers (Anderson and Juma, 2014). According to Anderson and Juma (2014) low production levels, low prices offered by hotels and restaurants coupled with late payments for the products delivered were the most serious problems cited by local suppliers in Zanzibar. There is also a certain degree of mistrust between the local suppliers and the operators (Wineaster, 2013). A study in Indonesia by Telfer and Wall (1996) indicated that purchases of local food products by the tourism sector were limited by inadequate supplies, inconsistency in supplies and unsatisfactory quality of agricultural products. Torres (2003) found that, among others, the nature of local farming systems; and the quality, quantity, reliability, seasonality, and the elevated price of local production affected the linkage between the tourism and agriculture sectors in Mexico. Besides transaction costs, the level of local technological capabilities and the existence of food processing facilities also affected linkages between the agriculture and tourism sectors (Torres, 2003).

1.1.4 Food supply system in the tourism sector

The food supply systems in the tourism sector also indicated some similar challenges on the linkage between tourism and agriculture sectors (Felipe *et al.,* 2010; Ross *et al.,* 2012). For example, about 25% of fruits and vegetables produced in Cuba that were sold and intended to reach tourist hotels. Only 15% of fruits and vegetables produced reached the hotels (Ross *et al.,* 2012; Felipe *et al.,* 2010). Irregular supply and lack of quality were reported to be the critical challenge that led hotels to import the products (Felipe *et al.,* 2010; Ross *et al.,* 2012). To tap the potential tourist hotels market, the food supply system must provide for a quality, consistent and reliable supply of food.

1.1.5 Transaction costs and smallholders market access

Transaction costs occur when a good or service is transferred across a technologically separable interface. Transaction costs raise the prices paid by the buyers of goods and services and lower the prices received by the sellers of goods and services (de Janvry and Sadoulet, 2006; Ellemare and Arrett, 2006; Goetz, 1992; Jordaan and Grové, 2013; Key *et al.,* 2000; Mmbando *et al.,* 2015). In the developing countries transaction costs are the embodied causes of market failures since farmers are lacking sufficient means to overcome the costs of entering the market due to high transaction costs (Ellemare and Arrett, 2006; Mmbando *et al.,* 2015). Transaction costs have been categorized into Fixed Transaction Costs (FTC) and Proportional or Variable Transaction Costs (PTC) (Goetz, 1992; Key *et al.,* 2000; Mmbando *et al.,* 2015). The fixed transaction costs are invariant to the volume of output traded and affect smallholder farmers' market participation decisions. They include the costs of (a) searching for a trading partner, (b) negotiating and bargaining, particularly when there is imperfect information about prices, and (c) enforcement of contracts and supervision, particularly when credit sales are involved, as the sellers have to screen the buyers for reliability and lower the likelihood of defaults (Bwalya, 2013; de Janvry and Sadoulet, 2006; Ellemare and Arrett, 2006; Goetz, 1992; Jordaan and Grové, 2013; Key *et al.,* 2000; Mmbando *et al.,* 2015). On the other hand, proportional transaction costs are per unit costs of accessing markets that vary with the volumes being traded and may affect the decision to participate in the market as well as the quantity traded. They include costs associated with transferring the output being traded, such as transport costs and time spent delivering the product to the market or access costs (Key *et al.,* 2000; Mmbando *et al.,* 2015). Generally, transaction costs are largely unobservable (Ellemare and Arrett, 2006; Mmbando *et al.,* 2015), in some cases only part of the transaction costs can be observed, for example, transport cost may be observable if the farmers paid for the use of transport services, but if the farmers

transported the crops themselves the cost of transport may not be easy to measure. Therefore, many authors (de Janvry and Sadoulet, 2006; Ellemare and Arrett, 2006; Goetz, 1992; Jordaan and Grové, 2013; Key *et al.,* 2000; Mmbando *et al.,* 2015) use the variables such as physical distance from the markets, ownership of assets like oxen carts for transport, location (regions), access to information and experiences to proxy for transaction costs.

The literature on constraints to market access for smallholder farmers has largely focused on the transaction costs as the main cause of market failure, and has analyzed the influence of transaction costs (FTC and PTC) to smallholder farmers' market participation. Goetz (1992) studied the market participation of the Senegalese farmers to the grain market using a probit model for the farmers' discrete decision to participate in the grain market, followed by the continuous decision of the extent of the farmers' market participation using a fixed transaction. Specific proxy variables for fixed transaction costs were used. These included ownership of carts for transportation to market, physical distance from market, number of persons in the household and a regional dummy variable separating study area into two regions with the region being well integrated into the transport and communication infrastructure hence facing low information gathering costs while the other one was not. Other variables used include age of household head with older and more experienced heads expected to have greater contacts, which allow them to discover trading opportunities at low cost. An interaction term for information was also included. The study found that in the case of the effects of fixed cost-type variables on market participation, better information plays an important role. For buyers, adding a person to the household raises the likelihood of market participation while ownership of assets was important in reflecting market access costs. Key *et al.* (2000) studied the effect of fixed and proportional transaction costs separately to the Mexican farmers' discrete

decisions and continuous decisions to the maize market participation using a structural model to estimate structural supply functions and production thresholds. It was found that ownership of assets such as transport equipment (pick-up) tends to reduce entry barriers into the market. Ellemare and Arrett (2006) studied the participation in Kenyan and Ethiopian livestock market, whether the farmers make the decision to participate in markets simultaneously or sequentially using the farmer's characteristics that are the proxy for fixed transaction costs and variable transaction costs. They found that households that make sequential marketing decisions are more prices responsive and less likely to be vulnerable to trader exploitation. Mmbando *et al.* (2015) studied farmers' participation in maize and pigeon-pea markets in Tanzania. They found that fixed transaction costs associated with market information and household characteristics such as gender and education level of the household head had a statistically significant influence on market participation. Proportional transaction costs (distance to market) and variables such as output prices, farm size, labour force, and geographical location of households influenced both market participation and intensity of participation. None of the studies included institutions such as social networks, farmers' cooperatives or producers' groups and contract farming as the condition for market participation under the smallholder farmers in developing countries: North (1987) points out that, under dense social networks of interaction transactions costs are very low in that society, this is because individuals either engage in repeat dealings with others or otherwise have a great deal of personal knowledge about the attributes, characteristics, and features of each other. Cheating, shrinking and opportunism is limited or indeed absent because they simply do not pay. Kinship ties, friendship, and personal loyalty all play a part in constraining the behaviour of participants or repeat dealing and personal knowledge of the other participants constrain behaviour. On the hand, in the absence of social networks, appropriate contracts must be devised to constraint the behaviour of participants in the exchange (North, 1987).

Institutions such as appropriate contracts and governance to constrain the behaviour of markets participants are lacking in many parts of the underdeveloped world. Gereffi and Fernandez-stark (2016) argued that governance is the means smallholder farmers improve access to markets through the capacity built by the lead firms to the farmers. This is by the acquisition of production technologies. According to Williamson (1981), the two assumptions on which transaction cost analysis relies are (1) the recognition that human agents are subject to bounded rationality and (2) the assumption that at least some agents are given to opportunism. Williamson (2016) argued that, with bounded rationality, all economic exchange could be efficiently organized by contract; however, it is impossible to deal with complexity in all contractually relevant respects, as a consequence, incomplete contracting is the best that can be achieved.

This study, therefore, includes institutions such as contract farming and social networks in the modelling of market participation for smallholder organic tomatoes and sweet peppers producers in Arusha and Unguja. Social network perspective implies viewing systems in terms of relations between individual actors, where actors and actions are seen as interdependent rather than independent (Brookes and Singh, 2008). Social Network Analysis (SNA) focuses attention on network interdependencies and emphasizes the impact of network design on firm competitiveness (Sloane and O'Reil, 2010). The role that social networks can play in resource transfer, understanding the ways that social networks support or impinge upon the value chain structures is of interest to the effective management of value chains (Brookes and Singh, 2008). Scholars in economics started to use the concept of the social network to analyze the industrial sectors trying to explain organizations and their performance. Using the network analysis, it is possible to access different tools to map the structure of inter-organizational relationships (Talamini and Ferreira, 2010).

1.2 Problem Statement and Justification

1.2.1 Problem statement

Access to the tourist hotels as a market for organic tomatoes and sweet peppers has been challenged by a number of problems. These problems emanated from both the supply of the products by the producers and suppliers and the demand of the products by the suppliers and tourist hotels. The suppliers in this study are referred to traders selling specifically to the tourist hotels. Poor quality, limited quantity, elevated prices of the local products, violation of the agreed contracts, lack of trust among actors and high transaction costs were some of the problems reported in Indonesia, Mexico and Tanzania (Telfer and Wall, 1996; Torres, 2003; Wineaster, 2013; Anderson and Juma, 2014). A study in Indonesia by Telfer and Wall (1996) indicated that purchases of local food products by the tourism sector were limited by inadequate supplies, inconsistency in supplies and unsatisfactory quality of agricultural products. Torres (2003) found that, among others, the nature of local farming systems; and the quality, quantity, reliability, seasonality, and the elevated price of local production affected the linkage between the tourism and agriculture sectors in Mexico. In Tanzania, a study by Anderson and Juma (2014) indicated poor quality of the locally supplied products, business informalities, high transaction costs and violation of agreements by local suppliers were some of the problems. According to Anderson and Juma (2014) low production levels, low prices offered by hotels and restaurants coupled with late payments for the products delivered were the most serious problems cited by local suppliers in Zanzibar. Another study in Tanzania by Wineaster (2013) indicated that there was a certain degree of mistrust between the local suppliers and the operators. Generally, these problems have been associated with high transaction costs, lack of social network and social capital (trust among actors) and poor governance of the tourist hotels market. However, most of the studies mentioned above focused on the transaction costs; Goetz (1992), Key *et al.* (2000), Ellemare and Arrett (2006) and

Mmbando *et al.* (2015). There were limited studies that focused on social networks and governance influence on access to the tourist hotels markets. Besides the transaction costs, this study focused on the social networks and governance influence on the access to the tourist hotels market.

1.2.2 Justification

Organic farmers have been targeting the organic market that could give higher prices (premium prices). However, most of the organically produced fruits and vegetables were sold in the conventional market. Studies were done by Telfer and Wall (1996), Torres (2003) and Anderson and Juma (2014) indicated that some problems that limit smallholder farmers market access are the poor quality of the locally supplied products, business informalities, high transaction costs and violation of agreements by the local suppliers. Organically produced products are of high quality in terms of health to consumers, yet they do not fetch premium prices (Preliminary survey, 2014).

The missing link between producers on the supply side and consumers on the demand side is a problem that limits smallholder organic farmers' access to the market. There is a great demand for fruits and vegetables in the tourism sector which could form a market for high quality organically, produced fruits and vegetables.

Organic food and fibre chain are one of the fastest growing high-value market chains with high potential for benefiting smallholder farmers and processing companies in East Africa (EPOPA, 2009; Willer *et al.,* 2009). Trade in organic food and drinks attained USD 50 billion a year, in the world in 2008. Despite the economic slowdown and financial crises the percentage of growth in organic food products remains the highest, for example, more than 50% of baby foods products sold in the United Kingdom were organic (Ndugire,

2010). However, it is not clear to what extent market-oriented smallholder farmers will be competitive in these markets. According to the Belgian Technical Cooperation (BTC, 2012), most individual local buyers are also not able to meet the quality and quantity requirements of international buyers.

Organic agriculture has gained increasing attention much because of premium prices that organic produce fetches in international markets as well as lobbying at the national and international levels (UNEP-UNCTAD, 2010). Organic farming is significantly developed in Southern and Eastern Africa, accounting for over three-quarters of the certified organic land in Africa (Willer *et al.,* 2009). In some countries, including South Africa, Zambia and Malawi, the growth of certified organic farms was a result of the few large export farms being converted into organic production. Likewise, in Uganda and Tanzania (East Africa) the growth was a result of engaging smallholder farmers in export commodity production (Hine and Pretty*,* 2006). The target market for organic produce in East Africa has been the export market, paying little attention to the local market and tourist hotels market (Hine and Pretty, 2006). Tanzanian certified organic farmers produce almost exclusively for the export market. The total value of the nine most exported products in 2012 was estimated to be almost USD 17 million in 2009 (BTC, 2012).

Globally, awareness of health and environmental concerned to consumers and growth in the tourism sector with the increasing number of hotels can create a market for smallholder organic producers in Tanzania. The development of the organic market within the tourism sector could have poverty-reducing effects among smallholder organic producers.

Therefore, this study aimed at understanding the influence of different institutions such as social networks in resource and information transfer among different actors in the value chain in the tourism sector. The findings help to ascertain the more influential actors in the value chain. These actors help to identify the entry point for intervention to bridge the gap between the demand and supply side and eventually, removing or reducing the missing link between the demand and supply side. Social networks analysts like Jones *et al.* (2010) and Talamini and Ferreira (2010) argue that trust and relational norms are used to safeguard inter-organizational relations informally, promoting flexibility, solidarity, and information exchange among organizations.

1.3 Objectives

1.3.1 Overall objective

To map and characterize the social networks of main actors and determine the influence of governance and transaction costs on access to organic tomatoes and sweet peppers tourist hotels market in Arusha and Unguja.

1.3.2 Specific objectives

   i.   To determine the social networks of the main actors in the organic food value chain in the tourism sector.
  ii.   To determine governance in the value chain of organic tomatoes and sweet peppers for the tourism sector in Arusha and Unguja.
 iii.   To evaluate production and transaction costs of actors in the organic tomatoes and sweet peppers value chain in Arusha and Unguja.

1.4 Research Questions

1.4.1 Overall research question

Do institutions like social networks, contract farming or farmers' cooperatives reduce transaction costs in organic tomatoes and sweet peppers tourist hotels market in Arusha and Unguja?

1.4.2 Specific research question

i. What is the network organization of actors in the value chain of organic products for the tourism industry in Tanzania?

ii. What type of governance structures exists in the value chain for organic tomatoes and sweet peppers?

iii. What type of institutions are needed (formal and informal) to reduce transaction costs and improve the economic performance of smallholder organic tomatoes and sweet peppers producers?

1.5 Conceptual Framework

1.5.1 Transaction costs

Transactions costs are the embodiment of barriers to market participation by smallholder farmers and have been used as a definitional characteristic of smallholders and as factors responsible for significant market failures in developing countries (Mmbando *et al.,* 2015). They are the costs associated with the market exchange of goods and services which some are observable and others are unobservable costs in the exchange process (Bwalya, 2013; Jordaan and Grové, 2013; Mmbando *et al.,* 2015). In principle, transaction costs raise the prices paid by the buyers of goods and services and lower the prices received by the sellers of goods and services (de Janvry and Sadoulet, 2006; Key *et al.,* 2000). The organic farmers may participate in the markets for the exchange of goods and services either as a buyer, seller or decide not to participate in the markets depending on the prices (de Janvry and Sadoulet, 2006; Key *et al.,* 2000). Market participation is determined by comparing the utility obtained from selling, buying, and remaining self-sufficient in a particular commodity (Key *et al.,* 2000). The utility is increasing in the decision price for sellers and decreasing in the decision price for buyers (Fig. 1.1). Hence, starting from autarky point C_0, a household which faces no fixed transactions costs will be

better off selling at market prices above $\tilde{p} + t_p^s$, thereby obtaining utility V_0^s as shown in figure 1.1 by the half-line $C_0 D_0$. Similarly, the household will be indifferent between buying and being self-sufficient if $P^m + t_p^b = \tilde{P}$, and better off buying at any market price below $\tilde{P} - t_p^b$, thereby obtaining utility V_0^b as shown in the figure by the half-line $B_0 A_0$. The optimal market participation for a household is to follow the path $A_0 B_0 C_0 D_0$. In the particular case of no PTCs, points B_0 and C_0 are identical. Households facing a market price P^m and both PTCs and FTCs can achieve utility V^s as sellers and utility V^b as buyers. As shown in figure 1.1, if the household faces a market price above $\underline{P}^s + t_p^s$, it is better off selling (half-line CD), whereas, for market prices below $\underline{P}^s + t_p^s$, it is better off not selling. Hence, the household will buy the good if the market price is below $\underline{P}^b - t_p^b$ (half line BA in the figure). The optimal market participation for a household is to follow the path ABCD, buying for market prices below $\underline{P}^b - t_p^b$, being self-sufficient for market prices $\underline{P}^b - t_p^b < P^m < \underline{P}^s + t_p^s$, and selling for market prices above $\underline{P}^s + t_p^s$. V^a is the utility under the autarky.
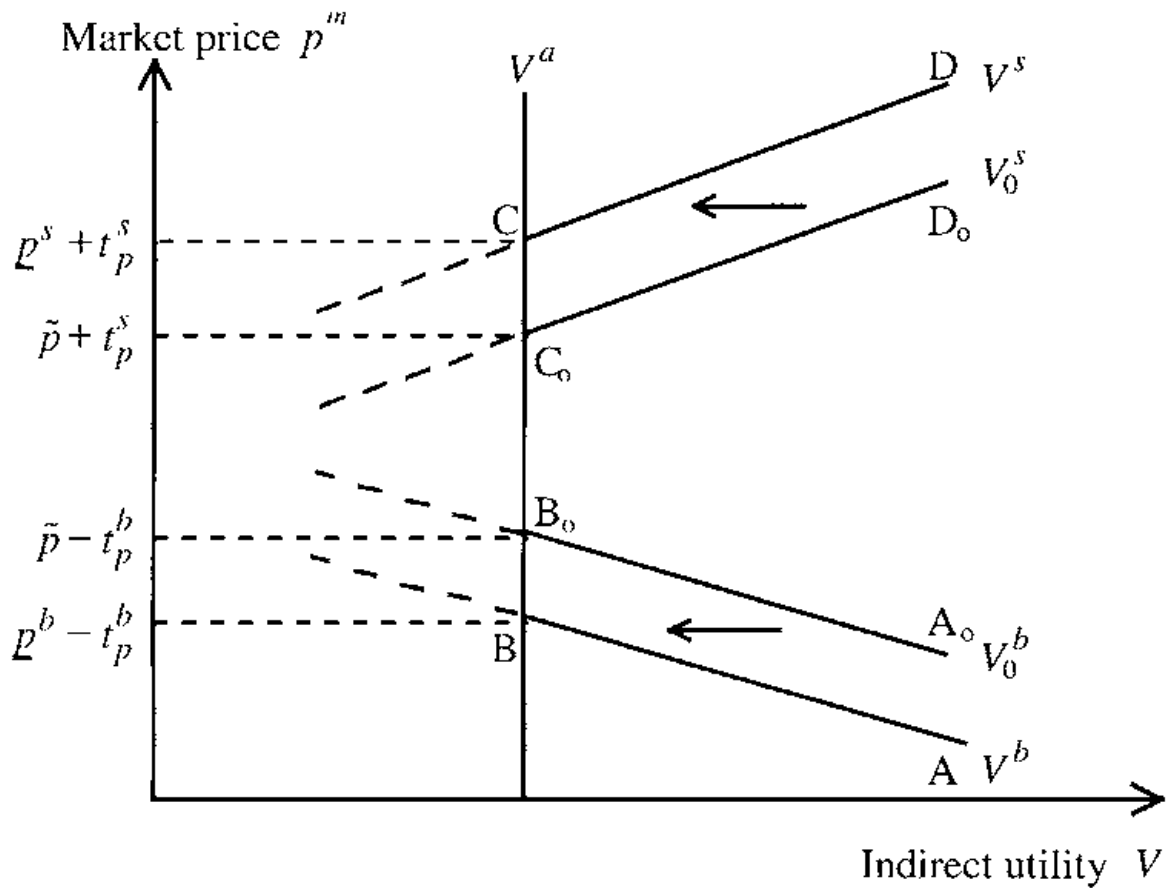
Figure 1.1: Household indirect utility under proportional and fixed transactions costs
Source: (de Janvry and Sadoulet, 2006; Key *et al.*, 2000)

1.5.2 Social networks

Social networks are the ties and relationships between individual actors and have been associated with the movement of resources and information among individuals in the market (Carrington, 2011; Wasserman and Faust, 1994). The resources that are moving through social networks are social capital (Leavy, 2011). While social networks are the ties and relationships such as kinship, social capital reflect the norms and networks that facilitate collective actions (Leavy, 2011). Operationally social capitals are the resources embedded in social networks and accessed and used by actors for actions. Social networks have been used to explain the movement of people and labour (Borgatti *et al.,* 2009). Such as the movement of employees within the educational institutions through a connection that they have created. Social networks have been the means through which developing

countries producers improve access to credit, marketing information and reduce the costs of transactions (Kuepié *et al.*, 2014). The exchange of information and resources in the value chain has been explained through social networks (Lazzarini *et al.,* 2001). That is the horizontal and vertical movement in the value chain. Vertically in the value chain is the movement of the product upstream to downstream and horizontally be the movement of information and the relationships among the individual actors in the value chain fig. 1.2.
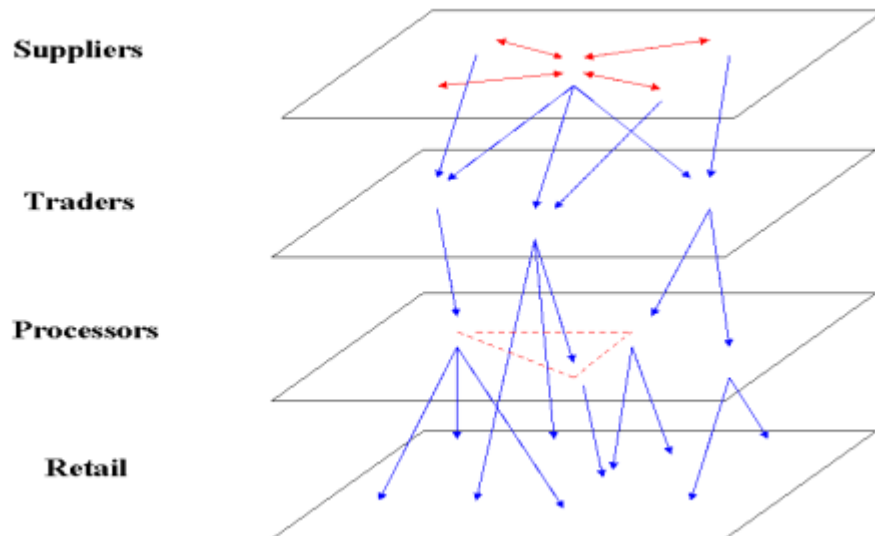
Figure 1.2: Net chain
Source: (Lazzarini *et al.,* 2001)

1.5.3 Governance

The value chain governance is the ability of the lead firms in the market to take control of the market (Gereffi *et al.,* 2001). The control over the market is by setting quality and standards that other actors must follow to access the markets. In developing countries, governance enables smallholder producers to comply with set quality and standards (Gereffi and Fernandez-stark, 2016). The acquisition of production technologies and compliances with quality and standards enables producers' to access markets. Gereffi *et*

al. (2005) extended the three forms of supply relationship from Sturgeon and Lee (2001) based on the degree of standardization of product and process: (1) the 'commodity supplier' that provides standard products through arm's length market relationships, (2) the 'captive supplier' that makes non-standard products using machinery dedicated to the buyer's needs, and (3) the 'turn-key supplier' that produces customized products for buyers and uses flexible machinery to pool capacity for different customers. To the five forms of governance structures figure 1.3 based on the (1) complexity of transactions (2) codification and (3) capability of suppliers. According to Gereffi *et al.* (2005), markets is when transactions are easily codified, product specifications are relatively simple, and suppliers have the capability to make the products in question with little input from buyers. A modular value chain is when the ability to codify specifications extends to complex products. A relational value chain is when product specifications cannot be codified, transactions are complex, and supplier capabilities are high. Captive value chains is when the ability to codify in the form of detailed instructions and the complexity of product specifications are both high but supplier capabilities are low and Hierarchy is when product specifications cannot be codified, products are complex, and highly competent suppliers cannot be found, then lead firms will be forced to develop and manufacture products in-house.
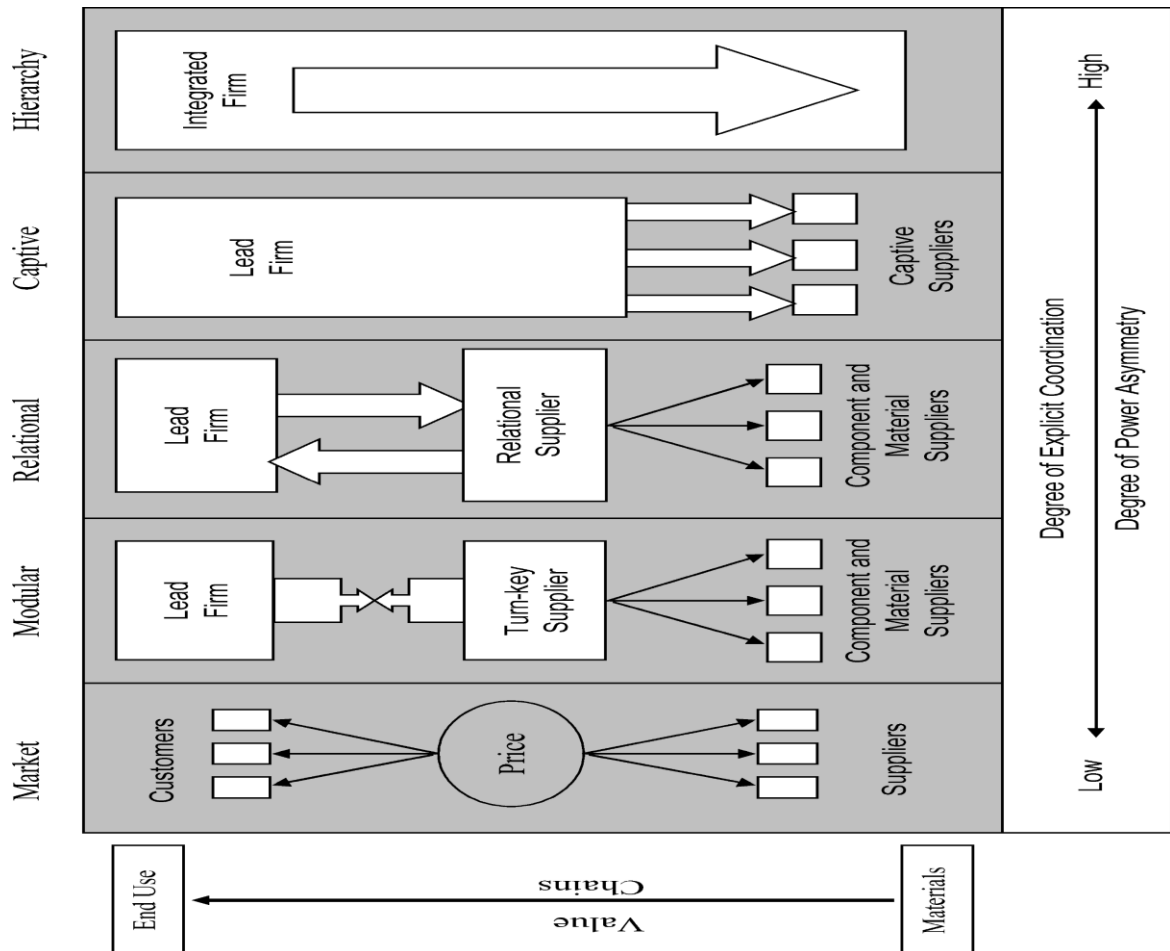
Figure 1.3: Five global value chain governance types

Source: (Gereffi *et al.,* 2005)

1.6.1 Tourism and agriculture linkage

The tourism sector is an important sector for developing countries for generating foreign exchange, increasing employment, attracting development capital and promoting economic independence (Torres, 2003; Torres and Mommsen, 2004; Anderson and Juma, 2010; Telfer and Wall, 2010). Basically, establishing linkages between tourism demand for food and local agricultural production is critical in maximizing host country benefits (Torres, 2003; Torres and Mommsen, 2004). This is particularly true for the countries in which the majority of their people depend on agriculture. Tanzania is one of these countries, where about 75% of its population is poor, smallholder farmers and who rely on agriculture.

Studies done by Torres (2003), Torres and Mommsen (2004) and Anderson and Juma (2010) have analysed the potential of linking tourism, agriculture sector and local suppliers to the host countries. Anderson and Juma (2010) analysed the challenges underlying the linkage of tourism to local food suppliers in Zanzibar. Among others, poor quality of the locally supplied products, business informalities, high transaction costs and violation of agreements by local suppliers were the constraints pertaining to the linkage between agriculture and tourism sector in Zanzibar.

Similarly, the number of tourist hotels increased by over 100% from 1996 to 2014. This translates into an increase in the demand for food because about one-third of the tourist's expenditures constituting food products (Telfer and Wall, 2010; Mak *et al.,* 2012). This is an opportunity for creating linkages with the agriculture sector in terms of the supply of food products including fresh fruits and vegetables (Nguni, 2017).

1.6.2 Overview of the tourist industry

According to the World Travel and Tourism Council (WTTC) (2014), travel and tourism's total contribution to the global economy rose to 9.5% of global GDP (the US $7 trillion). This is not only outpacing the wider economy but also growing faster than other significant sectors such as financial and business services, transport and manufacturing. In total, nearly 266 million jobs were supported by travel and tourism in 2013 – one in eleven of all jobs in the world (WTTC, 2014).

In Sub-Saharan African (SSA) the number of tourists visiting the region rose to over 300% between 1990 and 2012. In 2012 about 33.8 million tourists visited the region, contributing to the region's economy over US$36 billion and directly contributed just over 2.8% to the region's GDP (WTTC, 2017). Notably, in Tanzania the total contribution of

travel and tourism to GDP was USD 4.23 billion (12.9% of GDP) in 2013, and was predicted to rise by 4.3% in 2014, and to rise by 6.7% per annum to USD 8.47 billion (12.6% of GDP) in 2024 (WTTC, 2017). According to the National Bureau Statistics Tanzania Tourism Sector Survey (TTSS) (2010), the number of international tourist arrivals went up by 9.6% to782 699 in 2010, whereas earnings from tourism increased by 8.2% to USD 1,254.5 million in 2010, from the level recorded in 2009 (TTSS, 2010).

1.6.3 Organic agriculture

Organic agriculture refers to production techniques that are based on the use of crop rotation, composting, green manure and biological pest control without using industrial or synthetic fertilizers and pesticides (International Federation for Organic Agriculture Movement) (Willer *et al.,* 2012). According to Willer *et al.,* 2012 (2012, pp.13):

> "*Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and good quality of life for all involved.*"

According to Willer *et al.* (2009), Tanzania is among the countries with the highest number of organic producers of about 90 222 in the world outpaced by Uganda with about 206 803. Uganda is leading in terms of the number of organic producers in East Africa and the World in general (Willer *et al.,* 2009).

1.6.4 Institutional environment in organic production

Institutional environment refers to the broader social-economic framework in which institutional arrangements are found. The institutional arrangement is a set of rules governing specific groups of people in meeting specific objectives; they are very important in reducing transactions costs (Eaton *et al.,* 2008). Research in Fresh Fruits and Vegetables (FFV) in Tanzania indicated that Producers Groups (PGs) and Contract Farming (CF) were very important in reducing transactions costs (Eaton *et al.,* 2008).

Institutions are the humanly devised constraints that structure political, economic and social interaction (North, 1991). They consist of both informal constraints (sanctions, taboos, customs, traditions, and codes of conduct), and formal rules (constitutions, laws and property rights). Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange (ibd). According to North (1991) in transaction cost terms, institutions reduce transaction and production costs per exchange so that the potential gains from trade are realizable. An example of this is in the villages, small-scale village trade exists within a "dense" social network of informal constraints that facilitates local exchange, and the costs of transacting in this context become very low (ibd).

1.6.5 Value chain analysis and social networks analysis

The value chain can be seen as a vehicle in which new forms of production, technologies, logistics, labour processes and organizational relations and networks are introduced (Trienekens, 2011). Value Chain Analysis (VCA) is describing a set of sequential activities creating value within firms. Network Analysis (NA), in turn, map the structure of inter-organizational relationships or "ties" based on the recognition that network structure constraints and at the same time are shaped by firms' actions. Both, VCA and

NA stress on the importance of interdependencies between multiple firms and how inter-organizational relationships can be a source of competitive advantage (Lazzarini *et al.,* 2001). It has been recognized that NA could benefit from a careful assessment of distinct types of ties, whereas VCA could benefit from a network-based perspective of inter-firm relations. VCA is particularly concerned with vertically organized ties, while NA is connected with horizontal relationships between firms belonging to a particular industry or group (Lazzarini *et al.,* 2001). A network structure has two dimensions: vertical and horizontal. The vertical dimension reflects the flow of products and services from the primary producer up to end-consumer. The horizontal dimension reflects relationships between actors in the same chain link (between farmers, between processors). Lazzarini *et al.* (2001) developed the concept of the net chain to show the interrelationships between the horizontal and vertical dimensions of value chains (Fig. 1.2).

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CHAPTER TWO

MANUSCRIPT ONE: Network organization of the organic tomatoes and sweet peppers value chain in the tourism sector, Arusha and Unguja[1]

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Abstract

The objective of this paper was to determine the social networks of the main actors in the organic tomatoes and sweet peppers value chain in Arusha and Unguja. Social networks are the relationship and ties among individuals that influence information and resources flow among actors in marketing. A preliminary survey was conducted in 2014 to understand the value chain and actors. Stratified sampling was used to select a sample of actors from the different stratum producers, suppliers/traders and tourist hoteliers. Then key informants interviews and the snowball sampling procedure was used to identify the social networking among actors, including 51 hoteliers, 31 suppliers and 41 producers in Arusha and 71 hoteliers, 24 suppliers and 41 producers in Unguja. The findings show that producers were very close with closeness centrality of 2.12 in Arusha and 3.12 in Unguja

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[1] This paper is under resubmission to Agrekon

to all other actors in the network in the sense that, they received information from other actors more readily than tourist hoteliers and suppliers. This implies that there are opportunities for organic vegetable producers to network and do business with suppliers and tourist hoteliers. Organic vegetable suppliers in Arusha were central and played the brokers role between hoteliers and producers as they were very often on the shortest path among actors in the entire network with betweenness centrality of 91. Likewise, in Unguja producers' organization (UWAMWEMA) was central by betweenness centrality of 533. Lastly, organic farmers' organization (UWAMWEMA) and Meru Sustainable Land (MESULA) had the highest number of actors connected to them with a high degree centrality of 17 for MESULA in Arusha and 28 for UWAMWEMA in Unguja. MESULA and UWAMWEMA played an important role in the network and have a high influence on other actors in the marketing of organic tomato and sweet pepper. The density of the network was 0.01 in Arusha and Unguja indicating that actors were not very densely connected. To improve the density of the existing vegetable network, other important actors like input suppliers need to be included in the network. The network must also include formal support organization/institutions that will control quality, create awareness, and enforce standards and regulation for organic vegetables.

Keywords: Social network, tourist sector, organic market, vegetable value chain

2.1 Introduction

Agriculture is still the sector employing the majority of rural households in Tanzania. The sector employed about 48% of rural farming households in 2008 (National Bureau of Statistics, 2012), and it contributed 29% of the GDP in 2017 (Deloitte, 2017). The tourism sector also contributed to about 9% of the total GDP in 2017 (World Travel and Tourism Council, 2018). However, the contribution of the tourism sector has been small in supporting the agriculture sector because of less consumption of the local food products in

the tourism sector (Anderson and Juma, 2014; Torres, 2003). Studies by Anderson and Juma (2014), Telfer and Wall (1996) and Torres (2003) indicated leakage in the tourism sector by limited utilization of local food products. Leakage was a result of low levels of production, poor quality, and violation of agreements. The poor quality of the locally produced products and violation of agreed contracts among actors in the tourism sector led to high transaction costs. There was also a certain degree of mistrust between the local suppliers and the operators (Anderson and Juma, 2014; Nguni, 2017). Trust among actors is a network issue; it relates to how actors in the value chain built relation/ties between them.

Evidence from social network scholars indicated trust economises transaction costs (Jones *et al.,* 2010). However, economics and organization science, particularly Transaction Cost Economist (TCE) believed in the contract as a mechanism of inter-organizational governance (Williamson, 2016). In studying individuals and their interpersonal relationship (social network) in the value chain, trust becomes a mechanism of inter-organizational governance (Lazzarini *et al.*, 2001).

The marketing analysis of tomatoes and sweet peppers have used different approaches including Value Chain Analysis (VCA) by March Maker Associates (2008) and Nguni (2017) and SNA (Mwagike, 2015). VCA is an approach describing a set of sequential activities creating value within firms (Trienekens, 2011), whereas, Social Network Analysis (SNA), in turn, provides numerous tools to map the structure of inter-organizational relationships or ties. VCA is specifically concerned with vertically organized ties, while SNA with horizontal relationships between firms belonging to a particular industry (Lazzarini *et al.,* 2001). Studies by March Maker Associates (March Maker Associates, 2008) found that most farmers depended on rain-fed agriculture, which

means that the harvesting periods were almost same time, which resulted in over-production and a lot of wasted tomatoes and sweet peppers. The market was characterized by traditional spot market arrangements, the chains were long, the traders dominated the chain, there was no transparency or trust and the farmers were in a disadvantaged position. The study by Nguni (2014) examined the local linkage of smallholder fruits and vegetable producers to tourism market in Zanzibar using VCA and found that formal contracts coupled with captive linkages between tourist hotels and small farmers provide greater upgrading opportunities for smallholders. Market and other linkages characterized by informal contracts do not offer any potential for smallholders upgrading as they tend to reduce rewards and increase risks for small farmers with negative ramifications, whereas Mwagike (2015) adopted SNA, the study aimed at determining the effect of social networks on the performance of fresh tomato value chain in Kilolo District, Tanzania and found that socio-economic groups, network size, tie strength, and network density have significant positive influence on the sale volumes for tomatoes. These studies did not explain how social network through the flow of information and resources among actors in the value chain or trust among individuals in the value chain affects the linkage or could improve the market access and address the challenges and opportunities in the tourist hotels market. This study will, therefore, look at the influence of social networks on resources and information flow in tomatoes and sweet peppers value chain that improves market access through access to information and resources.

The objective was to determine the social networks of the main actors in the organic tomatoes and sweet peppers value chain in Arusha and Unguja. The research question was what is the network organization of actors in the value chain of organic products for the tourism sector in Tanzania? The aim was to understand the relations and ties of actors in the tourism sector in marketing organic tomatoes and sweet pepper. Social networks have

become the way of improving access to information and reducing enforcement of contracts and monitoring costs (Mwagike, 2015). According to Kuepié *et al.* (2014, pp.2): *"Social networks allow entrepreneurs to develop trust relationships in a business environment where information transmission is slow and costly, access to credit is difficult, and contracts are not strictly enforced by formal institutions''*

2.2 Theoretical Framework

2.2.1 Social networks

Social networks are the relationships and ties between individual actors and have been associated with the movement of resources and information among individuals in the market (Carrington, 2011; Wasserman and Faust, 1994). The ties among individuals are the means for bridging. According to Granovetter (1973), the strong tie can be a bridge, only if neither party to it has any other strong ties, unlikely in a social network of any size (though possible in a small group). Weak ties suffer no such restriction, though they are certainly not automatically bridges. What is important, rather, is that all bridges are weak ties. This implies that the ties between organic tomatoes and sweet peppers with suppliers/traders and tourist hoteliers could be the bridges for resources and information flow. However, the stronger ties may not be a bridge if connected to stronger ties but the weak ties are. The resources that are moving through social networks are social capital (Leavy, 2011). While social networks are the ties and relationships such as kinship, social capital reflect the norms and networks that facilitate collective actions (Leavy, 2011). Operationally social capitals are the resources embedded in social networks and accessed and used by actors for actions. The resources could be on production inputs such as seeds and fertilizer and the market for output and prices exchanged through the social networks. Social networks have been used to explain the movement of people and labour (Borgatti *et al.*, 2009); Such as the movement of employees within the educational institutions through a connection or ties that they have created. Social networks have been the means through

which developing countries producers improve access to credit, marketing information and reduce the costs of transactions (Kuepié *et al.,* 2014).

2.2.2 Value chain analysis and social networks analysis

Social network analysis is essentially a mapping of interactions and relationships between actors (people, groups, or organizations). In this study, social networks implied the mapping of the interaction between organic tomatoes and sweet peppers producers, traders/suppliers and tourist hoteliers. Then how did these ties influence resources such as production inputs and marketing information such as prices and product flow? In economics, SNA has been used among others in marketing studies. Marketing actors in the value chain or supply chain can be producers, processors, transporters, retailers, regulatory agencies, or certification providers. The links among them define the relationship of actors in that value chain. Thus the link or relation could be for actors who participated in a particular certification program or other relation.

Social network involves the analysis of the relationship among actors than their attributes (Borgatti *at al.,* 2011). For example, education and expertise are the characteristics of the relevant actors that enable one to access the job markets. By contrast, a network analytic to understanding the same phenomena would focus on ways in which mobility between educational institutions and multiple employers has created connections between organizations to access the job markets (Carrington, 2011). According to Borgatti *et al.* (2009) for social scientists, the theory of networks has been a gold mine, yielding explanations for social phenomena in a wide variety of disciplines from psychology to economics.

Generally, both, VCA and SNA stress on the importance of interdependencies between multiple firms and how inter-organizational relationships can be a source of competitive advantage (Lazzarini *et al.,* 2001). It has been recognized by Lazzarini *et al.* (2001) that NA could benefit from a careful assessment of distinct types of ties; whereas, VCA could benefit from a network-based perspective of inter-firm relations. VCA is particularly concerned with vertically organized ties, while NA is concerned with horizontal relationships between firms belonging to a particular industry or group (Lazzarini *et al.,* 2001). A network structure has two dimensions: vertical and horizontal. The vertical dimension reflects the flow of products and services from the primary producer up to end-consumer (i.e. the value chain or supply chain). The horizontal dimension reflects relationships between actors in the same chain link (between farmers, between processors). Lazzarini *et al.* (2001) developed the concept of the net chain to show the interrelationships between the horizontal and vertical dimensions of value chains (Fig. 2.1).
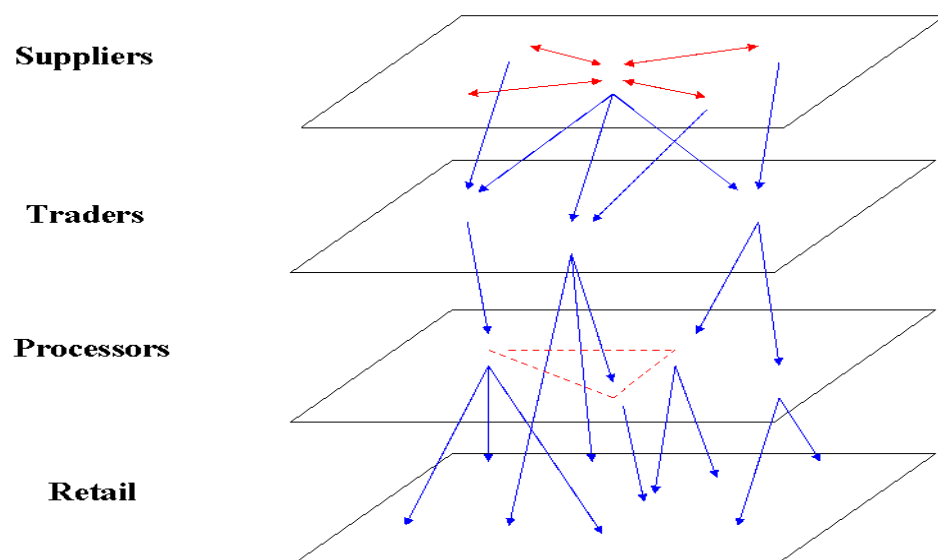
Figure 2.1: Net chain

Source: Lazzarini *et al.* (2001)

2.2.3 Network measures

According to Costenbader and Valente (2003), one basic and essential measure in social network analysis is centrality (degree, closeness and betweenness). But for this study, the intensity of relation was determined by network density (Mueller *et al.,* 2007). Degree centrality is the number of actors connected to a particular actor. For the directed network, we have in-degree, which implies direction towards an actor. This also indicates the popularity of that actor and out-degree implies direction away from an individual which also reflects an influential actor in the network (Wasserman, 1994). Closeness centrality is the average distance from starting actor to all other actors in the network or the average shortest path of a node to all other nodes. Closeness defines how long it takes for information to move from one actor to another actor in the network. Betweenness centrality measures how often an actor appears to be on the shortest path among actors in the network or the share of times node i need to reach node j via node k in the shortest path of a node k;

Network density is a measure of connectivity of the network. It is given by the number of actual ties of an actor per number of all possible ties in the network. According to Costenbader and Valente (2003), the average network density ranges from 1 to 47% in the networks. Network density is a result of four factors: network size, the number of nominations permitted, the number of network questions asked, and the type of questions asked. All other things being equal, as network size decreases network density will increase, whereas, as the number of nominations recorded decreases network density decreases. Also, studies that limited the number of nominations to five or nine nominations were less dense, while those that did not limit the number were denser.

Costenbader and Valente (2003) reviewed eight studies and found that network density was ranging between 0.03 to 0.49 in their network. A study on Physicians in four Illinois communities: Peoria, Bloomington, Quincy, and Galesburg in 1955 had network density of 0.06. A study of the diffusion of family planning practices in Korea in 1973 had a network density of 0.03. Also, a study of the spread of farming practices in Brazil in 1966 had a network density of 0.03. Further, a study of women's voluntary associations, tontines, in urban Cameroon in 1993 had a network density of 0.04 and 1997 which had a network density of 0.49. A study of all the attorneys, partners and associates, employed in a law firm in 1991 had network density of 0.32 and a study of information technology (IT) personnel within a Latin American company had a network of 0.20 and within a US company in 1996 a study had network density of 0.38.

2.3 Methodology

This study was conducted in the city of Arusha and Unguja. The study employed a cross-sectional study design CSD. A preliminary survey was conducted in 2014 to understand the value chain and actors. Five regions were involved during the preliminary survey, Arusha, Unguja, Kilimanjaro, Tanga and Dar Es Salaam. However, the two regions, Arusha and Unguja the tourist hotels market for the organic products were found to be well established. Therefore, Arusha and Unguja were found suitable for the study and selected for that reason. Then a stratified sampling was used to select a sample from each stratum of producers, traders/supplies and tourist hoteliers. The population of organic tomatoes and sweet peppers producers was approximately 100 in Arusha (MESULA, 2014) and 2100 in Unguja (UWAMWEMA, 2014), the tourist hoteliers were 108 in Arusha and 237 in Unguja (Zanzibar Commission for Tourism, 2014) but the population for the suppliers was not known since there was no source of data on the actual population of suppliers to the tourism sector (Table 2.1).

Table 2.1: Population of certified organic producers and tourist hoteliers

Population	Producers	Suppliers/traders	Hoteliers
Arusha	100		108
Unguja	2100		237
Total	**2200**		**345**

The boundary for sampling was then established using a table for calculating the sample for infinity population to estimate a sample for producers (Israel, 1991). The population of tourist hoteliers since was known exactly, a formula for calculating the finite population sample was used (Israel, 1991).

$$n = N/(1 + Ne^2) \tag{1}$$

Where: n = sample size, N= population size and e = the level of precision desired for the sample.

Since the population of suppliers was not known the researcher had to rely on snowballing from the producers and hoteliers to obtain a sample of suppliers and obtained the sample in table 2.2.

Table 2.2: Sample of certified organic producers, suppliers and tourist hoteliers

Sample	Producers	Suppliers	Tourist hoteliers
Arusha	41	31	51
Unguja	41	24	71
Total	**82**	**55**	**122**

However, for the purpose of understanding the value chain and key actors in the tomatoes and sweet peppers, key informants interview was done. Snowball sampling procedure was used to identify actors' social networks, including, tourist hoteliers, organic vegetable suppliers and producers. Snowballing sampling started with 51 tourist hoteliers, and 16 organic tomatoes and sweet peppers producers in Arusha and 71 tourist hoteliers and 5

leaders of organic producers in Unguja. A list of hoteliers and organic producers was obtained from grassroots NGOs for organic producers. Through snowballing, 31 organic tomatoes and sweet peppers suppliers and 25 tomatoes and sweet peppers producers were identified and included in the sample in Arusha. In Unguja, 24 organic tomatoes and sweet peppers suppliers and 36 organic producers were also identified and included in the sample. Two types of data were collected using structured questionnaire interview: relation data based on relation/ties among actors and attribute data which described the properties of an individual actor (Mueller *et al.,* 2007). Gephi-graph visualization and manipulation software were used to analyze relational data, and centrality measures such as degree: the counts of actor's connections or ties. Closeness: the average distance from starting actor to all other actors in the network. Betweenness: how often an actor appeared to be on the shortest path among actors in the network and density: the number of actual ties of an actor per number of all possible ties in the network, were determined, whereas, descriptive statistics, cross-tabulations and multiple responses for the attribute data were computed. Mainly primary source of data was used in the study. The secondary data was used for the reference purposes.

2.4 Results and Discussion

This section presents the social networks that existed among the tomatoes and sweet peppers producers, suppliers/traders and tourist hoteliers. It further explains the resources that were exchanged through the social networks that existed between the tomatoes and sweet peppers producers, suppliers/traders and the tourist hoteliers. Finally, the section shows the reliability of the resources exchanged by indicating the level of trust in the use of a particular resource depending on the source of that resource. The objective was to determine the social networks that existed among the tomatoes and sweet peppers producers, suppliers/traders and tourist hoteliers' value chain in the tourism sector.

2.4.1 Network measures: closeness centrality, betweenness centrality, degree centrality, and density

Social networks are the relationship and ties that exist among individuals/actors (Wasserman, 1994). The resources that are being exchanged in social networks and used by actors such as market information, advice, price, product, quality, availability, capacity, reliability, consumption, seed, fertilizer, pesticide and herbicide are the social capital (Leavy, 2011). The organic tomatoes and sweet peppers value chain were organized in such a way that producers' organization had much influence on the producers as much of the ties to producers were directed to the producers' organization. However, due to the numerous numbers of actors the density of the network was not very high. According to Webster and Morrison (2004), a dense network encourages cooperation, collaboration and conformity to the system and norms.

Social networks are often represented graphically to portray the relational and structural position of network members. In the graphs, nodes (or network members), are represented by points and relations between actors (nodes) are represented by lines between the points. Fig. 2.2 and 2.3 is a network of organic vegetable producers, suppliers/traders and tourist hoteliers in Arusha and Unguja respectively.

A visual look at the graphs shows that most of the marketing ties are directed to MESULA in Arusha and UWAMWEMA in Unguja. Some actors were not connected, particularly hoteliers. Loosely connected hoteliers purchased products directly from the market (spot transaction) without any established relation or contact with traders/suppliers. This is because some hotels did not depend on suppliers and instead, hotels' purchasing officers shop around the different markets and purchased products directly. Supplier/traders connected a network of both hoteliers and producers. This makes supplier central to the

entire network. The majority of producers had contact with MESULA and UWAMWEMA; this makes MESULA and UWAMWEMA NGOs very popular in the network and organic vegetable marketing.
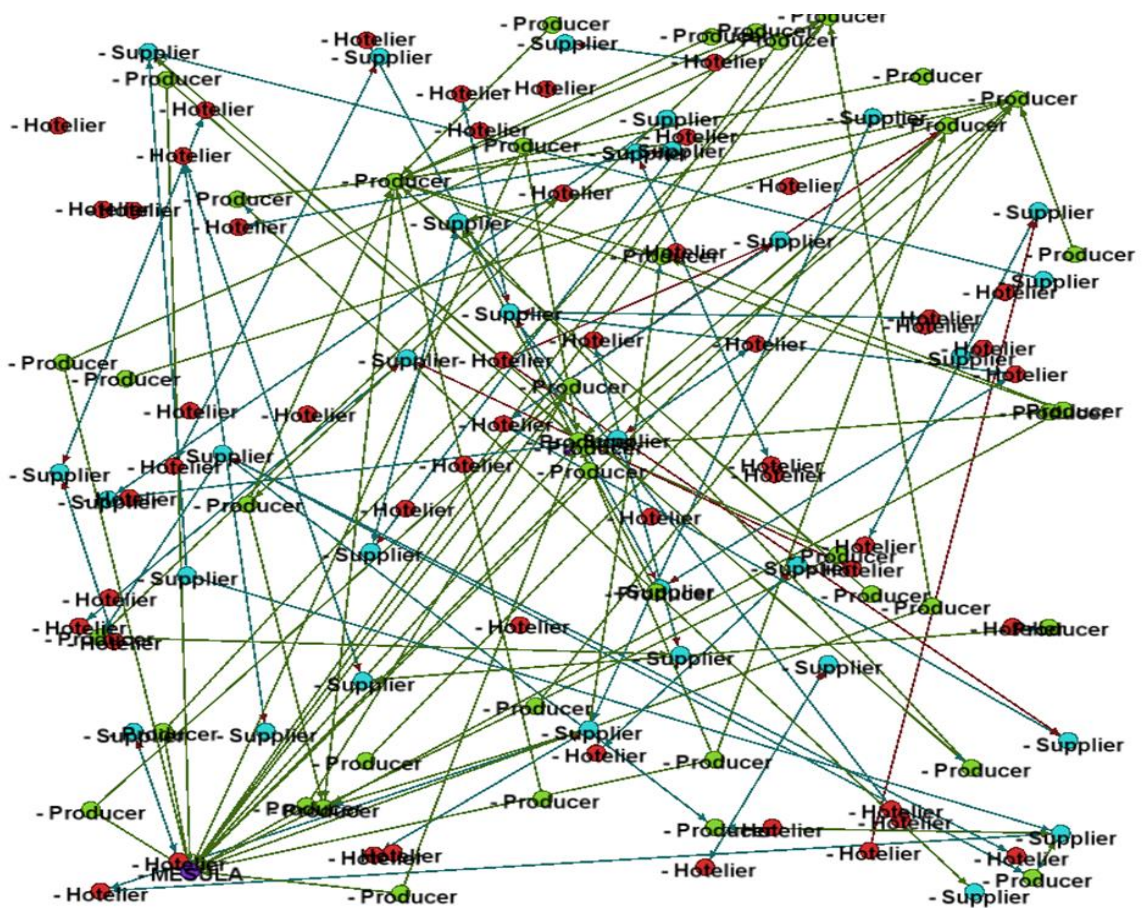
Figure 2.2: Network organization of the tourist industry organic food value chain in Arusha

Network map (graph) for Unguja was also very similar to that of Arusha above with producers organization (UWAMWEMA) being central. The organization had the highest degree in the entire network and became more influential in the network fig. 2.3.
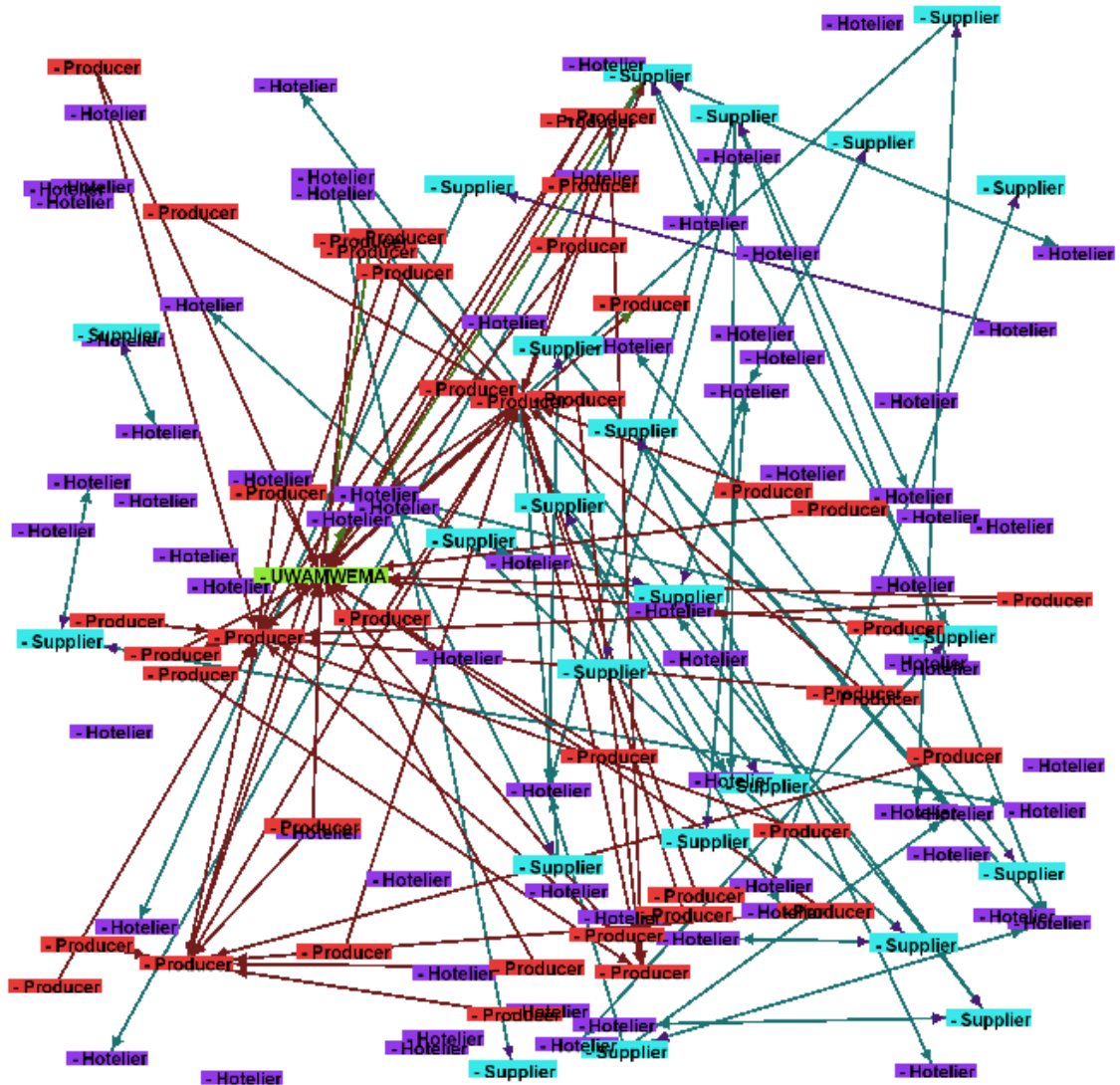
Figure 2.3: Network organization of the tourist industry organic food value chain in Unguja

Visual analysis alone in the network is not adequate for this study; other network measures relevant in marketing studies were used. These include closeness centrality, betweenness centrality, degree centrality and density.

Closeness centrality as a measure of the average distance of an actor from all other actors in network shows that producers on average were very close from the starting node (actor) to all other nodes (actors) in the network. On average, producers had the closeness of 2.12 in Arusha and 3.12 in Unguja, as indicated in the table on network measures (Table 2.3

and 2.4) respectively. This implies that producers received information from all actors very readily, which is an opportunity for organic vegetable producers to link with both suppliers and producers and access the tourist hotels market.

The frequency by which an actor appeared to be on the shortest path among actors in the network is measured by betweenness centrality. The findings of this study show that the highest betweenness was 91 (Table 2.3) for organic vegetable suppliers in Arusha and 533 (Table 2.4) for the producers organization in Unguja (UWAMWEMA). Suppliers, therefore, appeared to be very often on the shortest path between nodes (actors) in the network in Arusha while the producers' organization (UWAMWEMA) in Unguja appeared to be very often on the shortest path between nodes (actors) in Unguja network. This implies that suppliers connected both hoteliers and producers, and played the role of a broker in tomato and sweet pepper marketing in Arusha. However, the producers' organization (UWAMWEMA) connected both hoteliers and producers, and played the role of a broker in tomato and sweet pepper marketing in Unguja. Therefore, suppliers in Arusha and a producers' organization in Unguja (UWAMWEMA) enabled easy access and transaction between tourist hoteliers and organic vegetable producers.

The role of any individual actor in a network can be assessed by the number of actors connected to that particular actor termed as degree centrality. The highest degree centrality in the studied network was 17 (Table 2.3) in Arusha and this was for Meru Sustainable Land (MESULA) and 28 (Table 2.4) in Unguja for UWAMWEMA. MESULA and UWAMWEAMA had the highest degree in the entire network in Arusha and Unguja respectively. This shows that MESULA and UWAMWEMA were popular and played an important role in connecting the organic vegetable producers. MESULA and UWAMWEMA had more access and control of resources especially information, as a

result, they had an important influence on the network since they had the highest number of members connected to them. For instance, in making marketing decisions, MESULA and UWAMWEMA could have a high probability of influencing other members of the network.

The connectivity of actors or members of a network is measured by network density. Assuming all other factors are constant with a large number of actors in a network (increase in Network size), one will expect a decrease in network density (Costenbader and Valente, 2003). The density of the studied networks was 0.01 in Arusha and Unguja indicating that actors were not very densely connected. This is expected due to the large number of actors in the network especially smallholder vegetable producers, who are less connected to each other by having few connections or ties to other actors. Such networks do not have much influence on actors to exert more power in relationships. For a network to exert more power or influence, that actor must be connected to many actors that he/she can influence. According to Webster and Morrison (2004), dense networks encourage cooperation and collaboration among actors and at the same time they encourage conformity to systems and norms.

Table 2.3: Network measures: Closeness centrality, betweenness centrality, degree centrality and density in Arusha

Respondent type		In - Degree	Out- Degree	Degree	Closeness Centrality	Betweenness Centrality
Tourist Hotelier	Mean	0.58	0.66	1.25	0.87	1.74
	n	51	51	51	51	51
	Min	0.00	0.00	0.00	0.00	0.00
	Max	2.00	3.00	5.00	3.62	66.00
Suppliers	Mean	1.64	1.51	3.16	1.59	8.22
	n	31	31	31	31	31
	Min	0.00	1.00	1.00	1.00	0.00
	Max	5.00	4.00	9.00	3.00	91.00
Producer	Mean	1.17	1.53	2.70	2.12	4.19
	n	41	41	41	41	41
	Min	0.00	1.00	1.00	1.00	0.00
	Max	8.00	3.00	10.00	3.67	46.50
MESULA	Mean	16.00	1.00	17.00	1.00	8.00
	n	1	1	1	1	1
	Min	16.00	1.00	17.00	1.00	8.00
	Max	16.00	1.00	17.00	1.00	8.00
Total	Mean	1.16	1.16	2.33	1.46	4.22
	n	124	124	124	124	124
	Min	0.00	0.00	0.00	0.00	0.00
	Max	16.00	4.00	17.00	3.67	91.00

Network measures in Unguja were similar to that of Arusha. However, in Unguja producers' organization (UWAMWEMA) had the highest betweenness. The other measure such as closeness centrality was higher for producers similar to the network measures in Arusha. Again, producers' organization in Unguja had the highest degree or number of contacts similar to the producers' organization in Arusha. Tables 2.4 indicate the network measures in Unguja with the producers' organizations and producers showing similarity to the producers' organizations and producers in Arusha.

Table 2.4: Network measures: Closeness centrality, betweenness centrality, degree centrality and density in Unguja

Respondent type		In-Degree	Out-Degree	Degree	Closeness Centrality	Betweenness Centrality
Hotelier	Mean	0.58	0.46	1.04	0.88	2.28
	n	71	71	71	71	71
	Std. Deviation	0.80	0.63	1.38	1.34	13.67
	Min	0.00	0.00	0.00	0.00	0.00
	Max	3.00	3.00	6.00	4.75	113.00
Producer	Mean	1.00	1.41	2.41	3.12	16.11
	n	41	41	41	41	41
	Std. Deviation	3.06	0.87	3.61	0.52	50.51
	Min	0.00	1.00	1.00	1.88	0.00
	Max	14.00	6.00	16.00	4.35	289.00
Supplier	Mean	1.52	1.83	3.35	1.69	31.83
	n	23	23	23	23	23
	Std. Deviation	0.95	0.98	1.77	0.87	86.64
	Min	1.00	1.00	2.00	1.00	0.00
	Max	5.00	4.00	9.00	3.81	376.00
UWAMWEMA	Mean	22.00	6.00	28.00	2.06	533.50
	n	1	1	1	1	1
	Std. Deviation	.	.	.	.	.
	Min	22.00	6.00	28.00	2.06	533.50
	Max	22.00	6.00	28.00	2.06	533.50
Total	Mean	1.02	1.02	2.04	1.70	15.35
	n	136	136	136	136	136
	Std. Deviation	2.58	1.04	3.35	1.45	64.82
	Min	0.00	0.00	.00	0.00	0.00
	Max	22.00	6.00	28.00	4.75	533.50

2.4.2 Resources accessed by actors through social networks

According to Leavy (2011), the resources that are accessed through social networks are the social capital. The findings indicated that quality was the most pertinent information that actors would like to know from suppliers before they purchase tomatoes and sweet

pepper. Approximately, 88% in Arusha and 96% in Unguja of responses from tourist hoteliers and 63% in Arusha and 100% in Unguja of responses from vegetable suppliers/traders were looking for product quality as demanded by the tourist hotels, whereas to tomatoes and sweet peppers producers in Arusha and Unguja, none of the responses 0% (Table 2.5) indicated quality as being the pieces of information that would be sought from suppliers. This is an important indication that lack of sensitivity to product quality from the producers' perspective is one of the factors that limit producers, access to the tourist market.

However, some producers obtained information from the suppliers and companies that were supporting organic farmers like MESULA and UWAMWEMA the information on fertilizers by 16% in Arusha and 6% in Unguja, herbicides by 13% in Arusha and 31% in Unguja, seed by 11% in Arusha and 17% in Unguja and pesticide by 11% in Arusha and 0% in Unguja. MESULA and UWAMWEMA were concerned about the traceability of the products to ensure that the quality of the products was organic by providing on credit organic inputs like fertilizer (Minjingu fertilizer), seeds and seedlings.

Producers, unlike other actors in the network, were very much concerned with market information and advice. Approximately, 71% in Arusha and 53% in Unguja and 32% in Arusha and 36% in Unguja of producers' responses indicated to access information on marketing and advice respectively from suppliers. While approximately, 31% in Arusha and 0% in Unguja and 5% in Arusha and 0% in Unguja of suppliers responses indicated to access information on marketing and advice from suppliers respectively, 2% in Arusha and 1% in Unguja and 0% in Arusha and 1% in Unguja of hoteliers responses indicated to access information on marketing and advice from suppliers respectively (Table 2.5). This

implies that tourist hoteliers were less concerned about how tomatoes and pepper were produced. But they were more interested in the quality of the end product.

It is evident that there are obvious differences in the type of information required by different actors in the network. While producers were very much concerned with market information and advice, the issue of quality was a major concern by tourist hoteliers and suppliers.

Table 2.5: Resources accessed by actors through physical interaction

	Arusha								Unguja							
	Respondent type								**Respondent type**							
	Hotelier		**Supplier**		**Producer**		**Total**		**Hotelier**		**Supplier**		**producer**		**Total**	
Resources[a]	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Advice	0	0.0	1	5.3	12	31.6	13	12.1	1	1.4	0	0.0	13	36.1	14	11.1
Market information	1	2.0	6	31.6	27	71.1	34	31.8	1	1.4	0	0.0	19	52.8	20	15.9
Seed	0	0.0	0	0.0	4	10.5	4	3.7	0	0.0	0	0.0	6	16.7	6	4.8
Fertilizer	0	0.0	0	0.0	6	15.8	6	5.6	0	0.0	0	0.0	2	5.6	2	1.6
Pesticide	0	0.0	0	0.0	4	10.5	4	3.7	0	0.0	0	0.0	0	0.0	0	0.0
Herbicide	0	0.0	0	0.0	5	13.2	5	4.7	0	0.0	0	0.0	11	30.6	11	8.7
Price	21	42.0	9	47.4	1	2.6	31	29.0	50	72.5	12	57.1	0	0.0	62	49.2
Product	17	34.0	4	21.1	4	10.5	25	23.4	9	13.0	3	14.3	0	0.0	12	9.5
Quality	44	88.0	12	63.2	0	0.0	56	52.3	66	95.7	21	100.00	0	0.0	87	69.0
Availability	6	12.0	0	0.0	0	0.0	6	5.6	3	4.3	0	0.0	0	0.0	3	2.4
Capacity	7	14.0	0	0.0	0	0.0	7	6.5	4	5.8	0	0.0	0	0.0	4	3.2
Consumption	1	2.0	0	0.0	0	0.0	1	0.90	0	0.0	0	0.0	0	0.0	0	0.0
Place	2	4.0	3	15.8	0	0.0	5	4.7	2	2.9	1	4.8	0	0.0	3	2.4
Reliability	5	10.0	0	0.0	0	0.0	5	4.7	5	7.2	2	9.5	0	0.0	7	5.6
Total	**50**		**19**		**38**		**107**	**100.0**	**69**		**21**		**36**		**126**	**100.0**

Percentages and totals are based on respondents.

a. Group

2.4.3 Use of resources provided by actors through social networks

Access to market information and advice is very useful when linking actors especially producers with the market (Alemu *et al.,* 2006). The information on availability, capacity and consumption help producer to schedule production based on demand (Alemu *et al.,* 2006). The relationship between actors influence the use of resources (market information, advice, price, product, quality, availability, capacity, reliability, consumption, seed, fertilizer, pesticide and herbicide) as actors know well about each other and build trust between them. The findings in Table 2.6 indicate that approximately 71% of suppliers in Arusha and 24% in Unguja always trusted and used the resources when interaction was made between them (supplier to supplier). However, approximately 60% of hoteliers in Arusha and 58% in Unguja somewhat trusted and used the resources provided by suppliers, and approximately 44% of producers in Arusha and 51% in Unguja always trusted and used the resources provided by suppliers. This is an indication that, when the same actors interact (e.g., suppliers to suppliers), the level of trust becomes very high particularly in Arusha and when different actors interact the level of trust becomes low (e.g., when hoteliers and suppliers interact). Furthermore, the results indicated that producers' interactions with suppliers had more trust than that of hoteliers and suppliers. Producers always trusted suppliers though, at a low percentage, hoteliers somewhat trusted suppliers. This is true because, in the network developed, producers were very close to suppliers (Table 2.6). This is an indication of a facilitating role that suppliers perform in the value chain. That the producers' access to the tourist market depends to a large extent on the intervention (s) by the suppliers.

Table 2.6: Use of resources provided by actors through social networks

Respondent type		Always		Somewhat		Rarely		Never		Total	
		n	%	n	%	n	%	n	%	n	%
	Hotelier	17	34.0	30	60.0	1	2.0	2	4.0	50	100.0
Arusha	Supplier	15	71.4	5	23.8	0	0.0	1	4.8	21	100.0
	Producer	18	43.9	17	41.5	1	2.4	5	12.2	41	100.0
	Total	**50**	**44.6**	**52**	**46.4**	**2**	**1.8**	**8**	**7.1**	**112**	**100.0**

		Always		Most of the time		Somewhat		Rarely		Never		Total	
		n	%	n	%	n	%	n	%	n	%	n	%
	Hotelier	29	42.0	0	0.0	40	58.0	0	0.0	0	0.0	69	100.0
	Supplier	5	23.8	1	4.8	15	71.4	0	0.0	0	0.0	21	100.0
Unguja	Producer	20	51.3	1	2.6	17	43.6	1	2.6	0	0.0	39	100.0
	Total	**54**	**41.9**	**2**	**1.6**	**72**	**55.8**	**1**	**0.8**	**0**	**0.0**	**129**	**100.0**

2.5 Conclusions and Recommendations

2.5.1 Summary

Based on the results under section 2.4.1 which shows that producers were very close to suppliers and tourist hoteliers by 2.12 in Arusha and 3.12 in Unguja, there is an opportunity of linking organic vegetable producers with the market in tourist hotels through suppliers. Organic vegetable producers were very close to other actors in the network including suppliers and tourist hoteliers. They also received different types of information very readily from other actors. This implies that tourist hotels are potential markets for organic vegetables.

Based on the results under section 2.4.2 which indicated different information required by different actors, this implied that different actors demanded different types of information. Hoteliers and suppliers demanded information on the quality of the products. Producers demanded information on market, seed, fertilizer, herbicides, pesticides and advice. None

of the producers demanded information on the quality of the vegetables produced. Product quality is a very important aspect to enable producers to access market in tourist hotels.

Based on the results under section 2.4.1 the density of the organic vegetable network is low. The density of the network relies on the number of nomination permitted, the size of the network, the number of questions and the type of questions asked. The organic vegetable network was large in size due to numerous numbers of actors in the network. This has resulted in low density as the numerous numbers of actors were less connected to other important actors like supporting NGOs and input suppliers. Input suppliers were involved in spot transaction. Producers were purchasing input to any shop without established relationships that could ensure the quality of the input. At the same time, not all tourist hoteliers and suppliers traced the production processes that determine the quality of the end products.

2.5.2 Conclusion

The objective of the study was to determine the social networks of main actors in the organic tomatoes and sweet peppers value chain for the tourism sector. It can be concluded that there is enough evidence that social networks improve market access. Since producers were very close to suppliers and tourist hoteliers in the organic vegetable network. Therefore, the possible means to ensure organic vegetable producers access to the tourism market is through a network linkage between producers, the suppliers and tourist hoteliers. Quality from the producers', suppliers and hoteliers perspectives is a very important aspect to enable producers to access market in tourist hotels. However, on the one hand, suppliers and hoteliers tend to be more interested in the quality of the end product. On the other hand, producers did not show any sensitivity to the quality of the end products.

2.5.3 Recommendations

Since the results under section 2.4.1 indicated producers were very close to suppliers and tourist hoteliers, it is recommended that the closeness of producers to other actors in the network is an opportunity to link producers with the markets and for the government, NGOs and the support organizations to facilitate the linkage. The closeness between actors can be used to facilitate and maintain the linkage that will enable producers' access to the market.

Since the results under section 2.4.2 indicated producers were not looking for the quality as the information they would need in marketing, it is recommended that organic vegetable producers need support from NGOs or the government through the ministry of agriculture in terms of awareness creation and training on product quality. Training on how quality influence access to markets especially tourist hotels, sales volumes and prices are some of the important aspects that need emphasis.

Since the results under section 2.4.1 indicated the density of the studied network was very low, it is recommended that producers, suppliers and tourist hoteliers need support by NGOs or government to establish contacts with other important actors. If producers established and maintained contact with input suppliers and support organization; Network density would have increased, and the number of important actors connected to them could have increased. The marketing of organic products needs formal supporting organization. Based on the nature of the market, marketing organic products have shown the need for supporting an organization that will control quality, organize the market and promote the product by educating and creating awareness of the product. Very few organizations existed to support organic production (e.g., MESULA). Hoteliers and suppliers need to trace the quality of the products from production level to the end quality

of the products. This will ensure the quality of the product is organic, rather than considering the end products quality. This will help producers comply with their standards and quality.

2.6 Acknowledgements

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CHAPTER THREE

MANUSCRIPT TWO: GOVERNANCE STRUCTURES IN ORGANIC TOMATO AND SWEET PEPPER VALUE CHAIN IN ARUSHA AND UNGUJA[2]

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Abstract

This paper aimed to determine the governance structures in organic tomatoes and sweet peppers value chain in Arusha and Unguja. A preliminary survey was conducted in 2014 to understand actors and the value chain. Then a stratified sampling was used to select a sample of 122 hoteliers, 55 suppliers and 56 organic producers. Snowball sampling procedure was used to select the sample of the unknown population of suppliers. The main actors in organic tomatoes and sweet peppers value chain identified included input suppliers/stockists, hoteliers in the tourist sector, traders/suppliers and producers. The findings show that organic production of tomatoes and sweet peppers mostly relied on the locally available input sources, input suppliers/stockist and strong relationship between producers and suppliers of the products. About four forms of governance structures

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existed in organic tomatoes and sweet peppers value chain: market, modular, relational and captive. When organic producers sold directly to the tourist hotels where most of the producers did not have a contract, prices received were 1250 TZS/kg for tomatoes and 1428 TZS/kg for sweet peppers. The prices received were slightly low when producers sold through suppliers (NGOs, companies and other traders); it was 1053 TZS/kg for tomatoes and 1289 TZS/kg for sweet peppers. In areas where the majority of producers were under contract farming, a captive governance existed. Hoteliers set slightly higher margins, 37% for tomatoes and 38% for sweet peppers than suppliers, 36% for tomatoes and 28% for sweet peppers. Contract farming and captive governance structure ensured organic quality through the value chain. Organic producers' organizations enabled registration to obtain organic mark that enabled access to local organic market and East Africa. The choice of captive governance structure in tomatoes and sweet peppers value chain by lead actors was not only a cost minimization decision but also to ensure continued relation and access to market and organic input such as fertilizers, seeds and seedling inasmuch as the majority of producers sell through organic suppliers under contract relationships.

3.1 Introduction

The concept of value chain governance refers to the ability of lead firms to take control of the market, through non-market coordination of activities achieved through inter-firm relationships and different institutional mechanism (Gereffi, 2014b; Gereffi *et al.,* 2005; Singh, 2006). These lead firms in value chains can be of more than one form: producer-driven, supplier- driven, buyer-driven and external agents like government or institutions in the value chain (Blažek, 2016; Singh, 2006; Zoss, 2014). The control over the market is

by the setting up of product parameters, and in developing countries, buyers of products play an important role in setting up these parameters (Gereffi *et al*., 2005; Singh, 2006). The set parameters are in the form of what to produce (product specification), how to produce that includes: production processes, technology to be used (e.g., organic production of vegetables), quality systems, fair production systems, labour and environmental standards, when to produce and how much to produce and of which all smallholder producers have to adapt to access the market (Fernandez-Stark *et al.,* 2011; Singh, 2006; Van Dijk and Trienekens, 2012).

According to Singh (2006) the need for value chain governance in export market arises due to the fact that there are difficulties for developing country producers to meet developed country market standards due to technical and cost reasons (for example, certification and registration costs in organic production). There is also increased concern on labour, environmental and products safety standards by legal obligations, consumers, government and NGOs. Thus, value chain governance is an important means of ensuring access to domestic as well as export markets by smallholder producers, as through lead firms, smallholder producers build their capacity by adhering to the set standards (Gereffi *et al*., 2005; Gereffi *et al*., 2008; Singh, 2006). The acquisition of production capabilities is through smallholder farmers' interaction with the lead firms. It is through value chain governance that, distribution of gains in marketing can be assessed and firms with competences in the chain will accrue more gains and lead the chain (Gereffi *et al*., 2005; Humphrey and Schmitz, 2001a).

Generally, five forms of governance structures can be distinguished in the value chain: market, modular, relational, captive and hierarchical (Gereffi, 2014a; Gereffi *et al*., 2005; Gereffi *et al*., 2008; Humphrey and Schmitz, 2001b; Williamson, 1979). The governance

types are defined and categorized based on the three variables: the complexity of information or transactions, codification and the capability of suppliers (Humphrey and Schmitz, 2004). According to Dietz (2008), Gereffi *et al*. (2005), Gereffi *et al*. (2008) and (Humphrey and Schmitz, 2004) *under market, the complexity of information is low (simple transactions), and suppliers levels of codification and capabilities are too high (Fig 3.1), market linkages can persist over time with repeat transactions. Costs of switching to new partners are low for both parties and price is the mode of governance. In modular governance, the suppliers codification capability extends to complex transactions (Fig 3.1), suppliers make products based on customer/buyer specification; this mode is distinctive to market in that, it relies on codification rather than price and the switching costs are rather high since the product made is distinct to a specific buyer. Relational is based on the complex interaction that leads to mutual dependence between buyers and sellers and asset specificity. In this, the suppliers' codification ability is low due to the drastic change in the industry technology that increases the complexity of information or transactions. In captive small suppliers, capabilities are low and much dependent on large buyers with a high degree of monitoring and control by lead firms. Hierarchical is characterised by vertical integration triggered by the limited capability and codification ability of the suppliers (Fig. 3.1) and the form of governance is managerial control (e.g., from managers to subordinates or from headquarters to subsidiaries and affiliates*.

Governance type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base
Market	Low	High	High
Modular	① High ② ↑	③ ↑ High ④ ↓	↑ High
Relational	↓ High	Low ↓	⑤ High ⑥
Captive	High	High	Low ↓
Hierarchy	High	Low	Low

Dynamics of changes in governance:
① Increasing complexity of transactions also reduces supplier competence in relation to new demands.
② Decreasing complexity of transactions and greater ease of codification.
③ Better codification of transactions.
④ De-codification of transactions.
⑤ Increasing supplier competence.
⑥ Decreasing supplier competence.

Figure 3.1: Determinants of governance structures

Source: (Humphrey and Schmitz, 2004)

3.2 Theoretical Frameworks

3.2.1 The choice of governance structures

According to Williamson (1979), the choice of governance forms relies on the type of transaction costs. A simple transaction does not necessitate complex governance structure to organize or coordinate it. For example, if the transaction involves a standard product that every supplier can supply based on the transaction requirements, then market forms of governance is appropriate. However, the transaction that involves a non-standard product or a specified product that the suppliers' capability to meet the transactions requirements is low then captive may be appropriate. The most common initial form of governance that leads firms to establish with the suppliers in developing countries is the captive form (Humphrey and Schmitz, 2004). This is because such a transaction requires the lead firm (usually the global buyers from the United States or Europe) to monitor and organize or coordinate the transaction specific requirements that the supplier must meet. The costs involved in monitoring and organizing or coordinating the transaction are the transaction costs (FTCs) that the lead firm must incur (Williamson, 2016). When an asset becomes

more idiosyncratic and specific to one transaction then vertical integration and hierarchical forms of governance are appropriate. Firms will choose to vertically integrate their functions when the assets become more specific to a transaction such that competent suppliers to meet all the transaction specific requirement cannot meet the requirements; the assets referred to are both human and physical capital (Williamson, 1979, 1986).

Studies by Gereffi *et al.* (2008) and Zoss (2014) indicate that more than one form of governance structures exist in one industry this is because of the nature of the industry and transactions involved (standard, nonstandard or idiosyncratic). Gereffi *et al*. (2008) in their study of governance structures of U.S.-based food and agriculture value chains and their relevance to healthy diets, found that, processed tomato value chain is characterized by the co-existence of captive, relational, and modular governance structures since the transaction was specific to the buyers and some suppliers could not meet the codification, while in fresh tomato value chain, spot market exchange was the major mechanism of governance since the transactions involved standard product. A study by Zoss (2014) on governance modes, collective organisation and external facilitators' interventions in vegetable value chains in Northern Tanzania found that there is a continuum between the two extreme cases, the green markets with their spot-market arrangements and the fresh vegetable exports with an almost hierarchic governance form. A hierarchic partly because competent suppliers to meet the export market transaction requirements for fresh vegetables could not be found and the firms decided to vertically integrate. The type of governance structures that existed in the organic tomatoes and sweet peppers value chain for the tourism sector in Arusha and Unguja is not yet known. This study, therefore, seeks to establish the governance structures in the organic tomatoes and sweet peppers value chain for the tourism sector in the study areas.

3.2.2 Determinants of governance structure

The form of governance can change as an industry evolves and matures, and governance patterns within an industry can vary from one stage of the chain to another (Humphrey and Schmitz, 2004). Three variables account for the dynamic nature of governance: the complexity of information that the manufacture of a product entails (design and process); the ability to codify or systematize the transfer of knowledge to suppliers; and the capabilities of existing suppliers to efficiently and reliably produce the product (Gereffi *et al.,* 2005). Additional influences on the governance structure include the quality, stability, and power of the business enabling environment and institutions, as well as other sources of power in the chain, such as suppliers and consumers (Humphrey and Schmitz, 2004). The complexity of information refers to the intricacy of information and knowledge that must be transferred to ensure a particular transaction can occur. Information codification is the extent to which lead firms can convert tacit, implied information and knowledge into explicit, concrete and situation-specific information and transmit it to producers effectively, efficiently and at minimal cost. Supplier capability refers to the ability of suppliers to meet all transaction requirements. These may include quantity and quality specifications; on-time delivery; and environmental, labour and safety standards (Gereffi *et al.,* 2005).

3.2.3 Dynamism in governance

If one of these three variables changes, then value chain governance patterns tend to shift in predictable ways (Humphrey and Schmitz, 2004). For example, if a new technology renders an established codification scheme obsolete, modular value chains are likely to become more relational; and if competent suppliers cannot be found, captive networks and even vertical integration would become more prevalent (Fig. 3.1). Conversely, rising supplier competence might result in captive networks moving towards the relational type,

and better codification schemes set the stage for modular networks (Gereffi *et al.,* 2005). In this study, therefore, the three determinants (variables) of governance structures were used to determine the governance structures in the value chain for organic tomatoes and sweet peppers: complexity, codification and capacity of the existing suppliers.

3.3 The market for organic products

The market for organic products is largely dependent on affluent people, experts, tourist and people with middle and high income (Sangkumchaliang and Huang, 2012). In East Africa, the major focus for the organic market was on the export market (Bakewell-Stone *at al.,* 2008); the major access points for organic products were therefore targeted towards these consumers. Organic producers and organizations targeted these niche markets for organic products; this was by the establishment of market targeting such consumers. The use of farmers' markets is one of the ways where organic products from producers were brought for sale in the farmers market. In Unguja, the Union of Organic Vegetable Producers in Western Unguja (UWAMWEMA) producers' organization or cooperative organized such market focusing on these consumers. In Arusha, the Meru Sustainable Land Company (MESULA) organized farmers market at Oikos, where the target market was middle and high-income class such as workers of the United Nations and tourists (Own survey, 2015). Apart from farmers' markets, the middle and high-income class were some of the people that make use of the proliferation of supermarkets. Hence, supermarkets were also the targets for organic products, organic organizations and companies. Companies used supermarkets as the target consumers for organic products. Labelling for organic products (organic mark) was a means of identifications and local certification; however, for fresh products like tomatoes and sweet peppers, the use of labelling was inadequate. Establishments of specialized sale points in the local market (Unguja) and farmers' market in Arusha and Unguja was identified by the places that sell

organic products and not the labels on the products such as tomatoes and sweet peppers (Own survey, 2015). Organizations and company's suppliers also targeted tourist hotels as a special outlet for organic products, awareness creations through marketing and seminars that invited tourist hoteliers by UWAMWIMA and MESULA. However, limited production, unsteady quantity and seasonality in production challenged tourist hotels market access, similar challenges identified by Torres (2004) in Mexico and Wineaster (2013) in Zanzibar. Notwithstanding, the challenges in access to the tourist hotels market, there is a growth in the tourism sector and its contribution in Tanzania economy is over 13% of the Gross Domestic Product (GDP) (World Travel and Tourism Council, 2014), and about one third of consumption of tourists consists of food products (Torres, 2004). The tourist hotels market was considered a potential market for organic products and was the reasons for this study, mainly due to the fact that, quality is the biggest challenge which leads to importation and leakages in the tourism economy (less utilization of local food products) (Telfer and Wall, 2000). However, organic products are of high quality, therefore they will increase access to the tourist hotels markets (Chang *et al.,* 2013).

This paper aimed at determining the governance in the value chain of organic products for the tourism sector in Tanzania. The research question put forward was what type of governance structures exists in the value chain for organic tomatoes and sweet peppers? The major focus is on the tourism sector as a market for organic products, an alternative to the export market.

3.4 Methodology

This study was conducted in the Northern tourist circuit in the city of Arusha and Unguja. A preliminary survey was conducted in 2014 to understand actors and the value chain. Five regions were involved during the preliminary survey, Arusha, Unguja, Kilimanjaro,

Tanga and Dar Es Salaam. However, the two regions, Arusha and Unguja the tourist hotels market for the organic products were found to be well established. Therefore, Arusha and Unguja were found suitable for the study and selected for that reason. Stratified sampling was used to select a sample of 122 hoteliers, 55 suppliers and 56 organic producers. The study design was cross-sectional. While the tourism sector is broad, this study focused on tourist hotels as a potential market for organic tomatoes and sweet peppers. For the purpose of understanding the value chain and key actors in tomatoes and sweet pepper marketing, key informants interview was done. Snowball sampling procedure was used to identify a sample of unknown suppliers. The population of tourist hotels in Unguja was 237 according to the Zanzibar Commission for Tourism and was 108 for Arusha, while that of traders/suppliers for Arusha and Unguja was unknown since there was no source of data on the actual population of suppliers to the tourism sector (Table 3.1).

Table 3.1: Population of actors

Population	Producers	Suppliers/traders	Tourist hotels
Unguja	2100	-	237
Arusha	100	-	108
Total	**2200**	**-**	**345**

Then, using the formula for calculating the finite and infinite population for the population of organic tomatoes and sweet peppers producers (Israel, 1991). The sample from each stratum was obtained and established the sampling boundary.

$$n = N/(1 + Ne^2)$$ …………………………………………………………………...(2)

Where: n = sample size, N= population size and e = the level of precision desired for the sample. The population of suppliers and traders since was not easy to establish it a snowballing procedure was introduced based on the reference of the sample of 56 organic

producers obtained using infinite population sample table (Israel, 1991), 71 tourist
hoteliers in Zanzibar and 51 tourist hoteliers in Arusha obtained by using the formula for
calculating finite population sample (Table 3.2).

Table 3.2: Sample of actors

Sample	Producers	Suppliers	Tourist hoteliers
Arusha	15	31	51
Unguja	41	24	71
Total	**56**	**55**	**122**

The actors identified included tourist hoteliers, organic tomatoes and sweet peppers
suppliers and producers. Snowballing sampling started with 51 tourist hoteliers and 15
organic tomatoes and sweet peppers producers in Arusha Region and 71 tourist hoteliers
and five (5) leaders of organic producers in Unguja. A list of hoteliers and organic
producers was obtained from grassroots NGOs for organic producers. Through
snowballing, 31 organic tomatoes and sweet peppers suppliers were identified and
included in the sample in Arusha Region. In Unguja, 24 organic tomatoes and sweet
peppers suppliers and 36 organic producers were also identified and included in the
sample. The data were collected using structured questionnaire interview. Statistical
Package for Social Science (SPSS) and Stata was used to analyse the data. Descriptive
statistics, cross-tabulations, means, tables and multiple responses analysis were done.
However, the governance structures were identified using the three criteria: codification
ability, the complexity of information and the capability of suppliers. Mainly primary
source of data was used in the study. The secondary data was used for the reference
purposes.

Marketing margins

The value chain governance is an important factor for the producers or suppliers acquisition of production capability, market access and the distributions of gains (Humphrey and Schmitz, 2004). At every point in the value chain, a different form of governance structures exist and the distribution of gains are also different for each of the actors involved in a particular point in the value chain (ibd). This was the reason to why marketing margin at every point in the chain was calculated in this study to understand the distribution of gains.

Market margins are differences between prices at different market levels. With the products that remain unchanged during the marketing process, marketing margins refer to the difference between the producer (farm-gate) and consumer (retail) prices of an equivalent quantity and quality of the commodity (total gross margins or total price spread) (Smith *et al*., 1992). However, it may also be used to describe price differences between other points in the marketing chain, for example, between producer and wholesaler or wholesale and retail prices. Marketing margins can be calculated as farm-gate price as a percentage of the retail price to show farmer's share (%) or the difference between retail price and farm-gate price as a percentage of the farm-gate price to show the percentage total markup. Marketing margins can also be calculated as the difference between retail price and farm-gate price as a percentage of the retail price to show the total cost of marketing or percentage total gross margins (Smith *et al*., 1992).

The marketing margins were calculated to estimate the total costs of marketing. The percentage of total gross margins was therefore calculated as follows:

$$\frac{Retail\ price - farm-gate\ price}{Retail\ price} \times 100 = Total\ gross\ margin\ (\%)\ \text{------------------------ (3)}$$

3.5 Results and Discussions

This section presents the description of the value chain since the governance is different from each point in the value chain. It was important to describe the value chain from the point of inception to consumption: input, production, processing, distribution and the output market. The section further, presents the types of governance structure identified using the three criteria, the capability of suppliers, codification and complexity of the transaction. Again, the section presents the additional influences on the governance structure include the quality, stability, and power of the business enabling environment and institutions, as well as other sources of power in the chain, such as suppliers (organic organization (UWAMWEMA and MESULA) and consumer (tourist hoteliers). The objective was to identify the type of governance structures that existed in the organic tomatoes and sweet peppers value chain.

3.5.1 Input sources

The production of organic tomatoes and sweet peppers relied on the locally available inputs, green manure, compost manure and animal manure. Animal manure was bought from neighbouring livestock keepers based on agreements between buyers (producers) and sellers (livestock keeper). Producers who kept livestock, own manure were the major sources of input in production. Through a strong relationship with producers' organization/NGOs and companies such as Meru Sustainable Land (MESULA) and the Union of Organic Vegetables Producers in Western Unguja (UWAMWIMA), organic producers were also able to obtain organic inputs. MESULA supplied in the form of in-kind credit, Minjingu organic fertilizer to producers from Minjingu Fertilizer Company and seedlings. Seeds were either supplied in the form of in-kind credit by producers' organization/NGOs and company or bought from local stores/stockists in the nearby town,

Arumeru, Arusha and Unguja. Producer paid back the credit in-kind after the harvest and sale of the crop at a pre-determined price that is agreed before the harvest.

In addition, the company and NGOs supporting these producers provided the service for monitoring production by these producers. This was production management contract farming, whereby; suppliers or buyers take more control of the production process and provide inputs required for production. Buyers in these cases incur some production costs and most of the marketing risks and are required to provide a market for organic tomatoes and sweet peppers. This leads into the captive form of governance, as producers under organic productions were continuously monitored and controlled by the supporting NGOs and companies. Organic producers were to follow production methods and input regimes decided by suppliers or buyers. According to Gereffi *et al*. (2005) over-dependence on the few large buyers for market or input and high levels of control and monitoring by the lead, firms led into a captive form of governance.

3.5.2 Production

Production was carried out by smallholder organic producers with on average 0.51 acres for tomatoes and 0.48 for sweet pepper (Table 3.3). According to the National Bureau of Statistics (2012, pp. 23), on the average, the area under smallholder remained 2ha per household in 2002/2003 and in 2007/2008. Organic production of tomatoes and sweet peppers was characterized by contract farming. Producers under organic farming were entering a contract for production of specific vegetables. The contracts enabled producers to acquire input for production, such as fertilizers, seeds and seedlings, though some of the tomatoes and sweet peppers produced by producers, in Arusha for example, could not find a market, resulting into asset specific problems to producers. According to Gereffi *et al*.

(2005), a relational form of governance is characterized by complex interaction which leads to a mutual dependence and asset specific.

Table 3.3[3]: Area under organic production for tomatoes and sweet pepper (acres)

	Arusha					Unguja					Total			
	n	min	max	mean	SD	n	min	max	mean	SD	n	min	max	mean
Size of area cultivated for organic tomatoes in acres	13	0.13	1.00	0.32	0.25	27	0.13	2.00	0.59	0.43	40	0.13	2.00	0.51
Size of area cultivated for organic sweet peppers in acres	13	0.13	0.50	0.27	0.14	28	0.25	1.00	0.58	0.26	41	0.13	1.00	0.48

SD- standard deviation

3.5.3 Processing

To large extent tomatoes and sweet peppers produced were sold unprocessed (Table 3.4). In the study areas, none of the producers processed tomatoes, only 1% of the producers said to receive training on processing. However, in the tourism sector which was the major focus of this study; buyers of tomatoes and sweet peppers were purchasing unprocessed tomatoes and sweet pepper directly from producers, NGOs or through suppliers. As a result tourist hotelier sourced processed tomatoes from the supermarkets.

Table 3.4: Processing facilities for tomatoes

	n	%
No	81	99
Yes	1	1
Total	**82**	**100**

3.5.4 Market outlet[4]

Organic tomatoes and sweet peppers were sold through three outlets (channels) (Fig. 3.2); producers selling tomatoes and sweet peppers: i) direct to the markets (like tourist hotels,

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[3] Not all organic producers produced both crops; some produced only tomatoes while others produced only sweet peppers. This analysis selected only organic producers; sample or count will increase from producers producing both crops as the areas for tomatoes and sweet peppers were different

[4] The arguments under this value chain map section are based on the preliminary survey (2014) findings, through key informant interviews.

farmers market, expatriates, supermarket and local market) ii) through suppliers of organic

tomatoes and sweet peppers, or iii) through organic farmers organizations and companies.

The suppliers facilitated marketing functions including transportation and storage for

organic tomatoes and sweet peppers. The role of suppliers and producers organization was

mainly transportation and adding value by storing tomatoes and sweet peppers (Fig. 3.2).

Conventionally produced tomatoes and sweet peppers in Unguja were mainly purchased

from producers in Arusha, Morogoro, Iringa and Lushoto in Tanga. This resulted into

suppliers in Unguja incurring additional transaction costs (TCs)[5]. For example, they had to

negotiate and coordinate the purchase of tomatoes and sweet peppers from the mainland.

Shipment of tomatoes and sweet peppers from the mainland by boat were some additional

marketing costs pertaining to value chain difference between Arusha and Unguja. Some

organic tomatoes and sweet peppers pass through conventional suppliers and

compromised organic quality and mainly sold into the local market as conventional

products (Fig. 3.2). Some of the conventional suppliers purchased tomatoes and sweet

peppers from the local markets and sold them in the tourist markets. There were four local

markets: Kilombero Market, Main Market in Arusha, Darajani and Mwanakwerekwe

Market in Unguja. The Kilombero Market received most of the tomatoes and sweet

peppers direct from producers. The tomatoes and sweet peppers from Kilombero Market

were also bought by the traders/suppliers from the Main Market in Arusha. The traders or

suppliers in the Main Market sold most of the tomatoes and sweet peppers to the tourist

hoteliers who came directly to the market in the spot market. Darajani and

Mwanakwerekwe markets in Unguja were other local markets. The tomatoes and sweet

peppers purchased by suppliers from the mainland Tanzania were directly received by

suppliers or traders in Mwanakwerekwe Market. This market received tomatoes and sweet

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[5] TCs -stand for transaction costs- suppliers in Zanzibar were coordinating purchase of tomatoes and sweet
peppers from Tanzania Mainland Arusha, Iringa, Morogoro and Lushoto in Tanga.

peppers shipped by boat from the mainland, then suppliers took tomatoes and sweet peppers to Darajani Market; Darajani Market is the main market in Zanzibar. The tourist hoteliers mostly purchased their tomatoes and sweet peppers from the suppliers in Darajani Market in the spot market. The suppliers were selling their tomatoes and sweet peppers in both markets: the local market where they own retail sale points and also to the tourist hotels where they have supply contracts either verbal or written to the tourist hotels.

Figure 3.2: Tomatoes and sweet peppers value chain map

3.5.5 Governance structures

There are three criteria that are used to determine the governance structures in the value chain: the complexity of information, codification ability and the capability of suppliers to meet the transactions requirements (Gereffi *et al.,* 2005; Humphrey and Schmitz, 2004). Furthermore, governance in the value chain may either be buyer driven, supplier-driven or producer driven (Gereffi *et al.,* 2005). Tomatoes and sweet peppers value chain in the study area was a buyer (hoteliers) and suppliers (traders) driven. Buyers and suppliers led the value chain in organic tomatoes and sweet peppers. About four governance structures were identified based on criteria for identifying governance structures: (i) the complexity of transactions or interaction, (ii) ability to codify transactions and (iii) capability of suppliers (Gereffi *et al*., 2005) (Table 3.5 and 3.6). The governance structures were market, modular, relational and captive:

A market form was observed when a simple transaction between the producers and tourist hoteliers were made and tomatoes and peppers were standard. In modular form organic standard was considered by organic suppliers as lead actors, however, in this form producers received training on organic production which made codification easy to supply organic tomatoes and sweet peppers. The codification was extended to the complex transaction by the unification of product and process for organic products that enabled or increased the capacity to supply by organic producers.

Some hoteliers relied on the close relationships with their suppliers to the extent that the requirements by the tourist hoteliers were met through close relationships between them. Friends and relative ties between suppliers and hoteliers led into a relational form of governance, where the complexity of interaction and transaction were managed based on trust and family or friends relationships, however, contracts secured transactions. About

28% of actors relied on friends and relatives in accessing information over the markets (Table 3.9).

Overdependence on suppliers' organizations like UWAMWIMA and companies such as MESULA on input for production, transportations to the market, search for market, production technology (e.g., training on organic production by NGOs and companies) resulted into producers as suppliers to control very few functions on marketing and they became captive. Captive in the sense that prices for organic were secured through contracts with the organisation and company to the extent that, reliable and competitive prices were not possible to producers when supplying to the local markets, mainly due to fluctuations in prices, which made suppliers'/traders' organization became the major buyers for organic tomatoes and sweet peppers (Table 3.5 and 3.6). Three criteria were used as indicated in Table 3.5 and 3.6 in terms of codification, complexity and the capacity of suppliers whether it is high or low (Table 3.5 and 3.6).

Table 3.5: Governance structures

Governance Power asymmetry	Market		Modular		Relational		Captive	

Power asymmetry: (arrow pointing from left to right, narrowing toward Captive)

	Lead actors							
	Buyer (Hoteliers)		**Suppliers or traders** (lead actor)		**Suppliers and hoteliers** (lead actors)		**Organic suppliers/traders (NGOs and company)** (lead actor)	
Criteria	**Ability**	**Characteristics**	**Ability**	**Characteristics**	**Ability**	**Characteristics**	**Ability**	**Characteristics**
Codification	High	Some hotels consider tomatoes and peppers standard Set few or no quality attributes Negotiated prices with producers Bought under spot market arrangements Linkage persisted for some time (e.g., harvesting time)	High	Organic standard Organic quality Production and process technology organic However, producers needed the training to supply organic	Low	Friends and relatives ties existed About 28% of suppliers and buyers relied on friends and relatives to access market information	High	Input supplied by NGOs and company Technology/process is provided by NGOs and company Market assured through contracts between buyers and suppliers (traders and producers) Transport was also provided by NGOs and companies

Table 3.6: Governance structures

Governance	Market		Modular		Relational		Captive	
Power asymmetry								
				Lead actors				
	Buyer (Hoteliers)		**Suppliers or traders**		**Suppliers and hoteliers**		**Organic suppliers/traders (NGOs and company)**	
			(lead actor)		**(lead actors)**		**(lead actor)**	
Criteria	**Ability**	**Characteristics**	**Ability**	**Characteristics**	**Ability**	**Characteristics**	**Ability**	**Characteristics**
Complexity of interaction/transactions	Low	Products were considered standard	High	Organic standards needed monitoring and control of quality by lead actors	High	So many standard attributes: Organic, size, colours, shape, type, ripeness Contracts secured transactions	High	High level of monitoring and control by NGOs and company suppliers/traders Contracts secured transactions
Capability of suppliers	High	Few standards and attributes and possible to switch to another buyer	High	Organic producers must have the training to supply organic	High	Through Strong ties: relatives and friends Contracts were trustworthy	Low	Only NGOs and company secured the purchase of organic Competitive prices under NGOs and Companies A switching to the local market is costly to producers (low prices, mainly due to fluctuations)

NB: no cases of vertical integrations were found in tomatoes and sweet peppers marketing (e.g., in input sources, production and marketing)

3.5.6 Opportunities and challenges on governance

Governance in the value chain is a means of least developed countries producers get access to the markets, acquire production capabilities or technical assistance and gain in the market through interaction with the lead firms in marketing (Humphrey and Schmitz, 2004). Through interaction with lead firms, suppliers were able to access market information by 76% and producers by 8% on organic tomatoes and sweet peppers (Table 3.7). Eight percent of producers were offered technical assistance from hoteliers (Table 3.7). Limited production challenged producers' direct access to the market as approximately 90% of producers and 11% of suppliers did not access the tourist hotels markets as they could not meet the quantity and quality required. This resulted in hoteliers' over-reliance on suppliers as suppliers were collecting tomatoes and sweet peppers from different producers and therefore creating more access to the tourism market to suppliers by approximately 90% than the producers 10% of market access (Table 3.7).

Table 3.7: Opportunities and challenges on governance

		Opportunities			Challenges	
		Producers (%)	Suppliers (%)		Producers (%)	Suppliers (%)
1	Access to market information	8	76	Limited access to specification	92	24
2	The offering of technical assistance from hoteliers	8	-	Limited access to technical specifications from hoteliers	92	-
3	Market access	9.9	89.9	Poor market access	90.1	11.1

3.5.7 Exchanged marketing information with hoteliers

Market Information Systems (MIS) is a means of increasing efficiency of marketing systems and promoting improved price formation. According to Alemu *et al.* (2006), improved information enables farmers to plan their production more in line with the market demand, schedule their harvests at the most profitable time, decide to which

markets they should send their produce and negotiate on a more even footing with traders. Also improved information enables traders to move to produce profitably from a surplus to a deficit market and to make decisions about the viability of carrying out storage, where technically possible (ibd). However, one of the characteristics of the market form of governance is that a buyer does not need to give much of the information about the market (Gereffi *et al.,* 2005). It is believed that suppliers/traders are competent enough to meet the market requirements and the price is the major mechanism of governance in the value chain. Traders just use their experience in the market to make a transaction of goods and services and there are possibilities of turning to another vendor without a loss (Williamson, 1979). On the contrary, the analysis shows that the marketing of organic tomatoes and sweet peppers, only between hoteliers the exchange of information did not exist, but there was always an exchange of marketing information between suppliers and producers and the consumers or hoteliers. The analysis indicates that 68% of suppliers in Arusha and 88% in Unguja, and 7% of producers in Arusha and 5% in Unguja exchanged marketing information with hoteliers (Buyers or consumers). The information is based on the products that are demanded not only the market price (Table 3.8). The suppliers had more information on the tourist hotels market than the producers this created more access to the market to suppliers than the producers.

Table 3.8: Exchanged marketing information with hoteliers

| | | Arusha | | | | | | Unguja | | | | | |
| | | Hotelier | | Supplier | | Producer | | Hotelier | | Supplier | | Producer | |
		n	%	n	%	n	%	n	%	n	%	n	%
Exchanged marketing information with hoteliers	No	51	100	10	32	14	93	71	100	3	12	39	95
	Yes	0	0	21	68	1	7	0	0	21	88	2	5
	Total	51	100	31	100	15	100	71	100	24	100	41	100

3.5.8 Means of obtaining market information under market and relational governance

Access to market information may determine the level of governance in that particular value chain. If the value chain is in the form that information access requires a close relationship between actors (for example relatives or people related) a relational kind of governance may prevail (Gereffi *et al*., 2005). If the information is available to every actor in the market and actors are capable of using the information or their experience to deliver products to the market (simple transaction), then a market form of governance may be said to exist in that value chain. The data shows that there were two major sources of accessing information about the market in organic tomatoes and sweet peppers value chain: Market survey and relatives or friends. About 58% of responses of actors in the value chain indicated to rely on the market survey as a means of obtaining marketing information (Table 3.9). The marketing surveys were done by visiting different market outlets and directly asking the prevailing prices. Likewise, 28% of responses from actors indicated to rely on friends and relatives (Table 3.9). By asking friends and relatives producers were able to understand which market outlet has a better price and decide on where they could sell their products. Suppliers were also able to make decisions on where to take the products by understanding the prevailing marketing prices, demand and supply of a particular market.

Table 3.9: Means of obtaining market information under market and relational governance

		Responses		**Percent of**
		n	**%**	**Cases**
Means of obtaining marketing information[a]	Through friends and relatives	66	28.3	28.4
	Marketing information was not available	10	4.3	4.3
	Through suppliers	18	7.7	7.8
	Market survey	135	57.9	58.2
	Competition	1	0.4	0.4
	Farm Radio	1	0.4	0.4
	Price is fixed through contract	1	0.4	0.4
	TAHA (Tanzania Horticultural Association)	1	0.4	0.4
Total		**233**	**100.0**	**100.4**

a. Group

3.5.9 Technical assistance offered by suppliers (Organic suppliers) under the captive governance

One of the advantages of governance is the acquisition of technical assistance (Gereffi *et al.,* 2005). It is through value chain governance that, the capabilities of producers are developed to comply with products specification, including size, colour, uniformity and freshness or organic products (Humphrey and Schmitz, 2004). The organic producers' organizations UWAMWIMA and MESULA offered technical assistance to organic producers. Through the organizations (UWAMWIMA and MESULA) agronomist's producers were offered training on organic production practices. The organization also helped to link producers with Tanzania Organic Agricultural Movement (TOAM) and through Participatory Guarantee Systems (PGS) the organizations' producers have been able to be registered as organic producers. The analysis indicates that 93% of producers in Arusha and 46% in Unguja were offered technical assistance from suppliers (Table 3.10). The suppliers in the organic products industry were NGOs which purchased or collected the products directly from producers under the organizations and sold them to the tourist hotels or others suppliers of organic products.

Table 3.10: Technical assistance offered by suppliers under the captive governance

		Arusha Producer		Unguja Producer	
		n	%	n	%
Technical assistance offered by suppliers	No	1	7	22	54
	Yes	14	93	19	46
	Total	**15**	**100**	**41**	**100**

3.5.10 Product specification under the modular governance structure

Product specification or standards are the means of value chain governance. According to Dietz (2008), in a modular form of governance, sellers rely on the specification provided by buyers of the products, and products must be supplied based on buyers specification. This happens when sellers rely on few large buyers of the products. The findings show that 81% of suppliers in Arusha and 100% in Unguja, 27% of producers in Arusha and 20% in Unguja received tomatoes and sweet peppers specification from the tourist hotels as the major buyers of tomatoes and sweet peppers (Table 3.11). Hoteliers were concerned about the timely delivery, seasonality, capacity and sustainability in supply that producers could not offer; this made them rely on suppliers who would collect tomatoes and sweet peppers from different producers.

Table 3.11[6]: Products specification under the modular governance structure

		Arusha						Unguja					
		Hotelier		Supplier		Producer		Hotelier		Supplier		Producer	
		n	%	n	%	n	%	n	%	n	%	n	%
Product specification to hoteliers	No	51	100	6	19	11	73	71	100	0	0	33	80
	Yes	0	0	25	81	4	27	0	0	24	100	8	20
	Total	**51**	**100**	**31**	**100**	**15**	**100**	**71**	**100**	**24**	**100**	**41**	**100**

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[6] Hoteliers are consumers/buyers of tomatoes and sweet peppers and did not give specification to them, instead, set specifications to producers and suppliers

3.5.11 Product standards and quality attributes (specifications) under the captive governance

To ensure the product specifications are met by the suppliers, buyers of the organic tomatoes and sweet peppers must coordinate the supply of the products and set up the requirements of the transaction. This is to make sure the producers with low codification ability meet all the transactions requirements (Gereffi *et al.,* 2005). The marketing of organic tomatoes and sweet peppers had quality attributes that buyers of tomatoes and sweet pepper preferred (Table 3.12). The most preferred tomatoes and sweet peppers quality and standards set were the size of tomatoes and sweet peppers, organic tomatoes and sweet peppers or fresh tomatoes and sweet peppers, colour and ripeness. The findings show that about 34% of responses from suppliers and hoteliers considered size (big sized) of tomatoes and sweet peppers as the most preferred attribute. The second best quality that suppliers and hoteliers indicated as preferred was ripeness of tomatoes and sweet peppers by 13% of responses, and the third quality that buyers would like to get was organic tomatoes and sweet peppers or fresh tomatoes and sweet peppers by 12%. Lastly, the colour of tomatoes and sweet peppers was the fourth quality preferred that actors indicated by 10% of responses (Table 3.12). There are other qualities and standards set; the quality and standards set are the means of ensuring governance of the value chain, and every buyer would have different parameters in the purchase of tomatoes and sweet peppers. This led into a captive form of governance as the buyer had to ensure the suppliers meet all the transactions requirements since some producers could not meet all the transaction requirements.

Table 3.12: Products standards and quality attributes (specifications) under the

    captive governance

		Responses		Percent of Cases
		n	**%**	
	Big sized	116	33.6	52.7
	Firm	11	3.2	5.0
	Medium sized	22	6.4	10.0
	Ripped/full ripped	37	10.7	16.8
	Round	1	0.3	0.5
	Semi ripped/ not ripped	46	13.3	20.9
	Uniform colored	33	9.6	15.0
	Good shape/quality/appearance	7	2.0	3.2
Products standards and quality attributes[a]	Long lasting	2	0.6	0.9
	Cherry tomato	5	1.4	2.3
	Organic products/ Fresh products	41	11.9	18.6
	Money maker	5	1.4	2.3
	Packed	1	0.3	0.5
	Roma/Mshumaa	10	2.9	4.5
	Small sized	5	1.4	2.3
	Clean	1	0.3	0.5
	Red pepper	2	0.6	0.9
Total		**345**	**100.0**	**156.8**

a. Group

3.5.12 Monitoring and coordination in the value chain under the captive governance

To ensure tomatoes and sweet peppers standards and the quality settings are met, lead actors in the value chain have to monitor and coordinate from the production process to the end consumer of tomatoes and sweet peppers. This is to make sure the producers with low codification ability meet all the transactions requirements (Gereffi *et al.,* 2005). However, buyers of tomatoes and sweet peppers mostly relied on the physical appearance of the end products rather than inspecting the whole production processes (for example, the input used in production, processing, packaging, storage, distribution and the end consumers). Hoteliers and suppliers relied on the end quality of tomatoes and sweet peppers instead of inspecting tomatoes and sweet peppers from the point of production. However, for the organic quality to be ensured all the stages (input used in production, processing, packaging, storage, distribution and the end consumers) in production must follow the organic principles. The analysis indicated that only 2% of hoteliers in Arusha

inspected the production chain. There was also a lack of quality testing instruments for quality assurance. The findings indicated that cooking, testing, trust; garden inspection and physical observation were some of the methods of ensuring food safety (Table 3.13). This compromised the quality of the products as for organic quality to be ensured inspection by all the actors and all the stages in the value chain must be followed.

Table 3.13: Means of ensuring the set standards and quality are adhered/met under the captive governance

| | | Arusha | | | | Unguja | | | |
| | | Hotelier | | Supplier | | Hotelier | | Supplier | |
		n	%	n	%	n	%	n	%
Means of ensuring set standards and quality are adhered[a]	Physical observation	48	94.1	31	100.0	71	100.0	24	100.0
	Cooking	2	3.9	0	0.0	0	0.0	0	0.0
	Using trusted suppliers	1	2.0	0	0.0	0	0.0	0	0.0
	Garden inspection	1	2.0	0	0.0	0	0.0	0	0.0
	Testing	1	2.0	0	0.0	0	0.0	0	0.0

Percentages and totals are based on respondents.

a = Group

3.5.13 Marketing margins (Percentage total gross margins)

Marketing margins (Percentage total gross margins) reflect the total cost of marketing hoteliers and suppliers or producers set margins by considering the costs of goods sold (COGS). The choice of governance structures is based on lead actors decision to reduce the costs associated with marketing. The costs that lead actors to seek to reduce are production, marketing and transactions costs (total costs) (Williamson, 1979, 1981, 1986). However, the analysis of marketing margins shows that the marketing margins were 37% for tomatoes and 38% for sweet peppers based on producers' price set to hoteliers and 47% for tomatoes and 44% for sweet peppers based on the producer's prices set to suppliers (Table 3.15). The marketing margins were slightly low when the producers were selling through suppliers (NGOs, companies and other traders) where the majority of the producers were under contract farming and a captive kind of governance existed. The findings show that the marketing margins were 36% for tomatoes and 28% for sweet

peppers based on the producer's prices set to hoteliers and 46% for tomatoes and 35% for sweet peppers based on the producer's prices set to suppliers (Table 3.15). The suppliers' prices received by the producers were lower by 1053 TZS/kg for tomatoes and 1289 TZS/kg for sweet peppers than the hotelier prices which were 1250 TZS/kg for tomatoes and 1428 TZS/kg for sweet peppers. This is the reason margins calculated from the suppliers' prices were also higher than the hoteliers, as prices offered by the suppliers to the producers were lower than those of the hoteliers (Table 3.14). This implies that the decisions of the suppliers were not only the Costs of Goods Sold (COGs) but also the cost of maintaining a continued relationship with the producers. The cost that was needed to maintain the relationship is like a contract relationship with suppliers (transaction costs). The suppliers and producers, in this case, had to incur the cost of maintaining the relationship. In return, producers were able to obtain inputs like fertilizers, seeds, and seedlings from their suppliers through the contracts in the form of in-kind credit. However, there were some other reasons as to why very few producers were selling directly to the tourist hotels. Based on the preliminary survey findings, one of it was capacity that producers needed to organize a continued supply which for the individual producers was not possible. Also time delivery of products by the producers was an issue due to unreliable transport and seasonality in production. Eventually, these led into the unsteady supply.

Table 3.14[7]: Prices set and received by different actors in TZS/kg

	Hotelier prices					Supplier prices					Producer prices				
	n	min	max	mean	SD	n	min	max	mean	SD	n	min	max	mean	SD
The market price of tomatoes from traders	122	800	5000	1969	651						39	350	2000	1053	460
The market price of tomatoes from tourist hotels						47	625	3000	1952	515	6	700	2500	1250	592
The market price of pepper from traders	122	900	4300	2285	755						37	500	2500	1289	769
The market price of pepper from tourist hotels						45	700	3500	1976	722	7	700	2500	1428	589

SD-standard deviation

[7] Not all producers sold tomatoes and sweet pepper directly to tourist hotels and not all producers sold tomatoes and sweet peppers to the tourist hotels indirect through suppliers.

Marketing margins in table 3.15 were calculated based on the prices set by hotels and suppliers to the producers above. The data indicated the margins calculated based of suppliers' prices were higher as suppliers set low producers price than hoteliers.

Table 3.15: Marketing margins (%) calculated based on hotels and suppliers prices

	Hotels		Suppliers	
	Producers price set by hoteliers	Producers price set by suppliers	Producers price set by hoteliers	Producers price set by suppliers
Tomatoes	37	47	36	46
Sweet peppers	38	44	28	35

3.6 Conclusions and Recommendations

3.6.1 Summary

Based on the results under section 3.5.1 and 3.5.2 the production under the organic standard is still low and relies on the locally available inputs. Organic tomatoes and sweet peppers production in the study areas is at the development stage. Farmers with the support of MESULA started production on organic vegetables in 2013 about five years ago, though, some of its producers were previously practising organic production. UWAMWIMA was founded in 2004 and registered in 2005 with about 15 organic producers; production is characterised by the limited supply of organic inputs; this resulted into producers to rely on the locally available inputs, local stockists and on the close relationships of producers with the buyers. There is a limited production of tomatoes and peppers which are organic in the study area.

Based on the results under section 3.5.13 lead actors did not only consider the cost but also the relationship with their suppliers. The choice of governance structures was therefore not only a cost-minimizing decision by lead actors, but to ensure access to inputs for organic production such as organic fertilizer, seed and seedling. This led the suppliers and the producers to rely on a captive form of governance structure despite the relatively low marketing margin. The marketing margins were higher when selling under spot market direct to the hotels where the market form of governance existed. However, the majority of producers were selling tomatoes and sweet peppers through the suppliers where contract relationship and captive form of governance existed. To overcome the challenges in accessing tourist markets such as unsteady supply, unreliable transport; seasonality and low capacity, producers tend to rely on the relationship with the suppliers. This ensured the producers' direct access to the tourist market.

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Based on the results under section 3.5.5 and 3.5.9 there were very few producers' organization and institutions which were supporting organic productions in the study areas. However, the presence of producers' organization has led farmers to participate in the modular and captive governance structures which increased the capability of producers to produce organically and comply with the organic standard. Their existence has shown a positive impact in the producers' access to market and compliance with the organic standards, as producers' organization were able to secure registration costs for these smallholder producers. Producers also enjoyed low training and registration costs through the organization with the support of NGOs into small producers groups.

3.6.2 Conclusions

The objective of this paper was to identify the types of governance structures that existed in the organic tomatoes and sweet peppers value chains. The results show that about four

forms of governance structures existed in the tomatoes and sweet peppers organic value chain: market when the simple transaction between tourist hoteliers and producers occurred. Modular when producers were to supply based on the organic supplier's organization requirements that increased the capabilities of organic suppliers to codify the production and process for the organic product. Relational when suppliers and tourist hoteliers relied on a complex set of interaction between them that only family ties and friendship enabled them to meet the transaction requirements. And captive, when the low capacity to meet the organic and other transaction requirements, necessitated organic organization to monitor and coordinate the organic transaction. The modular and captive governance structures built the capacity of the producers to supply the products based on the organic standard. However, the choice on the form of governance was determined by the lead actors on which form to choose that will ensure compliance with the organic standard, quality and quantity.

3.6.3 Recommendations

Since the results under section 3.5.1 indicated production under organic mostly relied on the locally available inputs. It is recommended that the NGOs and companies supporting organic agricultural productions currently (for example, MESULA and UWAMWIMA) should not only focus on the locally available inputs. They should focus on the sustainability of production once they exit their support to these smallholder farmers and create an institutional environment that will ensure organic input are in the market at large. The best way in doing this is supporting initiatives made in making organic inputs in the country, locally made inputs should be tested by the Tanzania Bureau of Standards (TBS) and registered by TBS for large production and wide applications.

Since the results under section 3.5.13 indicated the lead actors considered the costs of goods sold and not the producers. It is recommended that the producers should also

consider their Costs of Goods Sold (COGs) when making a decision on the sale of tomatoes and sweet peppers. The market price under the market form of governance where the producers sold in a spot market to the tourist hotels was higher than when the producers sold under contract farming with a supplier under captive governance, though the producers were supported on inputs such as fertilizers, seeds and seedlings.

Since the results under section 3.5.1 indicated that the organic production relied on the locally available inputs. It is recommended here that there is a need for the government through the ministry of agriculture to implement its support policy on the NGOs supporting organic production. The ministry of agriculture may decide to subsidize the costs of the initial certification to organic producers and also by facilitating the training of organic production, as currently, the organic production industry is largely dependent on the foreign supporting NGOs, which once they stop their support, organic production will be jeopardized. Also, private companies should also embark on investing in the sectors, but this can only be done when there exists a pressure to avoid false claims of vendors on organic products.

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CHAPTER FOUR

MANUSCRIPT THREE: Institutions, production and transaction costs in the value chain of organic tomatoes and sweet peppers in tourist hotels, Unguja and Arusha[8]

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Abstract

The aim of this paper was to evaluate production and transaction costs in organic tomatoes and sweet peppers value chain. Transactions costs are the embodiment of barriers to market participation by smallholder farmers and have been used as a definitional characteristic of smallholder and as factors responsible for significant market failures in developing countries. The study was conducted in Arusha, Tanzania Mainland and Unguja, Zanzibar. A preliminary survey was conducted in 2014 to understand the value chain and actors. Then a stratified sampling procedure was used to select a sample of producers, tourist hoteliers and traders or suppliers. Key informants interviews and snowballing sampling procedures were also used. The Heckman's procedure was used to analyze factors affecting the likelihood and extent of participation in tomatoes and sweet

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peppers markets. The probit results from the Heckman's two-stage process show that ownership of assets such as storage facilities, transportation assets and being under contract farming or farmers cooperatives increased the probability of market participation, while the heckit results (OLS corrected for selectivity bias) shows that experience in marketing increased the quantities of tomatoes and sweet peppers marketed while high marketing costs such as levy, brokers and communication or mobile phone costs decreased the quantities of tomatoes and sweet peppers marketed. Organic producers' cooperatives and collective marketing strategies are the possible solutions to reduce transaction costs, improve access to the tourism market, and increasing shelf life by having collective storage facilities and transport. Policy changes that will ensure producers sell under cooperatives and collective marketing strategies should be implemented to improve producers' market access.

4.1 Background

In Sub-Saharan Africa (SSA) the tourism sector has been growing substantially, contributing about 3% of its Gross Domestic Product (GDP) (World Travel and Tourism Council, 2014). In Tanzania, the sector contributed about 13% of the total GDP in 2013 (World Travel and Tourism Council, 2014). However, the sector has been criticized for having high external leakages (for example, less utilization of the local food products) that could support the economic development of the local people (Telfer and Wall, 2000; Torres, 2003). The agriculture sector is one of the sectors that could benefit well, through

the linkage with the tourism sector. It is approximated that, about one-third of the spending by the tourist constitute food products (Torres, 2003). Tomatoes and sweet peppers are among the vegetables grown at large in Tanzania. The production of tomatoes was dominant in the Mainland with most of it produced at the end of the long rainy season. On average the production of the crop was 11.99 tons/ha in the long rainy and 13.27 tons/ha in the short rainy seasons (National Bureau of Statistics , 2012). The Southern Highlands, Northern Highlands and Morogoro Region are among the leading areas for the crop production (Putter and Koesveld, 2007). The production of tomatoes and sweet peppers at the peak prices requires high input costs such as the high application of fungicides and pesticides during the high rainy season at the end of May (Putter and Koesveld, 2007). This limits the possibility of the supply of quality products. The tourist hotels market can create a backward and forward linkage and improve market and production for the crop; however, it requires quality throughout the year. Organic products offer a good opportunity to supply quality food products in the market as they are of high quality, healthier and ecologically sound (Chang *et al.,* 2003).

The efforts to increase the benefits of tourism to the host nations have been increasing the number of tourists visiting the home countries, the length of stay and tourist overall expenditures by promoting the tourism attractions in the host countries (Tohidy, 2011). The alternative way to enhance the benefits of tourism is to expand the backward economic linkage by increasing the number of local food products consumed in the tourist hotels (Telfer and Wall, 2000). However, the participation of the poor has been limited by inadequate education and training, high tourism sector quality requirements and lack of economic and social capital (Torres, 2004). Studies by Nguni (2014) and Wineaster (2013) on the challenges of tourism and agriculture linkage in Tanzania have listed demand and supply related challenges such as the poor quality of supplied products,

limited quantity of supplied products, contract violations and high transaction costs. While some other studies on participation listed transaction cost as the main challenge to smallholder markets access. Key *et al.* (2000) in the study of the market participation of Mexican corn farmers found that both Fixed Transaction Costs (FTCs) and Proportional Transaction Costs (PTCs) have effects on market participation. The fixed transaction costs are invariant to the volume being traded and include things such as (a) searching for the market information and trade partners (b) bargaining for the products before the sale and (c) enforcement of the agreements made. On the other hand, proportional transaction costs are variant to the volume being traded such as transport and distance to the market (Mmbando *et al.,* 2015). Goetz (1992) in the study of the market participation of the Senegalese grain farmers identified that fixed transaction costs were the major causes of failure to participate in markets. In their study, it was found that improved market information increased the probability of participation by sellers, while access to cereals-processing technology increases quantities transacted by both sellers and buyers. Mmbando *et al.* (2015) on the study of the market participation of pigeon pea farmers in Tanzania identified fixed transaction costs associated with market information and household characteristics such as gender and education level of the household head had a statistically significant influence on market participation. Proportional transaction costs (distance to market) and variables such as output prices, farm size, labour force, membership of farmer associations and geographical location of households influenced both market participation and intensity of participation. These studies on market access did not list institutional setup or arrangement as a problem in accessing the markets. Institutional environment refers to the broader social-economic framework in which institutional arrangements are found. The institutional arrangement is a set of rules governing specific groups of people in meeting specific objectives. It has its importance in reducing transaction costs that also affect access to the tourist hotels markets (Eaton *et al.,*

2008). Therefore, for the tourism sector to enhance rural development, it needs products that are cheap to produce, easily available locally and of high quality to meet the demand of the tourism sector. The sector also needs a good institutional setup that will mobilize production and link producers to the tourist hotels market. Tanzania has about 115 000 ha of certified organic production, about 33% of organic producers in East Africa (Tow, 2011). These producers are an opportunity for the country to supply quality organic products to the tourism sector. Organic production in Tanzania and East Africa had been exporting based (Issakul *et al.,* 2007). Tourist hotels market is an alternative to the export market in Tanzania.

This paper aimed at evaluating production and transaction costs of actors in the organic tomatoes and sweet peppers value chain as limited production by organic tomatoes and sweet peppers producers and high transactions costs limits producers' access to markets. But the difference from other studies done above on market access, this paper will look on the role of institutions such as contract farming or farmers cooperatives in influencing access to markets and removing the barriers to markets or market failure. The research question put forward is what type of institutions are needed (formal and informal) to reduce transaction costs and improve the economic performance of smallholder organic tomatoes and sweet peppers producers.

Moreover, this study was motivated by the development of the tourism sector in Tanzania which contributed to about 13% of the GDP in 2013 (World Travel and Tourism Council, 2014). This is a substantial growth which implies an important employment opportunity to the organic producers in the country. The major focus on organic products in Tanzania was the export market (Issakul *et al.,* 2007). The tourist hotels market in this regard saves

as an alternative to the export market that was the major focus for organic products in Tanzania.

4.2 Conceptual Framework

Transactions costs are the embodiment of barriers to market participation by smallholder farmers and have been used as a definitional characteristic of smallholder and as factors responsible for significant market failures in developing countries (Mmbando *et al.,* 2015). They are the costs associated with the market exchange of goods and services which some are observable and others are unobservable costs in the exchange process (Bwalya, 2013; Jordaan and Grové, 2013; Mmbando *et al.,* 2015). In principle, transaction costs raise the prices paid by the buyers of goods and services and lower the prices received by the sellers of goods and services (de Janvry and Sadoulet, 2006; Key *et al.,* 2000). The organic tomatoes and sweet peppers farmers may participate in the markets for the exchange of goods and services either as a buyer, seller or decide not to participate in the markets depending on the prices (de Janvry and Sadoulet, 2006; Key *et al.,* 2000). Market participation is determined by comparing the utility obtained from selling, buying, and remaining self-sufficient in a particular commodity (Key *et al.,* 2000). The utility is increasing in the decision price for sellers and decreasing in the decision price for buyers (Fig 4.1). Hence, starting from autarky point C_0, a household who faces no fixed transaction costs will be better off selling at market prices above $\tilde{p} + t_p^s$, thereby obtaining utility V_0^s as shown in figure 4.1 by the half-line $C_0 D_0$. Similarly, the household will be indifferent between buying and being self-sufficient if $P^m + t_p^b = \tilde{P}$, and better off buying at any market price below $\tilde{P} - t_p^b$, thereby obtaining utility V_0^b as shown in the figure by the half-line $B_0 A_0$. The optimal market participation for a household is to follow the path $A_0 B_0 C_0 D_0$. In the particular case of no PTCs, points B_0

and C_0 are identical. Households facing a market price P^m and both PTCs and FTCs can achieve utility V^s as sellers and utility V^b as buyers. As shown in figure 4.1, if the household faces a market price above $\underline{P}^s + t_p^s$, it is better off selling (half-line CD), whereas, for market prices below $\underline{P}^s + t_p^s$, it is better off not selling. Hence, the household will buy the good if the market price is below $\underline{P}^b - t_p^b$ (half line BA in the figure). The optimal market participation for a household is to follow the path ABCD, buying for market prices below $\underline{P}^b - t_p^b$, being self-sufficient for market prices $\underline{P}^b - t_p^b$ $< P^m < \underline{P}^s + t_p^s$, and selling for market prices above $\underline{P}^s + t_p^s$. V^a is the utility under the autarky.
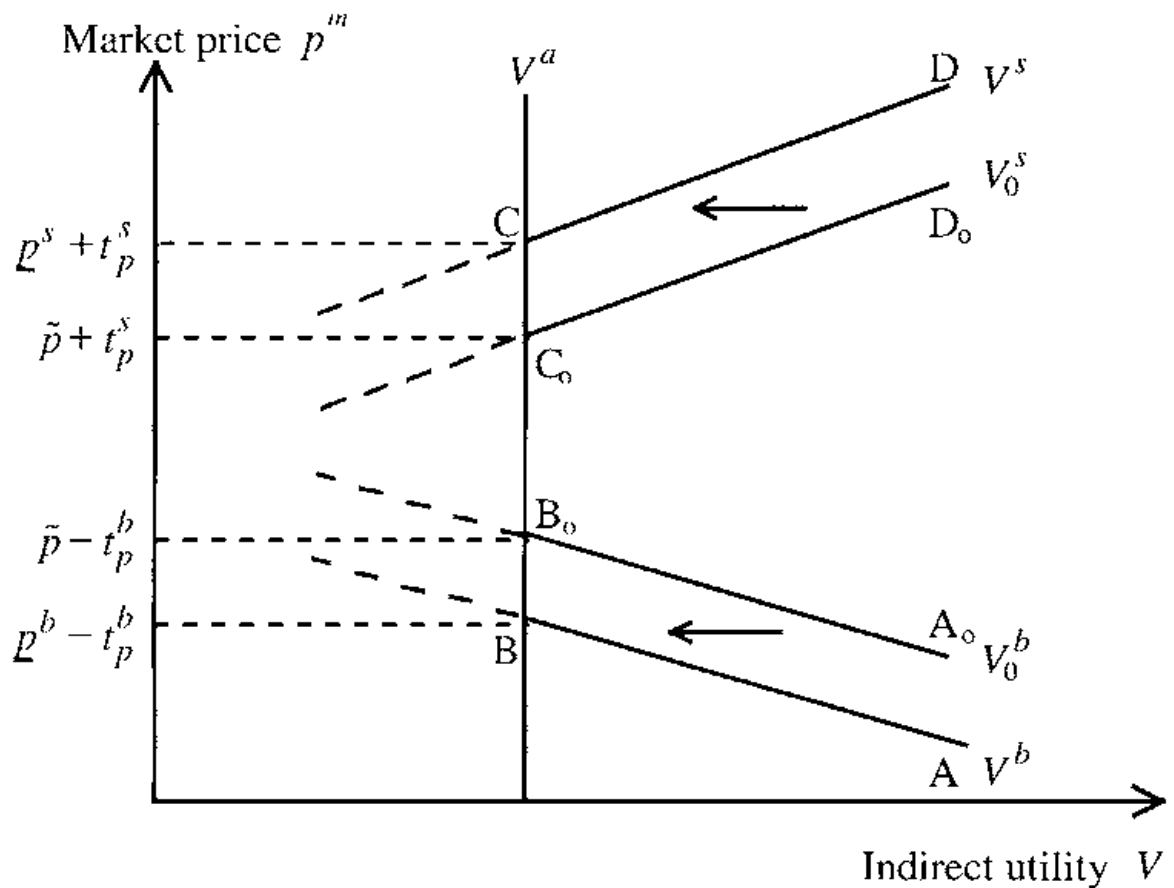
Figure 4.1: Household indirect utility under proportional and fixed transactions costs
Source: (de Janvry and Sadoulet, 2006; Key *et al.*, 2000)

4.3 Methodology

4.3.1 Theoretical Model

To incorporate transactions costs into an agricultural household model framework, it is convenient to specify market participation as a choice variable (Key *et al.,* 2000). That is, in addition to deciding how much of each good i to consume C_i, produce q_i, and use as an input X_i, the household also decides how much of each good to "market" m_i (where m_i is positive when it is a sale and negative when it is a purchase).

If there were no transactions costs, the household's objective would be to maximize the utility function:

$$u(C_a C_m C_l; Z_u) \tag{4}$$

where: C_a = household food (tomatoes and sweet peppers in this case); C_m = purchased good; C_l = home time subject to:

$$\sum_{i=1}^{N} P_i^m m_i + T = 0 \qquad \text{(Cash constraints)} \tag{5}$$

$$q_i - x_i + A_i - m_i - c_i = 0, \qquad i = 1 \dots \dots \dots N \quad \text{(Resource balance)} \tag{6}$$

$$G(q, x; z_q) = 0 \qquad \text{(Production technology)} \tag{7}$$

$$C_i q_i, x_i \geq 0 \qquad \text{(Non-negativity constraint)} \tag{8}$$

where: P_i^m is the market price of good i , A_i is an endowment in good i, T is exogenous transfers and other incomes, m_i is quantity of good i marketed, c_i is quantity of good i consumed, x_i is quantity of input i used, q_i is quantity of good i produced, $z_u \ and \ z_q$ are exogenous shifters in utility and production, respectively, and G represents the production technology.

Considering that, transaction costs are costs paid by buyers but not received by sellers, and/or the costs paid by sellers but not received by buyers (Key *et al.,* 2000), they effectively raise the price paid by a buyer and lower the price received by a seller (Mmbando *et al.,* 2015). Although these costs are mostly unobservable and cannot be easily recorded, factors that explain them can be observed (Ellemare and Arrett, 2006). Therefore, by introducing and expressing the transaction costs in monetary terms, the cash constraint becomes.

$$\sum_{i=1}^{N}[P_i^m - t_{pi}^s(z_t^s)\delta_i^s + \left(p_i^m + t_{pi}^b(z_t^b)\right)\delta_t^b]m_i + T = 0 \tag{9}$$

Where: δ_i^s is equal to one if $m_i > 0$ and zero otherwise and δ_i^b is equal to one if $m_i < 0$ and zero otherwise. Introduction of transaction costs imply that the price effectively received by the seller is lower than the market price p_i^m by the unobservable amount t_{pi}^s, and the price effectively paid by the buyer is greater than P_i^m by the unobservable amount t_{pi}^b. The transaction costs are expressed by the observable exogenous characteristics z_t^s and z_t^b that affect these costs when selling and buying. As such, under transaction costs, the household's objective can be expressed by Equations (4) and (6) to (9), while to derive the supply and demand equations, we define the Lagrangian:

$$L = u(c; z_u) + \sum_{i=1}^{N} \mu_i \ (q_i - x_i + A_i - m_i - c_i) + \emptyset G(q, x; z_q) + \lambda[\sum_{i=1}^{N}[(P_i^m - t_{pi}^s)\delta_i^s + \left(P_i^m + t_{pi}^b\right)\delta_i^b]m_i + T] \tag{10}$$

Where μ_i, $\emptyset$, and λ are the Lagrange multipliers associated with the resource balance, the technology constraint, and the cash constraint, respectively. Because the transaction costs create discontinuities in the Lagrangian, the optimal solution cannot be found by simply solving the first order conditions (de Janvry and Sadoulet, 2006; Key *et al.,* 2000). The solution is decomposed in two steps, solving first for the optimal solution conditional on

the market participation regime, and then choosing the market participation regime that leads to the highest level of utility. Under the usual assumptions for utility and technology, the conditional optimal supply and demand are obtained by solving for the first order conditions are as follows:

$$\frac{\partial u}{\partial c_i} - \mu_i = 0, \quad i = \{^i/_{c_i} > 0\} \qquad \text{(for consumption goods)} \tag{11}$$

$$-\mu_i + \emptyset\frac{\partial G}{\partial q_i} = 0, \quad \{i = {}^i/_{q_i} > 0\} \quad \text{(for outputs)} \tag{12}$$

$$-\mu_i + \emptyset\frac{\partial G}{\partial x_i} = 0, \quad \{i = {}^i/_{x_i} > 0\} \quad \text{(for inputs)} \tag{13}$$

$$\mu_i + \lambda[(p_i^m - t_{pi}^s)\delta_t^s + (p_i^m + t_{pi}^b)\delta_t^b] = 0 \qquad \text{(for traded goods)} \tag{14}$$

The decision prices P_i is given by :

$P_i = P_i^m - t_{pi}^s$, if $m_i > 0$, for sellers

$P_i = P_i^m + t_{pi}^b$, if $m_i < 0$, for buyers

$P_i = {}^{\mu_i}/_\lambda$, if $m_i = 0$, for self sufficient

Where: $\widetilde{P_l}$ is the autarky shadow price. Using the decision prices P_i and the first order conditions, utility maximization subject to the technological constraint leads to a system of output supply equations $q(p, z_q)$ and input demand equations $x(p, z_q)$. Utility maximization subject to the income constraint leads to a system of demand equations for consumer goods $c(p, y, z_u)$.

$$\sum_{i=1}^{N} P_i C_i = y = \sum_{i=1}^{N}[P_i(q_i - x_i + A_i) - t_{fi}^s\delta_i^b] + T \tag{15}$$

The household supply curves for home-produced goods as a function of the market price under fixed transaction costs (FTCs) and proportional transaction costs (PTCs) can be derived by let $q(P^m, z_q)$ be the supply curve without transaction costs. Then with transaction costs, the supply curve is:

$$q^s = q(P^m - t_p^s, z_q) \quad \text{for sellers} \tag{16}$$

$$q^b = q(P^m + t_p^b, z_q) \quad \text{for buyers} \tag{17}$$

$$q^a = q(\breve{P}, z_q) \quad\quad \text{for autarky} \tag{18}$$

The transaction costs shift the supply curve upward for sellers and downward for buyers. Making the supply curve discontinuous with three distinct regions:

$$q^b = buyers\ supply\ curve\ for\ market\ prices\ below\ \tilde{P} - t_p^b \tag{19}$$

$$q^s = sellers\ supply\ curve\ for\ market\ prices\ below\ \tilde{P} + t_p^s \tag{20}$$

$$q^a = \text{autarky prices between the two thresholds} \tag{21}$$

This implies that fixed transaction costs delay entry into the market as a seller until market price reaches the higher level of $\tilde{P} + t_p^s$. Similarly, they delay entry into a market as a buyer until the market price is as low as $\tilde{P} - t_p^b$. The household remains self-sufficient between these two thresholds. A household will switch from autarky to selling when the price that it receives is high enough to compensate for transaction costs.

4.3.2 Econometric Model Estimation

Assuming linear expression:

$$q\left(P, z_q\right) = P\beta_m + z_q\beta_a \quad (\text{ for supply functions}) \tag{22}$$

$$t_p^s = -z_t^s\beta_p^s \quad\quad (\text{for PTCs for sellers}) \tag{23}$$

$$t_p^b = -z_t^b\beta_p^b \quad\quad (\text{for PTCs for buyers}) \tag{24}$$

The linear expression for supply by sellers become (q^s)

$$q^s = P^m\beta_m + z_t^s\beta_t^s + z_q\beta_q \tag{25}$$

And by the buyers (q^b)

$$q^b = P^m\beta_m + z_t^b\beta_t^b + z_q\beta_q \tag{26}$$

And for the autarky households (q^a)

$$q^a = z_q\,\beta_q^a + z_c\beta_c^a \tag{27}$$

For production thresholds, linear expressions for ($\underline{q^s}$) are used such that:

$$\underline{q^s} = z_t^s\alpha_t^s + z_q\alpha_q^s + z_c\alpha_c^s \tag{28}$$

And for ($\underline{q^b}$) such that:

$$\underline{q^b} = z_t^b\alpha_t^b + z_q\alpha_q^b + z_c\alpha_c^b \tag{29}$$

The econometric expression is obtained by adding an error term to the supply functions:

$$q^s = P^m\beta_m + z_t^s\beta_t^s + z_q\beta_q + \mu_i \qquad \text{(sellers supply equation)} \tag{30}$$

$$\equiv x_i\beta_i + \mu_i \tag{31}$$

$$\underline{q^s} = z_t^s\alpha_t^s + z_q\alpha_q z_c\alpha_c + \mu_2 \qquad \text{(sellers thresholds)} \tag{32}$$

$$\equiv x_2\alpha_2 + \mu_2 \tag{33}$$

Where x_i is a vector of exogenous explanatory variables such as household characteristics and location characteristics that influence market participation. The market participation indicator variable (q^s) for the commodity is defined as:

$$q^s = 1 \text{ if } P^m \geq \tilde{P} + t_f^s \text{ or } P^m \leq \tilde{P} - t_f^s \text{ (when a household sells)} \tag{34}$$

$$q^s = 0, \text{ if } \tilde{P} - t_f^s \leq P^m < \tilde{P} + t_f^s \text{ (when the household does not sell)} \tag{35}$$

4.3.3 Methods for data generation

This study was conducted in the Northern tourist circuit of Tanzania Mainland, in the city of Arusha and in Unguja, Zanzibar. The data collection started with the preliminary survey in 2014 to better understand the tourism sector value chain and actors. Five regions were involved during the preliminary survey, Arusha, Unguja, Kilimanjaro, Tanga and Dar Es Salaam. However, the two regions, Arusha and Unguja the tourist hotels market for the organic products were found to be well established. Therefore, Arusha and Unguja were found suitable for the study and selected for that reason. Since the population of actors was not the same (homogenous). A stratified sampling was used to select a sample

from the different stratum of actors identified in the preliminary survey, producers, suppliers/traders and tourist hoteliers. The population of organic producers was 100 in Arusha and around 2100 in Unguja. The population of tourist hotels in Unguja was 237 according to the Zanzibar Commission for Tourism and was 108 for Arusha, while that of traders/suppliers for Arusha and Unguja was unknown since there was no source of data on the actual population of suppliers to the tourism sector (Table 4.1).

Table 4.1: Population of certified organic producers and tourist hoteliers

Population	Producers	Suppliers/traders	Tourist hotels
Unguja	2100	-	237
Arusha	100	-	108
Total	**2200**	**-**	**345**

Then, using the formula for calculating the finite and infinite population for the population of organic tomatoes and sweet peppers producers (Israel, 1991). The sample from each stratum was obtained and established the sampling boundary.

$$n = N/(1 + Ne^2) \tag{36}$$

Where: n = sample size, N= population size and e = the level of precision desired for the sample. The population of suppliers and traders since was not easy to establish it a snowballing procedure was introduced based on the reference of the sample of 82 producers obtained using infinite population sample table (Israel, 1991), 71 tourist hoteliers in Zanzibar and 51 tourist hoteliers in Arusha obtained by using the formula for calculating finite population sample (Table 4.2).

Table 4.2: Sample of certified organic producers, suppliers and tourist hoteliers

Sample	Producers	Suppliers	Tourist hoteliers
Arusha	41	31	51
Unguja	41	24	71
Total	**82**	**55**	**122**

The study design used was a Cross-sectional Study Design (CSD). While the tourism sector is broad this study focused on the tourist hotels[9] as a potential market for organic produce. For the purpose of understanding the value chain and key actors in tomatoes and sweet peppers marketing, key informants interview was done. Snowball sampling procedure was used to identify actors, including, tourist hoteliers, organic tomatoes and sweet peppers suppliers and producers. Snowballing sampling started with 51 tourist hoteliers, and 16 organic tomatoes and sweet peppers producers in Tanzania mainland (Arusha) and 71 tourist hoteliers and 5 leaders of organic producers in Zanzibar. A list of hoteliers and organic producers was obtained from grassroots NGOs for organic producers. Through snowballing, 31 organic tomatoes and sweet peppers suppliers and 25 tomatoes and sweet peppers producers were identified and included in the sample in Arusha. In Unguja, 24 organic tomatoes and sweet peppers suppliers and 36 organic producers were also identified and included in the sample. The data were collected using structured questionnaire interview. Descriptive statistics were computed, cross tabulations and tables, means, t-test and multiple responses. Mainly primary source of data was used in the study. The secondary data was used for the reference purposes.

4.3.4 Data analysis

The analysis was done based on the decision of the household to participate in the tourist hotels markets. The first decision was that of whether to sell tomatoes and sweet peppers to the tourist hotels market and the second was on how much to sell (Goetz, 1992; Key *et al.,* 2000). Since some household did not participate in the tourist hotels market using an ordinary least square (OLS) regression would have lead into model selectivity bias (Alene *et al.*, 2008; Mmbando *et al.,* 2015). To avoid the selectivity biases for the household that did not participate in the tourist hotels market, Hackman's two-step selection model has

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[9] ''Tourist hotels/hoteliers'' in this study means the destination for foreign visitors, as they were health conscious on food products. The focus market for organic products in Tanzania and East Africa was export market (Issakul *et al*., 2007). Hence, tourist hotels in this case were considered as an alternative to export market. Research also indicates that, about 90% of consumers of organic products were foreign visitors or tourists, expatriates and affluent people (Sangkumchaliang and Huang, 2012). Though, local people could also visit and stay in tourist hotels.

been used to select for the household that participated in the tourist hotels market. The first part of the model is the probit model estimating the probability of participating in the tourist hotels market. (While the second part is the (OLS) that the selectivity biases has been corrected estimating the extent of market participation. The model takes the following form: Where by (Table 4.3).

Table 4.3: Variable descriptions

Variable	Description	Measurements
The first part of the probability of selling or the probit model		
Sold_Crop_1_Tour_Htl	Selling crop to the tourist hotel market	Dummy variable: yes, no (1,0)
Sex	Sex of the respondent	Dummy variable: male, female (1,0)
Age	Age of the respondent	Complete years
Edu_level	Education level	Complete years of schooling
Region	The region the respondent was interviewed	Categorical variable: (1) Arusha, (3) Unguja
Dist_htl_km	Distance to the tourist hotels market	Distance in km
Contct_frmng	Contract farming	Dummy variable: yes, no (1,0)
Stor_fac_tom	Ownership of storage facilities	Dummy variable: yes, no (1,0)
Obt_mrk_info	Source of marketing information	Categorical variable: (1) Through close relationship with actors to obtain marketing information (2) Through friends and relatives (3)Through suppliers (4) Market survey (5) Competition (6) Marketing information was not available
Tot_trans_cost_tom	Transportation costs	TZS
The second part on the extent of market participation		
Amnt_Sold_prod_tom	Amount sold	Amount in kg
Size_1	Size of the area cultivated	Acres
Organic_understand	Awareness of organic products	Dummy variable: yes, no (1,0)
Exp_crop_1	Experiences	Complete years
Tot_mkt_cost_tom	Total marketing costs	TZS
Mkt_prce_trad_tom	The market price for the product	TZS

4.4 Results and Discussion

This section presents the results on production particularly the input production costs and transaction costs, but since the study is on the value chain a description of the value chain map is given first. Production costs and household characteristics that have been used to model for transaction costs are presented including distance from the market, access to marketing information, ownership of assets like storage facilities for transporting and storing tomatoes and sweet peppers (Alene *et al.,* 2008; Mmbando *et al.,* 2015). Lastly, the household models of transaction costs for the producers where institutions including contract farming or farmers cooperatives have been included in the model are presented.

4.4.1 Organic tomato and sweet pepper value chain map[10]

Organic tomatoes and sweet peppers were sold through three outlets (channels) (Fig. 4.2); producers selling tomatoes and sweet peppers: i) direct to the markets (like tourist hotels, farmers market, expatriates, supermarket and local market) ii) through suppliers of organic tomatoes and sweet peppers, or iii) through organic farmer's organizations and companies. Suppliers facilitated marketing functions including transportation and storage for organic tomatoes and sweet peppers. The role of suppliers and producers organization was mainly transportation and adding value by storing tomatoes and sweet peppers (Fig. 4.2). Conventionally produced tomatoes and sweet peppers in Unguja were mainly purchased from producers in Arusha, Morogoro, Iringa and Lushoto in Tanga. This resulted in suppliers in Unguja incurring additional transaction costs or access costs (TCs)[11]. For example, they negotiated and coordinated the purchase of tomatoes and sweet peppers from Tanzania Mainland. Shipment of tomatoes and sweet peppers from the mainland by

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[10] The results under this value chain map section are based on the preliminary survey (2014), through key informants interviews
[11] TCs -stand for transaction costs- suppliers in Unguja were coordinating purchase of tomatoes and sweet peppers from Tanzania Mainland Arusha, Iringa, Morogoro and Lushoto in Tanga.

boat were some additional marketing costs pertaining to value chain difference between Arusha and Unguja. Some organic tomatoes and sweet peppers pass through conventional suppliers and compromised organic quality and mainly sold into the local market as conventional products (Fig. 4.2). Some of the conventional suppliers purchase tomatoes and sweet peppers from the local markets and sell them in the tourist hotels markets. There were four local markets: Kilombero Market and Main Market in Arusha, Darajani and Mwanakwerekwe markets in Unguja. The Kilombero Market received most of the tomatoes and sweet peppers direct from producers. Tomatoes and sweet peppers from Kilombero Market were also bought by traders/suppliers from the Main Market in Arusha. Traders or suppliers in the Main Market sold most of the tomatoes and sweet peppers to the tourist hoteliers who came directly to the market in the spot market. Darajani and Mwanakwerekwe markets in Unguja were other local markets. Tomatoes and sweet peppers purchased by suppliers from the Mainland Tanzania were directly received by the suppliers or traders in Mwanakwerekwe Market. This market received tomatoes and sweet peppers shipped by boat from the Mainland, then suppliers took tomatoes and sweet peppers to Darajani Market; the Darajani Market is the main market in Unguja. Tourist hoteliers mostly purchased their tomatoes and sweet peppers from the suppliers in Darajani Market in the spot market. The suppliers were selling their tomatoes and sweet peppers in both markets, the local market where they own retail sale points and also tourist hotels where they have supply contracts either verbal or written to the tourist hotels.

Value chain maps:	Arusha	Unguja

Input source → Production → Collection → Transportation → Marketing → Consumption

Arusha:
- Input → Stockist and local / MESULA (Organic)
- Producers → Individual producers producing conventionally / Producers group under MESULA in Arusha (organic)

Site specific TCs to suppliers in Unguja

Unguja:
- Input → Stockist and local / UWAMWIMA (Organic)
- Producers → Producers group under UWAMWIMA in Unguja (organic) / Individual producers producing conventionally in Tanzania mainland

Collectors in Tanzania mainland → Shipment to Unguja, Boat

Supplier for both organic and conventional | Supplier specific for organic and (MESULA) | Supplier specific for organic and (UWAMWIMA) | Supplier for both organic and conventional in Unguja

Tourist hotels market | Local market | Supermarket | Farmers market & experts

Kilombero and Main market in Arusha. Mwanakwerekwe and Darajani market in Unguja

Figure 4.2: Tomatoes and sweet peppers value chain map

4.4.2 Agricultural production

Agricultural production in Arusha and Unguja involves a diversity of crops. In Arusha production of fruits and vegetables includes green beans, peas, tomato, spinach, herbs, peppers, and lettuce. The production of tomatoes was dominant in the Mainland with most of it produced at the end of the long rainy season. On average the production of tomatoes was 11.99 tons/ha in the long rainy and 13.27 tons/ha in the short rainy seasons (National Bureau of Statistics, 2012).

In Unguja production of fruits and vegetables included watermelon, mangoes, cucumber, pineapples, avocados, passion fruits, papaya, sweet melon, shocks hock and banana, amaranths, eggplants, tomatoes, okra, sweet papers, carrot, onions, cabbages, Irish potatoes, lettuce, zucchini, broccoli, white cabbage, red cabbage, green paper, pumpkin and spinach. The production of tomatoes was dominant with most of it produced in the long rainy season. On average the production of tomatoes in Unguja was about 5.49 tons/ha in the long rainy and 4.58 tons/ha in the short rainy season (National Bureau of Statistics, 2012). This study focused on two vegetable crops, Tomatoes and Sweet Peppers. The reasons being transaction cost differs for all crops and would have been easy to focus on the two crops in this respect.

Tomatoes and sweet pepper production

This study focused on two crops, tomatoes and sweet peppers. Production per unit area of the two crops is a function of several factors including management practices, input use like fertilizers, the variety used and weather. The production of tomatoes in Unguja was about 2.92 tons/ha due to the variety cultivated. Producers of tomatoes in Unguja preferred cherry tomatoes to Roma. Cherry tomatoes were preferred for making the sauce. Production of sweet pepper in Unguja was about 3.67 tons/ha (Table 4.4). The data is

below the national sample census of agriculture averages of 4.58 tons/ha in short rainy and 5.49 tons/ha in long rainy for tomato production (National Bureau of Statistics , 2012). This was because of the data for Unguja due to snowballing included only organic producers. Organic producers did not make use of synthetic inputs like inorganic fertilizers, herbicides and insecticides or pesticides which have diverse effects on health. Furthermore, traders in Unguja were mainly purchasing tomatoes from Mainland Tanzania.

In Arusha production of tomatoes was about 26.3 tons/ha for conventional producers and 15.47 tons/ha for organic producers. Producers in Arusha produced Roma variety for tomatoes. The production of sweet pepper in Arusha was about 16.77 tons/ha for conventional producers and 19.13 tons/ha for organic producers (Table 4.4). These production data are higher than national sample census of agriculture averages of 13.27 tons/ha in short rainy and 11.99 tons/ha in long rainy for tomato production in Tanzania mainland (National Bureau of Statistics , 2012). Snowballing in Arusha included conventional producers with a high level of intensification, use of synthetic input and greenhouse production of the crops (Table 4.4). High intensification in Arusha is reflected by its total input production costs for the crops, in tomatoes production for example, the total input cost of production was 1 585 609 TZS/ha for conventional producers compared to 238 763 TZS/ha for organic producers, and for sweet pepper production the total input cost of production was 1 764 435 TZS/ha for conventional producers compared to 294 000 TZS/ha for organic producers (Table 4.5). The costs were for improved seeds, fertilizers, herbicides and insecticides or pesticides.

However, the production of the crops was affected by seasonality. In Unguja for example, the production of the crops was high between June and October. On the other hand, the

production of the crops has been low during the short rainy and long rainy between November and May. Similarly to Arusha, this seasonality in production has affected prices of the crops, leading to high price fluctuation. In Unguja during the low production season, they import most of the tomatoes and sweet pepper from the mainland. Low production of the crops has lead Unguja to import most of its tomatoes and sweet pepper from Lushoto, Iringa and Arusha. It is approximated over 55% of tomatoes and sweet peppers consumed in Unguja tourist hotels are imported from the Mainland.

Table 4.4: Production per unit area of tomatoes and sweet peppers in tons per hectares

| | Arusha | | | | | | | | | | | | | | | Unguja | | | | | | | | | |
| | Conventional | | | | | Organic | | | | | Conventional | | | | | Organic | | | | |
	n	min	max	mean	STD	n	min	max	mean	STD	n	min	max	mean	STD	n	min	max	mean	STD
Tomatoes production per unit area (t/ha)	22	0.88	105.84	26.30	30.83	13	1.57	52.92	15.47	20.08	0	.	.	.		27	0.15	14.70	2.92	3.22
Sweet peppers production per unit area (t/ha)	22	0.59	92.61	16.77	24.48	13	1.57	41.16	19.13	16.15	0	.	.	.		27	0.20	15.68	3.67	4.55

STD-Standard Deviation

No conventional producers are included for Unguja since most tomatoes and sweet peppers came from Tanzania Mainland (zero in the table) site-specific transaction costs were also involved for suppliers/traders in Unguja as access costs (Fig. 4.2)

4.4.3 Input production costs for tomatoes and sweet peppers

Agricultural intensification and use of synthetic input have resulted in high input cost in Arusha. The cost of buying inputs like improved seeds, fertilizers, herbicides, insecticides or pesticides has resulted in producers in Arusha incurring the high cost of input. On average the total cost of input in Arusha for tomatoes production was 1 585 609 TZS/ha for conventional producers and 238 763 TZS/ha for organic producers, for sweet pepper production the total cost of input was 1 764 435 TZS/ha for conventional produce and 294 000 TZS/ha for organic producers (Table 4.5).

The use of locally, cheap and natural or biological inputs like compost manure, seeds, and locally made insecticides or pesticides reduces the total input production costs for the crops. On average the total input production costs of tomatoes in Unguja was 411 227 TZS/ha for organic producers, and the total input production costs of sweet peppers were 473 550 TZS/ha for organic producers (Table 4.5). However, with the presence of high level of infestation like frost, locally made insecticides and pesticides were inefficient and reduced crop production per unit area, particularly, under large-scale production.

Table 4.5: Total input production cost for tomatoes and sweet peppers in TZS/ha

| | Arusha | | | | | | | | | | Unguja | | | | | | | | |
| | Conventional | | | | | Organic | | | | | Conventional | | | | | Organic | | | |
	n	min	max	mean	STD	n	min	max	mean	STD	n	min	max	mean	STD	n	min	max	mean	STD
Tomatoes	22	196000	12740000	1585609	2627467	13	58800	529200	238763	179248	0	.	.	.		27	49000	1764000	411227	410753
Sweet pepper	22	135566	11662000	1764435	2535901	13	58800	857500	294000	252538	0	.	.	.		27	49000	1749300	473550	424479

STD-Standard Deviation
No conventional producers are included for Unguja since most tomatoes and sweet peppers came from Tanzania mainland (zero in the table) site-specific transaction costs were also involved for suppliers/traders in Unguja as access costs (Fig. 4.2).

4.5 Description of Variables Included in the Model

4.5.1 Age of the respondents or actors

Age in agricultural activities has been associated with the labour force participating in agricultural activities (Alene *et al.,* 2008). This result is consistent with the theory that the younger population is less involved in agricultural activities and tend to migrate to the urban areas for activities other than agricultural activities(Alene *et al.,* 2008). On average the producers were older, 44 years than the suppliers or traders 39 years and tourist hoteliers 37 years (Table 4.6). These results indicated the younger population is more involved with the activities located in the urban centres like the tourism sector and trading.

Table 4.6: Age of the respondent/Actor

Type of actor	Region	n	Minimum	Maximum	Mean	Std. Deviation
	Arusha	51	22.00	70.00	38.98	11.15
Hotelier	Unguja	71	20.00	56.00	35.17	8.48
	Total	122	20.00	70.00	36.76	9.82
	Arusha	31	21.00	71.00	40.58	10.38
Supplier	Unguja	24	21.00	52.00	37.87	8.05
	Total	55	21.00	71.00	39.40	9.44
	Arusha	41	23.00	72.00	42.05	10.44
Producer	Unguja	41	23.00	80.00	45.29	11.30
	Total	82	23.00	80.00	43.67	10.94

4.5.2 Sex of the respondents or actors

Sex of the respondents has an influence on the economic activities that the households are involved. In tomatoes and sweet peppers production, female households in Unguja were more engaged in the agricultural activities by 89% than male households. The male households were more involved in the hotels by 63% than the female households (Table 4.7). The finding from another study by Alene *et al.* (2008) indicated the same that female respondents were more participating in the supply of labour for agricultural activities.

Table 4.7: Sex of the respondents or actors

		Arusha						Unguja					
		Hotelier		Supplier		Producer		Hotelier		Supplier		Producer	
		n	%	n	%	n	%	n	%	n	%	n	%
Sex of the	Female	18	45.0	11	27.5	11	27.5	3	10.7	0	0.0	25	89.3
respondent/Actor	Male	33	39.8	20	24.1	30	36.1	68	63.0	24	22.2	16	14.8

4.5.3 Education levels of the respondents or actors

The education levels are associated with the ability to interpreting information and to negotiate on transactions. Mmbando *et al.* (2015) found that highly educated households were more participating in the maize and pigeon pea markets than less educated households. On average producers had 9 years of education Table 4.8 indicating the ability to interpreting information and negotiating on the transaction.

Table 4.8: Education levels of the respondents or actors

Type of actor	Region	n	Minimum	Maximum	Mean	Std. Deviation
	Arusha	41	7	13	8.27	2.03
Producer	Unguja	41	2	15	8.78	2.99
	Total	82	2	15	8.52	2.55
	Arusha	41	7	13	8.27	2.03
Total	Unguja	41	2	15	8.78	2.99
	Total	82	2	15	8.52	2.55

4.5.4 Region

The regions are differentiated in the endowments with transportation facilities and communication infrastructures that have an influence on the transaction costs (Goetz, 1992). The regions with more transportation facilities and communication infrastructures are hypothesized to have fewer transaction costs. Approximately, 53% of actors were interviewed in Unguja and 48% in Arusha (Table 4.9). These regions were expected to have a difference in transaction costs that influence market access due to their difference in transportation and communication infrastructures.

Table 4.9: Region the respondents were interviewed

	n	%
Arusha	123	47.5
Unguja	136	52.5
Total	**259**	**100.0**

4.5.5 Participation in the tourist hotels market

Market participation is explained by selling or supplying to the tourist hotels market by the producing households where the decisions made were in two folds. The first decision was on whether the household sold to the tourist hotels market and the second decision was on the amount sold to the tourist hotels market (de Janvry and Sadoulet, 2006; Goetz, 1992; Key *et al.*, 2000). Approximately 10% of the producing household sold tomatoes to the tourist hotels market and 11% sold sweet peppers to the tourist hotels market (Table 4.10).

Table 4.10: Producers who sold to the tourist hotels market

		n	%
Tomatoes	No	73	90.1
	Yes	8	9.9
Sweet peppers	No	70	88.6
	Yes	9	11.4

4.5.6 Storage facilities

Transaction costs have been estimated by the ownership of assets for transportation that households endowed with more transportation asset have lower transaction costs than less endowed households (Alene *et al.*, 2008; Mmbando *et al.*, 2015). Assets for storage and transportation such as a cold truck for transporting fresh tomatoes and sweet peppers are such a proxy for the transaction costs. Dedicated assets like storage facilities enabled producers to transport and maintain the quality for organic products. Storage facilities were huge investments made by producers in Unguja. The degree of investment by

producers in Unguja was high in terms of storage facilities as they put in place cold rooms, particularly to secure transaction of organic products as organic products are not supposed to be mixed with conventional products (ethics in organic production). According to Williamson (1981; 1986) the degree of investment made specific to a transaction is one of the dimensions of transaction cost. The investments were made particularly to meet organic market. These dedicated assets, furthermore, help to increase the shelf life and quality of tomatoes and peppers as appropriate storage facilities were needed to maintain organic quality. Also, when dealing with perishables, the decision of selling the product is not only dictated by the prevailing market prices but also the perishing ability or ripeness of the products. Lack of appropriate storage facilities to smallholder producers is a major source of post-harvest losses and low prices for products. The finding shows that 100% of tourist hoteliers owned storage facilities for tomatoes and sweet peppers. However, about 6% of the suppliers in Arusha and 4% of the suppliers in Unguja owned storage facilities for tomatoes. Similarly, 6% of the suppliers in Arusha and 4% of the suppliers in Unguja owned storage facilities for sweet peppers (Table 4.11). However, none of the producers in Arusha owned storage facilities for tomatoes or sweet peppers or invested in such dedicated assets. This implies that hoteliers have the ability to influence the market price of tomatoes and sweet peppers. They can purchase large amounts of tomatoes and sweet peppers during high supply season and store to reduce the amount of purchase when supply is low.

In Unguja, approximately 2% of producers owned storage facilities for tomatoes and sweet peppers (Table 4.11). This implies that producers of tomatoes and sweet pepper are still vulnerable to prices set by suppliers and tourist hoteliers. This is due to the fact that, there is no way they can store their products and wait for them to fetch competitive prices, particularly, in Arusha. The findings indicated that not only lack of storage facilities was a

problem for smallholder producers but also lack of processing facilities (Fig. 4.3). Hoteliers store tomatoes and sweet peppers based on the frequency of purchase. Some would purchase daily, twice a week, thrice a week. If a hotelier makes purchases of the products weekly, it implies that this hotel would not purchase products from producers for a week, though producers cannot wait for hoteliers' stock to finish once the products are ripe. This will result in producers to sell products in an alternative market which might not offer competitive prices.

Table 4.11: Ownership of storage facilities

| | | Arusha | | | | | | Unguja | | | | | |
| | | Hotelier | | Supplier | | Producer | | Hotelier | | Supplier | | Producer | |
		n	%	n	%	n	%	n	%	n	%	n	%
Tomatoes	No	0	0	29	94	41	100	0	0	23	96	40	98
	Yes	51	100	2	6	0	0	71	100	1	4	1	2
Sweet peppers	No	0	0	29	94	41	100	0	0	23	96	40	98
	Yes	51	100	2	6	0	0	71	100	1	4	1	2

Figure 4.3: Tomatoes left in the field due to a lack of appropriate storage and processing facilities in Arumeru District, Arusha.

4.5.7 Type of storage facilities

Transaction costs have been estimated by the ownership of assets for transportation that households endowed with more transportation asset have lower transaction costs than less endowed households (Alene *et al.,* 2008; Mmbando *et al.,* 2015). The type of storage facilities reflects the capacity of the tourist hotels and frequency of purchase by the tourist hotels when hoteliers make transactions frequently the cost for communication and information searching on the products will be higher than hoteliers with few transactions. The most common storage facilities used by hoteliers included cold rooms and refrigerators. However, some hoteliers used cages, rooms, plastic plates and panting. Hoteliers would make the daily purchase due to the type and limitation of the storage facilities. This increased the frequency of purchase and transaction cost to hoteliers. The findings show that 26% of tourist hotels in Arusha and about 46% in Unguja were using cold rooms for storing tomatoes. Similarly, 26% of tourist hoteliers in Arusha and about 49% in Unguja were using cold rooms and refrigerators for storing sweet peppers (Table 4.12). The use of refrigerators was also common whereby, 52% of tourist hoteliers in Arusha and 52% in Unguja were using refrigerators for storing tomatoes. Similarly, 52% of tourist hoteliers in Arusha and about 49% in Unguja were using refrigerators for storing sweet peppers (Table 4.12). There were very few suppliers in Arusha who were using the cool truck for transporting tomatoes and sweet peppers. Organic farmer's organization (UWAMWIMA) has also enabled some producer to access the use of a cold room in Unguja. In Arusha Meru Sustainable Land (MESULA) was in the process of installing cold rooms for organic vegetable producers. This also explains the difference between organic and conventional producers in support provided within their institutional framework.

Table 4.12: Types of storage facilities

| | | Arusha | | | | | | Unguja | | | | | |
| | | Hotelier | | Supplier | | Producer | | Hotelier | | Supplier | | Producer | |
		n	%	n	%	n	%	n	%	n	%	n	%
Storage facilities for sweet pepper	Cool chambers/cold room	13	26	0	0	0	0	35	49	1	100	1	100
	Refrigerator/freezer	26	52	1	50	0	0	35	49	0	0	0	0
	Room/ store for short period storage	10	20	0	0	0	0	1	1	0	0	0	0
	Plastic plates	2	4	0	0	0	0	0	0	0	0	0	0
	Cages	5	10	0	0	0	0	1	1	0	0	0	0
	Chili house	1	2	0	0	0	0	0	0	0	0	0	0
	Cool truck	0	0	1	50	0	0	0	0	0	0	0	0
	Panting	1	2	0	0	0	0	0	0	0	0	0	0
Storage facilities for tomatoes	Cool chambers/cold room	13	26	0	0	0	0	33	46	1	100	1	100
	Refrigerator/freezer	26	52	1	50	0	0	37	52	0	0	0	0
	Room/ store for short period storage	10	20	0	0	0	0	1	1	0	0	0	0
	Plastic plates	2	4	0	0	0	0	0	0	0	0	0	0
	Cages	5	10	0	0	0	0	1	1	0	0	0	0
	Chili house	1	2	0	0	0	0	0	0	0	0	0	0
	Cool truck	0	0	1	50	0	0	0	0	0	0	0	0
	Panting	1	2	0	0	0	0	0	0	0	0	0	0

4.5.8 Institutional arrangements

4.5.8.1 Contract farming

Throughout history, institutions have been devised by human beings to create order and reduce uncertainty in exchange (ibd). According to North (1991) in transaction cost terms, institutions reduce transaction and production costs per exchange so that the potential gains from trade are realizable. Institutional environments are a broader social-economic framework in which institutional arrangements are found. According to Eaton *et al.* (2008), Institutional arrangements help to reduce transaction cost as rational producers will choose the form of governance in the framework of an institution that reduces transactions cost. The analysis indicated that all organic producers (100%) in Arusha were under contract farming with a company supporting organic producers (Table 4.13). These producers were selling organic products through a collective marketing strategy organized by Meru Sustainable Land Co. Ltd. (MESULA).

In Unguja, about 4% of organic producers were under contract farming with producers'
organization called Union of Organic Vegetables Producers in Western Unguja
(UWAMWIMA). Organic producers under contract farming with MESULA and
UWAMWIMA were not incurring the costs of searching for information on markets and
prices. The organization assisted producers in finding the market and channelling the
products to the tourist hotels market. This enabled farmers to access tourist markets by
selling through the organization.

However, in Arusha about 27% of conventional producers produced tomatoes and 32%
produced sweet peppers were under contract farming with suppliers of conventional
products (Table 4.13). Producers under contract farming with suppliers in Arusha were
assisted to obtain synthetic input such as fertilizers, pesticides, improved seeds and
sometimes the cost of land preparation and cultivation with the agreements that,
conventional producers will sell tomatoes and sweet peppers to these suppliers. However,
organic producers' contractual relationships were found more organized than conventional
through organic farmers' organization UWAMWIMA and Meru Sustainable Land Co Ltd
(MESULA). This organization and the company have been searching for a different
market for products collected from producers. The market outlet includes tourist hoteliers
market, supermarket, expatriates, specialized organic products outlets established with the
support of the organization and company and farmers' markets through the organization
and the company's selling points.

4.5.8.2 Opportunities for rural development through market linkage

Organic producers in Unguja were organized into small production groups, sold products
through their group leaders who also collect products and supplies to the tourist hotels
through UWAMWIMA, major organic farmer group. UWAMWIMA had about 2100

producers; 700 were under the Participatory Guarantee System (PGS), while 1400 were not under PGS. This organization is an opportunity to mobilize organic production and ensure continuity in the supply of quality organic product. Furthermore, the Organic producers in Unguja had a range of products produced, mainly fruits: watermelon, mangoes, cucumber, pineapples, avocados, passion fruits, papaya, sweet melon, shocks hock and banana and vegetables: amaranths, eggplants, tomatoes, okra, sweet papers, carrot, onions, cabbages, Irish potatoes, lettuce, zucchini, broccoli, white cabbage, red cabbage, green paper, pumpkin and spinach. A range of products like this will ensure that the demand by the tourist hoteliers is sustained. Lastly, the market for tomatoes and sweet peppers is available as Unguja has about 237 tourist hotels, with the increasing number of organic producers. This is an opportunity for organic producers to be linked with the growing number of tourist hotels through UWAMWIMA. Organic products will improve quality as demanded by the tourist hotels. As it is approximated about one-third of tourist expenditures constitute food and beverage products (Torres, 2003; Torres, 2004).

Organic producers in Arusha were also organized into production groups that were established like the Meru Sustainable Land (MESULA) initiatives. MESULA supports about 100 organic farmers of about four farmers groups; Mapambano, Ovegro, Jabali Water Farm and Bwawani Farm Group. This institutional arrangement is an opportunity to boost organic production. They also have a range of products to meet the demand for tourist hoteliers. Organic producers in Arusha had been growing organic products like green beans, peas, tomato, spinach, herbs, peppers, and lettuce. Also, the numbers of tourist hotels have been increasing to approximately 98 hotels currently. This is an opportunity for organic farmers to supply quality products to the hotels in the region. Organic Farming Supporting Groups (OFSGs) like MESULA and UWAMWIMA are also

an opportunity for smallholder organic producers to access the tourist market through Collective Marketing Strategy (CMS).

Table 4.13: Contract farming

		Arusha						Unguja						
		Tomatoes		Sweet pepper				Tomatoes		Sweet pepper				
		Conventional		Organic		Conventional		Organic		Conventional		Organic		Conventional		Organic
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Contract for farming	No	16	72.7	0	0.0	13	68.4	0	0.0	0	0.0	26	96.3	0	0.0	27	96.4
	Yes	6	27.3	13	100.0	6	31.6	13	100.0	0	0.0	1	3.7	0	0.0	1	3.6

4.5.8.3 Contract failure

Human asset specificity is referred to the degree of investments made in human capital (Eaton *et al*., 2008; Williamson, 1981), such as training that producers receive specifically for the organic production and through learning by doing. The training could have no incentives for producers to undertake them when selling in a conventional market which does not offer premium prices and the contracts with buyers of organic products fail or breach. The capacity built in human such as training that is specific to a specific activity or production and which cannot be used to yield the same benefit to another activity or production is human asset specific (Williamson, 1981). The organic production technology that producers were trained to some extent did not give the benefit intended as the contracts failed and organic producers sold in the conventional markets. The data shows that, in tomatoes production, about 80% of conventional producers and 20% of organic producers in Arusha experienced contract failure. Similarly, in sweet peppers production, about 67% of conventional producers and 33% of organic producers in Arusha experienced contract failure (Table 4.14).

In Unguja, none of the organic producers experienced contract failure. The extent of contract failure could be explained by the difference in contractual relationships between

organic and conventional producers. Suppliers or buyers of vegetable products were requesting production of specific vegetables produced organically for an organic market that offer premium prices and could not buy those vegetables or find the market for the products, particularly, in Arusha. This has resulted in a loss to producers under contract farming as some of the products could not find an alternative market that offers competitive prices. Some producers left products in the field/farm in Arusha as they could not find a buyer of the products due to reliance on an organic buyer (Fig. 4.4).

Table 4.14: Contract failure

		Arusha Contract failure				Unguja Contract failure			
		No		Yes		No		Yes	
		n	%	n	%	n	%	n	%
Tomatoes	Conventional	18	60.0	4	80.0	0	0.0	0	0.0
	Organic	12	40.0	1	20.0	27	100.0	0	0.0
Sweet pepper	Conventional	15	57.7	4	66.7	0	0.0	0	0.0
	Organic	11	42.3	2	33.3	28	100.0	0	0.0

Figure 4.4: Crops left in the field due to the failure of the buyer under contract farming to buy the products in Arumeru, Arusha

4.5.8.4 Delays in payments by different actors (contracts violation)

To reduce transaction cost, the contract is one of the ways actors in the market can ensure the reduction of the cost of exchanging goods and services (Williamson, 1981). Timely payments were one among the contract specifications by actors in the marketing of tomatoes and sweet peppers, however, lack of trust among actors (dishonest), or the desire to obtain more gains in the market led some actors to breach the contract. Unfaithful actors sold the products to different actors who offer higher prices or purposely delayed the payments to reinvest the capital (money) and paid suppliers and producers late. The findings show that in Arusha 64% of tomatoes and sweet peppers suppliers and all producers (100%) who entered contracts with tourist hoteliers were not paid on time. Likewise, in Unguja, 44% of suppliers were not paid on time (Table 4.15). Also, actors in the marketing of tomatoes and sweet peppers were afraid of entering formal contracts. Some of the tourist hoteliers in Unguja, for example, claimed that, for the suppliers or producers to get a contract with them, they must register their business. This was like avoiding contracts; for smallholder producers' registering a business is expensive, due to their smallness in the capital. It is also not common for producers to register to farm as a business in Tanzania and very few producers have registered to farm as a business.

Table 4.15: Delays in payments by different actors (contract violation)

| | | Arusha | | | | Unguja | | | |
| | | Supplier | | Producer | | Supplier | | Producer | |
		n	%	n	%	n	%	n	%
Timely payment for purchased tomatoes in tourist hotels	No	7	64	1	100	4	44	0	0
	Yes	4	36	0	0	5	56	0	0
Timely payment for purchased sweet pepper in tourist hotels	No	7	64	1	100	4	44	0	0
	Yes	4	36	0	0	5	56	0	0

This data is based on producers and suppliers who ensured contract with tourist hoteliers. There were very few producers and suppliers who ensured contract with tourist hoteliers (not full sample)

4.5.8.5 Institutional costs

Institutional costs in this study refer to the costs of maintaining the contracts and relationship between organic producers and organic producers' organizations or cooperatives. Producers were required to pay the organization fee of TZS 10 000 per year per individual organic producer. This fee was used by the organizations for registration and training of organic producers.

4.5.9 Transport facilities accessed for tomatoes and peppers

4.5.9.1 Distances to the market

When producers are located very far from the market it implies that hoteliers and suppliers have to incur more transaction costs such as transport cost as the distance become far from the market (Mmbando *et al.,* 2015) According to Eaton *et al*. (2008) coordination is one of the transaction costs (fixed transaction costs which are not easy to quantify) in marketing when actors are exchanging goods and services. The costs involved in coordinating a distant transaction might involve more supervision and coordination which increases the cost of a transaction. The analysis indicated that producers in Unguja were about 21 km away from the market and producers in Arusha were about 11 km away from the market. This implies that hoteliers and suppliers in Unguja incurred high transaction cost of coordination when compared to the hoteliers and suppliers in Arusha (Table 4.16).

Table 4.16: Distance to the market

		n	mean	t	Df	Sig. (2-Tailed)	Mean Difference
Distance to the market in kilometers	Unguja	41	20.87	3.73	80	0.00	9.83
	Arusha	41	11.04	3.73	70.08	0.00	9.83

Df-stands for degrees of freedom and Sig.-stands for the level of significance

Furthermore, distance from the market, type of transport and access to transport facilities affected the decision of producers to sell their products. Unreliable transport facilities

affected the prices received or gained in the marketing of tomatoes and sweet peppers. The findings show that 100% of suppliers transported tomatoes and sweet pepper to the markets. However, about 87% of producers in Arusha and 86% in Unguja transported tomatoes to the markets.

On the contrary, about 13% of producers in Arusha and 50% in Unguja sold tomatoes on the farm (Table 4.17). Similarly, about 88% of producers in Arusha and 91% in Unguja transported sweet peppers to the market. On contrary, about 12% of producers in Arusha and 44% in Unguja sold sweet peppers on the farm (Table 4.17). This was due to the fact that, producers in Unguja were far from the market. On average producers in Unguja were 21 km away from the market when compared to producers in Arusha who were on average 11 km away from the market (Table 4.16). This has resulted in a large number of producers in Unguja selling their products on the farm.

Table 4.17: Selling of agricultural products

		Arusha				Unguja			
		Supplier		Producer		Supplier		Producer	
		n	%	n	%	n	%	n	%
Selling of pepper to the market (both market)	Transporting to the market	24	100	28	88	24	100	29	91
	sold on farm	0	0	4	12	0	0	14	44
Selling of tomatoes to the market (both market)	Transporting to the market	28	100	26	87	24	100	24	86
	sold on farm	0	0	4	13	0	0	14	50

4.5.9.2 Means of transport used

The types of transport have also limited producers in Unguja to transport their products to the market as the majority of them were using public transport. The means of transport used is very important in ensuring the qualities of the products are organic. However, due to the lack of transport facilities and unreliable transport, producers were required to rely on public transport (bus commuters commonly known as *Daladala*). This affected the

shelf life and quality of the products. The suppliers had relatively large capital which enabled them to hire a private truck. The findings show that about 82% of the suppliers in Arusha and 79% in Unguja were using the private truck. On the contrary, about 39% of producers in Arusha and 95% in Unguja were using public transport (Table 4.18). This to a large extent has affected the quality of organic products and prices received, as some decided to sell their products on the farm, whereby, suppliers/traders who bought their tomatoes and sweet peppers some of them were the conventional suppliers.

Table 4.18: Means of transport used

| | | Arusha | | | | Unguja | | | |
| | | Supplier | | Producer | | Supplier | | Producer | |
		n	%	n	%	n	%	n	%
Means of transport used	Truck	23	82	14	45	19	79	0	0
	Motorcycle	4	14	5	16	1	4	1	3
	Bicycle	0	0	0	0	3	12	1	3
	On foot	1	4	2	6	0	0	0	0
	Ox-cart	0	0	1	3	0	0	0	0
	Public transport	0	0	12	39	1	4	35	95

4.5.10 Awareness[12] of organic products

Producers of organic products were entering a contract with organic farmers' organization, a nonprofit organization such as UWAMWIMA and companies like MESULA. The organizations supported in creating awareness and finding a market for the products. The organizations also mobilized production of organic producers. However, some producers of conventional tomatoes and sweet peppers were under contract farming with the suppliers and produced the products conventionally. Conventional producers under contract farming with suppliers received the prices after deducting costs that were paid by suppliers for seeds, fertilizers, insecticides and sometimes land preparation and cultivation. The final prices for organic and conventional products were also affected by

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[12] ''Awareness'' in this case refers to understanding of organic products, production practices, who is selling and where to obtain the products''

this. The findings show that about 69% of hoteliers, 39% of suppliers and 63% of producers were aware of organic products in Arusha. On the other hand, 37% of the hoteliers, 17% of the suppliers and 100% of the producers in Unguja were aware of organic products. Most of the organic tomatoes and sweet peppers were sold through suppliers in the organic farmers' organization (Table 4.19). For example, in Arusha MESULA collected organic products from organic producers using organization transport and brought the products to farmers' sales market or other markets. UWAMWIMA has also selected suppliers from the organization. That is why; to some extent awareness of organic products did not reflect the prices paid by suppliers between organic and conventional products.

Table 4.19: Awareness of organic products

| | | Arusha | | | | | | Unguja | | | | | |
| | | Supplier | | Producer | | Hotelier | | Supplier | | Producer | | Hotelier | |
		n	%	n	%	n	%	n	%	n	%	n	%
Actors understanding of organic	No	19	61	15	37	16	31	20	83	0	0	45	63
products	Yes	12	39	26	63	35	69	4	17	41	100	26	37

4.5.11 Marketing information

Marketing information enables producers to plan for production and schedule the supply according to the demand (Alemu *et al.,* 2006). Goetz (1992) in the study of marketing participation of the Senegalese grain farmers found that improved market information increases the probability of participation by sellers. The results indicated that friends and relatives and marketing survey were the major sources of information on organic tomatoes and sweet peppers marketing (Table 4.20).

Table 4.20: Means of obtaining marketing information

	Producer		Supplier		Hotelier	
	n	%	n	%	n	%
Through close relationship with actors to obtain marketing information	0	0.0	0	0.0	0	0.0
Through friends and relatives	49	59.8	26	47.3	0	0.0
Marketing information was not available	18	22.0	2	3.6	2	1.7
Through suppliers	8	9.8	3	5.5	9	7.4
Market survey	5	6.1	23	41.8	109	90.1
Competition	0	0.0	1	1.8	0	0.0
Farm Radio	1	1.2	0	0.0	0	0.0
Price is fixed through contract	0	0.0	0	0.0	1	0.8
TAHA	1	1.2	0	0.0	0	0.0

4.5.12 Transportation costs

The empirical studies by Key *et al.* (2000) and Bwalya (2013) have shown that ownership of transportation assets reduce the per unit cost of production and delivering produce to the market. Assets such as oxen reduce variable transaction costs faced by households leading to higher levels of market participation. However, the costs of the transport may be difficult to estimate or unobservable when the farmers decide to transport the crops by themselves. This analysis estimates the total costs of transportation when producers, suppliers or traders and tourist hoteliers pay for transportation services when using the transport facilities such as truck, pickups, oxen, and donkey for transportation. The analysis indicates that producers had lower costs of transportation (Table 4.21) when compared to suppliers or traders and tourist hoteliers. This could be explained by the fact that most of the farming households are transporting the crops by themselves using owned assets or sell most of their produce on the farm.

Table 4.21: Transportation costs

		Total transport cost for tomatoes	Total transport cost for sweet pepper
Producer	n	82	82
	Maximum	540 000.00	540 000.00
	Minimum	.00	.00
	Mean	46 329.63	38 965.85
	Standard Deviation	107 465.96	84 183.32
Supplier	n	55	55
	Maximum	73 000 000.00	73 000 000.00
	Minimum	.00	.00
	Mean	9 095 722.22	4 938 777.78
	Standard Deviation	18 192 465.76	1 3821 350.05
Hotelier	n	122	122
	Maximum	36 500 000.00	36 500 000.00
	Minimum	.00	.00
	Mean	1 104 978.82	1 157 844.26
	Standard Deviation	3 453 505.84	3 486 130.99

4.5.13 Household size

The farming for smallholder farmers is dependent on family labour. Goetz (1992) found that increasing a household member in the household increases the probability of market participation as the household members supply labour to the household. The results indicate that the household size for tomatoes and sweet peppers producers is 5.77 approximately 6 people in the household (Table 4.22). This number of household member could increase the supply of labour for tomatoes and sweet pepper production if the family members are at the age group liable for working in the household.

Table 4.22: Household size

	Mean	n	Minimum	Maximum	Std. Deviation
Arusha	5.80	41	1	14	2.358
Unguja	5.73	41	1	13	2.829
Total	5.77	82	1	14	2.588

4.5.14 Farm size

The size of the area cultivated reflects the production of surplus tomatoes and sweet peppers that could be marketed. The large area could have implied enough production for

the surplus if the crop is under well management practices. An empirical study by Alene *et al.* (2008) and Bwalya (2013) indicated that increase in the size of the area cultivated for maize was associated with the high probability of participating in the market. However, the analysis on tomatoes and sweet pepper production indicate on average the area under production for tomatoes was 0.82 acres or 0.33 hectares and for sweet peppers was 0.62 acres or 0.25 hectares (Table 4.23). The area under smallholder production in Tanzania is below 2 hectares (National Bureau of Statistics, 2012). This production of tomatoes and sweet peppers reflects the characteristics of smallholder production in Tanzania.

Table 4.23: Size of the area cultivated

	n	Minimum	Maximum	Mean	Std. Deviation
Size of area cultivated for tomatoes in acres	62	0.13	8.00	0.82	1.19
Size of area cultivated for sweet peppers in acres	60	0.13	5.00	0.62	0.68

4.5.15 Experience

Experience in production and marketing reflects the number of contracts an actor could have in marketing (Bwalya, 2013). The more experienced the producers are, the more contacts and trust created among the trading partners are. The results indicate that producers were more experienced in producing tomatoes by approximately 7 years than in producing sweet papers by approximately 6 years (Table 4.24). This is enough experience for produces to supply tomatoes and sweet peppers to the tourism market.

Table 4.24: Experience

	n	Minimum	Maximum	Mean	Std. Deviation
Experience in producing tomatoes in years	62	1.00	25.00	6.58	5.09
Experience in producing sweet peppers in years	60	1.00	25.00	5.97	5.21

4.5.16 Total marketing costs in TZS per kg per year

The total costs associated with marketing included the payments for marketing fees or market levy, brokers and communication costs. According to Goetz (1992), improved market information increases the probability of participation by sellers. Therefore communication infrastructures were vital in increasing access to the tourist hotels market. Access to the tourist hotels market included payments for the fees associated with marketing that actors paid. The results indicate producers had less cost for marketing than were the suppliers (Table 4.25). This is explained by the fact that many producers sold tomatoes and sweet peppers on the farm and the marketing cost that they incurred were mainly the communicating costs. The communication costs were some of the costs that were partly observable when mobile phones were used and their costs were accounted. However, if the producers decided to use the other means of communication like direct visiting the tourist hotels, quantification was not possible and the costs associated with communication was unobservable.

Table 4.25: Total marketing costs in TZS per kg per year

	Producer					Supplier				
	n	Max	Min	Mean	Standard Deviation	n	Max	Mini	Mean	Standard Deviation
Total marketing cost for tomatoes	82	4 290 000	0	111 812	488 070	55	53 290 000	0	3 447 896	10 109 189
Total marketing cost for pepper	82	4 250 000	0	98 674	475 873	55	22 447 500	0	1 138 460	3 063 306

4.5.17 Market prices

Prices influence the decision of producers to participate in the market as a seller, buyer or not to participate in the markets (de Janvry and Sadoulet, 2006; Goetz, 1992; Key *et al.,*

2000). When the prices are low producers may decide not to sell tomatoes and sweet peppers and instead buy tomatoes and sweet peppers. Likewise when the prices are high producers may decide to sell and not to buy tomatoes and sweet peppers. The utility that producers achieve is, therefore, a function of the market prices as prices become the decision for market participation. The analysis indicates that the market prices received by producers who participated in the tourist hotel market were TZS 1250 for tomatoes and TZS 1375 for sweet peppers (Table 4.26). The suppliers received the prices higher than producers it was TZS 1952 for tomatoes and TZS 1976 for sweet peppers. The difference in prices between producers and suppliers is explained by the difference in marketing costs between the producers and suppliers. Suppliers increased the margin to cover their costs of goods sold. Again, many producers sold their tomatoes and sweet peppers on the farm; this explains why the prices they received were lower than that of the suppliers.

Table 4.26: Market prices of tomatoes and sweet peppers in TZS per kg

Type of actor		The market price of tomatoes from tourist hotels	The market price of pepper from tourist hotels
Supplier	n	47	45
	Minimum	625	700
	Maximum	3000	3500
	Mean	1952.94	1976.16
	Std. Deviation	515.616	722.542
Producer	n	8	8
	Minimum	700	700
	Maximum	2500	2500
	Mean	1250.00	1375.00
	Std. Deviation	592.814	589.794
Total	n	55	53
	Minimum	625	700
	Maximum	3000	3500
	Mean	1850.69	1885.42
	Std. Deviation	578.433	731.971

4.5.18 Quantities of tomatoes and sweet peppers sold to the tourist hotels market

The decision of the household to participate in the markets is depending on the amount of production for a surplus that can be marketed. The quantities to be sold is the second decision that the household decide after the first decision of whether to participate in the market as a buyer, seller or not to participate (de Janvry and Sadoulet, 2006; Goetz, 1992; Key *et al.*, 2000). However, the prices for the output may also determine the quantities to be sold in the market (de Janvry and Sadoulet, 2006; Goetz, 1992; Key *et al.,* 2000). On average the producers sold 10727 kg of tomatoes and 5284 kg of sweet peppers (Table 4.27). The production of tomatoes was higher than that of sweet peppers but the prices for sweet peppers was also higher than that of tomatoes. This could imply the amount marketed of sweet peppers is more influenced by the prices than tomatoes that are more influenced by the quantity produced.

Table 4.27: Quantities of tomatoes and sweet peppers sold to the tourist hotels market

	n	Minimum	Maximum	Mean	Std. Deviation
Amount of tomatoes sold in kg	52	60	307 200	10 726.67	45 390.620
Amount of sweet pepper sold in kg	47	40	189 000	5284.06	27 448.935

4.5.19 Production and transaction costs under contracts farming and organic and convention production

Proportional transaction costs are variant to the volume being transacted (Alene *et al.,* 2008; Jordaan and Grové, 2013; Mmbando *et al.,* 2015). The cost of input production, labour and handling were higher for conventional producers under contract farming than organic producers under contract farming in both crops except the handling costs for tomatoes (Table 4.28). This is explained by the fact that tomatoes were more perishable than sweet peppers. According to Alene *et al.* (2008), the transaction costs of transport is proportional to the volume transacted. This was the reason transport costs and marketing costs were proportional to the volume being transacted and higher for producers with large volume sold to the tourist hotels market. The results indicated transportation and marketing costs were higher for organic producers under contract farming than conventional producers under the contracts farming (Table 4.28).

Table 4.28: Production and transaction costs under contracts farming and organic and convention production

| | Conventional Contract for farming | | | | | | Organic Contract for farming | | | | | |
| | No | | | Yes | | | No | | | Yes | | |
	n	Mean	Standard Deviation	n	Mean	Standard Deviation	n	Mean	Standard Deviation	n	Mean	Standard Deviation
Total Input cost for tomatoes	16	465 000	703 361	6	725 166	739 856	26	67 230	76 717	14	37 785	50 960
Total Input cost for pepper	16	257 812	617 452	6	633 833	702 532	26	45 576	85 013	14	36 500	59 252
Total labour cost for tomatoes	16	690 312	1 700 621	6	957 833	954 091	26	73 423	101 912	14	123 464	131 196
Total labour cost for pepper	16	541 968	1 571 197	6	476 000	795 349	26	33 153	75 299	14	100 892	153872
Total handling cost for tomatoes	16	543 250	1 990 157	6	32 666	50 622	26	14 423	73 543	14	49 785	83 816
Total handling cost for sweet pepper	16	88 062	299 161	6	46 000	54 479	26	14 423	73543	14	18 857	43 956
Total transport cost for tomatoes	16	31 000	79 094	6	45 000	110 227	26	36 315	53 360	14	145 892	198 494
Total transport cost for sweet pepper	16	39 250	77 041	6	80 000	125 379	26	18 373	38 417	14	84 892	147 544
Total marketing cost for tomatoes	16	295 256	1 066 576	6	83 000	99 796	26	16 942	71 374	14	250 429	241 438
Total marketing cost for pepper	16	279 313	1 059 358	6	74 833	101 117	26	14 923	71 455	14	177 536	164 133

4.5.20 Factors determining organic tomatoes and sweet peppers producers to participate in the tourist hotels markets

This analysis relies on the factors that influence producers of tomatoes and sweet peppers to participate in the tourist hotels market. The striking results are that ownership of assets like storage facilities such as cold trucks for storing and transporting tomatoes and sweet peppers increases the probability of participating in the tourist hotels market (Table 4.29). This result is consistent with the other finding by Bwalya (2013) and Goetz (1992) that found ownership of assets for production and transporting the products to the market such as oxen reduces variable transaction costs faced by households leading to higher levels of market participation. The results indicated producing under contract farming increases the probability of participating in the markets for both crops. Alene *et al.* (2008) found that institutions arrangements such as collective marketing in Kenya increase the probability of participating in the maize markets by lowering the transaction costs. Again the producers who managed to pay for transportation costs increased their probability of participating in the tourist hotels market (Table 4.29). The access to transportation facilities increases the likelihood to participate to the tourist hotels market. This result is consistent with the findings from another study by (Goetz, 1992) that the region with more communication and transportation infrastructures had lower transaction costs and increased their probability of participating in the markets. The other variables, sex, age, education levels, region, distance to the tourist hotels market, and access to the marketing information were not significant (Table 4.29).

Table 4.29: Factors determining organic tomatoes and sweet peppers producers to participate in the tourist hotels market

Heckman selection model -- two-step estimates				Number of observation =		57
(regression model with sample selection)				Censored observation =		10
				Uncensored observation =		47
				Wald chi2(9) =		38.01
				Prob > chi2 =		0.0000

	Tomatoes			Sweet peppers		
	Coef.	(Std.Err).	z	Coef.	(Std.Err).	z
Sold_Crop_1_Tour_Htl						
Sex	-.019	(0.11)	-0.17	-0.09	(0.10)	-0.88
Age	-0.00	(0.00)	-0.65	-0.00	(0.01)	-0.29
Edu_level	-0.01	(0.02)	-0.71	0.03	(0.03)	1.43
Region	0.11	(0.08)	1.36	0.02	(0.09)	0.31
Dist_htl_km	-0.00	(0.01)	-0.29	0.01	(0.01)	1.56
Stor_fac_tom	1.15	(0.23)	4.99***	0.83	(0.39)	2.15**
Contct_frmng	0.27	(0.13)	2.01**	0.32	(0.16)	1.99**
Obt_mrk_info	-0.06	(0.06)	-1.02	-0.09	(0.06)	-1.52
Tot_trans_tom	1.11e-06	(0.52e-07)	2.02**	2.79e-06	(2.61e-07)	3.67***
_cons	0.31	(0.41)	0.74	-0.04	(0.41)	-0.09

* = Significance at 10% ** = significance at 5% and *** = significance at 1%

4.5.21 Factors influencing the quantities of organic tomatoes and sweet peppers sold to the tourist hotels market

This analysis relies on the factors influencing the quantity of tomatoes and sweet peppers marketed by the producers. Interesting, producers with more experiences increased the quantities of tomatoes and sweet peppers marketed (Table 4.30). The results are similar to the results by Bwalya (2013) that found experience in maize marketing makes certain information and search costs low. Goetz (1992) found that due to the prevalence of social networks. Experienced households may also have greater contacts and increased trust gained through repeated exchange with the same parties. Further, the marketing costs that involved payments of levy, brokers and mobile phone costs in marketing reduce the quantities of tomatoes and sweet peppers marketed (Table 4.30). However, Goetz (1992) found that marketing information increased the probability of participating in the markets.

The costs of marketing such as levy, brokers and communication or mobile phone costs were higher such that they reduced the quantities of tomatoes and sweet peppers marketed. Other variables like household size, size of the area cultivated, awareness of organic products and market prices were not significant.

Table 4.30: Factors influencing the quantities of organic tomatoes and sweet peppers sold to the tourist hotels market

Amnt_Sold_tom	Tomatoes			Sweet peppers		
	Coef.	(Std.Err).	z	Coef.	(Std.Err).	z
Hhld_size	-0.06	(0.11)	-0.56	0.14	(0.11)	1.35
Size_1	-0.16	(0.46)	-0.36	-0.38	(0.70)	-0.55
Organic_understand	0.48	(0.69)	0.70	-0.01	(0.65)	-0.01
Exp_crop_1	0.17	(0.09)	1.78*	0.10	(0.07)	1.45
Tot_mkt_cost_tom	-3.52e-06	(1.25e-06)	-2.82***	-6.22e-06	(2.05e-06)	-3.03***
Mkt_prce_tom	-0.00	(0.00)	-0.40	-0.01	(0.00)	-0.67
_cons	0.74	(0.91)	0.81	0.13	(0.08)	0.16
mills						
Lambda	-0.48	(0.22)	-2.16**	-0.31	(0.24)	1.96**

* = Significance at 10% ** = significance at 5% and *** = significance at 1%

4.6 Conclusions and Recommendations

4.6.1 Summary

Since the results of section 4.5.20 indicated those producers of both tomatoes and sweet peppers under contract farming increased their probability of participation in the tourist hotels market. Institutional arrangements (e.g., contract farming) are a potential solution to improve linkages between the agriculture sector and tourism sector. Institutions major roles in facilitating the linkages include improving market access, creating awareness for organic products and reducing transaction cost, for example, searching for market and related information costs. The organic producers under contract farming were incurring less cost in search of information on prices and markets. The organization for organic producers under contract farming was responsible for searching for information and a new

market for agricultural products. Furthermore, producers involved in contract farming increased their access to the tourist hotels market than those not involved in contract farming.

Since the results of section 4.5.21 indicated that, the total cost of marketing that included market levy, brokers and communication or mobile phone costs decreased the quantities of tomatoes and sweet peppers marketed. This implies transactions costs of communication or information search limited producers' access to the tourist hotels market, as costs increased with decreased access to the tourist hotels market. However, the longer the distance producers in Unguja were, the number of tourist hotels and focus on tourist hotels market enabled producers to access the market.

Since the results of section 4.4.2 indicated organic tomatoes and sweet peppers production was lower than conventional. It implies that production under organic was lower than that of conventional producers. This was associated with the use of input with diverse effects for conventional producers. Lack of organic input resulted in organic producers to rely on the locally made insecticides or pesticides. These locally made insecticides and pesticides could not be applied on large scale. In the same circumstance, they were also not very efficient. As a result, the area cultivated was not significant statistically and did not seem to influence yields and an access to tourist hotels market. However, the uses of inorganic input (synthetic) were associated with the increase in the total input cost of production.

4.6.2 Conclusions

The objective of this study was to evaluate production and transaction costs in the value chain for organic tomatoes and sweet peppers. Then identify the institutional arrangements that could have reduced the transaction costs. There is enough evidence

based on the results under section 4.5.20 that producers under the contract farming increase the probability of participating in the tourist hotels market for tomatoes and sweet peppers. Therefore, contract farming or producers cooperatives reduce transaction costs associated with the exchange of tomato and sweet peppers.

4.6.3 Recommendations

Based on the results on section 4.5.20 that both tomatoes and sweet peppers producers under contract farming increased their probability of participation in the tourist hotels market, it is recommended that sustainability of the organization to continue offering support to producers under the contract needs to be ensured particularly the organic producers. There is a need by the NGOs supporting organic producers to build the capacity of producers within the local community. This is because once these supporting organizations exit, sustainability of production under organic producers will be compromised. The producers under organic farming are currently motivated by the promising efforts of their organization to search for better markets of the products.

Based on the results in section 4.5.21 that the marketing costs such as communication costs decreased the quantities of tomatoes and sweet peppers marketed, it is recommended that, Improvements in agricultural marketing information systems like the use of farm radios will improve and reduce communication costs or search and information costs that producers and suppliers/traders have been incurring in search for information by cutting down mobile phones costs. This will also enable planning of production for producers based on demand; and will enable suppliers/traders to schedule and plan their supply by moving products from surplus to deficit areas at least cost possible.

Based on the findings in section 4.4.2 that indicated organic tomatoes and sweet peppers production was lower than conventional, it is recommended that. The marketing of

organic products needs to go hand in hand with production. The NGOs supporting the production of organic products should not only focus on the market, but also on the availability of organic inputs that will boost production. The presence of organic input will ensure sustainable production that will also secure the market, particularly organic insecticides or pesticides. Registration and wider production of the locally available inputs that are currently being applied by producers may help on this. However, high intensification has been associated with high input production costs.

4.7 Reference

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CHAPTER FIVE

KEY CONTRIBUTIONS, CONCLUSIONS, RECOMMENDATIONS FOR POLICY AND AN AREA FOR FURTHER STUDY

5.1 Introduction

This chapter highlights key contributions to the body of knowledge that the present study has made, gives the general conclusions of the present study, suggests the areas that have been identified for further studies and gives policy recommendations that will help to improve the current situations.

5.2 Key Contribution of the Present Study

The study has mapped the organization of actors in the organic food value chain for the tourism sector. The producers' organizations or cooperatives and companies have been identified as the entry point to promote organic production and access to different markets, tourism in particular. This study has contributed knowledge to the currently scanty study on the social network of actors or social capital in organic food value chain for the tourism sector in Arusha and Unguja.

The study also revealed that the choice of captive and modular governance in organic tomato and sweet pepper value chain by lead actors was not a cost-minimizing decision. But, lack of organic input and limited access to an organic market which resulted in organic suppliers and producers to rely much on their organization suppliers or traders. Further, the low and seasonal production limited single producer access to tourist hotels market as tourist required steady supply and reliable quantity, while in the tourist hotels where market governance structure exist the prices were attractive.

The study further has identified that institutional arrangement (for example, contract farming and producers' cooperatives) can improve access to markets and help in reducing access costs such as transaction costs. However, this depends much on the type of institutional arrangements. For a market specification contract where the agreement between a buyer and a seller (producer) is on assuring access to the market, but producers bear much of the production and marketing risks. Producers were at high marketing risks and were affected by price fluctuation that lowered the final prices received. A production management contract where producers are assured of markets and buyers bear some production and marketing risks and a resource proving contract where a buyer bears most of production and marketing risks were found more ideal for reducing market access cost such as transaction costs.

5.3 General Conclusions

There are limited certified organic inputs in Arusha and Unguja and organic inputs suppliers. This limits possibilities for price differentiation in the market. Non-availability of dedicated storage and processing facilities also limits the potential for fetching a high income of the product.

The existing institutions such as farmers' cooperatives, contract farming and social networks in support of the organic sector in Arusha and Unguja has facilitated the growth of the sector in many ways. It is noted, however, that a lot of effort is directed on the supply side where farmers are targets and supported to produce organic products. Focus on the demand side, for example creating awareness among consumers including tourist hotels and domestic industries (e.g., food industries) is very limited. Increased demand for organic products especially vegetables has the potential to stimulate further organic production and therefore improve smallholder livelihood.

While there are direct benefits to organic vegetable producers, one of the main challenges is the control of organic products quality standard by actors through the value chain (e.g., suppliers and transporters particularly when suppliers are handling both organic and conventional products in the market are involved in the value chain for organic), suppliers as business people some of them were not only dealing with organic, had sale points in the local market for conventional products.

5.4 Recommendations for Policy

Institutions both governmental and non-governmental in support of the organic sector development should design programs and/or advocacy materials to create awareness among consumers aiming at creating demand for organic produce. Organic value chain desk/focal person at the district level who will champion local awareness creation to consumers and presentation of benefits of organic products at various meetings/workshops held. The range of consumers should include individual households, hotels, restaurants, food industries and other food suppliers.

The Ministry of agriculture food and cooperatives should put in place rules and regulation in support of inputs for organic agricultural production. The government through the ministry of agriculture food and cooperatives should recognize the efforts of locally made organic inputs. Then scale up their production and certify them. The organic input should also enter into the inputs subside plans/programs.

The producers' organization should be included within the framework of regulatory authorities to develop the organic sector. This is by specifying some responsibilities that will be performed by the producers' organization. This is because producers'

organizations and companies have contributed to the increased organic production and were the major supporting framework of institutions in the organic sector.

Promotion of organic sector requires specialized human resources to manage and run the supporting institution, but also to become specialized organic producers. Government through the ministry of agriculture food and cooperatives and non-government agricultural training institutions should, therefore, include organic training courses in the current agriculture curriculum.

Through government set institutions, rules and regulations that can be used to sue people who make false claims that their products are organic should be put in place. This will help to control quality in the value chain for organic products.

5.5 An Area for Further Study

The present study focused on tourist hotels as a potential market and destination for tourist. Research indicates that tourist hotels are among the consumers of organic products besides foreign workers (expatriates) and affluent people. A study on the consumers' preference for organic products by tourists arriving into different destination or airports would add knowledge to the existing study.

APPENDICES

Appendix 1: Global value chain governance typologies

Power Asymmetry	Type	Characteristics
Low	Market	Market linkages can persist over time with repeat transactions.
		Costs of switching to new partners are low for both parties.
Semi-low	Modular	Products made to a customer's specifications (i.e., 'turn-key services')
		Suppliers take full responsibility for:
		Competencies surrounding process technology,
		Use generic machinery that limits transaction-specific investments,
		Make capital outlays for components and materials on behalf of customers.
Medium	Relational	Complex interactions between buyers and sellers
		Mutual dependence and high levels of asset specificity.
		Managed through reputation, or family and ethnic ties.
		Spatial proximity or Trust and reputation in spatially dispersed networks
Semi-high	Captive	Small suppliers are transactional dependent on much larger buyers.
		Suppliers face significant switching costs (i.e., 'captive')
		High degree of monitoring and control by lead firms.
High	Hierarchy	Vertical integration
		Managerial control: managers - subordinates or headquarters -

Appendix 2: Marketing margins

When selling tomatoes directly to hoteliers $\frac{(1969-1250)}{1969} = 0.365$ or $\frac{(1969-1053)}{1969} = 0.465$

When selling tomatoes through suppliers $\frac{(1952-1250)}{1952} = 0.359$ or $\frac{(1952-1053)}{1952} = 0.460$

When selling sweet peppers directly to hoteliers $\frac{(2285-1428)}{2285} = 0.375$ or $\frac{(2285-1289)}{2285} = 0.435$

When selling sweet peppers through suppliers $\frac{(1976-1428)}{1976} = 0.277$ or $\frac{(1976-1289)}{1976} = 0.347$

Note: marketing margins are computed based on hoteliers and suppliers prices received by producers respectively.

Appendix 3: Questionnaire for hoteliers (chefs, food and beverage managers,

procurement officers and hotels managers)

Hotelier identification number ------------- (hhldid)

GPS coordinates;

Latitude (South) ----------------------

Longitude (East) ----------------------

Altitude (m)----------------------------

Hotel identification

1. Date of interview -----------------------dd/mm/yyyy

2. The region the respondent was interviewed 1=Unguja 2= Arusha 3= Kilimanjaro -- -----------

3. District the respondent was interviewed -----------------------------

4. Division the respondent was interviewed ----------------------------

5. Ward the respondent was interviewed -------------------------------

6. Village the respondent was interviewed---------------------------- -

7. Name of the respondent in full --(first, middle and last)

8. Sex of the respondent 1= Male,0= Female ----------------

9. Age of the respondent in complete years --------------------(i.e. 20,35 or 50)

10. Name of the hotel -------------------------------------

Social networks of actors and quality of interactions

11. Do you purchase the following crops? (use codes in the first column)

Codes	Tomatoes	Sweet pepper
1= Yes, 0=No		

12. Who are your major suppliers of the following crops in the last 1 year/6 months?

S/N	Crops	
List of suppliers	Tomatoes	Sweet pepper
1		
2		
3		

13. For each supplier mentioned above (in question 11) please indicate whether is a farmer , supplier or supermarket (use codes in last row)

S/N	Crops	
List of suppliers	**Tomatoes**	**Sweet pepper**
1		
2		
3		
Codes 1=farmer 2= supplier 3=supermarket 4=Others type of suppliers specify		

14. Where did you purchase the following crops in the last 12 months? (use codes in the last row)

Crops	Tomatoes NB rank for multiple responses i.e. 1, 4 & 3	Sweet pepper NB rank for multiple responses i.e. 1, 4 & 3
Supplies		
Codes 1= Direct from producers 2= Direct from the market 3=From suppliers 4= From supermarket/ green groceries 5= Others specify ------------------------ ----		

15. Do you understand what organic products are? 1= Yes 0= No **---------(if no go to question 16)**

16. What type of crops did you purchase in the last 12 months?

Codes	Tomatoes	Sweet pepper
1.=Organically 2= Conventionally 3 = Both		

17. Did you ever exchange contacts with the following actors in purchase of crops in the last 12 months? Put 1 for Yes and 0 for No in the column of list of actors below (do not fill black boxes)

		In-degree (sum in columns)		
Out-degree (Sum in rows)	**Actors**	producers	**Suppliers/traders**	Hoteliers
	Producers	███████████████████████████		
	Suppliers/ traders	███████████████████████████		
	Hoteliers	███████████████████████████		

18. How did you establish the contacts you have to the following actors in the last 12 months? (use codes in the last row)

Type of contacts	Did you have this contact? (1= Yes, 0= No)	Suppliers	Hoteliers	Producers
Mobile phone				
Internet				
Physical				
Other contacts specify-----				
Codes -77= Missing -99= Not applicable **1**= Direct marketing 2= Through relatives/friends 3= Other means specify ----------------				

19. What resources did you access through interactions with the above actors for the following crops marketing in the last 12 months? (use codes in the last row)

Crops	Actors	contacts	Tomatoes NB. Rank for multiple responses i.e. (1, 2, and 3)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2, and 3)
Actors	Producers	Mobile phone		
		Internet		
		Physical		
	Suppliers/ traders	Mobile phone		
		Internet		
		Physical		
	Hoteliers	Mobile phone		
		Internet		
		Physical		
Codes -77= Missing -99= Not applicable 1= Advice 2= Market information 3= Price 4=Product 5=Place 6=Quality 7=Availability 8=Reliability 9=Capacity to supply 10= Others specify ----------------				

20. Who initiated contacts most of the time in the last 12 months? (use codes in the last row)

Type of contacts	Did you have this contact? (1= Yes, 0= No)	Suppliers	Hoteliers	Producers
Mobile phone				
Internet				
Physical				
Other contacts specify-----				
Codes; -77= Missing -99= Not applicable 1= Always them 2= Mostly them 3= 50/50 4= Mostly me 5= Always me ------------------				

21. Where did you interact in the last 12 months? (use codes in the last row)

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
Physical			
Other contacts specify-----			
Codes; -77= Missing -99=Not applicable 1= Farm 2= Store 3= Office 4= Market 5= Cooperative office/NGOs 6= Community center 7= Farmer field day 8=By phone 9= Others specify -------------------------			

22. How often did you interact in the last 12 months? (use codes in the last row)

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
Physical			
Other contacts specify-----			
Codes; -77= Missing -99= Not applicable 1= Weekly 2= Biweekly 3= Monthly 4= Seasonally 5=Twice a day 6=Daily 7= Yearly --------------			

23. Did you use resources provided by these actors in the last 12 months?

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
Physical			
Other contacts specify-----			
Codes; -77= Missing -99= Not applicable 1= Always 2= Most of the time 3= Somewhat 4= Rarely 5= Never			

24. List all actors where you purchase produce from them or they connected you to producers of crops in the last 12 months by their gender (used codes for gender in last row)

Actors	Name	Contact (Phone)	Gender (Code in the last row)
Producers			
Suppliers			
Hoteliers			
Codes; -77= Missing -99= Not applicable 1= All male 2= Mostly male 3= 50/50 4. Mostly female 5= All female			

Storage

25. Do you own storage facilities for the following crops? **(If no go to question 27)**

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

26. What storage facilities did you use in storing crops last season/year?

Crops	Tomatoes	Sweet pepper
Storage facilities		
Codes; -77= Missing -99= Not applicable 1=Cool chambers/cold room 2= Refrigerator or freezer 3= Room/store for short period storage 4= Others specify------ -------------------------------		

Governance

27. Do you observe the following collaboration among actors in the purchase of crops?

collaboration	Little	No formal
Codes; 1=Yes 0= No		

28. Did you exchange any marketing information with the following actors last year?

Marketing information	Suppliers	Producers
Codes; 1=Yes 0= No		

29. Did you give technical assistance to the following actors last year?

Technical assistance	Suppliers	Producers
Codes; 1=Yes 0= No		

30. Did you specify to your suppliers on what type of crops you would like to buy last year? (use codes in the last row)

	Traders	Producers	Supermarket	Local market
Suppliers				
Codes; 1= Yes 0= No				

31. What standards did you set or require last year? 1= Organic tomatoes and sweet pepper 2= Fair trade production system of tomatoes and sweet peppers supplied to you 3= Others specify ------------------

32. How did you ensure that the quality and set standards are met by your suppliers last year? Explain--

33. How did you obtain marketing information last year? 1= Through a close relationship with actors to obtain marketing information 2= Through friends and relatives 3=Marketing information was not available 3=Through suppliers 4=Market survey 5=Others means specify --------------------------

Handling and transport costs

34. Please indicate the costs incurred in handling and transporting of the following crops as shown in tables below from the market.

34 A: Indicate the handling cost incurred in last 12 months

Handling costs	Tomatoes		Sweet pepper	
	Cost in (TZSs/kg or Bag)	Total cost	Cost in (TZSs/kg or Bag)	Total cost
1. Cleaning				
2.Selection/grading				
3. Packaging				
4. Package				
5. Storage				
6. Sewing				
7. Thread				
8. Payment to those doing the storage				
9. Others specify				

34 B: Indicate transport cost incurred in the last 12 months

Means of transport	Tomatoes		Sweet pepper	
	Cost in (TZSs/kg or Bag)	Total cost	Cost in (TZSs/kg or Bag)	Total cost
1. Wheel barrow				
2. Tractor				
3. Scania				
4. Trucks/vehicles				
5. Bicycle				
6. On foot				
7. Others specify				

Transactions costs

35. Did you have a contract with suppliers of crops you purchased last year? (use codes in the last row) **(if no to question 34 skip to 39)**

Suppliers	Traders	Producers	Supermarket	Local market	Other suppliers specify--------
Tomatoes					
Sweet pepper					
Codes; 1= Yes 0= No					

36. How long was the contract you have entered with suppliers of crops last year?

Suppliers	Traders	Producers	Supermarket	Local market	Other suppliers specify--------
Tomatoes					
Sweet pepper					
Codes; 1= One year 2= Six months 3= Three months 4= One month 5= Weekly 6= Daily 7= Others specify ----------------------- (do not read answers let hotelier mention him/herself)					

37. What type of contract did you have with your suppliers last year?

Suppliers	Traders	Producers	Supermarket	Local market	Others suppliers specify--------
Tomatoes					
Sweet pepper					
Codes; 1= Verbal 2= Written 3= Others specify ----------------					

38. Did it ever happen that you could not find suppliers of crops you entered into a contract last year? 1= Yes 0= No -----------------

39. What is specified in the contract for crops purchased last season/year? (use codes in the last row)

Crops	Tomatoes Rank for multiple responses i.e. 1,4 &3	Sweet pepper Rank for multiple responses i.e. 1,4 &3
Contract specification		
Codes; 1= Quantity supplied 2= Size of supplies 3= Weight of supplies 4= Height of supplies 5= Quality of supplies 6=Price 7= Others specify ----------------------		

40. How much crops did you purchase in the last 12 months?

	Amount in Kg of each crop purchased (TZS)				
Suppliers	**Traders**	**Producers**	**Supermarket**	**Local market**	**Other suppliers specify----**
Tomatoes					
Sweet pepper					

41. How much did you pay for the amount you purchased from the following actors last year?

Suppliers	Price per Kg of each crop purchased (TZS)				
	Traders	Producers	Supermarket	Local market	Other suppliers specify--------
Tomatoes					
Sweet pepper					

42. What prices were set by each supplier last season/year?--

Suppliers	Prices	Price per Kg of each crop purchased (TZS)				
		Traders	Producers	Supermarket	Local market	Other suppliers specify--------
Tomatoes	Market price					
	Set price					
Sweet pepper	Market price					
	Set price					

THANK YOU FOR YOUR COOPERATION

Appendix 4: Questionnaire for suppliers/traders of tomatoes and sweet peppers

Supplier identification number ------------- (hhldid)

GPS coordinates;

Latitude (South) ----------------------

Longitude (East) ----------------------

Altitude (m)----------------------

Supplier identification

1. Date of interview -----------------------dd/mm/yyyy

2. The region the respondent was interviewed 1=Unguja 2= Arusha 3= Kilimanjaro ------

3. District the respondent was interviewed -----------------------------

4. Division the respondent was interviewed -----------------------------

5. Ward the respondent was interviewed --------------------------------

6. Village the respondent was interviewed---------------------------- -

7. Name of the respondent in full ---(first, middle and last)

8. Sex of the respondent 1= Male,0= Female ----------------

9. Age of the respondent in complete years --------------------(i.e. 20,35 or 50)

Social networks of actors and quality of interactions

10. Do you purchase the following crops? (use codes in the first column)

Codes	Tomatoes	Sweet pepper
1= Yes, 0=No		

11. Where did you purchase the following crops in the last 12 months? (use codes in the last row)

Crops	Tomatoes **NB** rank for multiple responses i.e. 1, 4 & 3	Sweet pepper **NB** rank for multiple responses i.e. 1, 4 & 3
Supplies		
Codes 1= Direct from producers 2= Direct from the market 3=From middlemen 4= From supermarket/ green groceries 5= Others specify ---------------------------		

12. Do you understand what organic products are? 1= Yes 0= No **---------(if no go to question 14)**

13. What type of crops did you purchase in the last 12 months?

Codes	Tomatoes	Sweet pepper
1.=Organically 2= Conventionally 3 = Both		

14. Did you ever sell crops purchased to tourist hotels last year? (use codes in the first column)

Codes	Tomatoes	Sweet pepper
1= Yes, 0=No		

15. Where else did you sell your crops purchased last year?

Crops	Tomatoes NB rank for multiple responses i.e. 1, 4 & 3	Sweet pepper NB rank for multiple responses i.e. 1, 4 & 3
Market		
Codes 1= Others suppliers/traders 2= Supermarket/ greengroceries 3= Local market 4=Cafeteria/restaurants 5=Others specify------------		

16. Did you ever exchange contacts with the following actors in sell of crops into tourist industry last year? Put 1 for Yes and 0 for No in the column of list of actors below (do not fill black boxes)

		In-degree (sum in columns)		
Out-degree (Sum in rows)	**Actors**	producers	**Suppliers/traders**	Hoteliers
	Producers	■		■
	Suppliers/ traders	■		■
	Hoteliers	■		■

17. How did you establish the contacts you have to the following actors in the last 12 months? (use codes in the last row)

Type of contacts	Did you have this contact? (1= Yes, 0= No)	Suppliers	Hoteliers	Producers
Mobile phone				

Internet				
Physical				
Other contacts specify-----				
Codes -77= Missing -99= Not applicable **1**= Direct marketing 2= Through relatives/friends 3= Other means specify ----------------				

18. What resources did you access through interactions to above actors for the

following crops marketing in the last 12 months? (use codes in the last row)

Crops	Actors	contacts	**Tomatoes** NB. Rank for multiple responses i.e. (1, 2, and 3)	**Sweet pepper** NB. Rank for multiple responses i.e. (1, 2, and 3)
Actors	**Producers**	Mobile phone		
		Internet		
		Physical		
	Suppliers/ traders	Mobile phone		
		Internet		
		Physical		
	Hoteliers	Mobile phone		
		Internet		
		Physical		
Codes -77= Missing -99= Not applicable 1= Advice 2= Market information 3= Price 4=Product 5=Place 6=Quality 7=Reliability 8= Others specify ----------------				

19. Who initiated contacts most of the time in the last 12 months? (use codes in the

last row)

Type of contacts	Did you have this contact? (1= Yes, 0= No)	Suppliers	Hoteliers	Producers
Mobile phone				
Internet				
Physical				
Other contacts specify-----				
Codes; -77= Missing -99= Not applicable 1= Always them 2= Mostly them 3= 50/50 4= Mostly me 5= Always me ------------------				

20. Where did you interact in the last 12 months? (use codes in the last row)

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
Physical			
Other contacts specify-----			
Codes; -77= Missing -99=Not applicable 1= Farm 2= Store 3= Office 4= Market 5= Cooperative office/NGOs 6= Community center 7= Farmer field day 8=By phone 9= Others specify -------------------------			

21. How often did you interact in the last 12 months? (use codes in the last row)

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
Physical			
Other contacts specify-----			
Codes; -77= Missing -99= Not applicable 1= Weekly 2= Biweekly 3= Monthly 4= Seasonally 5= Yearly 6=Daily 7=Twice a week 8=Three times a week 9=Others specify --------------			

22. Did you use resources provided by these actors in the last 12 months?

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
Physical			
Other contacts specify-----			
Codes; -77= Missing -99= Not applicable 1= Always 2= Most of the time 3= Somewhat 4= Rarely 5= Never			

23. List all actors where you purchased and sold produce or who connected you to tourist hotels in the last 12 months by their gender (used codes for gender in last row)

Actors	Name	Contact (Phone)	Gender (Code in the last row)
Producers			
Middlemen			
Hoteliers			
Codes; -77= Missing -99= Not applicable 1= All male 2= Mostly male 3= 50/50 4. Mostly female 5= All female			

Marketing information

24. How far is the nearest tourist hotel from your business, store or sales point? in walking minutes----------------in kilometers-------------------

25. How far is the nearest market from your business, store or sales point? in walking minutes-----------in kilometers--------------

26. How did you sell your crops last year/season? **(if not transported to market go to question 28)**

Crops	Tomatoes	Sweet pepper
Means of sell		
Codes; 1= Transporting to market 2= Sell on farm 3=Others specify --------------		

27. What means of transport did you use for transporting your produce to the market

1= Track 2= Motorcycle 3= bicycle 4= On foot 5= Ox-cart 6= Other specify -------

Global Value Chain Analysis

Storage and packaging

28. Do you own storage facilities for the following crops? **(If no go to question 30)**

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

29. What storage facilities did you use in storing the crops last season/year?

Crops	Tomatoes	Sweet pepper
Storage facilities		
Codes; -77= Missing -99= Not applicable 1=Cool chambers/cold room 2= Refrigerator or freezer 3= Room/store for short period storage 4= Others specify-------------------------------------		

30. What storage and packaging activities do you do when storing your crops?

Crops	Tomatoes **NB**. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper **NB**. Rank for multiple responses i.e. (1, 2and 3)
Storage and packing activities		
Codes; -77= Missing -99= Not applicable 1= Selection/grading 2= Packing 3= Cutting 4=Labeling 5= Others specify --------------------------		

Processing

31. Do you own processing facilities for the following crops? (**if no go to question 33)**

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

32. Into what finished products are your crops processed?

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper NB. Rank for multiple responses i.e. (1, 2and 3)
Finished products		
Codes; -77= Missing -99= Not applicable 1= Dried products 2= Frozen products 3= Preserved products 4= Fruits and pulps -----------------------------		

Distribution and marketing

33. Did you export any crop purchased in the last 12 months? (**If no go to question 35)**

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

34. To which nries did you export crops purchased last year? (mention nries exported)

Crops		Tomatoes	Sweet pepper
Nries	1		
	2		
	3		

Governance

35. Do you observe the following collaboration among actors in purchase and sale of crops?

collaboration	Little	No formal
Codes; 1=Yes 0= No		

36. Did you exchange any marketing information with the following actors last year?

Marketing information	Hoteliers	Producers
Codes; 1=Yes 0= No		

37. Did you give technical assistance to the following actors last year?

Technical assistance	Hoteliers	Producers
Codes; 1=Yes 0= No		

38. Did any customer/tourist hotels specify to you on what type of crops they would like to buy in the last 12 months? 1= Yes 0= No --------------------------

39. What standards are set by these customers or do they require? (use codes in the last row)

Actors	Other traders	Hoteliers
Standards		
Codes; 1= Organic tomatoes and sweet pepper 2= Fair trade production system of tomatoes and sweet pepper supplied to them 3= Others specify ----------------------------		

40. How do they ensure that the quality and the set standards are met? Explain----------
----
----

41. How did you obtain marketing information last year? 1= Through a close relationship with actors to obtain marketing information 2= Through friends and relatives 3=Marketing information was not available 3=Others means specify ------

42. Which buyers you depend on have power and control over the market? (Mention them)---

Handling, transport and marketing costs

43. Please indicate the costs incurred in handling, transport and marketing of the following crops as shown in tables below to the final consumers/tourist hotels

43 A: Indicate the handling cost incurred in last 12 months

Handling costs	Tomatoes		Sweet pepper	
	Cost in (TZSs/kg or Bag)	Total cost	Cost in (TZSs/kg or Bag)	Total cost
10. Cleaning				
11. Selection/grading				
12. Packaging				
13. Package				
14. Storage				
15. Sewing				
16. Thread				
17. Payment to those				

doing the storage				
18. Others specify				

43 B: Indicate transport cost incurred in the last 12 months

Means of transport	Tomatoes		Sweet pepper	
	Cost in (TZSs/kg or Bag)	Total cost	Cost in (TZSs/kg or Bag)	Total cost
8. Wheel barrow				
9. Tractor				
10. Scania				
11. Trucks/vehicles				
12. Bicycle				
13. On foot				
14. Others mention them				

43 C: Mention other marketing costs incurred in last 12 months

Type of cost	Tomatoes		Sweet pepper	
	Cost in TZSs	Total cost	Cost in TZSs	Total cost
1. Communications				
2. Levy				
3. Brokerage costs				
4. Others specify				

Transactions costs

44. Did you have contract with buyers/hotels of your crops you purchased last year?

Buyers	Local market	Green groceries	Tourist hotels
Tomatoes			
Sweet pepper			
Codes; 1=Yes 0= No			

45. How long was the contract you have entered with buyers of crops last year?

Buyers	Local market	Green groceries	Tourist hotels
Tomatoes			
Sweet pepper			
Codes; 1= One year 2= Six months 3= Three months 4= One month 5= Weekly 6= Daily 7= Others specify ------------------------ (do not read answers let suppliers mention him/herself)			

46. What type of contract did you have with buyers last season/year?

Buyers	Local market	Green groceries	Tourist hotels
Tomatoes			
Sweet pepper			
Codes; 1= Verbal 2= Written 3= Others specify ----------------			

47. Did it ever happen that you could not find buyers of crops you entered into a

contract last year? 1= Yes 0= No -----------------

48. What is specified in the contract for crops purchased and sold last season/year?

(use codes in the last row)

Crops	Tomatoes Rank for multiple responses i.e. 1,4 &3	Sweet pepper Rank for multiple responses i.e. 1,4 &3
Contract specification		
Codes; 1= Quantity supplied 2= Size of supplies 3= Weight of supplies 4= Height of supplies 5= Quality of supplies 6=Price 7= Others specify ---- -----------------		

49. Did your buyers you have contract with pay in time based on the contract last

year?

Buyers	Local market	Green groceries	Tourist hotels
Tomatoes			
Sweet pepper			
Codes; 1=Yes 0= No			

50. How much crops did you purchase and sell in the last 12 months?

	Amount purchased and sold to different buyers in Kg		
Buyers	**Local market**	**Green groceries**	**Tourist hotels**
Tomatoes			
Sweet pepper			

51. What prices did you receive for the amount purchased by different buyers last

year?

	Prices	Prices paid for purchased amount to different buyers in TZS		
Buyers		**Local market**	**Green groceries**	**Tourist hotels**
Tomatoes	Market price			
	Set price			
Sweet pepper	Market price			
	Set price			

52. How much did you pay for the amount you purchased, for the following costs in the last 12 months?

Crops	Tomatoes		Sweet pepper	
Type of costs	**Amount paid in TZS/Kg**	**Total costs in TZS**	**Amount paid in TZS/Kg**	**Total costs in TZS**
1. Brokerage fee				
2. Market fee				
3. Others specify				

THANK YOU FOR YOUR COOPERATION

Appendix 5: Questionnaire for producers of tomatoes and sweet peppers

Household identification number ------------- (hhldid)

GPS coordinates;

Latitude (South) -----------------------

Longitude (East) -----------------------

Altitude (m)----------------------------

Household identification

1. Date of interview -----------------------dd/mm/yyyy

2. The region the respondent was interviewed 1=Unguja 2= Arusha 3= Kilimanjaro -----------

3. District the respondent was interviewed -----------------------------

4. Division the respondent was interviewed -----------------------------

5. Ward the respondent was interviewed --------------------------------

6. Village the respondent was interviewed----------------------------- -

7. Name of the respondent in full ---(first, middle and last)

8. Sex of the respondent 1= Male,0= Female ----------------

9. Age of the respondent in complete years --------------------(i.e. 20,35 or 50)

10. Marital status of respondent 1= Married 2= Single 3= Divorced 4= Widowed --------------

11. The education level of the respondent in years spent in school ---------------------- (i.e. 7, 11, 13, or 16)

12. Size of the household -----------------(household members living together in a same house and eating on same pot)

13. Main occupation (source of most household income) of the respondent 1= Farming 2= Farming and business 3= Employed or salaried worker 4= Business 5= Others specify -----------------------

Social networks of actors and quality of interactions

14. Do you cultivate the following crops? (Use codes in the first column), **(if no go to question 16)**

Codes	Tomatoes	Sweet pepper
1= Yes, 0=No		

15. What is the size of the area for the crop you cultivated in the last 12 months?

Crops	Tomatoes	Sweet pepper
Areas in acres		

16. Do you understand what organic products are? 1= Yes, 0= No **----------(if No go to question 18)**

17. How did you produce the following crops? (use codes in the first column)

Codes	Tomatoes	Sweet pepper
1. Organically 2. Conventionally		

18. For how long have you been cultivating the following crops?

Crops	Tomatoes	Sweet pepper
Experience in years		

19. During the last 12/6 months, where did you sell the crops that you produced (list all who bought the totals? (use codes in the last row)

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2, 3 and 6)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2, 3 and 6)
Buyers		
Codes; -77= Missing -99= Not applicable **1**= Suppliers/traders 2=Supermarkets 3=Green groceries 4= Local market 5=Cafeteria 6= Restaurants 7= Others specify ----------------------		

20. Did you ever sell your crops to tourist hotels? 1= Yes, 0= No ---**(if no go to question 22)**

21. How much did you get from the sale of crops into tourist hotels in the last 12 months?

Crops	Amount sold (Kg)	Price per Kg	Total
Tomatoes			
Sweet pepper			
Total			

22. Did you ever exchange contact with the following actors in selling of crops into tourist industry in the last 12 months? Put 1 for Yes and 0 for No in the column of list of actors below (do not fill black boxes)

	In-degree (sum in columns)			
Out-degree	**Actors**	**producers**	Suppliers/traders	Hoteliers
	Producers			
	Suppliers/ traders			
	Hoteliers			

23. How did you establish the contacts you have to the following actors in the last 12 months? (use codes in the last row)

Type of contacts	Did you have this contact? (1= Yes, 0= No)	Suppliers	Hoteliers	Producers
Mobile phone				
Internet				
Physical				
Other contacts specify-----				
Codes　-77= Missing -99= Not applicable **1**= Direct marketing 2= Through relatives/friends 3=Through farmers group 4= Other means specify ----------------				

24. What resources did you access through interactions to above actors for the following crops marketing in the last 12 months? (use codes in the last row)

Crops	Actors	contacts	Tomatoes NB. Rank for multiple responses i.e. (1, 2, and 3)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2, and 3)
Actors	**Producers**	Mobile phone		
		Internet		
		Physical		
	Suppliers/ traders	Mobile phone		
		Internet		
		Physical		
	Hoteliers	Mobile phone		
		Internet		
		Physical		
Codes　-77= Missing -99= Not applicable 1= Advice 2= Market information 3= Seed 4= Fertilizer 5= Pesticide 6= Herbicide 7= Tractors 8= Others specify -----------------				

25. Who initiated contacts most of the time in the last 12 months? (use codes in the last row)

Type of contacts	Did you have this contact? (1= Yes, 0= No)	Suppliers	Hoteliers	Producers
Mobile phone				
Internet				
physical				
Other contacts specify-----				
Codes; -77= Missing -99= Not applicable 1= Always them 2= Mostly them 3= 50/50 4= Mostly me 5= Always me ------------------				

26. Where did you interact in the last 12 months? (use codes in the last row)

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
physical			
Other contacts specify-----			
Codes; -77= Missing -99=Not applicable 1= Farm 2= Store 3= Office 4= Market 5= Cooperative office/NGOs 6= Community center 7= Farmer field day 8=By phone 9= Others specify -------------------------			

27. How often did you interact in the last 12 months? (use codes in the last row)

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
physical			
Other contacts specify-----			
Codes; -77= Missing -99= Not applicable 1= Weekly 2= Biweekly 3= Monthly 4= Seasonally 5= Yearly 6=Daily 7=Twice a week 8=Three times a week 9=Others specify --------------			

28. Did you use resources provided by these actors in the last 12 months?

Type of contacts	Suppliers	Hoteliers	Producers
Mobile phone			
Internet			
physical			
Other contacts specify-----			
Codes; -77= Missing -99= Not applicable 1= Always 2= Most of the time 3= Somewhat 4= Rarely 5= Never			

29. List actors who bought produce by their gender

Actors	Name	Contact	**Gender** (Code in the last row)
Producers			
Suppliers			
Hoteliers			
Codes; -77= Missing -99= Not applicable 1= All male 2= Mostly male 3= 50/50 4. Mostly female 5= All female			

Marketing information

30. How far is the nearest tourist hotel from your farm? in walking minutes--------------

--in kilometers-------------------

31. How far is the nearest market from your farm? in walking minutes-----------in

kilometers--------------

32. How did you sell your crops last year/season?

Crops	Tomatoes	Sweet pepper
Means of sell		
Codes; 1= Transporting to market 2= Sell on farm 3=Others specify ---------------------------		

(if not transported to market go to question 34)

33. What means of transport did you use for transporting your produce to the market

1= Track 2= Motorcycle 3= bicycle 4= On foot 5= Ox-cart 6= Other specify -------

----

Global Value Chain Analysis

Input side

34. What was the source of inputs used in producing the following crops last

season/year? (use codes in the last row)

Crops		Tomatoes	Sweet pepper
Inputs	Seeds		
	Fertilizers		
	Herbicides		
	Fungicides		
	Pesticides		
	Farm equipments		
	Irrigation equipments		
	Codes; -77= Missing -99= Not applicable 1= Own 2= Bought 3= Given from friends and relatives 4= Stored from previous years 5= Others specify ------------------------------------		

35. What type of input did you buy in the production of the following crops last

year/season?

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2, 3 and 6)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2, 3 and 6)
Inputs		
Codes; -77= Missing -99= Not applicable 1= Seeds 2= Fertilizers 3= Herbicides 4= Fungicides 5= Pesticides 6= Farm equipments 7= Irrigation equipments 8=Others specify ---------------------------------		

36. What types of inputs you bought were organic last year/season?

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2, 3 and 6)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2, 3 and 6)
Inputs		
Codes; -77= Missing -99= Not applicable 1= Seeds 2= Fertilizers 3= Herbicides 4= Fungicides 5= Pesticides 6= Others specify ---------------------------------		

37. Where was the source of inputs you bought last season/year? Mentioned in (35)

Inputs							
Sources							

38. Where was the source of inputs you bought last season/year? Mentioned in (36)

Inputs							
Sources							

Production side

39. For what purposes did you produce the following crops last year/season? (use codes in the last row)

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2, and 3)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2, and 3)
Purposes		
Codes; -77= Missing -99= Not applicable 1= Processed food for domestic consumption 2= Processed food for export 3= Fresh food for domestic consumption 4= Fresh food for export---------		

40. What quality did you set for processing for crops you processed last year/season?

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2and 3)	Sweet pepper NB. Rank for multiple responses i.e. (1, 2and 3)
Quality		
Codes; -77= Missing -99= Not applicable 1= Small sized 2= Large sized 3= Spotted 4= Uniform colour 5= Others specify --------------------------		

41. What quality did you set for fresh consumption for crops you produced last year/season?

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper NB. Rank for multiple responses i.e. (1, 2and 3)
Quality		
Codes; -77= Missing -99= Not applicable 1= Small sized 2= Large sized 3= Spotted 4= Uniform colour 5= Others specify --------------------------		

Storage and packaging

42. Do you own storage facilities for the following crops? (**If no to question 42 go to 45**)

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

43. What storage facilities did you use in storing crops last season/year?

Crops	Tomatoes	Sweet pepper
Storage facilities		
Codes; -77= Missing -99= Not applicable 1=Cool chambers/cold room 2= Refrigerator or freezer 3= Room/store for short period storage 4= Others specify--------------------------------------		

44. What storage and packaging activities do you do when storing your crops?

Crops	Tomatoes **NB**. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper **NB**. Rank for multiple responses i.e. (1, 2and 3)
Storage and packing activities		
Codes; -77= Missing -99= Not applicable 1= Selection/grading 2= Packing 3= Cutting 4=Labeling 5= Others specify --------------------------		

Processing

45. Do you own processing facilities for the following crops?

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

If no to qn 45 go to qn 47

46. Into what finished products are your crops processed?

Crops	Tomatoes **NB**. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper **NB**. Rank for multiple responses i.e. (1, 2and 3)
Finished products		
Codes; -77= Missing -99= Not applicable 1= Dried products 2= Frozen products 3= Preserved products 4= Fruits and pulps ------------------------------		

Distribution and marketing

47. Where did you sell your crops you produced in the last 12 months?

Crops	Tomatoes NB. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper NB. Rank for multiple responses i.e. (1, 2and 3)
Market		
Codes; -77= Missing -99= Not applicable 1= Tourist market 2= Supermarkets/ green groceries 3= Food services 4= Importers and wholesalers 5= Small scale retailers/local market 6=Suppliers 7=Others specify -----------------------		

48. Did you export any crop produced in the last 12 months?

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

If the answer to qn 48 is no go to qn 50

49. To which nries did you export crops produced? (mention nries exported)

Crops		Tomatoes	Sweet pepper
Nries exported	1		
	2		
	3		

Governance

50. Do you observe the following collaboration among actors in selling of crops?

collaboration	Little	No formal
Codes; 1=Yes 0= No		

51. Did you incur any cost when switching from one partner (buyer) to another?

Crops	Tomatoes			Sweet peppers		
Costs	Change in price	Products does not find a buyer	New quality demanded by a new buyer	Change in price	Products does not find a buyer	New quality demanded by a new buyer
Codes; 1=Yes 0= No						

52. What price did you observe when you change from one partner to another?

Crops	Tomatoes		Sweet pepper	
Price	First buyers in agreement (TZS)	New buyer not in agreement (TZS)	First buyers in agreement (TZS)	New buyer not in agreement (TZS)
Change (TZS)				

53. Did you exchange any marketing information with the following actors last year?

Marketing information	Suppliers/traders	Hoteliers
Codes; 1=Yes 0= No		

54. Did you receive technical assistance from the following actors?

Technical assistance	Suppliers/traders	Hoteliers
Codes; 1=Yes 0= No		

55. What determines the sale of your crops? 1= Prices 2= Quality 3= Others specify ---

----

56. Do any customer specify to you on what type of crops they would like to buy?

1= Yes 0= No -------------------------

57. What standards were set by these customers or did they require last year? (use

codes in the last row)

Actors	Suppliers/traders	Hoteliers
Standards		
Codes; 1= Organic tomatoes and sweet pepper 2= Fair trade production system of tomatoes and sweet pepper supplied to them 3= Others specify -- --------------------------		

58. How did you obtain marketing information? 1= Need close relationship with

actors to obtain marketing information 2= Through friends and relatives

3=Marketing information was not available 3=Through suppliers 4=Others means

specify --------------------------

59. Which buyers you depend on have power and control over the market? (Mention

them)--

60. Did you have a contract for farming with other actors? 1= Yes 0= No ---------------

--

61. Who are the actors you have a contract with? (mention them) ------------------------

----

Institutional setup

62. Did you have access to hired labour in production of crops (tomato and pepper)

last season/year? 1= Yes 2= No ---------------

63. What type of labor did you use in production of crops? 1= Men 2= Women --------

----

64. Did you have access to financial services in last 12/6 months? (Credit)? 1= Yes

0= No --------------------------**(if no go to question 66)**

65. Where did you access the financial services? 1= Farmers cooperatives 2= Banks

3= VICOBA 4= SACCOS 5= Others specify ----------------------

66. Did you access government subsidy in production of the following crops last

season/year? **(if no go to question 68)**

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

67. What kind of subsides did you receive in production of the following crops?

Crops	Tomatoes **NB**. Rank for multiple responses i.e. (1, 2and 3))	Sweet pepper **NB**. Rank for multiple responses i.e. (1, 2and 3)
Subsides		
Codes; -77= Missing -99= Not applicable 1= Seed 2= Fertilizers 3= Herbicides 4= Fungicides 5= Others specify --------------------------		

68. What rules or regulations guide you in production of crops? (mention them) 1------

----------------------2----------------------------------3--------------------------

69. Who set the rules? 1= Government 2= NGOs 3= Farmer's organizations 4= Others

specify

Production (input and labour), handling, transport and marketing costs

70. Please indicate the costs incurred in production & marketing of the following

crops as shown in tables below

70 A: Indicate the inputs used in production for each crop in the last 12 months

Inputs used	Tomatoes			Sweet pepper		
	(Quantity) i.e. in Kg	Unit price in (TZSs)	Total costs	(Quantity) i.e. in Kg	Unit price in (TZSs)	Total costs
1. Seeds						
2. Fertilizer						
3. Herbicides						
4. Pesticides						
5. Fungicides						
6. Others mention them						

70 B: Indicate the costs of labour in production for each crop in the last 12 months

Activity	Tomatoes		Sweet pepper	
	Labour cost (TZSs/man day or piece of work	Total cost	Labour cost (TZSs/man day or piece of work	Total cost
1. nursery establishment				
2. Transplanting				
3. Cultivation (Primary)				
4. Cultivation (Secondary)				
2. Planting				
3. Weeding				
4. Harvesting				
5. Transporting				
6. Loading				
7. Unloading				
8. Others mention them				

70 C: Indicate the handling cost incurred in last 12 months

Handling costs	Tomatoes		Sweet pepper	
	Cost in (TZSs/kg or Bag)	Total cost	Cost in (TZSs/kg or Bag)	Total cost
19. Cleaning				
20. Selection/grading				
21. Packaging				
22. Package				
23. Storage				
24. Sewing				
25. Thread				
26. Payment to those doing the storage				
27. Others specify				

70 D: If transported products to the market indicate Transport cost in the last 12 months

Means of transport	Tomatoes		Sweet pepper	
	Cost in (TZSs/kg or Bag)	Total cost	Cost in (TZSs/kg or Bag)	Total cost
15. Wheel barrow				
16. Tractor				
17. Scania				
18. Trucks/vehicles				
19. Bicycle				
20. On foot				
21. Others mention them				

70 E: Mention other marketing costs incurred in last 12 months

Type of cost	Tomatoes		Sweet pepper	
	Cost in TZSs	Total cost	Cost in TZSs	Total cost
5. Communications				
6. Levy				
7. Other fees for organic				
8. Others specify				

Transactions costs

71. Did you produce the following crops with particular focus on organic market or organic buyers last year? (**if no skip to question 74**)

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

72. What investments have you made in organic productions? 1=Training 2= Registration 3= Certification 4= Others specify -----------------

73. How much did it cost you to invest in organic productions? Indicate cost spent for each item in the last 12 months

Type of costs	Amount paid in TZS	Total costs in TZS
1. Training fee		
2. Registration fee		
3. Certification fee		
4. Others specify		

74. Did you have contract with buyers of your crops last season/year?

Crops	Tomatoes		Sweet pepper	
Buyers	**Suppliers**	**Hoteliers**	**Suppliers**	**Hoteliers**
Codes; 1=Yes 0= No				

75. How long is the contract you have entered with buyers of your crops last season/year?

Crops	Tomatoes		Sweet pepper	
Buyers	**Suppliers**	**Hoteliers**	**Suppliers**	**Hoteliers**
Contract time				
Codes; 1= One year 2= Six months 3= Three months 4= One month 5= Weekly 6= Daily 7= Others specify ------------------------ (do not read answers let producers mention him/herself)				

76. What type of contract did you have with buyers last year?

Crops	Tomatoes		Sweet pepper	
Buyers	**Suppliers**	**Hoteliers**	**Suppliers**	**Hoteliers**
Contract type				
Codes; 1= Verbal 2= Written 3= Others specify --------------				

77. Did it ever happen that you could not find a buyer of your crops you entered into contract last season/year?

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

78. What is specified in the contract for crops produced last season/year? (use codes in the last row)

Crops	Tomatoes	Sweet pepper
Contract specification		
Codes; 1= Quantity supplied 2= Size of supplies 3= Weight of supplies 4= Height of supplies 5= Quality of supplies 6= Others specify ---------------------		

79. Did your buyers you have contract with pay in time based on the contract last year?

Crops		Tomatoes	Sweet pepper
Buyers	Suppliers		
	Hoteliers		
	Others specify		
Codes; 1=Yes 0= No			

80. Did you have irrigation facilities for production of the following crops last year?

Crops	Tomatoes	Sweet pepper
Codes; 1=Yes 0= No		

81. How reliable was the source of water for irrigation last season? (use codes in the last row)

Crops	Tomatoes	Sweet pepper
Water availability		
Codes; 1= Available throughout the year 2= Available during the rainy season 3= Others specify -----------------------		

82. Did it ever happen that you lost production due to dependency on rainfall 1= Yes
2= No -----------------

83. How much did you sell in the last 12 months (amount in Kg)

Crops	Tomatoes	Sweet pepper
Amount sold in Kg		

84. How much did you pay for the amount you have sold, for the following costs

Crops	Tomatoes		Sweet pepper	
Type of costs	Amount paid in TZS/Kg	Total costs in TZS	Amount paid in TZS/Kg	Total costs in TZS
4. Brokerage fee				
5. Market fee				
6. Others specify				

85. What price did other actors in the market pay to you, last season/ year?

Crops	Tomatoes		Sweet pepper	
Actors	Suppliers/traders	Hoteliers	Suppliers/traders	Hoteliers
Price paid (TZS/Kg)				
Market price (TZS/Kg)				

Household sources of income (livelihood)

86. Please indicate other sources of income apart from that of sale of tomatoes and sweet pepper

Income source	Income for the past 12 months		
	Cash (TZS)	In-kind (cash equivalent in TZS)	Total (TZS)
Income from salaried employment			
Income from machinery services for other farms (plowing etc.)			
Income from casual labor (on-farm)			
Income from casual labor (off-farm)			
Income from own **non-agricultural** businesses (shops, salons etc)			
Income from non-farm agribusiness (grain milling, grain trading etc)			
Selling charcoal, brick making, selling firewood etc			
Income from sale of livestock; cattle, sheep, goats, pigs, chicken, etc			
Income from sale of other crops, maize, rice, etc			
Pensions			
Remittances from family members/friends who do not live in the household			
Revenues from leasing out land			
Other sources (specify)…………			

THANK YOU FOR YOUR COOPERATION