

ASSESSMENT OF MARKET OPTIONS FOR SMALLHOLDER HORTICULTURAL GROWERS AND TRADERS IN TANZANIA

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ABSTRACT

Vegetable production to smallholder growers and traders in Tanzania has been facing a number of problems including seasonality, poor infrastructure and alternative markets to sale the produce. This study was done in selected Towns and Cities to capture information on market options, potential markets for both local and exports: and to do an analysis on the vegetable value chain per link. A survey of 113 respondents to include growers, traders, processors, supermarket managers and one exporter was done. Results show that, most smallholder traders has been doing vegetable business with a very low margin as compare to the medium and large traders who are able to access the central markets and the National Market in Dar es Salaam. Options for the markets are available locally and internationally, only that these options favours the medium and large traders due to sound capital they own. The potential markets available are horizontal (to expand the available markets) and vertical (move to higher level markets). The value chain per link is not well established for smallholder farmers but in this study the calculation of the Gross Profits Margin (GPM) range between 2-4%. It is concluded that more efforts like teaming up of smallholder trades is done so that they become strong enough to face the market challenges.

Keywords: Small holder traders, Vegetables, Market options, Tanzania.

INTRODUCTION

Background

Horticultural agriculture in Tanzania is characterized by a sector unable to meet the demands of the market and suffering from stagnant growth as the economy grows increasingly import-dependent (Kirsten, and Sartorius, 2012). The domestic supply of fruits and vegetables is often insufficient, inconsistent and/or not up to standards to meet the demand of operators, leading to the import of significant volumes of produce from neighboring countries like Kenya, Zambia and Malawi that could be sourced locally.

Insufficient planning along the value chain has led to a supply-demand mismatch. Smallholder farmers face difficulties in accessing markets and in acquiring market information. Farmers rarely operate as farmer groups and endure high production costs due to the lack of scale economies (Mwasha and Leijdens, 2013). Expensive transport options prevent delivery to the market at a competitive price. Many of the farms are widely dispersed or have bad road conditions making it difficult for buyers to source directly from farmers. Accessibility has prohibited post audit support activities from the Ministry of Agriculture. Extension staff has been unable to efficiently provide training, follow-up advice and support (Levin and Mbamba, 2014).

The consequence of the inability to find viable markets has been post-harvest waste. There are insufficient pack- houses and storage facilities in rural areas, dramatically reducing the

shelf life and quality of the produce. Likewise, farmers are unable to provide security and are at risk from theft, particularly of high-value goods. The high degree of information asymmetry, combined with the large number of both producers and buyers operating in rural areas, has resulted in a highly competitive arena. Few contracts are established as both are willing to search for more prices competitive options, and little trust exists as previous contracts have been broken by both parties (Mwasha and Leijdens, 2013).

The purpose of this study is to contribute in showing the marketing options in Tanzania, ranging from open market right up to specialized markets; show the potential markets (local and exports) that can be explored in future; and to make an analysis of current market chains (flow of vegetable from farm to consumer) with added value per link. The study therefore uses a value chain approach to understand the needs and constraints facing different smallholder horticultural traders in order to access feasible market system of vegetable crops for processing, distribution and selling that can improve the commercial links between producers and buyers in the domestic, regional and international markets, and makes recommendations that incorporate lessons learnt from different areas of the study.

Study Rationale

For many years, the use and hence the commercialization of vegetables has remained low despite their nutritive value and potential economic use. Their commercialization has only begun to gain prominence in the Tanzanian markets and especially in the cities of Dar es Salaam and Arusha, and other towns such as Mwanza, Mbeya, Morogoro and Zanzibar (Mburu and Wale, 2006). The successful development of these market could be considered as a milestone in re-introducing underutilized food crops for food security as well as for on-farm economic growth of smallholder farmers. However, there is limited information available concerning the state of the market options for smallholder traders and growers in the country. Increased consumption of these vegetables brings with it social, economic and health benefits. From direct observation, there seems to be an increase in both demand and supply within markets.

Most Sub-Saharan African countries, including Tanzania, have been faced with a situation of serious food insecurity. It has been reported that food security has worsened in Sub Saharan Africa since 1970, with the percentages of malnourished people remaining at around 35% but with absolute numbers increasing due to population growth (Rosegrant *et al.*, 2015). Thus, enhanced production and marketing of vegetables would go a long way in ensuring food security. Lack of socio-economic studies on the dynamics of market development implies that factors both for and against the marketing of vegetables have remained largely unknown. Promotion from either supply or demand ends, without the balancing effect of one on the other, could be an inhibiting factor to further market development. Past studies have shown that on-farm conservation of crop genetic resources can easily be enhanced through provision of markets for traditional crops (Meng *et al.*, 2008). However, increased consumer demand for certain specific vegetable species could also lead to a need for more market options. Other studies have empirically demonstrated that farmers are likely to specialize in the few varieties demanded by the market, thus leading to a low level of diversity or uniformity of vegetable varieties (Smale and Bellon, 2009; Mburu and Wale, 2006). Consequently, there is a need for more thorough investigation into this ambiguous role of the market options.

Objectives

The general objective of the study is to do a Market Options Research (MOR) the results or findings of which will not only inform farmers but also key players in the vegetable industry

on the market options available to Tanzania vegetable producers. As the purpose of the entire vegetable growing and trading is to contribute to food security strategy and vegetable industry development in Africa, it is expected that findings of the research will also be used not only for decision making processes within the context of the projects like SEVIA but scaling up to a big spectrum marketing options in Tanzania and elsewhere in Africa. In order to pursue this broad objective, the study uses both primary and secondary datasets that are qualitative and quantitative in nature. The specific objectives were as follows:

- (i) To investigate marketing options in Tanzania, ranging from open market right up to specialized markets;
- (ii) To analyze potential markets (local and exports) that can be explored in future; and
- (iii) To analyze the current market chains (flow of vegetable from farm to consumer) with added value per link.

METHODOLOGY

The Study Area

The study was carried out in the selected cities, towns and peri-urban to include Dar es Saaalm, Mwanza, Arusha, Iringa, Morogoro, Mbeya, Zanzibar, Lindi, Mtwara and Moshi. In the original plan, Morogoro was not listed but it turned out to be one of the areas mentioned by Dar es Salaam traders as one of the prominent suppliers of vegetables in Kariakoo and other markets. Dar es Salaam is a cosmopolitan city of more than four million people. It is both the commercial and the largest city in Tanzania, and as such all the ethnic backgrounds are represented. The food consumed in the city comes from right across the united republic and this also includes different kinds of vegetables. The rest of the study areas were selected due to their proximity to the borders of which could explain market options across countries e.g Moshi, Arusha, Mwanza, Iringa and Mbeya. Some were selected due to their historical popularity of horticultural production e.g Morogoro while Zanzibar and Arusha could be good areas for the study in terms of exportation for vegetables. The study targeted traders marketing vegetables and growers in the nearby production areas. Distant production areas were therefore not visited during the market option surveys. Also few processors (Dabaga Co. LTD and Red Gold in Iringa) and export organization specifically TAHA were visited.

The study used questionnaire-based surveys for growers and traders as well an interview guide for the exporters. Surveys are used to assess the needs of the participants/respondents in the study area and therefore key factors influencing the engagement in growing and trading of the horticultural products may be obtained directly from the source persons. It also allows an examination of external factors that may influence an undertaking and provide a better understanding of the participants' context, terminology and processes. The descriptive analysis used in the study provides an indication of the market options, potential markets and the value chain that would be realized in the future.

RESULTS AND DISCUSSION

Respondents Description

A total of 113 respondents (86 female and 27 males) smallholder retailers, wholesalers, growers, processors, 2 Supermarket managers and 1 export organization were interviewed as presented in Table 1.

Sex of Respondents

The majority vegetables traders to markets in the study areas and the neighboring areas are women (71.7% of the sample). This confirms the trend shown in other reports that most of the vegetable traders are women. Particularly Nekesa and Meso (2007) and Maundu, *et al.* (2009) indicate that as much as 95% of the vegetable traders are women. Vegetable business remains a woman's venture especially when you talk about small scale vegetable trading. Despite the fact that the wholesale trade is carried out very early in the morning for retail traders to get the supplies, it is normally considered to be insecure and risky for women, still a significant number of female trader is noticed.

Table 1: Number of Respondents

Region	Market Place	Female	Male	Total
kilimanjaro	Mbuyuni – Moshi	4	0	4
	Sadala (Hai District)	2	0	2
	Central market	4	1	5
Mtwara	Central market	3	1	4
Lindi	Central market	2	3	5
Zanzibar	Central market	3	1	4
	Darajani market	3	2	5
	Forodhani market	2	1	3
Mbeya	Soweto	3	2	5
	Sido	3	0	3
	Tukuyu- Ushirika	2	1	3
Morogoro	Central market	3	2	5
	Gairo - Kilosa	2 (growers)	2	4
Iringa	Central market	3	2	5
	Ilula	2 (growers)	2	4
Arusha	Kilombero (City)	4	1	5
	Tengeru (Meru District)	3	0	3
	Namanga (Tanzania-Kenya boader)	4	1	5
Mwanza	Central market (City)	4	1	5
	Kirumba (Ilemela District)	3	0	3
	Buhongwa	2	1	3
Dar es Salaam	Kariakoo	5	2	7
	Temeke	4	0	4
	Mabibo	3	0	3
	Kisutu	3	1	4
	Shekilango	3	0	3
	Sinza	2	0	2
	Total	81	27	108
	Processors		2	2
	Exporters		1	1
Supermarkets		2	2	
Grand Total		81	32	113

Source: Field data 2017, (n= 113)

Age of respondents

About half of the respondents (47%) were aged between 36- 45 years while the age between 18 -32 and 46- 55 were each covering 20.4% of the respondents. The age between 56 -65 and

that of 66 and above covered only 9.6 and 2.6 respectively as indicated in Table 2. The result indicate that vegetable trading is done by middle aged group that is energetic in terms of market development and tapping more opportunities in other markets.

Table 2 : General Characteristics of Respondents (n=113)

Categories (traders and Growers)	Characteristic	Number of Respondents	Percentage (%)
Sex	Male	32	28.3
	Female	81	71.7
	Total	113	100
Age	18-35	23	20.4
	36-45	53	47.0
	46-55	23	20.4
	56-65	11	9.6
	66+	3	2.6
	Total	113	100
Education level	Primary	40	35.4
	Secondary	35	31.2
	College	24	21.0
	University	14	12.4
	Total	113	100
Experience with Vegetable Business/Organization experience	1-5 years	32	28.3
	6-10 years	52	46.0
	More than 10 years	29	25.7
	Total	113	100

Source: Field data 2017.

Education of Respondents

With regards to education of respondents, 35.4% (40) findings show that had primary school while 31.2% (35) has gone to secondary school education. Furthermore, findings indicate that 21% (24) of the respondents have tertiary education and 12.4% (14) have University education. Education is important for traders and growers as it gives capacity to negotiate interpret different market information and search for new Markets.

Experiences in Vegetable Business/Organization

Most actors (46%) in the vegetable market are well experienced between 6-10 years. While more than one fourth (28.3%) of the respondents have an experience of 1-5 years. Those who are more than 10 years of experience cover 25.7%. This statistics indicate that, most of the people engaged in vegetable business are more experienced which may suggest that, they have a great knowledge of the markets force (demand and supply) of specific types of crops along the year but also across customer categories.

Marketing Options for Tanzania Small Scale Vegetable Traders Stakeholders in the Vegetable Industry

Vegetable stakeholders in Tanzania include farmers most of whom are small with an average of 0.25 acres per farmer, it is estimated that there are more than 30,000 smallholder farmers are involved in vegetable production in each region which are commonly producers of vegetables. Producers get supplies of seeds, fertilizers, pesticides and fungicides from inputs

stockiest who are readily available normally within a short distance. There is minimal mechanization in vegetable plots as much of the critical activities are done by hand. A few with a little big plots use equipment that is common to includes ox ploughs, petrol engine powered water pumps and knapsack sprayers. The equipment is sold by dealers in farm implements located in district headquarters and major settlements. Crop husbandry skills are largely passed over through action-learning and this is complemented by ward/village extension officers.

Traders can be categorized as “inward” or “outward”, inward are those who originate from vegetable markets while outward are those from vegetable growing areas who take the produce to markets. Artisans in woodwork for example produce wooden crates are also important in the value chain. Given the perishability of vegetables, efficient transport is very important; truck owners facilitate the flow of produce to the market. As the chain develops it may be important to work with financial institutions especially SACCOS, banks and MFIs. A number of farmers need business management skills, organizational/group development services thus BDS providers will be important actors. Vegetable processing has increasingly becoming important in some areas. Processors in the Southern Highlands like Redgold, Dabaga and IVORI are found in Iringa while Marriet Natural Foods is based in Njombe. Small scale vegetable processing industries for sources and ketchups are also increasingly operating in big cities and towns like Dar es Salaam, Zanzibar, Arusha and Mwanza. This is a good indication of markets to farmers and traders. The problem that has been mentioned severally in the study is about the volume required by the processors but also the quality.

The government is an important active actor because it provides valuable extension services, builds business relations e.g. the use of proper weights and measures, through its institutions such as TPRI and TOCSI do ensure inputs into the sector are up to standards. TFDA regulates food safety while OSHA ensures that tomato processing actors operate and produce products that conform to healthy and safety requirements.

Vegetable Production

Vegetables are a wide field of study. There are different varieties and different consumer market segments and preferences. Trade can be local, inter-regional and international. According to the proponents and practitioners of Horticultural sector analysis methodology, it is crucial to define the precise parameters of vegetables in order to create focus and clarity. Whilst acknowledging this necessity, it was necessary to adopt a working definition of vegetables for especially the urban market. Commonly demanded vegetables are produced in the most parts of the country and some to specialized places. The common vegetable basket includes tomatoes; cabbage, carrot, cauliflower, iceberg lettuce, sweet pepper, Kale (Figiri), Spinach, Water melon, Pumpkin leaves, Carrots, Onion, Okra and Amaranth. The market focus of the study is the urban markets in Dar es Salaam, Arusha, Mwanza, Morogoro, Iringa, Mbeya, Zanzibar, Lindi Mtwara and Kilimanjaro. In Dar es Salaam the most important entry point for vegetables is Kariakoo market. The main production areas of temperate vegetables are in the Southern and in the Northern highlands. In Kilimanjaro Region Hai and Siha Districts are the most important production areas while in Arusha Region there is small-scale production in Arumeru District and some areas have specialized in specific crops. Morogoro has been the main producer of Water melon, Cucumber and Tomatoes while Mwanza, Mtwara and Lindi has been on small scale production.

Reflecting seasonality of supply of Tomato for example in Dar es Salaam (which comes from different parts of the country) prices do fluctuate significantly. Higher prices between March

and May and a trough (low) from June through September. The spike in December is assumed to be caused by year-end festivals when consumption is highest. Traders who take the risk at farm gate indicate that the major risk in tomato marketing is oversupply caused by weak market intelligence and inability to forecast. In order to minimize losses from such fluctuations many traders have business networks at Tarakea, Lushoto and Taveta (for monitoring tomato from Kenya) that provide indicative market situation. Table 3 indicates tomato production calendar in most parts of the country.

Table 3: Tomato Production Calendar for most parts in Tanzania

Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec

Source: Field data 2017

Key:

	Nursery preparation, land planning and harrowing
	Planting, weeding, fertilizer application, pesticides and disease control
	Harvesting and selling

Market Analysis and Options

The food supply chain in Tanzania is very complex and disorganized. This is to the disadvantage of the producers especially the smallholder producers (Lynch, 2014).

Table 4: Characteristics of Different Markets in Tanzania.

	Local village markets	Regional markets	National markets	Export markets
Location	Cross roads near villages	Region centers and/or district capitals	Dar es Salaam	Foreign
Traders	Women and children	Large, medium and small traders	Large traders	Foreigners
Supply	Unreliable	Reliable	Reliable	Reliable
Product	Local/limited choice/low quantity	Regional/broad range /low to large quantity	National/broad range/large quantity	National/focused on special crops/large quantity

Source: Field data

Currently supply chains are based on the contacts and knowledge of the people involved in the trading and not just in the presence of physically roads, buildings and vehicles. In general vegetables are sold through 5 different chains. Four of them being local village markets, regional markets, national market and export market. A fifth one is the supermarket as explained in the earlier. Local village markets are run by women and children to earn some money. Choice of products is low and also supply is unreliable.

The National market is located in Dar es Salaam and the products for sale there are collected from all regions. All vegetables that are intended for sale and just only for direct consumption in Dar es Salaam must be sold through the national market (Kariakoo market) via licensed wholesalers. However, law enforcement is absent so besides this legal market an informal system has been developed. Mostly the products sold at the national market are not for local consumption but for consumption in the regions. The market is dominated by a small number

of large traders. Access to the National market is limited to most traders since they require capital and transport to collect large quantities of different products from all over the country and to trade it at the market. As a result, at the Kariakoo market, those with a medium level of capital have permanent places within the market structure while for smallholder traders most of them do sale the produce in streets close-by the market.

Producers who market their produce beyond the farm-gate fall into two categories: those who sell in bulk to other wholesalers or retailers and those who choose to retail direct to consumers. Most producers sold wholesale to the traders in order to get time to undertake other activities and minimize transaction costs. Only a limited number (like 3%) chose to retail and, even then, only on market days in their nearest market centers

Regional markets (usually called the central markets) are the most important since they are easily accessible compared to the National market and a broad range of vegetables are for sale. Traders at this market can be distinguished in large, medium and small traders. Large traders have more capital available and are in a position to cover a large area for buying products. Medium traders are more restricted to the area where they trade and offer only local products. Medium traders and large traders have better access to capital giving them an opportunity to give credit to buyers thus generating a higher turnover. At the same time, because they are reliable the traders can get credit as well from the farmers when they purchase products from them. Small traders are mostly people who don't own land and have no other option than to trade in order to earn a living. Mostly they buy product from a large trader leaving them only a small margin. At the regional market traders have to buy a permit to trade and besides they have to pay a daily fee. A large trader has an average turnover of 50,000 to 200,000 Tsh per day while a medium trader has a turnover of 40,000 Tsh per day and a small trader a turnover of 7,000 Tsh per day. Personal contacts are very important in order to do business and to make deals. Since the legal system is not functioning in case when a customer is failing in paying for the purchased goods, people only want to deal with someone they know and can trust. Also since a market information system is lacking people like to do business only with someone they know. As a result the supply chain can be very long.

Supermarkets also provide markets for the vegetable traders as well. There are about 6 Shoprite supermarkets of which 5 are based in Dar es Salaam and 1 in Arusha. Shoprite owns its own company, Freshmark, in order to collect vegetables and fruits for the stores. Besides Shoprite a number of others like Uchumi, Kishimba, Nakumart a few to mention are operational. Supermarkets buy from wholesalers and require large quantities, good quality products which are cultivated according to safety standards. For the small farmers this can be a threat since they lose a share of the market whilst supermarkets are expected to exclude small scale farmers from their suppliers.

Analysis of potential markets (local and exports)

The Local Markets

There has been good reasons explained for the continuing growth of vegetable consumptions and hence markets in most parts of the country which presents an opportunity for market expansion to smallholder vegetable growers and traders. The mostly commonly reported reasons include the following:

(a) General health awareness

There has been an increasing general awareness associating many of the diseases of the affluent (such as diabetes, high blood pressure, and ulcers) with an unhealthy food consumption pattern. From newspapers to scientific writings, there has been general awareness pointing to the fact that our great grandparents lived longer and mainly because they ate indigenous food such as vegetables. This, coupled with campaigns by nutritionists and conservationists of genetic resources, has made a great impact on the eating pattern of the consumers which in turn is expanding the market. This is part of the potential market if it is well tapped.

(b) HIV/AIDs pandemic

With the advent of the HIV/AIDs scourge, vegetables have also been floated as health boosters. They are said to be rich in micro-nutrients (vitamins, iron, potassium), polyphenols and are generally considered good for people who are ill. Most vegetables, especially African nightshade and *mitoo* are considered medicinal. In some cases HIV/AIDs patients have been given a general recommendation from health practitioners and herbalists to consume such vegetables. As such, farmers and traders can utilize this opportunity to expand their market base.

(c) Increased knowledge on preparation methods for various vegetables

A number of NGOs, national and international institutions, have been actively promoting different kinds of vegetables throughout the last decade through the press and audio-visual media. They have also been holding cooking exhibitions, engaging the public in talk shows through popular media and holding exhibitions in the selected retail outlets. All these activities led to some people hearing of many vegetables for the first time and being told how to prepare them appropriately. The increased awareness of preparation is expected to result into more people's demand for vegetables. Hotels, restaurants, schools and hospitals may be good markets to expand the market share as more people becomes aware of the preparation of a different range of vegetables.

(d) Peer influence

Other key informant interviews indicated that people have been learning from acquaintances, traders and work colleagues about the nutritive value of vegetables. At the start, this group of consumers would not have chosen to eat vegetables because of their nutritive importance but mainly because their friends and people of their social class do so. Many people (customers) has benefited mainly from the introduction of vegetables on the shelves of the major supermarket chains. Selling vegetables at these chains also helps to boost their image and acceptance in the minds of would-be consumers (potential customers). Only that, smallholder producers and traders misses this opportunity because of the capital base and quality of the produce they may come up with.

The above mentioned reasons seem to be horizontal i.e. to expand the market within the already existing market base. The other vertical approach of market expansion for smallholder farmers is to team up in groups so that they can serve one big customer. However, doing that requires some technical advice on how groups may be formed and how the groups can advance into a market situation of that kind. NGOs, SACCOS and other institutions may be good actors to assist the farmers.

Export Markets

The export market is run only by large traders and they are mostly foreign and a few locals. Horticultural products that are being exported mainly to Kenya are tomato, onion and potatoes. The export agents collect large quantities at established buying centers. The products are mostly unprocessed leaving the Tanzanian farmers only a low profit while the added value is for the export organization.

Another great opportunity is to strengthen the export value chain, i.e. the farmers of Arusha and part of Kilimanjaro in Hai District produce tomato and onion in large quantities for the Mombasa market. Mombasa market welcomes the Tanzanian tomatoes because of their availability almost throughout the year. Because of the difference in climate and seasons, the produce from Tanzania is complementary to those from Kenya. The greatest concern of the farmers is that due to lowering yields, the occurrence of pest and disease and the volatility of the prices (offered by the brokers) they do not always make profit.

Especially Dar es Salaam which functions as a hub for all road and sea transport for Tanzania has four main arterial roads which all pass by Dar es Salaam (Peterson, 2003). When a product has to be transported from one part of the country to another part it has to go pass by Dar es Salaam due to the infrastructure. Taking this into account it seems that the Arusha region has the highest potential to develop a domestic and export market seeing that this region has good access to Kenya, Dar es Salaam and to other countries via the international airport located at Kilimanjaro or via Jomo Kenyatta international airport at Nairobi. In general the three major horticultural regions (North eastern highlands, Southern Highlands and Central and Eastern coastal regions) are accessible by paved roads so products can be easily transported to Dar es Salaam or bordering countries. From the central places in those regions, however, roads to farms are mostly in a poor condition giving problems at transporting the vegetables from the farms to a collection point.

This particular study was meant to come out with findings on the market options that smallholder traders have. Consequently, results show that there are options that the smallholder traders have in the regional and World market. Only that some hindrance factors do hold back the process. For example, small traders need much more capital, technical support and access to information to trade in specialized markets and external markets. It was found out that a potential market for Moshi traders is Mombasa in Kenya while for Arusha this is Nairobi in Kenya. These two places can also be used by other traders from other regions only that the distance factor as revealed in the previous sections can be a limitation factor plus the other factors mentioned. Potential markets for Mbeya and Iringa are Malawi and Zambia although currently in a very limited capacity. This is because, the same countries they do produce much of the almost same vegetable types. Zanzibar and Comoro also are other potential markets mentioned for Tanzania mainland vegetable growers.

Juba and the United Arab Emirates (UAE) were mentioned positively by exporting organization (TAHA) being good exporting destinations for Tanzania vegetables. All types of red and yellow sweet pepper or hot pepper have a great market in Qatar. The challenge has been to have the right quantity and the associated transport costs. In general, the Middle East and Far East are good consumers of Tanzanian horticultural products (TAHA, 2017). There is also a good market for European Union (EU) especially with the High Value Vegetables (HVV) due to the continuous expansion of vegetable processing factories for packaged foods. The problem however has been that more countries from Africa especially the Western African countries like Nigeria are producing a lot of vegetables aiming the same market.

Analysis of the current market chains (flow of vegetables from farm to consumers) with added value per link.

Supply Chain Overview

The vegetable supply chain in Tanzania is predominately a 'push' based supply chain. Farmers produce commodities that are 'pushed' into the marketplace via a highly indirect route which involves a large variety of middle men and traders. In these supply chains, producers (farmers) are generally isolated from the majority of end-consumers (customers) and there is little control over input costs or the price received for their goods. This trend appears to be true for the vegetable supply chain almost across the country.

Supply and demand trends

The study revealed that characteristics of vegetable prices are similar across all markets. Prices are said to be good during dry season when there is short supply and they drop when there is a high supply i.e. during or after rainy season. Normally prices are not fixed; they fluctuate every now and then. Each day might have its own price due to demand and/or supply of vegetables on that day. When demand is high vegetables will fetch good prices, for instance at Kilombero market tomato prices on 6th August 2017 was higher by 66% compared to the price for the previous day. A crate was sold at 50,000 compared to 30,000 the previous day i.e. 5th August 2017. The reasons advanced were that there was high demand in Mombasa and Dar es Salaam. As a result traders went directly to the farm and therefore causing scarcity at wholesale farmers' markets. The study learnt that for tomatoes the price is high in the months of March to May, then low in June July and then start to rise in the end of August to December. Some specific vegetables and their price profiles are as indicated in Table 5 (benchmarked for the year 2016). Generally almost all vegetables need timing for cultivating and planting. Table 5 also presents the correct time for planting and harvesting of different kinds of vegetables in the country to have a good price command in the market:

Table 5: Correct time for planting and harvest to get good vegetable prices

Vegetable type	Appropriate time to harvest	Measurement	Price (Tsh)	Bad time to harvest	Price (Tsh)	Appropriate time to plant
Tomatoes	Jan- May	40kg @crate	35,000-52,000	June- Dec	17,800-34,000	Sept- Dec
Onions	Jan- June	120kg @ Bag	136,000-200,000	July- Dec	90,000-135,000	Sept- Feb
Hoho	Feb- April	100kg @bag	110,000-200,000	July – Jan	52,000-110,000	Oct- Nov
Cucumber	Feb –May	50kg @bag	46,000-67,000	June- Jan	34,000-45,000	Dec- Jan
Carrots	Oct- March	100kg @bag	70,000-95,000	April- Dec	57,000-70,000	July- Oct
Irish potatoes	March- June	120kg @bag	91,000-116,000	July- Feb	77,000-90,000	Dec- Feb

Source: TAHA (2017)

Profitability along the chain

Chains can be very complex due to people's preference to do only business with others they know. In Table 6 several actors for an agricultural chain are listed with approximately margins they have. Margins on vegetables to farmers or producers are unknown. In our calculations of the gross margins however, it ranged between 2-4%.

Table 6: Market actors and the margins in the market chain

Actor	Description	Margin (% of consumer price)
Producer and Small holder retailers	Live in rural areas, selling products mostly only source of cash, sell product mostly directly at farm to void transport costs. Smallholder retailers sale vegetables in the evening markets and some public markets.	2-4%
Local brokers	Know the region and the producer. Do not have enough capital to act as large trader. Serve as intermediaries between producer and large trader.	7-20%
Large scale traders	Buy directly from farmers or through local broker	40,000 Tsh per trip
Transporters and transport brokers	They organize and facilitate transport, they don't buy product themselves.	10- 12% of transport costs
Brokers in central markets	They distribute large quantities over small buyers. Act as trade facilitators to match seller and buyer they know and by their presence at the deal act as a safeguard to guarantee a deal.	5 – 10%
Wholesalers in central markets	Small scale wholesalers have a working capital on average of 400,000 – 3,000,000 Tsh, Large scale have more than 5,000,000 Tsh. They sell large quantities and have equipment to grade and weigh their products. They also have the capital to pay right away in cash for transport.	8% +
Retailers in central markets	Mostly small scale traders who buy from larger trader and help them distributing products to the consumer.	20 – 50%
Export Agents	Collect large quantities from wholesalers or directly from large farms to export.	7 – 15 %

Source: Field data 2017.

The profitability analysis has been a painstaking process as the data gathered were not consistent. The reasons for the data to be unreliable and difficult to compare, both between actors and between regions are: (i) prices fluctuate significantly; (ii) the measurements in the chain are not standardized and even within one chain the measurements are changing from one actor to the next; and (iii) the actors in the chain are all prone to high risks of losses or damage. Despite the fact that data are inconsistent an attempt was made to calculate the Simplified Gross Margins (SGM) for the different actors. In most cases the activities are profitable but taking in account the above, the calculated SGMs can only be a proxy indicator of the profitability.

Using the survey data, the following average costs and prices were calculated:

- (i) Cost to Produce: The total cost that a farmer has to pay to produce this crop
- (ii) Received Price: The price that the farmer is able to sell his/her crop for at the local market (auction)

- (iii) Final Selling Price: The price at which the final salesman (usually a trader) is able to sell the crop

The conversions to Kilograms (Kg) in the market was based on the measurements commonly used in the market i.e. buckets, sacks, crates, bunches etc. Using this information, the following key metrics were calculated for 1 kg of each crop type as we are interested in the extent to which farmers receive a fair price for their produce and the relative profitability of each crop from the perspective of the farmer:

1. The Farmer Selling Price as a proportion of Final Selling Price: This shows the proportion of the final selling price that farmers actually receive. A low value indicates that farmers are in a weak negotiating permission as they are only able to charge a fraction of the final value of their goods.
2. The Farmer's Profit Margin: This shows profit as a proportion of the farmer's received revenue (the received farmer price). Similarly to the previous metric, a low value means that the costs of production are high relative to the received farmer price. This metric allows comparison of profitability between crops. In addition, the variance of cost to produce, received farmer price and final selling price in each season was also analyzed. The results of this analysis are summarized in the detailed analysis section below.

Summary of Findings – Farmers' Selling Price as a proportion of Final Selling Price

This figure provides a side-by-side comparison between *Masika* season (long rainy season with harvest in July/August) and *Vuli* season (short rainy season with harvest in January/February) of the farmer selling price as a proportion of final selling price for each season as indicated in the literatures studied:

Table 7: Selected Crop Margins (Volume in Kg and Prices in Tshs.)

Crop	Description	Masika	Vuli
Cucumber	Market selling price	Tshs. 1,236	Tshs.1,049
	Received Farmer Price	Tshs. 414	Tshs. 373
	Proportion of final selling price received by a farmer:	33.5%	35.6%
	Farmers Profit Margin	72.2%	22.7%
Eggplants	Market selling price	Tshs. 918	Tshs.787
	Received Farmer Price	Tshs. 409	Tshs. 1,134
	Proportion of final selling price received by a farmer:	44.5%	144%
	Farmers Profit Margin	24.1%	77.4%
Okra	Market selling price	Tshs. 2,078	Tshs. 1,810
	Received Farmer Price	Tshs. 781	Tshs. 1,132
	Proportion of final selling price received by a farmer:	37.6%	62.5%
	Farmers Profit Margin	22.5%	70.2%

Onions	Market selling price	Tshs. 1,379	Tshs. 1,239
	Received Farmer Price	Tshs. 350	Tshs. -
	Proportion of final selling price received by a farmer:	25.4%	-
	Farmers Profit Margin	58.2%	-
Sweet pepper	Market selling price	Tshs. 3,000	Tshs. 3,000
	Received Farmer Price	Tshs. 1,349	Tshs. 944
	Proportion of final selling price received by a farmer:	45%	31.5%
	Farmers Profit Margin	70.3%	45.7%
Tomato	Market selling price	Tshs. 1,213	Tshs. 1,379
	Received Farmer Price	Tshs. 1,241	Tshs. 350
	Proportion of final selling price received by a farmer:	102%	52.9%
	Farmers Profit Margin	85.9%	64.0%
Water melon	Market selling price	Tshs. 800	Tshs. 800
	Received Farmer Price	Tshs. 357	Tshs. 121
	Proportion of final selling price received by a farmer:	44.6%	15.2%
	Farmers Profit Margin	93.3%	77.8%

Source: VSO ICS Report April 2015

CONCLUSION

From the findings of this study it is concluded that:

- Most of the traders and growers in the sample have primary, secondary and tertiary education while a few of them have college and University education. The low level of education to many especially the smallholder farmers brings about problems in terms of search and understanding of different market information, price negotiation and adoption of marketing procedures domestically and internationally.
- Vegetable trade especially the retail one is more done by women. This is so probably because it requires less capital and done mostly in nearby places. This gives women more time to take care of their families.
- Smallholder traders in terms in market options are still constricted but still more opportunities are available for them. Teaming up for example makes it possible to save one big customer.
- Potential customers for the smallholder vegetable traders and growers are available. They need to extend their operations to the central markets and National Market. In their context being small, again teaming up to save one big customers like schools, hospitals, restaurants and some other institutions expands their market base.

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