Assessment of the Power Relations Among Strategic Actors in the Sesame Value Chain in Tanzania

ABSTRACT

This study assessed of the power relations among actors in the sesame value chain in Tanzania. It employed a cross-sectional research design, whereas a sample 58 Agricultural Marketing Cooperative Societies AMCOS was randomly drawn through probability sampling techniques. Data were collected using a survey questionnaire, Focus group discussions and key informants interviews and analysed using the descriptive analysis. The study found that (AMCOS) positively influence power relations among actors in the sesame value chain. Furthermore, the study found that capacity of sesame (AMCOS) in Lindi and Mtwara is low and policy framework guiding the sesame sub-sector is weak, hence paving the way to middlemen (*chomachoma*) dominancy, poor operation of Warehouse Receipt System (WHRS) and low productivity. It was further eminent that demographic factor age, education, sex, income and non-farm activities are important factor on the performance of actors in the chain. The study found that key sesame value chain activities were input supply, production, trading/exporting, transportation, processing and support services. The sub sector map shows sesame products currently flow via several alternative supply chain paths from farm to various end market consumers in Tanzania and Export channel. The data revealed that six primary channels or supply chain paths operate within the regions. The study concluded dominance of uncoordinated and unregulated middlemen (Chomachoma in the sesame value chain as well as heavy involvement of UNIONS and government in the marketing of sesame is the direct effect of weak support services provided by AMCOS resulting from lack of policy framework to guide the sub-sector. The Study recommends strengthening institutional and technical capacity of the sesame AMCOS and improving policy environment to allow the sub-sector to thrive and benefit its stakeholders, majority of who are resource poor smallholder farmers.

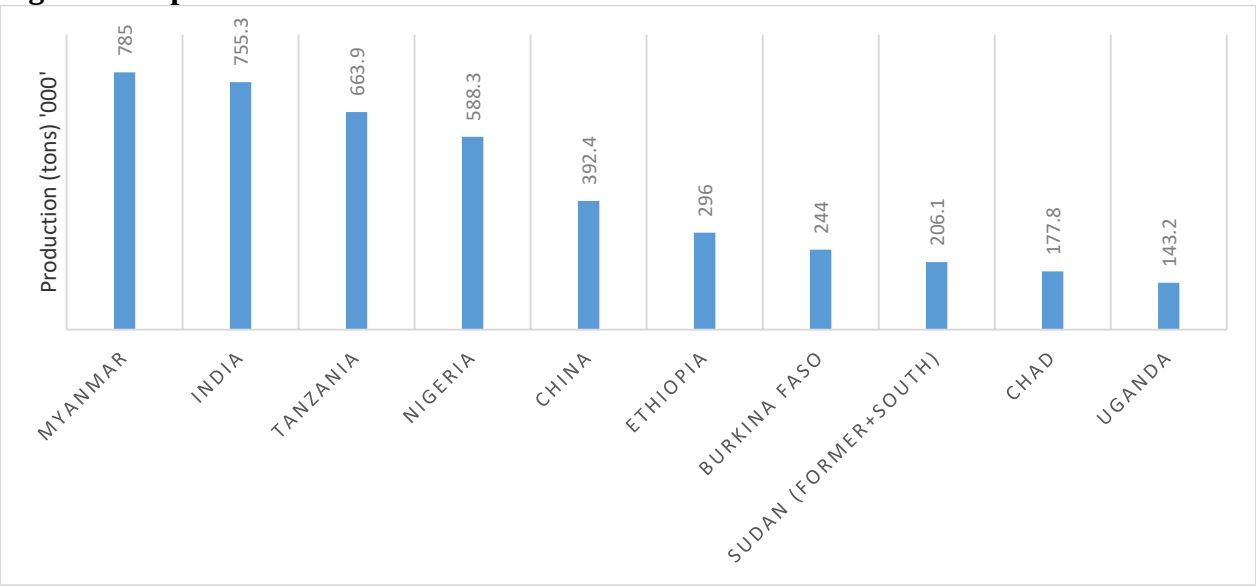
Keywords

Sesame Value Chain Chomachoma, AMCOS, WHRS

INTRODUCTION

The world production of sesame amounted to 6.1million tonnes with Tanzania, Myanmar, India, China and Sudan ranking top producing countries in the world (FAO, 2017). According to FAO (2017), estimated total national demand for sesame is 13 Million tonnes per year (ibid). However, the potential of sesame in Tanzania has not been tapped adequately; production is still low, and the sesame producing communities in Lindi and Mtwara are still poverty stricken; only 34,000 tons were produced in 2014 realizing only 8.5 percent of its full potential (TanTrade, 2016).

Figure 1: Top Producers of Sesame Worldwide in 2020



Source: FAO (2020)

The sesame is one among major export crops in Tanzania ranked the first in the world production in 2016, with total production of 940,221 tonnes (FAO, 2017). Lindi and Mtwara regions are the major sesame producers in Tanzania with a production of more than 400,000 tonnes in 2014; this is equivalent to 35% of all sesame seeds exported in Tanzania in 2014, and which benefited about 80,000 producers in the two regions (TanTrade, 2016). According to Naliendele Research Institute annual reports (NARI, 2011), sesame in Lindi and Mtwara accounted for almost 70% of the total sesame export from Tanzania. Sesame is among the highly demanded crops in the world market; projected global demand of sesame in 2016 was 250

million tonnes per year with the largest importers being Japan, China, US, Canada, the Netherlands, France, and Turkey.

Sesame is widely rooted crop in tropical regions around the world, and is the oldest oilseed crops known, domesticated well over 3000 years ago. It has one of the highest oil contents of any seed Its rich and nutty flavor makes it a common ingredient in cuisines across the world. Sesame is grown for its seeds, and the primary use of the sesame seed is as a source of oil for cooking. The young leaves may also be eaten in stews, and the dried stems may be burnt as fuel with the ash used for local soap making, but such uses are entirely subordinate to seed production (Linn, n.d.). However, Sesame is one of the crops in Tanzania whose potential has not been tapped adequately and its benefits have not reached majority of the resource poor farmers in the country (Mashindano and Kihenzile, 2013). It has the potential to contribute to household welfare, employment creation and poverty reduction for urban and rural dwellers if it was well developed coordinated and the export market was well exploited especially in the regions where it is grown.

Trading of sesame is highly regulated by government; the Government exerts a level of oversight and control and determines who can enter the market. There are two major marketing channels of Sesame in Tanzania; local market and export market. The local market channel is mostly dominated by middlemen locally known as "*Chomachoma*" and local processors. The export market channel is dominated by traders or exporters who buy sesame in auctions through Warehouse Receipt System (WHRS). Enforcement of WHRS has resulted into increased price of sesame; for example, some farmers at Kingoli AMCOS in Kilwa in 2018/2019 sold to middle-men (*Chomachoma*) their sesame at Tzs 1,300 per kg while their fellow farmers sold through WHRS at between TZS 2,292 and TZS 2,810 per Kg. However, despite the WHRS, Middlemen (*Chomachoma*) have still remained dominant chain actors enjoying between 30 and 60 percent of the value created by the WHRS with gross margin of about TZS 1,292.02 per Kg. AMCOS have not prioritized support services to their members other than operating as collection centers: about 65.2 percent of the services offered by AMCOS were collection and selling of the sesame, 11.2 percent access to inputs, 15.7 percent linkage to technical skills and assistance, and 7.9 percent access financial support; and hence paving the way to "*Chomachoma*" dominancy. Total sesame traded in 2018/19 amounted to 62,494,628 kg (Lindi 53,752,748 kg and Mtwara 8,741,880kg).

Cognisant, Financial institutions operating in the Lindi and Mtwara regions are mainly CRDB Bank, NBC Bank, NMB Bank, Postal Bank of Tanzania and Yetu Bank. According to Lindi and Mtwara Regional Guidelines for sesame (2019), the regional governments (Lindi and Mtwara) is generally responsible for provision of guidelines, supervision of implementation of WHRS, provision of cooperative education, and conflict resolution and arbitration. TARI Naliendele is responsible for research, provision of improved foundation seeds and extension support; TARI-Naliendele developed and released several varieties of improved sesame seeds which are *Bora, Naliendele 92, Zawadi 94, Ziada 94, Lindi 2002, Mtwara 2009, Mtondo 2013*; however, only three varieties *Lindi 2002, Ziada 94* and *Naliendele 92* are in use by farmers; this is because these seeds are perceived to have more yields and are more pests, diseases and climate resilient. Agricultural Seed Agency (ASA) is responsible for seed multiplication and promotion. District councils are responsible for extension services.

This study was conducted to guide interventions that can unlock the potentials of the sesame sub-sector by assessing the power relations among actors in the Sesame value chain in the study area. The study has identified contraints and opportunities for leverage, and has proposed key priority interventions and policies that are thought to come up with an efficient and competitive sesame sub-sector in Tanzania.

Value Chain Theory

The study was guided by Value Chain Theory. Kaplinsky & Morris (2001) defines value chain as the full range of activities that are required to bring a product or service from conception, through the different phases of production, delivery to final consumers and final disposal use. Usually, the existence of value chain development is found where operators share common vision and goals for managing the chain processes, thus allowing for mutual decision-making on how to link production with markets and sharing of risks and benefits. The better all value chain partners cooperate, the greater will be the value generated for the individual operator at every stage of the chain (Will, 2008). Value chain operates within a range of institutional environment which affects its performance; within the institutional environment there exist laws, rules, policies and regulations, social norms and customs, organizational culture, structures, trade

agreements which in one way or the other, affect performance of the value chain (KIT & IIRR, 2006). Sesame value chain in Tanzania involves different participants who are categorized into three types: primary actors- these are the core actors that feed the chain, secondary actors-these include input supplies, extension and financial services and contemporary actors that include associations, projects and NGOs which create the enabling environment and organizations which influence laws, regulations and policies. The sesame value chain actors include sesame producers, sesame traders/intermediaries, processors, retailers and distributors (wholesalers) (Magabe, 2016). This study employed value chain theory to map the sesame value chain in Lindi and Mtwara and assess its strategic position in relation to its actors namely inputs suppliers, producers (farmers), Middle-men (Chomachoma), traders, exporters, Cooperative societies and support services. The theory has provided the means of linking up different activities to bring about business value and examine organizational production and support processes and their contributions towards developing competitive sesame sub-sector in the study area.

METHODOLOGY

The study was carried out in Liwale and Kilwa districts in Lindi region, and in Masasi rural and Nanyumbu districts in Mtwara region.The study adopted a cross-sectional research design where data was collected in the four districts in one time, and then employed descriptive study to determine relationship of variables (Kothari, 2004). Methods of data collection used were questionnaires, focus group discussion and key informants. A sample of 58 AMCOS dealing with sesame in the study area were drawn using stratified random sampling, and one leader (chairperson, vice chairperson, clerk or assistant clerk) from each AMCOS participated in the study as respondent. Data was collected from the four selected districts two from each region; Masasi and Nanyumbu in Mtwara and Liwale and Kilwa in Lindi. Secondary data was sourced from AMCOS in Mtwara and Lindi regions, Lindi and Mtwara Regional offices, UNIONS' offices, Ministry of Agriculture, Food Security and Cooperatives (MAFSC), Ministry of Industry, Trade and Marketing MITM & Tan-Trade. Key informants interviews were carried out with relevant officials among Local Government Authority representatives, District Councils, Financial Institutions, UNIONS and traders. The key informant interviews using a checklist were carried out to obtain value chain actor-specific information for assessing its modus operandi, performance, and its success and failure factors so far. Descriptive and content analysis

methods were used to analyse the data. Profitability analysis was done by calculating gross margins and simplified gross margins to establish the profit margin that different chain actors earned; this was done to provide a basis for understanding actor's benefits along the sesame value chain. Description of the sesame value chain was done quantitatively by identifying and examining the core function of each actor in the chain (primary, secondary and contemporary) and the channels that the sesame pass from the production to the last consumer. An initial map was drawn using data collected through key informants and focus group discussions which enabled to describe the value chain map and relative function of each actor. After triangulating the information with AMCOS representatives and secondary data, the map was adjusted.

Since the sampling frame was the AMCOS dealing with Sesame in both Lindi and Mtwara, and since the sample size was 58, then the number of AMCOS to be selected for each region were allotted proportionally (Number of AMCOS engaging is sesame in the particular region X 58 /106; where number of AMCOS engaging in Sesame in both Lindi and Mtwara was 106). The same formula was applied to apportion number of AMCOS in each district. The Number of AMCOS selected for each district was as follows; Liwale DC (14 out of 25), Kilwa DC (11 out of 20), Masasi DC (17 out of 31) and Nanyumbu DC (16 out of 30). Table 1 shows sampling distribution of the study.

Table 1: **Sampling distribution**

Region	**District**	**AMCOS**	**Proportionate Sample size**
Mtwara	Masasi	31	17
	Nanyumbu	30	16
Lindi	Liwale	25	14
	Kilwa	20	11
	Total	**106**	**58**

RESULTS AND DISCUSSIONS

This chapter presents and discusses the main findings of the study. The first section presents the socio-Economic characteristics of respondents. The second section presnte startegic actors

characterists against service delivery of the cooperatives in the study area these included; third section presents presents descritiom and mapping of sesame value chain in the study area.

Socioeconomic Characteristics

Unit of enquiry were AMCOs leaders; chairpersons, vice-chairpersons, clerks or assistant clerks. A total of 58 AMCOS leaders were interviewed using structured survey questionnaire. In the Mtwara region a total of 33 AMCOS out of 61 were selected and from which a total of 13 Chairpersons, 18 Clarks and 2 assistant clerks; being 39.4 %, 54.5 % and 6.1 % of respondents respectively were interviewed. In the Lindi region 25 AMCOS out of 45 were selected and from which a total of 7 chairpersons, 3 vice-chairpersons, 10 clerks and 5 assistant clerks; being 28 %, 12 %, 40 % and 20 % of respondents respectively were interviewed. **Error! Reference source not found.** indicates category of respondents in Mtwara and Lindi regions

Table 2**: Category of respondents in the study area**

Title of Respondent	**Mtwara**	**Lindi**
Chairperson	13 (39.4%)	7 (28.0%)
Vice Chairpersons		3 (12.0%)
Secretary	18 (54.5%)	10 (40.0%)
Assistant Secretary	2 (6.1%)	5 (20.0%)
Total	33 (100.0%)	25 (100.0%)

The Socio-Economic characteristics of respondents have important implication on the actors power relation. The composition of the board and the management of the cooperative society as well as gender and age usually influence the decisions and the manner the cooperative society operates. This section describes the characteristics of sampled respondents based on age, gender and education level in relation to power relation. Further, these attributes were relevant to the study since they have a bearing on the respondent to provide information that is valid, reliable and relevant to the study.

Age of respondents

Age of respondents in Cooperative societies of Mtwara region ranged from 24 to 70 years, mean age was 39.88 and standard deviation was 9.980, while age of respondents in the Cooperative Societies of Lindi region ranged from 23 to 72 years, mean age was 42.40 and standard deviation was 12.712 (Table 3). It is an important aspect with respect to the power relation, because it determines the experience one has in the governance and management of the cooperative society.This indicates that majority of the respondents are in their middle age and therefore suitable in undertaking management and governance work which require effective decision making.

Table 3**: Distribution of Respondents by Age**

Region	Variable	N	Minimum	Maximum	Mean	Std. Deviation
Mtwara	Age of Respondent	33	24	70	39.88	9.980
Lindi	Age of Respondent	25	23	72	42.40	12.712

Level of Education of the respondents

The study found that level of education of respondents varied from primary education to tertiary, with majority being of primary and secondary level. In Mtwara region 13 (39.39%) respondents had primary education, 17 (51.52%) secondary education, and 3 (9.09%) tertiary education Likewise, in the Lindi region shows that half of interviewed respondents 13 (52%) had primary education, while 11 (44%) had secondary education and only 1 (4%) had tertiary education; This indicates that majority of the respondents are literate and therefore suitable in undertaking farm and business productive activities which require technical knowhow Further, education is believed to improve the readiness of the household to accept new idea, innovations and better use of market information, which in turn reduces marketing costs and make it profitable to participate in the market channel entry decision and increase volume of sale and education level influence performance of cooperative societies. Education level refers to academic credentials or degree an individual has obtained (Arayesh, 2017).

Table 4**: Distribution of Respondents by Level of Education**

Region	Primary	Secondary	Tertiary	Total
Mtwara	13 (39.39%)	17 (51.52%)	3 (9.09%)	33 (100%)

Lindi	13 (52%)	11 (44%)	1 (4%)	25 (100%)

Value chain Actors Characteristics and Power Relation

Sesame Value Chain in respect to this study encompassed activities involved in the sesame sub-sector in the Lindi and Mtwara regions; from its production at a farmer level to its final use (consumer) and institutional framework within which the value chain operates. The study found that key sesame value chain activities in Lindi and Mtwara included: inputs supply, production, trading/exporting, transportation, processing and support services. Key actors associated with the activities were inputs suppliers, producers (farmers), middle-men (commonly known as *Chomachoma*), traders, Processors, exporters, Primary Cooperative Societies (AMCOS), UNIONS, TARI- Naliendele, Government, District Councils, and financial institutions (Banks).

- **Inputs Supply**

The study found that most of inputs supply shops in Lindi and Mtwara region are located in city centres, with limited outreach to rural areas, operating on a small capital base, which limits their ability to procure meaningful stocks for new technological products. Most inputs suppliers (inputs shops) operate seasonal business; they are only active during farming season when they have to supply inputs to smallholder farmers, and stay idle during the rest of the year. It is common for small holder rural sesame farmers in the Lindi and Mtwara to travel great distances just for the opportunity to purchase seeds, herbicides, pesticides or other agro-chemicals. Lack of access to basic farm supplies has made it virtually impossible for small-scale farmers to increase their yield or incomes, reinforcing widespread poverty. Most of the sesame farmers in the study area use recycled seeds in consistence with the findings of Masalawala (2013). Approximately 93% of the seeds used by smallholder farmers in Tanzania each farming season are recycled from the previous crop (Masalawala, 2013).

Efforts made by TARI – Naliendele to develop sesame improved seeds has increased availability of the improved varieties of sesame, however the uptake by smallholder farmers has been very low. The low uptake of the improved seeds by smallholder farmers is partly attributed to the lack of awareness of the economic benefits, as well as low promotion or information

provision, and inadequate supply of the improved seeds (Masalawala, 2013). The use of recycled seeds with limited use of fertilisers and agronomic practices leads to low productivity. Agriquest (2013) argues that to increase agricultural production, farmers require a number of factors, which include: timely supply of improved seeds. Lack of business skills and financial literacy, and limited access to financial support (working capital) by many inputs suppliers are other limiting factors contributing to the limited access to agricultural inputs. Many inputs suppliers, particularly the rural inputs suppliers are not bankable as they lack collaterals.

- **Production**

The study found that Sesame production in Lindi and Mtwara is mostly done by smallholder farmers with farm size ranging between 0.2 and 1.6 hectares. This finding confirms the finding by TanTrade (2016) which asserted that increased oil seed farming like sesame and sunflower is carried out by small-scale as a source of income, given their high demand locally and internationally (TanTrade, 2016). The role of sesame farmers in the study area is prescribed in the Lindi Regional Sesame Guideline (2019); the guideline states that the role of farmers is the production of sesame and post-harvest handling (harvesting, drying, cleaning, packaging, transporting to designate warehouse and to ensure security of his property). Production of sesame in the Lindi and Mtwara is characterized by low productivity /low output. Average sesame yield is currently at 800kg per hectare, while according to TARI –Naliendele (NARI, 2011) standard average recommended yield per hectare under good agricultural practices and use of improved seeds such as Lindi 2002 variety (Lindi white) is 1,500Kg (NARI, 2011). This finding is also supported by FAO and ILRI. According to FAO (2017), world yield of sesame was recorded at 5,778 kg/ha. African yield levels are quite low, about one third of Asian yields. The reasons for the low productivity include among other reasons: small size farms, distance from markets, use of poor seeds (outmoded seeds), lack of agronomic knowledge and seasonality. Smallholders farmers in Africa are very much exposed to seasonality (ILRI, 2007). The low sesame productivity in Lindi and Mtwara is partly caused by the use of recycled seeds, little knowledge of farmers on Good Agricultural Practices (GAP) and inappropriate use of agro-chemicals (pesticides, weed and disease control chemicals) and lack of extension support services; according to Rutatora (2000), there is a significant correlation between falling productivity of smallholder farms and reduced provision to technical training, inputs and infrastructure support

(Rutatora and Mattei, 2000). Sesame farmers in Lindi and Mtwara practice shifting agriculture, whereby each two or three years they open new fields and desert the previous ones. The problem of lack of knowledge among sesame farmers is associated with lack of services supposed to be offered by AMCOS or other actors in the value chain. The study found that while farmers were highly constraint by limited access to inputs (improved seeds and agro-chemicals), access to finance and lack of extension support; cooperative societies mainly concentrated their efforts in coordinating collection or aggregation and marketing of sesame. About 65.2 percent of the services offered by AMCOS were collection and selling of the sesame; 11.2 percent access to inputs; 15.7 percent linkage to technical skills and assistance; and 7.9 percent access financial support.

Although the production of sesame in the study area for the last nine years has been rising and falling irregularly, but general production trend is on rising; production of sesame in Lindi region has increased by 82.4 % (Table 5): The increase in production in Lindi and Mtwara is associated with increased number of farmers engaging in the sesame production rather than the production efficiency or productivity. The study shows that, out of the selected sample (58 AMCOS) the number of AMCOS whose members engage in Sesame production in Mtwara increased from 7 in 2014/2015 to 33 in 2019/20 and in Lindi increased from 7 in 2014//2015 to 25 in 2019/20.

Table 5: Production of Sesame (Kg)

Region	2011/2012	2018/2019	Percentage Change
Mtwara	-	8,741,880	-
Lindi	9,487,056	53,752,748	82.4

Average number (mean) of farmers that engage in Sesame production per AMCOS in Mtwara and Lindi regions increased by 21.4% and 8.4% respectively (Table 6).This finding concurs that of Magabe (2016). Magabe attributes the rise in the production of sesame in Tanzania entirely to the increased investments by smallholder farmers (Magabe, 2016).

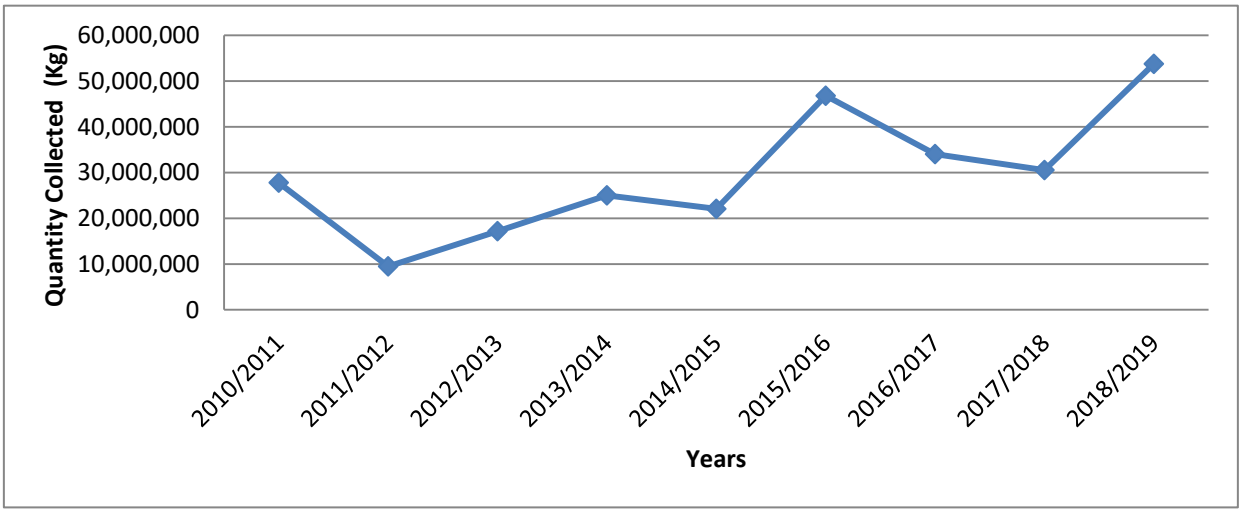
Table 6: Average Number of Farmers Engage in Sesame Production per AMCOS

Region	2015/2016	2018/2019	Percentage Change
Mtwara	220	280	21.4

Lindi	262	286	8.4

Average revenue and gross margin of a farmer from one acre of sesame (400kg) differs from one region to another and from one farmer to the other, depending to whether the farmer works on a new farm or an existing one. Average price of sesame in the 2018/19 season in Lindi was TZS 2,744.15 per kg, while in Mtwara was TZS 2,721.89. Total average revenue from one acre was TZS 1,097,660 in Lindi and TZS 1,088,756 in Mtwara. Gross margin per acre for a farmer ranged from TZS 489,660 to TZS 564,660; on average it was TZS 527,130 per acre which was about TZS 1,317.82 per kg (*Assumption: 1 acre =400kg of sesame*). The average gross margin was twice the costs of production. Cost of production of sesame per kilogram ranged from TZS 1,332.5 and TZS 1,492. A smallholder farmer can get up to 7.9% loss by selling the sesame through middlemen (chomachoma), but gross profit margin of up to 93.52% by selling through WHRS or up to 254.04% by selling as recycled seeds during farming seasons when sesame is sold at TZS 5,000 per kg.

Figure 2: Sesame production trend in Lindi region



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- **Sesame Trading**

The study found that trading of sesame in Lindi and Mtwara is highly regulated by government. The Government exerts a level of oversight and control and determines who can enter the

market. Every year the local government authority (Lindi and Mtwara regional governments) issues policy framework to guide the trading of sesame in the respective regions. Sesame marketing is done through auction organized and conducted by AMCOS and UNIONS. Heavy government control in business and marketing in the agricultural sector and the economy as a whole is one of the factors that compounds the poor performance of sesame sub-sector in Lindi and Mtwara. For example, various fees payable to AMCOS and UNIONS amounting to TZS 102 per kg, instituted by the government in Lindi creates no incentives for farmers to engage in agricultural production as a business.Trading of sesame involves a set of activities and actors; the trading activities include collection or aggregation of sesame in AMCOS warehouses, cleaning and packaging, conducting auctions and transporting the sesame from the AMCOS warehouses to buyer's site. Key value chain actors include Middle-Men (Chomachoma), buyers/traders or exporters, AMCOS and Unions.

The marketing channels

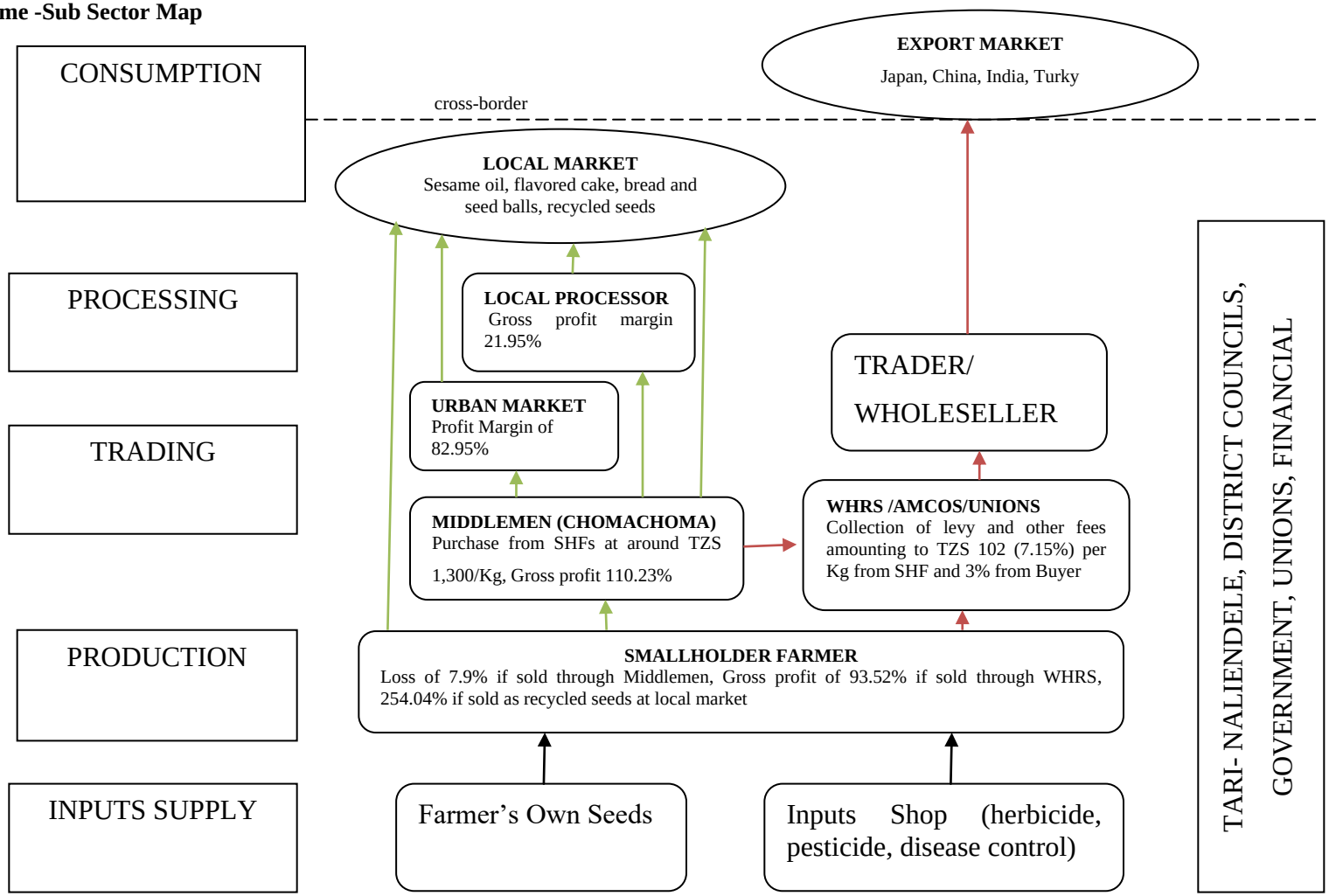
The marketing channels in Figure 2 shows all the actors involved in the Sesame value chain in the study area. The sub sector map shows how sesame products currently flow via several alternative chain paths from farm to either local market (consumers in Tanzania) or to Export Market. The study found two primary channels operating in the study area; one leading to local market and another leading to export market.

The first market channel is from a farmer (producer) to end local consumer or local market either directly or via middle-men (Chomachoma); these local consumers may include farmers who buy the sesame as seeds for the purpose of recycling in their farms, for food or for local processing. Sesame is locally consumed in its raw or semi-processed form; used as ingredient in vegetable or processed into sesame oil, seed cake, sesame butter, sesame paste, sesame flavored cake, sesame balls, and sesame flavored bread and other cookies. Given its commercial importance, only little of it is directly locally consumed. Smallholder farmers normally after harvesting do keep little of the sesame as seeds for the next season. They don't sell all of it; they keep some which they may also sell to their neighbors during farming seasons. Some smallholder farmers are only able to undertake their farming activities with the support of middlemen called Chomachoma, and in return, the Chomachoma are not paid in cash, but rather in sesame seeds. Among the options that

Chomachoma has are to resell the sesame locally as seeds, to sell to local processors or to sell to the local market for direct consumption as food. Many local processors normally operate at very low capacity and are not able to take part in auctions conducted by AMCOS or UNIONS. This is because the regulations require that whoever bids in auction should put a minimum security bond of TZS 10,000,000. This amount is regarded as too big for local processors; they cannot afford it. Most of such processors buy sesame directly from Chomachoma or farmers, process it into their desired products; products include sesame oil, seed cake, sesame butter or paste, sesame flavored cake, sesame balls, and sesame flavored bread and other cookies. This marketing channel is thinner than the export market channel. There is generally no regulation governing this business relationship because the business arrangements are informal. However, the government discourages informal business on sesame; the government has put in place policy to ensure that all sesame is sold through warehouse receipt system. Therefore anything outside warehouse receipt system is regarded illegal and is liable to legal sanctions

Second marketing channel is to the Export Market. This channel is regarded as official and is coordinated by the government, Primary Cooperative Societies and UNIONS through Warehouse Receipt Systems (WHRS). Farmers collect and aggregate their produce in their AMCOS warehouses, and the sesame is sold through Auction. The traders, who buy the sesame do cleaning, de-stoning, repackaging according to export requirements, branding and shipping to designate destinations. Most Middlemen also sell through this system; they collect sesame from smallholder farmers, clean, aggregate and sell through the WHRS as other ordinary farmers. This is possible because most of the Middle-men (Chomachoma) are also local sesame growers, they therefore they mix what they have harvested from their farms and what they have acquired from other farmers. Most of the Sesame of Tanzania is exported to Japan, Turkey, China and India. Sesame in the export market is used for food, cosmetics and pharmaceuticals. In China for example, Sesame is used to flavor cakes, cookies and popular desserts such as sesame seed balls and fried custard. Most of the sesame from Lindi and Mtwara go through this market channel.

Figure 3: Sesame -Sub Sector Map



- **Warehouse Receipt System (WHRS)**

All sesame in Lindi and Mtwara is supposed to be sold through Warehouse Receipt System (WHRS). The WHRS was intended not only to ensure collection of government levy, but also to help the smallholder farmers gain better prices. Since the introduction of the WHRS, the price of sesame has increased very significantly; for example, while at Kingoli AMCOS in Kilwa in the 2018/2019 season some sesame farmers who sold to middle-men (*Chomachoma*) sold at Tzs 1,300 per kg, those who sold through WHRS got between TZS 2,292 and TZS 2,810 per Kg. Unfortunately, to the surprise of many, the intended smallholder farmers, who actually are the majority, have become the main losers. The study found that most smallholder farmers produce about 400kg/acre per year, and most of them do so with the support of *Chomachoma*. Once they have paid back *Chomachoma's* dues, they remain with very little sesame produce which they consider as insignificant or less attractive to carry it to the AMCOS; especially considering the associated costs such as transportation, loading and off-loading, warehouse fees, marketing service fees and bank account operation costs. So, they prefer selling to *Chomachoma* as well. Apart from transportation, a farmer in Lindi pays Tzs. 100 per kg while his counterpart in Mtwara pays Tshs.102 per kg for various services offered by AMCOS, Unions and the government. In addition to the various fees, each farmer in order to sell through AMCOS must have a personal bank account to be credited directly; a smallholder farmer uses his account only once a year to receive his payments and once paid the account is left idle for the rest of the year; there are account operation costs and account renewal costs every year that the bank account holder is subjected to. All these put together discourage smallholder farmers to sell their produce through AMCOS or WHRS, they instead prefer to sell to *Chomachoma,* who in turn sell through the AMCOS /WHRS and take the largest stake. It was learned during focus group discussions and Key informant interview that between 30 and 60 percent of the sesame sold through AMCOS go through the hands of *Chomachoma.* It is therefore the *Chomachoma*, and not the smallholder farmers who benefit the most from the WHRS in Lindi and Mtwara. Warehouse receipt System would be more useful and would eliminate "chomachoma" if AMCOS had provided their members with mechanism to access financial and extension services. This failure of cooperatives to provide market access to its members is also argued by Schulz and Mbuvi, according to Schulz and Mbuvi (2010), an attempt by sesame farmers' cooperatives to use Warehouse Receipt System as marketing strategy in Lindi and Mtwara has failed and

discouraged farmers to engage in the sesame value chain development (Schulz & Mbuvi, 2010). WHRS (AMCOS, UNIONS, LGAs, Research and Development and other services) take about 7.15% as service fees and levy from a Smallholder farmer and 3% of the purchasing price from buyers

- ***Middlemen (Chomachoma)***

Middlemen in the case of sesame in Lindi and Mtwara are locally known as "*Chomachoma*". These are normally local medium and large scale farmers and entrepreneurs, mostly local shop owners. Unlike in other places where middlemen are considered as intermediaries between farmers and traders, in Lindi and Mtwara middlemen are companions of the smallholder farmers in one way and enemy in another way. Although they are considered illegal in the Sesame business, Chomachoma have big stake in the sesame value chain development in Lindi and Mtwara regions. There exist significant business relationship and partnership between smallholder farmers and the middlemen (*Chomachoma*). Their relationship is trust-based; *Chomachoma* provides a smallholder farmer with support such as farm working capital (Seeds, agro-chemicals, money), whereas in return the smallholder pays agreed quantity of sesame seed after harvest. The assistance is not limited to the farm working capital alone, but it extends to cash for other purposes such as school fees, food, medical services and other family or personal related needs. It is more so because sesame smallholder farmers in the Lindi and Mtwara are unable to meet production costs without financial and technical assistance and inability of AMCOS, District Councils and interested actors to undertake such a role. In short, the *Chomachoma* take the role that would have been taken by AMCOS, to offer extension services and credit support. Relationship between *Chomachoma* and smallholder farmers is not only based on trust, but also cemented by family ties. However, while smallholder farmers consider *Chomachoma* as trust worth and important business partners, the government considers them illegal; neither the existing laws nor the regional sesame guidelines recognize them. As a result, some *Chomachoma* knowing the risks associated with the illegal business and due to the lack of regulation to guide the business relationships, they demand disproportional returns from the smallholder farmers, and hence making the smallholder farmers unstable. Average price that Middlemen (Chomachoma) paid a smallholder farmer in 2018/2019 season was TZS 1,300 per kg, and in turn the Chomachoma sold the sesame through warehouse receipt system at average price of TZS 2,733.02 per Kg. Costs incurred by the middlemen (Chomachoma) are: packaging

(TZS 20 per Kg), Transportation (TZS 20 per Kg) and fees and levy which include union fees, AMCOS fees, Development Fund, and packaging materials (TZS 102 per Kg in Lindi and TZS 100 per Kg in Mtwara). Therefore, on average the middlemen paid cost of TZS 141 per kg, hence total cost is TZS 1,441 per Kg. Therefore on average, gross margin of a middleman (Chomachoma) is TZS 1,292.02 per Kg. On average, Middlemen can make gross profit margin of up to 110.23% by selling through WHRS or up to 284.62% buy selling as recycled seeds. Urban market or traders may make up to 82.95% gross profit.

- ***Traders***

Next in the sesame value chain in Lindi and Mtwara are traders. Traders that the Lindi Regional Sesame Guideline (2019) and Mtwara Regional Sesame Guideline (2019) recognize as buyers are those who have business license, including local and international individuals or companies registered and operating under the laws of Tanzania. Total sesame bought during 2018/19 Season from Lindi and Mtwara regions amounted to 62,494,628 kg (Lindi 53,752,748 kg and Mtwara 8,741,880kg). Most of Sesame from Lindi and Mtwara is for expert market. Most traders, who buy the sesame, do so for export purposes; the role of traders is buying, transporting, cleaning, de-stoning, repacking according to export requirements, branding and shipping to designate destinations. Most of the Sesame of Tanzania is exported to Japan, Turkey, China and India. Sesame in the export market is used for food, cosmetics and pharmaceuticals. In China for example, Sesame is used to flavor cakes, cookies and popular desserts such as sesame seed balls and fried custard.

Business of Sesame in the Lindi and Mtwara regions is regulated and properly controlled by Government through well stipulated regional guidelines. The guidelines are issued every year, and the most recent guidelines are Lindi Regional Sesame Guideline (2019) and Mtwara Regional Sesame Guideline (2019) that guided the sesame marketing during the season of 2018/19. The guidelines stipulate a set of procedures and process to follow and to adhere when engaging in buying or selling of sesame. The sesame in Lindi and Mtwara can only be bought through auction, and the buyers are subjected to a set of conditions and procedures in order to qualify to buy the sesame from the two regions. The conditions under which the buyers are subjected include to be registered by regional cooperative officer (assistant registrar) as buyer

of sesame in the respective region and season, to lodge official bid documents accompanied with a deposit slip of bid security as stipulated in the guideline (not less than TZS 10,000,000), to pay for all permits as required by respective districts authorities, to submit all bid documents to the Union one day before the auction and to pay for the successful bid in time. A successful bidder is required to immediately pay the district council levy of 3% of the market price (to deposit directly in the account of District Council), packaging materials (sacs) and to off-take all his consignment before the next auction takes place. The successful bidder for the case of Mtwara has to pay all his dues within two days after the sales invoice is issued, failure to do so, the Sesame would be sold to the second bidder in the list, and would be liable to a fine of 10 percent of the bid security as disturbance fees, and the difference in price between the first successful bidder and the second bidder shall be deducted from the security deposit. In case the successful bidder fails to comply with the condition of removing the sesame from the warehouse within two days after the payments, the bidder will be subjected to a fine of TZS 500 per kg per day for all extra days.

Companies (Buyers) that participated in the auction of the 2018/19 season and eventually bought sesame from the study area were 20 in number, namely H.S Impex LMT, Afrisian Ginning Ltd, Hyseas International Investment (T) Limited, Yihai-Kerry Hyseas Trading Ltd, Mega Movers Limited, Maviga East Africa Limited, Olam (T) Ltd, R.V.Exports Limited, Poa Price Mills, The Agro Processing Company Ltd, Export Trading Company Ltd, Bulewa Trade Company Limited, Afri(Ea) Limited, S.M.Holdings, Scalable Pace Investment Ltd, Sunshine Commodities Private Ltd, Rbst International Agribusiness Ltd, Nine Five Group Ltd, Hashimu And Sons Company Ltd And Tarhan Arin Ltd.

- ***Agricultural Marketing Cooperative Societies (AMCOS)***

Section (23) of the Cooperative Societies Act (2013) stipulates the objects of Agricultural based cooperative societies as being to provide services to its members including supplying agricultural inputs and collecting, processing and marketing of the products of their members. However, out of 58 AMCOS studied; while all the 58 AMCOS act as collection and selling points of sesame, only 10 facilitate access to inputs, seven (7) provided financial linkages and 14 facilitate access to technical skills and assistance to their members. This is happening while the farmers

themselves are complaining about the lack of those services such as access to credit, extension services, inputs and technical skills and assistance. The study found that 65.2 percent of the services offered by AMCOS were collection and selling of the sesame, 11.2 percent access to inputs, 15.7 percent linkage to technical skills and assistance, and 7.9 percent access financial support.

Table 7: Services offered by AMCOS in Lindi and Mtwara regions

Service	Frequency	Percent (%)
Collecting and Selling Via WHRs	58	65.2%
Farm Inputs	10	11.2%
Financial Support/Loans	7	7.9%
Technical skills and assistance	14	15.7%
Total	89	100.0%

The study further found that there is no much sense of ownership of the cooperative societies by some cooperative societies' members; some farmers became members of Cooperative societies by coercion of the government and not by their free will. The government has made it mandatory for all sesame farmers in Lindi and Mtwara to sell their sesame through WHRS. Some farmers do not appreciate the relevance of the cooperative societies, they consider it as a mere crop collection points designed to facilitate collection of government revenues, which in 2019 amounted to TZS 100 and TZS 102 per kg in Mtwara and Lindi region respectively, payable by a farmer, and 3 percent of the buying price payable by a buyer as district's council levy. No other relevant service apart from collection of sesame is thought from the cooperative societies. Further, all decisions made by board or Annual General Meetings of cooperative societies have to get approval from assistant registrar of cooperative societies. This finding is line with the observation made by Special Committee of Enquiry established by the president of Tanzania in January 1966. According to Maghimbi (2010), the Committee of inquiry established five basic problems of cooperative movement in Tanzania, namely, shortage of appropriate manpower, presence of uniformed membership, lack of democracy at union level, lack of skilled manpower, and susceptibility of the cooperative movement to political interference. Cooperatives often play a pivot role in agricultural value chain development and market access by providing critical

services to their members, who in most cases, are smallholder farmers. According to Mellor (2017), in low income countries, when effective cooperatives form, they bring added competition and margins tend to decline. Cooperatives are key in improving price information and market participation, increasing adoption of improved technology, and increased farmer income.

According to the Lindi Regional Sesame Guideline (2019) chapter (4.5), and Mtwara Regional Sesame Guideline (2019) chapter (3.1.6) AMCOS with respect to Sesame in both regions have to prepare and maintain list of all sesame farmers, to collaborate with government extension officers to supervise quality of sesame, to collect quality sesame from famers, to weigh and issue receipt to farmers in respect of the sesame received by the AMCOS, to ensure that the sesame collected is stored in appropriate approved sacs (weighing 50 kg each), to ensure that all sacs are labeled and marked by the registration number of the AMCOS, to prepare payment list of farmers and submit to cooperative officers for verification before final submission to banks, to administer payments of farmers (to follow up with respective Unions on the payment of the farmers), to ensure payments of all approved fees (levy) to respective authorities and actors, to maintain records of payments and collection of sesame, to relay relevant information among actors, to ensure that weighing scales have been inspected by Weights and Measures Agency before use, to post in the notice boards the names of famers who have collected sesame and their status of payments, and make available the farmers information especially those concerning the sales and banks so that the farmers themselves can verify.

Until January 2020 number of AMCOS engaging in Sesame production in both regions put together reached 230 (Lindi 134 and Mtwara 96), and except for a few in Lindi region, all AMCOS were primarily founded for Cashew nut marketing, it is only later that they incorporated Sesame in the list. According to RAA Lindi and Mtwara, total amount of sesame in Lindi and Mtwara collected and sold through WHRS during 2018/19 Season was 62,494,628kg (Lindi 53,752,748kg and Mtwara 8,741,880kg), worth a total of TZS 171,300,218,084 where as Lindi region TZS 147,505,726,256 and Mtwara region is TZS 23,794,491,848. RAA Lindi and Mtwara regard the total collected sesame as the total production in the study area for the season 2018/2019.

Figure 4: Number of AMCOS Vs Revenue collected from Sesame Sales in Lindi region in 2018/19

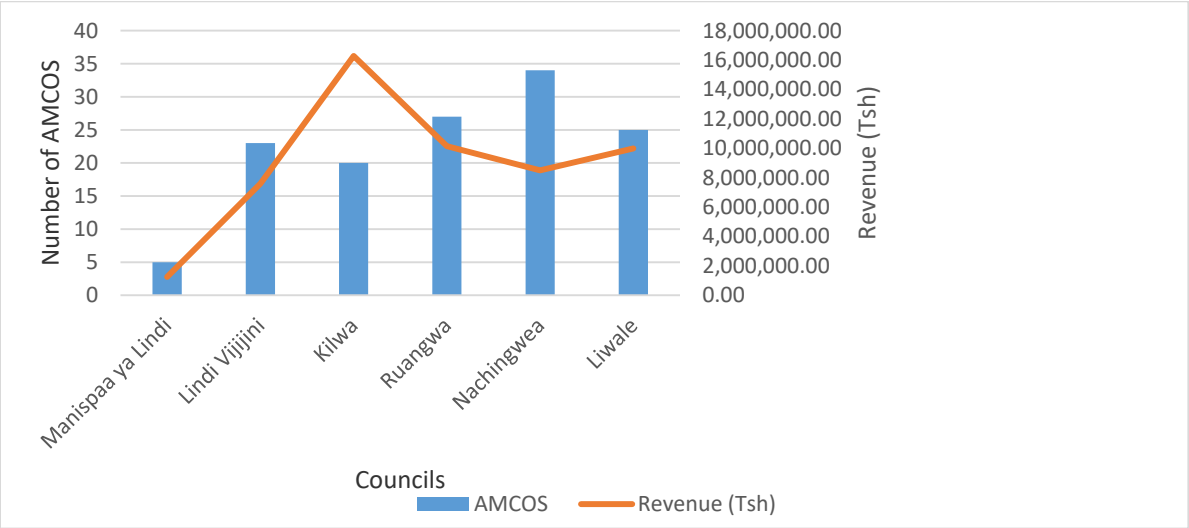
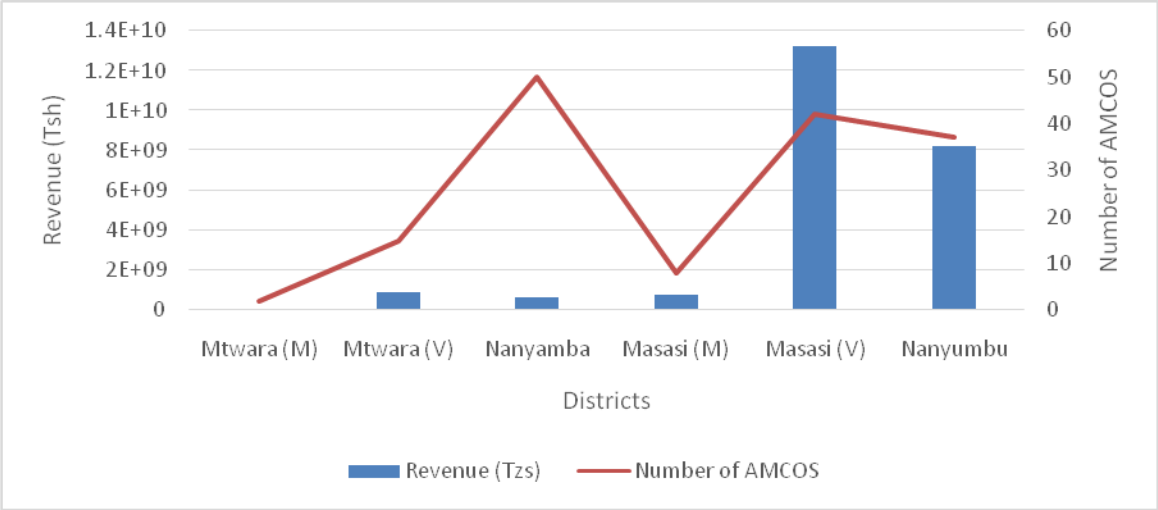


Figure 5: Number of AMCOS Vs Revenue collected from sesame sales in Mtwara region in 2018/19



- ***Unions***

In the hierarchy of the cooperative societies, Unions fall in the category of secondary societies. According to Cooperative Societies (2013), a secondary society means a registered society whose membership is open only to primary societies which are its members. Lindi region has two unions namely *Lindi Mwambao* and *RUNALI*. *Lindi Mwambao* serves Kilwa, Lindi rural and municipality of Lindi, while *RUNALI* serves Ruagwa, Nachingwea and Liwale. Mtwara region

has also two Unions namely MAMCU and TANECU; MAMCU serves Masasi TC, Masasi DC, Nanyumbu and Mtwara, while TANECU serves Tandahimba and Newala.

The role of the unions in the sesame value chain development in Lindi and Mtwara include organizing and administering all auctions, ensuring quality adherence by making sure that all sesame is packed and transported in appropriate recommended packaging materials, ensuring proper governance and management of AMCOS by making sure that all accounting books, record keeping books, guidelines and all working tools are available to the AMCOS and are used properly. The UNIONS also facilitate and oversee on the payments of farmers; UNIONS receive payments on behalf of farmers, transfer it to primary cooperatives (AMCOS) who in turn transfer to the farmers' personal accounts.

Collection and Storage of Sesame

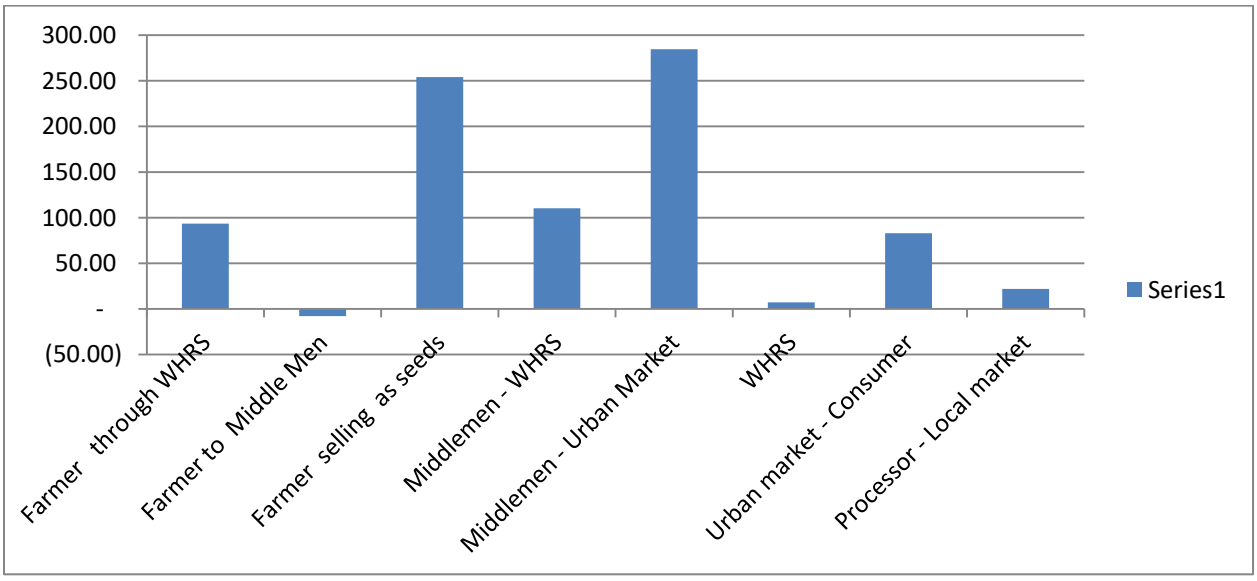
After harvesting and cleaning, farmers take the sesame to their respective AMCOS Warehouses where it is inspected and stored while waiting for auction. This practice is different from that with Cashew nut. Cashew nut is collected and then transferred to be stored and auctioned from the centralized warehouses owned by UNIONS, while Sesame is collected and auction from the local warehouses own by the AMCOS. These warehouses are generally in poor conditions and lack appropriate tools such as palates, moisture meters, sacs, weighing scales, drying facilities, cleaning facilities. UNIONS warehouses are more adapt and well equipped in terms of security, quality control facilities, record keeping and computerized system. On the contrary, most warehouses owned by AMCOS have weak security mechanism, poor data recording, lack quality control facilities and are managed manual. As a result, some farmers have been complaining against losses and theft of their stocks. Further, since most AMCOS use the same Warehouses for collection of Cashew nuts before transferring it to the centralized UNION warehouses, the sesame does not find sufficient space; it has to be removed quickly before the Cache nut season starts.

Sesame Processing

Sesame processing in the country is mainly undertaken by small and medium scale plants of capacities ranging between 5 - 6 tonnes per day (TanTrade, 2016), main product being oil. This is due to first of all high costs associated with processing sesame oil as compared to the cost of

the available alternatives such as palm or sunflower oil; cost of a litter of sesame oil at TEMNAR Company LTD in Masasi is three or four times higher than that of its alternatives, hence making its price unaffordable. Second, given its high demand in abroad, it would do better for export than for the local market; however the capacity of the local industry to meet quality demands of the export market of the sesame oil is low due to inability of the industry to acquire appropriate processing technology and machinery that could guarantee expected export quality. Export Trading Company is one of a few companies attempting to process sesame oil in Tanzania with plants in Dodoma and Arusha, but haven't been able to perform, it has instead resolved to exporting raw sesame. Third, buyers in abroad prefer raw sesame to processed ones because the sesame in abroad is demanded not only for its oil, but also for other broad range of products such as the oil itselft, lublicants, medicines and bekary products. Gross profit margin of a local processor is about 21.95%.

Figure 6: Estimated Gross profit margins of various actors using various marketing channels



Regulatory Framework and Support Services

According to Cooperative Societies Act (2013), section (4), the obligation of Government to Cooperative Societies is to provide and create conducive social, economic and legal environment for the development and prosperity of cooperative socieities. The government does so through formulation and review of policy and regulatory frameworks. The role of regional government authoirty in the development of AMCOS and Sesame sub-sector in Lindi and Mtwara is mainly

in the area of marketing, which is done through Warehouse Receipt System. According to Lindi and Mtwara Regional Guidelines for sesame (2019), the regional government is generally responsible for provision of guidelines, supervision of implementation of warehouse receipt system (WHRS), provision of cooperative education, conflict resolution and arbitration, as well as fostering the rule of law and order. This initiative by the regional government counters the observation by Mashindano and Maro that the sesame industry lacks policies, legislations and institutional framework to guide it (Mashindano & Maro, 2011).

The Cooperative Societies Act (2013) Section (4) subsection (1) provides provision for establishment of cooperative development office, and in this respect every regional government authority has a cooperative office. The officer incharge at the regional level is assistant registrar. According to Lindi and Mtwara Guidelines for sesame (2019), Assitant registrar is responsible for coordination of the warehouse receipt system, identification and preparation of AMCOS to engage with the market, supervision and monitoring of UNIONS and AMCOS to ensure proper crop collection, handling, marketing and distribution of books (PDN); identification, decernment and regisration of interested buyers. The Assistant registrar is also responsible for ensuring that every bidder deposits bid security in time (No buyer is allowed to bid if he/she has not deposited a minimum bid security of at least TZS 10,000,000 depending on the quantity intended to purchase; the high the guanlity the bigger the security bond required. Other mandate includes to suie any primary cooperative in accordance with the Coopearative Socieities Act (2013), no. 6 and the regulation of 2015, record collections,

- ***Financial Services***

Unlike their counter part cashewnut producers, sesame producers have very limited access to commercial loans; only seven (7) AMCOS out of 58 interviewed indicated that sesame producers had access to some commecial loans/credit. When compared to other services that the members of AMCOS had access to, loans scored only 7.9%. This is because sesame farmers are considered as risk partners by financial institutions since sesame is not a perennial crop, and in most cases the sesame producers practice shifting cultivation and have no perment settlements. In order for a sesame producer qualify for commercial loan, he or she needs to own either a farm planted perennial crop such as cachewnuts or coconuts, or have a valuable fixed asset such as a modern house. It was observed that majority sesame growers can not meet these conditions. Due

to these challenges facing smallholder sesame producers to acess credit, Government decided to introduce Warehouse Receipt System (WHRS). The system was intended among others to solve this problem, however the study realized that the WHRS as currently practiced in Lindi and Mtwara with respect to Sesame marketing is inactive, the practice by itself is a simple collective marketing system whereas the AMCOS act as mere collection or aggregation centers. Financial institutions operating in the Lindi and Mtwara regions are mainly CRDB Bank, NBC Bank, NMB Bank, Postal Bank of Tanzania and Yetu Bank. Role of the banks in Lindi and Mtwara with respect to Sesame Value Chain is mainly to facilitate payment of farmers. Unlike in the Cachewnut value chain where the banks provide credit to farmers, very little loans go to sesame farmers. This is because sesame farmers are considered as high risk partners due to shifting cultivation practices, highly rain dependency of sesame farming, and lack of immovable collateral or security. Unlike in the Cachewnut value chain were farms are accepted by banks as collateral, sesame fields are not; a sesame farmer needs to have perennial crop farm along with his/her sesame farm in order to get loan for the sesame production.

- ***District Councils***

District councils are the implementing arm of the government in general. The district councils in Lindi and Mtwara region, with respect to sesame value chain development are reposponsible for the implementation of the warehouse receipt system at the district level, to ensure that farmers have proper knowledge of the system, to encourage farmers to open and own bank accounts, to inspect and confirm warehouses that can be used for sesame collection, to enforce control in the control points (road brocks), to inspect all documents related to transportation of sesame grains in their respective areas, to inspect and control quality, and to educate farmers on postharvest management of sesame.

- ***Tanzania Agricultural Research Institute (TARI) Naliendele***

Tanzania Agricultural Research Institute (TARI) was established and operates under the Tanzania Agricultural Reasearch Institute Act, 2016 (No. 10 of 2016) to enhance the strengthening of agricultural research system in Tanzania. The mandate of TARI is to conduct, regulate, promote and coordinate all agricultural searche activities undertaken by public and private research institutes or organizations in Tanzania. (https://www.tari.go.tz/).

- ***Agricultural Seed Agency (ASA)***

Agricultural Seed Agency (ASA) was established under Executive Agencies Act No.30 of 1997 for the purpose of ensuring availability of high quality agricultural seeds to farmers and at affordable price. The Mandate given to ASA is to expand seed production and distribution networks, to promote increased private sector participation in the seed industry development through establishment of public-private partenrships or joint ventures in seed production and distributions, promote increased demand of certified seed, and strengthen research capacities for breeding and producing varieties that address farmers' specific demand. With respect to Sesame, ASA undertakes multiplication of certified seeds.

- ***Non Governmental Organizations (NGOs)***

The study could not find NGOs currently in operation in the sesame Value chain in the study area except one, MCknight Foundation which supported TARI – Naliendele to conduct research on white sesame in 2007. However, the demand is big, NGOs could assist in the areas of extension, education, access to improved seeds, postharvest handling and access to finance.

CONCLUSION AND RECOMMENDATIONS

Overall, the sesame value chain in Tanzania is characterized by low productivity caused by low adoption of improved seeds and good agronomic practices, lack of extension services, lack of access to working capital, inadequate processing technology and techniques, poor market structure (existence of Chomachoma). Dominance of uncoordinated and unregulated middlemen (*Chomachoma*) in the sesame value chain as well as heavy involvement of UNIONS and government in the marketing of sesame is the direct effect of weak support services provided by AMCOS resulting from lack of policy framework to guide the sub-sector. Heavy involvement of unions and government in the marketing system increases the market and transaction costs which are eventually borne by producers. The direct involvement of the Government in the AMCOS affairs including the implementation of WHRS is in violation of the agricultural liberalization policy that provides for the government's gradual withdrawal from the direct participation in productive activities Most sesame is sold in raw form to the export market, and hence exporting most of the value and employment opportunity to abroad; basically value additional activities are

limited by inadequate support services particularly lack of access to working capital, technology and policy framework. If most of the processing (value addition) were done in the country, much of the value associated with it as well as the employment generated would benefit the local economy.

COMPETING INTERESTS DISCLAIMER

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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