China-Africa Agriculture Value Chain Opportunities: In-depth Market Research Study for Avocado, Cassava and Red Chili Peppers in Tanzania



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March 2025

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Acronyms

- AASS: Annual Agriculture Sample Survey
- GACC: General Administration of Customs of China
- ITC: International Trade Centre
- ROI: Return on Investment
- SAGCOT: Southern Agricultural Growth Corridor of Tanzania
- TAHA: Tanzania Horticultural Association
- TIC: Tanzania Investment Centre
- TPHPA: Tanzania Plant Health and Pesticides Authority
- TPSF: Tanzania Private Sector Foundation

1 INTRODUCTION

1.1 Executive Summary

This study provided a comprehensive market analysis of Tanzania's agricultural export potential, focusing on three high-value crops: cassava, avocado, and chilies. The research was conducted through field visits, stakeholder interviews, and secondary data analysis across various Tanzanian regions with the aim of identifying investment opportunities and assessing the viability of export to China.

Cassava presents significant potential due to its adaptability and production scale. However, challenges such as limited processing infrastructure and stringent export requirements constrain its full export potential. Notwithstanding, targeted investment in value addition and export-compliant processing could unlock substantial returns.

Avocado production in Tanzania has expanded rapidly in recent years. The country has made notable inroads into international markets, including China, driven by growing demand and favorable agro-climatic conditions. Despite logistical and compliance hurdles, the avocado sector offers compelling opportunities across the value chain, particularly in export-oriented farming and packaging.

Chilies, while cultivated at a smaller scale, are increasingly gaining traction due to their profitability and rising global demand. Tanzania holds a competitive advantage in organic chili production, though issues such as inconsistent quality and pest management remain barriers to scaling exports to China.

The report also evaluates the broader **agricultural export policy and regulatory framework** in Tanzania. Key findings highlight both progress and gaps in policy implementation, infrastructure, and stakeholder coordination. Specific recommendations are made to address export bottlenecks, including strengthening compliance mechanisms, expanding farmer support services, and improving logistics.

In conclusion, while challenges persist, strategic investments and policy alignment can significantly enhance Tanzania's position in the global agricultural export market—particularly with China as a target destination.

1.2 Background

Agriculture is a key pillar of Tanzania's economy, providing livelihoods for a significant portion of the population. It contributes nearly one-third of the GDP and employs about 61% of the labor force.

Based on the market surveillance study, Chilies, Avocado and Cassava were identified as high potential crops for export to China. Following bilateral trade protocols that took effect in September 2024, chilies and avocado farmers would now have access to the Chinese market. The protocols established included guidelines and conditions that farmers would need to meet in order to qualify to export their produce to China. Some of the requirements included farm and pack-house registration with the General Administration of Customs of China (GACC) through the Tanzania Plant Health and Pesticides Authority (TPHPA) to obtain a traceability code, and adherence to good agricultural practices especially on integrated pest management practices.

This in-depth market study sought to explore the opportunities and challenges that exist for Tanzania to grow their chilies, avocado and cassava market export to China as an alternative market. We sought to speak with varying stakeholders ranging from farmers, exporters, and Government Regulatory Authorities.

1.3 Purpose of the Study

This study conducted an in-depth market analysis of Avocado, Cassava, and Chilies in Tanzania, focusing on production, value chain dynamics, and export potential. Building on the initial mapping study, it examined key aspects such as food safety standards, post-harvest management, and processing capabilities to provide insights for enhancing the competitiveness of Tanzania’s agricultural sector.

1.4 Scope

This study focused on evaluating the market potential and export readiness of three key agricultural commodities in Tanzania: **cassava, avocado, and chilies**. It covers a comprehensive analysis of their respective value chains—from production practices and post-harvest handling to processing, aggregation, and export capacity. Special attention is given to the crops' return on investment (ROI), their suitability for export—particularly to the Chinese market—and the enabling policy environment. The study also includes field assessments across select regions and integrates insights from stakeholders through interviews and focus group discussions.

The analysis further extends to a review of Tanzania's agricultural export policy and regulatory framework, identifying challenges and providing strategic recommendations to improve competitiveness and investment attractiveness.

1.5 Objectives

The key objectives of the study are to:

1. **Assess crop production systems** for cassava, avocado, and chilies, including farmer profiles, regional yield variations, and adoption of Good Agricultural Practices (GAP).
2. **Evaluate the value chain components**, including aggregation points, processing infrastructure, and post-harvest management techniques.
3. **Determine the export readiness** of each crop, with a focus on compliance with international standards and opportunities in the Chinese market.
4. **Analyze return on investment (ROI)** across different segments of the value chain to inform potential investors and stakeholders.
5. **Identify challenges and constraints** hindering value chain efficiency and export growth.
6. **Recommend strategic interventions** to improve market access, strengthen value addition, and enhance Tanzania's competitiveness in agricultural exports.

2 METHODOLOGY

2.1 Regions Visited

Table 1: Regions visited for interviews that informed the in-depth study

Value Chain	Region Visited	Government institution, Associations and Exporters Interviewed
Avocado	Arusha Mbeya Iringa Njombe	Avocado Society of Tanzania (ASTA) Green Gape Export Consulting Agency Avofresh Tanzania Plant Health and Pesticides Authority (TPHPA) The Tanzania Horticultural Association (TAHA) Lupembe Avocado Farm ARRU Capital Limited UWAMARU
Cassava	Pwani Dar es Salaam	Cereals and Other Produce Regulatory Authority (COPRA) The Tanzania Horticultural Association (TAHA) Tanzania Agricultural Research Institute (TARI) – Cassava breeder Tanzania Cassava Processors association Tanzania Cassava Growers Association
Chilies	Katavi Pwani Arusha Dodoma Morogoro	Tanzania Plant Health and Pesticides Authority (TPHPA) The Tanzania Horticultural Association (TAHA) Manyatta (Chili Exporters) Keedo chilly growers Stable farm Ayegro co. ltd

2.2 Data Collection

1. **Primary Data:**
    - **Interviews:** Structured and semi-structured interviews were conducted with from 29 people including farmers, traders, processors, exporters, and key stakeholders to gather firsthand insights.
    - **Focus Group Discussions:** 19 sessions were held with smallholder farmers and cooperatives to understand their challenges, opportunities, and perceptions of market dynamics.
2. **Secondary Data:**
    - **Literature Review:** Reports, policy documents, and previous studies on Tanzania's agricultural sector were analyzed to provide contextual background.

- **Market Reports and Trade Data:** National and international market data were reviewed to assess trends, demand, and export potential.
- **Regulatory Frameworks:** An evaluation of local and global food safety, quality, and export regulations was conducted.

3 TANZANIA MARKET ANALYSIS: CASSAVA, AVOCADO, AND CHILIES

3.1 Cassava

Participants

- Dr. Nsajigwa Mwakyusa – Cassava researcher – TARI – Kibaha
- Prof Joseph Ndunguru – Director – TPHPA – Arusha
- Dr. Emmanuel – Cassava Breeder – TARI – Mikocheni, Dar es Salaam
- Juma Ngomuo – Director – Lishe Mart Co.ltd
- Mercy Silla – Chairperson – Cassava processor Association of Tanzania

3.1.1 Introduction

Cassava (*Manihot esculenta Crantz*) is mainly used as food and for income generation. In 2019 about 54.7% of the world cassava production was produced from Africa with Nigeria contributing about 20.9%of the total worlds' production. Tanzania produced about 5% of the total production in Africa and ranked in sixth position after Nigeria, Democratic Republic of Congo (DRC), Ghana, Angola and Mozambique.

3.1.2 Production

In 2019, Tanzania produced about 5% of the total cassava production in Africa and ranked in sixth position after Nigeria, Democratic Republic of Congo (DRC), Ghana, Angola and Mozambique. The country annual production ranges from 4 to 8.2 million tons in 2016/2017 and 2018/2019 respectively (Figure 1). Production of green chillies and pepper reached 15.8 kt in 2022 in Tanzania, according to FAOSTAT.

In Tanzania Cassava is grown in almost all the agro-ecological zones in the country as a food security crop mostly by small holder farmers. According to the Annual Agriculture Sample Survey (AASS) 2016/2017 report, the crop is grown by more than 1.9 million farmers on a total of 853,015 ha of small plots of land averaging 0.4 ha per household, however, there are few large-scale farmers with more than 20 ha.

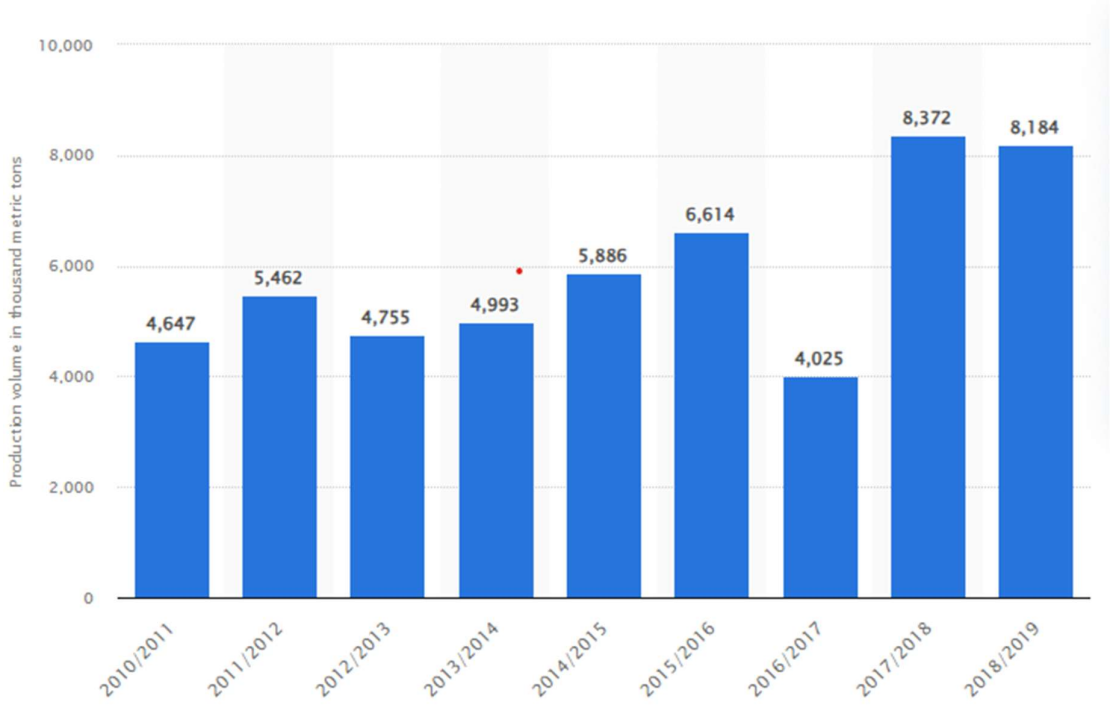

Figure 1: Historical production quantity of Cassava in Tanzania between 2010 to 2019 (Statistica 2024)

In the season 2018/2019, the production volume of Cassava in Tanzania was measured at 8,184 thousand metric tons. There was a slight decrease in comparison to the previous season, when the

production reached 8,372 thousand metric tons. Cassava is a major subsistence crop in the country, after maize and rice.

3.1.2.1 Variety suitability

Tanzania, through its research institutions, has conducted extensive research on Cassava, leading to the release of 25 improved Cassava varieties suitable for cultivation in different regions across the country.

Initially, Cassava breeding programs focused primarily on food security, with efforts directed at combating two major viral diseases that posed a serious threat to Cassava production:

a) **Cassava Brown Streak Disease (CBSD) and Cassava Mosaic Disease (CMD)**

These diseases significantly reduced Cassava yields. However, the improved varieties currently available in the market have been bred with resistance to these two major viral threats.

Traditionally, Cassava was primarily regarded as a food crop, and breeding efforts centered on enhancing its edibility and productivity. Today, Cassava has evolved into a highly versatile crop with diverse applications. These uses can be broadly categorized into three main sectors, each requiring specific quality parameters in breeding programs to meet targeted uses.

Table 2: Diverse uses of Cassava and breeding considerations

Uses	Breeding Qualities /Important Parameters
Fresh use	Drying ability
	Chewing ability
	Frying ability
Processing use	Ability to make chips/ crips
	Ability to make high quality flour
Industrial Usage (starch and bioethanol production)	Starch content (the higher the better)
	Starch quality

Past research primarily focused on developing Cassava varieties for fresh consumption and food processing to enhance food security. However, the emergence of the Chinese market, which predominantly imports Cassava for industrial use, has highlighted the need for new studies to identify varieties with suitable industrial qualities.

Since breeding new Cassava varieties is a time-intensive process (typically taking five years or more, depending on the desired quality parameters), it was crucial to screen 25 commercially released Cassava varieties to determine their suitability for industrial applications.

In 2022, researchers from TARI collaborated with China Canton Investment Limited, which established a Cassava processing factory in Handeni District, Tanga Region. As part of this collaboration, six Cassava varieties were planted on the company's farms in Handeni. Once the Cassava reached full maturity, researchers from both TARI and the Chinese company collected samples and tested their starch content.

KU 50, a widely grown Cassava variety in China, was also cultivated at the site and used as a benchmark for comparison. The study yielded the following results:

Table 3: Starch content of different Cassava varieties

Cassava variety	Starch content in percentage
KU 50- Benchmark	30

Kipusa	26
Kiroba	25
Taricas 4	28

This joint study conducted at the Chinese farm in Handeni District revealed that three Cassava varieties—Kipusa, Kiroba, and Taricas 4, produced high starch content comparable to the benchmark variety, KU 50. As a short-term solution for targeting the Chinese market, farmers and investors are advised to cultivate these three varieties, as they offer the highest starch content among the 25 commercially available varieties.

In the long term, researchers are working to develop and release new Cassava varieties with even higher starch content for industrial use. From the genetic material available in TARI's germplasm, five promising breeding lines have already been identified, with the potential to achieve starch content of up to 35%. However, additional funding is required to accelerate this research and facilitate the release of these improved industrial-use varieties.

Traditionally grown local Cassava varieties yielded about 7 metric tonnes per hectare. In contrast, improved varieties have the potential to produce between 20 and 45 metric tonnes per hectare, making Cassava cultivation significantly more economically viable for farmers.

3.1.3 Production potential

Agro-ecological suitability:

Cassava grows well in region with moderate rainfall (500 to 1500 mm annually) and well drained soil. This agroecological conditions translates almost all regions of Tanzania with a more significant production in Mwanza, Kagera, Kigoma, Mara, Tanga, Morogoro, Pwani Lindi and Mtwara regions. The commercially released varieties can be grown in all regions suitable for Cassava production.

1. Support from the Government and international organisations;

Government through TARI has been working on improved varieties which will be suitable for food consumption and industrial usage. Partners like Bill and Melinda gates (BMG) foundation has been very instrumental in providing funding for research for the last 10yearswhich has resulted to the release of the improved varieties resistant to the major two virus diseases which reduced yield significantly.

The government through Tanzania official Seed Certification Institute (TOSCI) has been able to facilitate multiplication of Cassava seeds by individual farmers and farmer groups in different districts/ regions to ensure that farmers can easily access the seeds at their localities. Individuals and farmer groups working on Cassava seedlings multiplications are all registered by TOSCI and farms are inspected at different stages to ensure that the distributed seeds are of high quality. This initiative by the government aimed at strengthening Cassava seed system.

Available well packed agronomical information for commercial production of Cassava by the research institution for all developed varieties has set a great stage for achieving maximum yield potential once applied on improved Cassava varieties. Agronomical information are packed in simple language that can easily be understood by the farmers.

3.1.4 Return on Investment in Cassava

Cassava farming provides a strong return on investment with significant profit margins at current market prices.

Yield per acre: 12,500 kg

Producer price (per kg): TZS 200/kg

Gross profit per acre: TZS 2,500,000

Total production costs: TZS 920,000 as tabulated below:

- Land preparation (ploughing): TZS 60,000
- Seeds: TZS 300,000
- Harrowing: TZS 60,000
- Planting: TZS 100,000
- Weeding (2x): TZS 150,000
- Harvesting: TZS 250,000

Net profit per acre: TZS 1,580,000

3.1.5 Challenges Limiting the Export of Cassava to China

1. Existing buyers who are exporting to China purchase at a very low price of 100TZS per Kg of fresh Cassava which is payable after delivery to their collection centre or processing facility. This price has made farmers to stop producing Cassava for export market and focus on local consumption which pays much higher price – 300 to 500 TZS per kg at farm gate.
2. Lack of direct linkages between commercial Cassava growers/ growers' associations / local traders with the buyers in China. This has caused middlemen who stands in between to disappear easily without fulfilling the contracts they sign with producers/ local traders after they have invested heavily on production and aggregation. This has cost many producers to lose trust and abandon the crop or not to invest heavily in commercial production.
3. Lack of enough processing facilities which can accommodate produced Cassava especially during harvesting seasons especially during rain season.
4. Requirements for exporting Cassava to China are not well known by majority of the farmers and exportes/ processors. More trainings/ awareness needs to be raised among farmers and local trading companies. Export requirements needs to be available in simple languages in public portal
5. List of companies with their contacts from China needs to be widely shared and updated from time to time to the producers and local exporters.
6. Low Productivity and Yield: African Cassava production often suffers from poor yields, averaging between 8–10 tons per acre instead of the expected 35–60 tons per acre. This is due to limited access to high-quality seeds, poor farming practices, and drought conditions. Example: In Tanzania, many Cassava farmers struggle to achieve high yields because they rely on rain-fed agriculture and have limited access to improved drought-resistant seed varieties.
7. Limited Access to Certified Seeds: Farmers struggle to access certified, high-yielding, and disease-resistant planting materials, making it difficult to scale up production. Example: In Rwanda, Cassava farmers benefited from government-distributed certified seed varieties, which increased their yield and enabled them to export to China. However, similar systems are lacking in Tanzania and Kenya. Implementing a similar system in Tanzania and Kenya could help address this gap and boost productivity and market access for local farmers.

3.1.6 Investment opportunities for Cassava

1. Large scale commercial farming; Tanzania still has vast land located in areas suitable for Cassava production which can be utilised for large scale commercial Cassava farming to supplying the growing market.
2. Establishing seed multiplication farms where researched varieties with resistance to the two major virus diseases and high productivity can be commercially multiplied for selling to the farmers around the country.
3. Establishing mechanisation centres around areas where Cassava production can be done at a large scale to reduce farmers' reliance on hand hoe and increase efficiency.
4. Contract farming models such as partnering with small holder farmers to ensure steady supply of Cassava throughout the year.
5. Investing in drying centres around areas with high production where farmers can sell and drying process can be done without compromising quality.

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3.2 Avocado

Participants:

- Prof Joseph Ndunguru – Director – TPHPA – Arusha
- Justin Goy -Green Gape Tanzania-
- Tanzania Horticulture Accosiation (TAHA);
    - Dr. Steven Tumaini
    - Athony Chawanga
- Joe Mwita– Avo-Fresh
- George Magonyozi -LUPEMBE AVOCADO FARM / ASTA
- Emmanuel Macha - ARRU CAPITAL t. LTD/ ASTA
- Halima James Mdee – ASTA
- Edward Kabuje - UWAMARU

3.2.1 Introduction

Avocado is emerging as a promising export crop for Tanzania, recognized for its high nutritional value and increasing global demand. Tanzania's Avocado exports have seen remarkable growth, from 17,711.49 tons valued at USD 51 million in 2021/2022 to 26,826.30 tons valued at USD 77.3 million in 2022/2023. In 2022, Tanzania exported Avocados worth $3.33 million to China, marking a notable but modest share of the global Avocado market (Tanzania Export Promotion Agency, 2023). By 2023, exports to China had increased to approximately $6.67 million, contributing to China's total Avocado imports, valued at around $300 million in 2022 (Trading Economics, 2024; TradeMap, 2024).

Avocado farming has become an essential component of livelihood diversification in producing regions, contributing to economic growth and helping reduce rural poverty. Livelihood diversification is particularly crucial in developing countries, where it can significantly improve living standards.

3.2.2 Production

Avocados thrive in subtropical climates, making Tanzania an ideal location for Avocado cultivation, particularly in areas suited for coffee and tea farming. The Hass Avocado, one of the improved high-yield varieties, matures and begins producing fruit within three years. Other high-yield varieties in Tanzania include Fuerte (or Puebla) and Pinkerton.

During this study, the team visited Avocado farmers and processors in Kilimanjaro, Mbeya, and Njombe regions, while desk research provided additional data for other parts of Tanzania. The key Avocado-exporting regions in Tanzania are Kilimanjaro (Siha District), Mbeya (Rungwe District), Njombe, Iringa, and Songwe.

- **Kilimanjaro Region** (Area: 13,250 km²; Population: 1,640,087) is one of Tanzania's 31 administrative regions, and its main Avocado-producing districts include Moshi, Hai, Siha, Rombo, Mwanga, and Same.
- **Njombe Region** (Area: 21,347 km²; Population: 702,097) is divided into districts like Ludewa, Makambako, and Makete.
- **Mbeya Region** (Area: 35,954 km²; Population: 2,707,410) is divided into districts such as Chunya, Mbarali, and Rungwe.

The main Avocado-producing areas include Mbeya, Njombe, Songwe, and Iringa in the southwest, as well as Kilimanjaro, Arusha, and Tanga in the northeast. The Southern Highlands, which includes the Mbeya, Iringa, and Njombe regions, is a socioeconomically important area with 4.3 million inhabitants. Agriculture, mainly small-scale and low-efficiency, is the primary economic activity, supplemented by cash cropping, livestock, beekeeping, and tree planting.

In these areas, the production of Avocados is largely dominated by smallholder farmers who account for 90% of total production, with commercial farmers contributing the remaining 10%. Improved varieties such as

Hass and Fuerte (Persea americana Mill) are the most widely cultivated due to their long shelf life, making them ideal for export markets. These varieties' ability to withstand long-distance transport has made them particularly valuable in exports to countries like Kenya, South Africa, China, and various European nations.

Commercial production and export are primarily led by Rungwe Avocado Company Ltd and Africado Ltd, both based in Kilimanjaro and Mbeya regions. The majority of other growers are smallholder farmers who cultivate a few to hundreds of Avocado trees around their homesteads or on distant farms. The primary Avocado varieties in Tanzania are Hass, Fuerte, Pinkerton, and, to a lesser extent, Puebla.

Africado and Rungwe Avocado Companies have supported over 6,000 smallholder Avocado growers by providing seedlings, agricultural advice, transport, and purchasing their harvests for export. The Tanzanian government is also investing in research and improved seedling production, aiming to increase Avocado farming productivity to 140,000 tons per year by 2025. In collaboration with the private sector, the government plans to supply improved seedlings and training to farmers across key regions, including Iringa, Kilimanjaro, Njombe, and Dar es Salaam for storage and packaging.

The study found that the majority of Avocado producers are from Rungwe District, compared to other districts. Most of these growers are members of local associations. The findings indicated that Avocado farmers benefit from marketing services provided by their associations, including collection, storage, collective bargaining, and access to marketing information. Additionally, farmers receive extension advisory services and input supplies through their associations. These agricultural services help reduce operational costs and increase profit margins by strengthening farmers' bargaining power.

Processors were found to dominate the Avocado market in Rungwe, Mbozi, Ileje, and Mbeya districts. These processors typically purchase Avocado fruits through local collectors, brokers, and farmer groups or cooperatives. Some respondents indicated that their main buyers are local merchants, while others sell their Avocados to middlemen or merchants from other districts or regions. A small percentage of farmers sell their produce directly to local collectors.

The harvest periods for Avocados in Tanzania are from January to March and May to August. From the farm, the fruit is transported directly to pack houses for processing, where it is professionally packed and prepared for export.

3.2.3 Tanzania Avocado Exports

In recent years, Tanzania has experienced substantial growth in avocado exports. Volumes have increased from 5,000 metric tons in 2019 to 30,000 metric tons in 2023, with an export value rising from USD 30 million in 2019 to USD 120 million in 2023 (FAOSTAT, 2024; Tanzania Invest, 2022). This growth reflects a significant expansion in both production and international market presence. In 2022, Tanzania exported avocados worth USD 3.33 million to China, marking a notable but modest share of the global avocado market (Tanzania Export Promotion Agency, 2023). By 2023, exports to China had increased to approximately USD 6.67 million, contributing to China’s total avocado imports, valued at around $300 million in 2022 (Trading Economics, 2024; Trade Map, 2024).

Tanzania's Avocado exports have grown significantly, with thousands of small-scale farmers beginning to produce and sell high-quality Avocados to large European markets in 2010. By that year, Avocados were listed among the top ten export products by the Tanzania Revenue Authority, generating annual revenue of US$ 12.7 million (Juma et al., 2019).

According to the Tanzania Horticultural Association (TAHA), Avocado exports reached 11,237 tons (equivalent to 510 containers) valued at USD 33 million in 2021 (Tanzania Invest, 2023). The export volume continued to rise, reaching 17,711.49 tons worth USD 51 million in 2021/2022, and increasing to 26,826.30 tons valued at USD 77.3 million in 2022/2023.

Approximately 85% of Tanzania's Avocado exports go to European markets, including France, the Netherlands, and the United Kingdom, while the remaining exports are sent to countries such as Kenya, Zambia, South Africa, China, Japan, Hong Kong, Saudi Arabia, and Qatar. The top destinations for Tanzanian Avocados are France and the Netherlands, which together account for more than three-quarters of the total exports.

Tanzania's Avocado export market has significant untapped potential, particularly in countries like Japan, Switzerland, Spain, Germany, the United Arab Emirates, and China. However, the market for Avocado exports to other African countries remains relatively small.

In November 2022, Tanzania and China signed 15 bilateral cooperation agreements, including a protocol for the Phytosanitary Requirements for the Export of Fresh Avocado Fruits from Tanzania to China. This agreement is expected to open new export opportunities to the Chinese market.

The rise in Avocado exports has been largely driven by two fast-growing local private sector companies: Africado in West Kilimanjaro and the Rungwe Avocado Company in the Mbeya region. These two companies dominate commercial Avocado production and export in Tanzania, contributing significantly to the country's success in the international market.

3.2.3.1 Avocado Export to China

China is a major source of foreign direct investment (FDI) in Tanzania, with over 1,098 investment projects worth USD 9.6 billion to date. The Chinese market presents significant opportunities, with an annual demand for Avocados estimated at 43,860 metric tons, valued at approximately USD 133.38 million.

In response to this potential, Tanzania's Ministry of Agriculture has announced plans to establish a shared facility in the Southern Highlands region to collect, sort, grade, and pack Avocados. This initiative aims to ensure consistent product quality before shipment. This development follows the successful negotiations and signing of a phytosanitary protocol in 2022 between Tanzania and China.

On September 1, 2024, the Tanzania Plant Health and Pesticides Authority (TPHPA), under the Ministry of Agriculture, officially opened the Chinese market for Tanzanian Avocados. TPHPA Director General, Professor Joseph Ndunguru, confirmed that the approved Avocado varieties for export to China include Hass, Fuerte, and Pinkerton. He emphasized that all Avocado exporters must register with the China Customs Authority (GACC) through TPHPA.

"From now on, all registered farms, as well as those that will be registered, must follow strict farming practices and implement integrated pest management to control pests such as fruit flies and moths," Professor Ndunguru stated. Additionally, all production farms, packaging facilities, and fumigation companies must be registered with TPHPA and obtain an identification number. These measures are part of the implementation of the bilateral cooperation protocol, which covers processing, packaging, storage, and transportation.

With the opening of the Chinese market, Tanzania is poised to strengthen its position in the global Avocado trade, building on its success in entering European markets.

3.2.3.2 Impetus for Avocado Farming in Tanzania

Tanzania's favorable agro-climatic conditions make it an ideal location for Avocado cultivation. Over recent years, the producer prices for Avocados have steadily increased, driven by rising demand both in international markets and domestically. As a result, Avocado farming has emerged as one of the country's key commercial crops.

Changes in global food habits and increased awareness of the nutritional benefits of Avocados have fueled global demand. However, despite the surge in demand, there remains a significant supply gap, highlighting the potential for growth in this sector.

Tanzania's annual Avocado production reaches approximately 190,000 metric tons, cultivated across various agro-ecological zones, including the Southern Highlands (Mbeya, Songwe, Iringa, and Njombe regions), the Northern Zone (Moshi and Arusha regions), and the Eastern Zone (Morogoro region). Smallholder farmers dominate production, contributing around 90% of the total output, with the remaining 10% coming from commercial growers.

The crop has gained significant attention, with production areas expanding due to the introduction of improved cultivars and growing export demand. Since 2009, when Avocado started to gain attention in cross-border trade, the crop's growth has been remarkable. In 2008, production was just 7,500 MT, but by 2020, it had soared to 190,000 MT—an increase of over 250%. Despite this rapid expansion, reliable data on production, consumption, exports, and imports remains scarce, largely due to weak institutional performance throughout the Avocado value chain.

3.2.4 Challenges in Avocado Production

Despite the growing interest and economic potential of avocado farming in Tanzania, the sector—largely driven by smallholder farmers—remains below its full yield and market potential. Key challenges include poor market linkages, pre-and post-harvest losses, pests and diseases, and a fragile natural ecosystem which limits productivity, restricts access to international markets and increases the vulnerability of farmers to climate-related risks (Malekela, 2022). Below is a summary of some the challenges identified.

1. Several factors limit farmers' participation in international markets, including limited access to market information, inadequate credit facilities, inflexible market requirements, and the absence of structured marketing and transportation infrastructure.
2. Many farmers lack direct links to international markets. Often, their produce is exported to Kenya, which then re-exports to Europe and Asia. In Kenya, the Avocado value chain is well-organized, with approximately 39% of the annual production being exported to foreign markets.
   In Tanzania, avocado farmers face barriers to international markets due to insufficient access to market information, limited availability of credit, rigid market standards, and a lack of organized marketing and transportation systems.
3. Most smallholder Avocado farmers sell their produce in local markets at lower prices due to poor quality. International markets pay more but require better quality. If smallholder farmers improve their avocado quality, they can access these markets and earn more.
4. A study by Gwambene and Saria (2024) highlighted that smallholder farmers in the Southern Highlands of Tanzania face significant climate challenges, such as shifting rainfall patterns, temperature fluctuations, and extreme events like floods and droughts. These farmers employ a variety of adaptation strategies, including the use of local knowledge and conventional methods, to mitigate their vulnerability to climate variability.
5. Marketing challenges; including unreliable markets, low prices, lack of market information, poor transport systems, and fruit damage during ripening.
6. Low bargaining power and the absence of structured markets, results in farmers receiving lower margins compared to other market actors, such as middlemen or brokers.
7. Price variability is another issue; some market agents (middlemen) purchase Avocados at Tshs 1,000 to 1,500 per kilogram, while others buy in trays at prices ranging from Tshs 15,000 to 25,000 depending on the season. These low prices are often associated with the size and quality of the fruits and are much lower than the prices consumers pay at the retail level.
8. Lack of essential market infrastructure, such as cold storage, hampers farmers' ability to store and maintain the freshness of their harvests, leading them to sell immediately after harvest, often at lower prices.

3.2.4.1 Challenges for Smallholder Farmers

The rise of supermarkets and the commercialization of food supply chains in the developing world have created new opportunities for smallholder farmers. However, this commercialization has also marginalized

smallholders, isolating them from more profitable markets and rendering their farming operations economically unfeasible.

Most agricultural outputs do not meet the required standards for modern markets, and selling through more refined channels, such as supermarkets and international markets, demands higher managerial skills, logistics capabilities, and stable production. Avocados, being perishable, are particularly vulnerable to market deterioration, making a well-established cold chain essential for maintaining quality and value in the supply chain.

The following are the key documents that are necessary during exportation of avocados:-

1. Buying documents (packing list, Invoice, airway/ship bill)
2. Export License from Business Registration and Licensing Agency (BRELA)
3. Export Permit from the Ministry of Agriculture
4. Quality and Standard Analysis Report/Certificate from Tanzania Bureau of Standards (TBS)
5. Certificate of Radioactivity Analysis from Tanzania Atomic Energy Commission (TAEC)
6. Certificate of Origin from Tanzania Chamber of Commerce, Industries, and Agriculture (TCCIA)
7. Phytosanitary Certificate from the Ministry of Agriculture
8. Voluntary market standard e.g. Global.G.A.P. standard

3.2.4.2 Exporting avocados from Tanzania to China involves several policy related challenges:

1. **Phytosanitary Requirements:** Tanzanian avocados must meet stringent phytosanitary standards set by Chinese authorities. This includes ensuring the produce is free from pests and diseases1. Farmers needs intensive trainings to understand the phytosanitary requirements and be able to comply. Government and other stakeholders must invest in farmers training.
2. **Registration and Compliance:** Farms, pack houses, and fumigation facilities must be registered with the Tanzania Plant Health and Pesticides Authority (TPHPA) and comply with Chinese regulations. Pack houses owners and operators needs to be sensitized and trained on requirements and provided with technical support to help them comply.
3. **Infrastructure:** There is a shortage of equipped warehouses, cold storage facilities, and efficient transportation services in Tanzania. These logistical bottlenecks can lead to delays and spoilage, reducing the competitiveness of Tanzanian avocados
4. **Market Access Procedures**: The process of gaining market access involves multiple steps, including video inspections and audits by Chinese customs authorities. This can be time-consuming and requires significant coordination.
5. **Quality Control:** Maintaining high-quality standards throughout the supply chain is crucial. This includes implementing good agricultural practices and integrated pest management to control quarantine pests2.
6. **Competition:** Tanzania faces competition from other avocado-exporting countries like Kenya and South Africa, which have already established a presence in the Chinese market.

3.2.5 Return on Investment (ROI) in Avocado Farming

The Return on Investment (ROI) in Avocado farming can vary depending on several factors, including the cost of production, yields, and selling prices, which differ across regions in Tanzania. Below is an overview of key elements related to ROI in Avocado farming, based on recent studies and reports.

3.2.5.1 Cost of Avocado Production

The capital costs for Avocado production include land, seedlings, fertilizers, and pesticides. Labor is also required for land preparation, weeding, and the application of fertilizers, pesticides, and integrated pest management.

The cost of Avocado production for export varies by region due to differences in input and labor costs. According to Mlengera et al. (2025), the estimated cost of Hass Avocado production per acre in Hai and Rungwe districts is as follows:

Table 4: Production costs for Avocado

Item of Cost	Hai (Cost in TZS)	Rungwe (Cost in TZS)
Variable Cost		
Fertilisers	200000.00	140000.00
Fertiliser application	100000.00	70000.00
Pesticides	14000.00	15000.00
Pesticide application	25000.00	20000.00
Weeding	114320.83	177166.67
Total	**453320.8333**	**422166.67**

3.2.5.2 Income from Avocados

To estimate potential incomes, certain assumptions are made regarding the spacing and yield of Avocado trees:

- **Spacing**: 10 x 10 meters, meaning there are 40 trees per acre.
- **Yield per tree**: Each tree produces 1,000 fruits annually once it reaches full maturity (usually after 5 years).
- **Total fruits per acre**: 40 trees × 1,000 fruits = 40,000 fruits per acre.
- **Price per fruit**: Each Avocado fruit is sold for approximately Tsh 250.

Therefore, the total revenue per acre would be:

- **Revenue per acre** = 40,000 fruits × Tsh 250 = Tsh 10 Million per acre annually.

In a study done in Hai and Rungwe Districts (**Mlengera et al. 2025**), revenue from Avocado production for export was found to be variable according to the region as below:

Table 5: Revenue from Avocado production across two regions in Tanzania

Item	Hai	Rungwe
Production per tree (kg)	9.18	12.79
Production per Acre (kg)	1101.14	1534.41
Price per Kg (TZS)	1600	1400
Total Revenue (TZS)	**1761825.92**	**2,148,174**

According to a study by **Mlengera et al. 2025** the yields of Avocado increases steadily up to 7 years from where it then remains steady at about 20,000 to 30,000kgs per year depending on the region

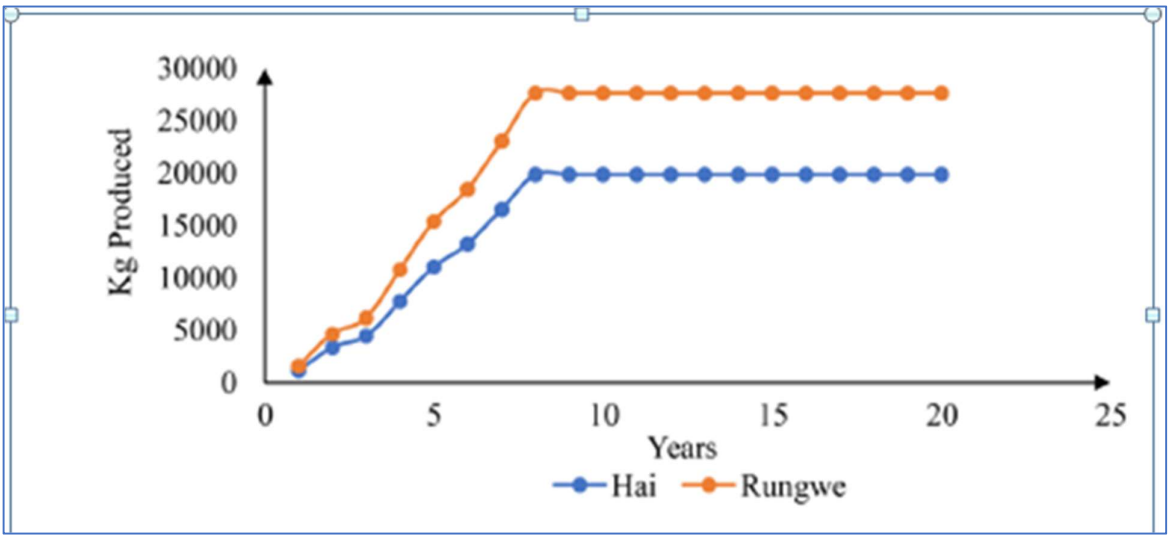

Figure 2: Production yield pattern of Avocado after planting in Hai and Rungwe regions of Tanzania

3.2.5.3 Avocado Selling Prices

While most smallholder farmers sell their Avocados at lower prices in local markets due to quality issues, findings reveal significant price variations across different districts. In regions where the quality is higher, farmers can fetch better prices:

- High-quality Avocados are priced between Tsh 1,100 and Tsh 2,000 per kilogram.
- Lower-quality or "reject" fruits are priced significantly lower, often ranging between Tsh 400 and Tsh 500 per kilogram.

Districts with strong cooperative management systems tend to have higher selling prices. For example:

- Mbozi district: Tsh 2,000 per kilogram for high-quality fruits.
- Mbeya district: Tsh 1,100 per kilogram for high-quality fruits.

But, unexpectedly the study found that brokers/ middlemen uses advantages of low buying prices for Avocado fruits with low quality “Rejects” to raise their profit margin by rejecting Avocado fruits with good quality so as to buy them as rejects.

3.2.5.4 Determinant of Avocado Fruits Selling Prices among Smallholder Farmers

Several factors influence the selling prices of Avocados, which ultimately affect the ROI for farmers. These include:

- **Size and quality of the Avocados**: Larger and higher-quality fruits fetch higher prices.
- **Variety**: The Hass variety is preferred for export markets, commanding higher prices. Hass variety is particularly valued for its higher yield, better flavor, and longer shelf life.
- **Bargaining power**: Farmers with stronger bargaining power, often through cooperative membership, can secure better prices.
- **Market conditions**: Seasonal fluctuations and demand in both local and international markets can impact prices.
- **Size of farm**: Larger farms may have a better bargaining power due to quantities.
- **Location of the farm:** Avocado market prices and price of inputs were found to be variable across regions.

3.2.5.5 Profitability of Avocado farming

The profitability of Avocado farming differs across districts based on selling prices, yields, and costs. A study by Mlengera et al. (2025) reported the following gross margins for Avocado farming in various districts:

- **Mbozi district**: Gross margin of Tsh 1,583,022.4 per acre.
- **Mbeya district**: Gross margin of Tsh 1,140,707.7 per acre.
- **Busokelo district**: Gross margin of Tsh 890,230.8 per acre.
- **Ileje district**: Gross margin of Tsh 333,400.0 per acre.
- **Rungwe district**: Gross margin of Tsh 232,933.3 per acre.

The lower profit margins in Busokelo and Rungwe are attributed to lower selling prices and higher marketing costs. This is also compounded by the low number of farmers participating in cooperatives, which weakens their bargaining power.

Table 6: Gross margin of Avocado farming in Tanzania

Variable/ Districts	Rungwe	Mbeya	Busokelo	Ileje	Mbozi
Average variable cost per acre	597,238.7	224,476.9	404,769.2	337,695.7	430,520.4
Average yield per acre	593.0	1,241.1	925.0	419.4	1,006.8
Average price per kg.	1,400.0	1,100.0	1,400.0	1,600.0	2,000.0
Gross revenue	830,172.0	1,365,184.6	1,295,000.0	671,095.7	2,013,542.9
Gross margin (TZS)	**232,933.3**	**1,140,707.7**	**890,230.8**	**333,400.0**	**1,583,022.4**

3.2.5.6 Percentage returns on investments

To calculate the rate of return on investment, it is important to look at the profitability of Avocado farming across different districts. The following percentage returns were observed in the study by Mlengera et al. (2025):

- **Mbeya district**: Return on investment (ROI) of **508.2%**.
- **Mbozi district**: ROI of **367.7%**.
- **Busokelo district**: ROI of **219.9%**.
- **Ileje district**: ROI of **98.7%**.
- **Rungwe district**: ROI of **39.0%**.

The lower ROI in Rungwe is attributed to lower selling prices, low productivity, and high marketing costs. Similarly, Ileje district shows comparatively low ROI due to high marketing costs.

3.2.5.7 Challenges Affecting ROI

Several challenges can lower the potential ROI for Avocado farmers in Tanzania:

- **Price Fluctuations**: Prices can vary significantly, and the lack of institutional support to regulate prices allows middlemen to exploit farmers.
- **Unreliable Markets**: Avocados are a seasonal crop, and farmers often face difficulties in finding buyers when their fruits mature.
- **Poor Infrastructure**: The lack of cold storage and transportation infrastructure limits the farmers' ability to store their fruits and maintain quality until they reach consumers, thus reducing profitability.
- **High Input Costs**: The cost of inputs such as fertilizers, pesticides, and labor can be high, affecting the overall profitability.

3.2.6 Investment Opportunities in the Avocado Value Chain

1. **Large-Scale Plantations**: There is significant potential for establishing large Avocado plantations, particularly in Tanzania's Southern Highlands (Mbeya, Iringa, Njombe, Ruvuma, Rukwa, and Katavi regions), Northern Zone (Arusha, Kilimanjaro, and Tanga), Lake Zone (Kagera and Mara), and Morogoro regions. These areas offer ideal conditions for scaling up Avocado production to meet growing export demands.

2. **Processing Facilities**: Investing in cold chain facilities and logistics in all Avocado growing regions to enhance the quality of fruits packed for export markets. Investing in Avocado processing facilities presents opportunities in sorting, cleaning, grading, packaging, and the production of value-added products such as salads, cooking oil, cosmetics, and soaps. This investment could help capture more value from the Avocado supply chain and meet the needs of both domestic and international markets.
3. **Supply of Inputs**: There is a demand for inputs across the entire Avocado value chain. Opportunities exist for manufacturing or supplying essential items such as seeds, pesticides, fungicides, fertilizers, farming equipment (tractors, trailers, and harvesting machines), processing and packaging machinery, specialized packaging materials (e.g., boxes for transportation), and cold storage units. Currently, much of the packaging material is sourced from Kenya, presenting a gap in the local market.
4. **Skilled Workforce and Expertise**: There is a growing need for skilled human resources to support the Avocado value chain, particularly internationally accredited experts who can conduct audits from farms to processing facilities. Additionally, the establishment of an ISO 17025-accredited laboratory in Tanzania represents an open opportunity for crop and horticulture scientists, as well as vocational training centers, to meet this demand and enhance the country's agricultural standards.
5. **Investment in cold chain logistics:** with growing numbers of Avocado farmers, cold chain storage and transport facilities are essential to maintain quality of produce.
6. **Contract farming:** With new farmers emerging in the Avocado production, establishing commercial certified nurseries for supplying farmers with high quality and traceable planting material is a great opportunity which is not fully tapped. Engage in contract farming by partnering with smallholder Avocado farmers to be able to have consistence in supply.

3.2.7 Conclusion

In a research study conducted in 2023 in Hai and Rungwe districts showed that Avocados contributed the largest share of income to total household earnings. Thus the need for promoting and supporting Avocado production for the export market in the country, especially in areas where the conditions for growing the crop are suitable (Kadigi., et al 2023)

To enhance their productivity, farmers need more support from the government and other development partners through targeted efforts such as the distribution of improved seedlings, provision of low-interest loans to enable more production, and strengthening of both vertical and horizontal integration in the value chain to enable smallholder farmers and other players in the value chain access more lucrative markets for their Avocados.

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3.3 Chili

Stakeholders Interviewed:

- Keedeo Chilly Growers Farmers Group
- Green Gape Tanzania- Justin Goy
- Fresh Field Manyatta -
- Tanzania Horticulture Authority (TAHA)
- Peter Heri – Ayegro Co. Ltd
- Rojaz Mbara - Stable farms
- Juma Ngomuo - Lishe Mart Ltd

3.3.1 Introduction

In Tanzania, several varieties of chilies are commonly grown, each with its unique flavor and heat levels. These varieties are well-suited to the climate and soil conditions in Tanzania, making them popular choices for both local consumption and export. Some of the commonly grown chilies includes;

1. **Moshi Chili Pepper:** The Moshi Chili Pepper originates from Tanzania, Africa. It is named for the village of Moshi, located at the base of Mount Kilimanjaro. It is a very rare but productive hot pepper variety, yielding many peppers. This variety is known for its medium-hot heat level, similar to Thai chilies or cayenne peppers
2. **African Bird's Eye Chili (Peri-Peri):** Also known as Thai Chili is a small but fiery variety popular in Southeast Asian cuisine. Its tiny size packs a punch, making it a favorite for adding intense heat to dishes like curries and spicy sauces. This small but potent chili is a staple in many African dishes, including the famous peri-peri sauce. It has a Scoville rating of around 175,000 SHU[2].
3. **Habanero:** Known for its intense heat, the habanero is also grown in Tanzania. It typically has a Scoville rating of about 225,000 SHU.

3.3.2 Production

Tanzania's chili production has gained momentum in recent years, contributing significantly to the country's agricultural exports. Historically, production of green Chili and pepper in Tanzania reached an all-time high of 16.3 kt in 2018 and an all-time low of 2.90 kt in 1991 (Figure 3). Tanzania has been ranked 73rd within the group of 117 countries we follow in terms of production of green Chili and pepper. Production of green and dry Chilies in Tanzania is dominated by small holder farmers. Chili cultivation in Tanzania is predominantly concentrated in regions with favorable climatic conditions and fertile soils. The primary chili-producing areas include:

- **Morogoro Region:** Known for its suitable agro-climatic conditions, Morogoro has become a hub for chili farming.
- **Iringa Region:** Farmers in Iringa have increasingly adopted chili cultivation due to its profitability and market demand.
- **Dodoma Region:** The semi-arid climate of Dodoma supports chili production, particularly during the dry season.
- **Arusha and Kilimanjaro Regions:** These northern regions benefit from favorable weather patterns and have seen a rise in chili farming activities.

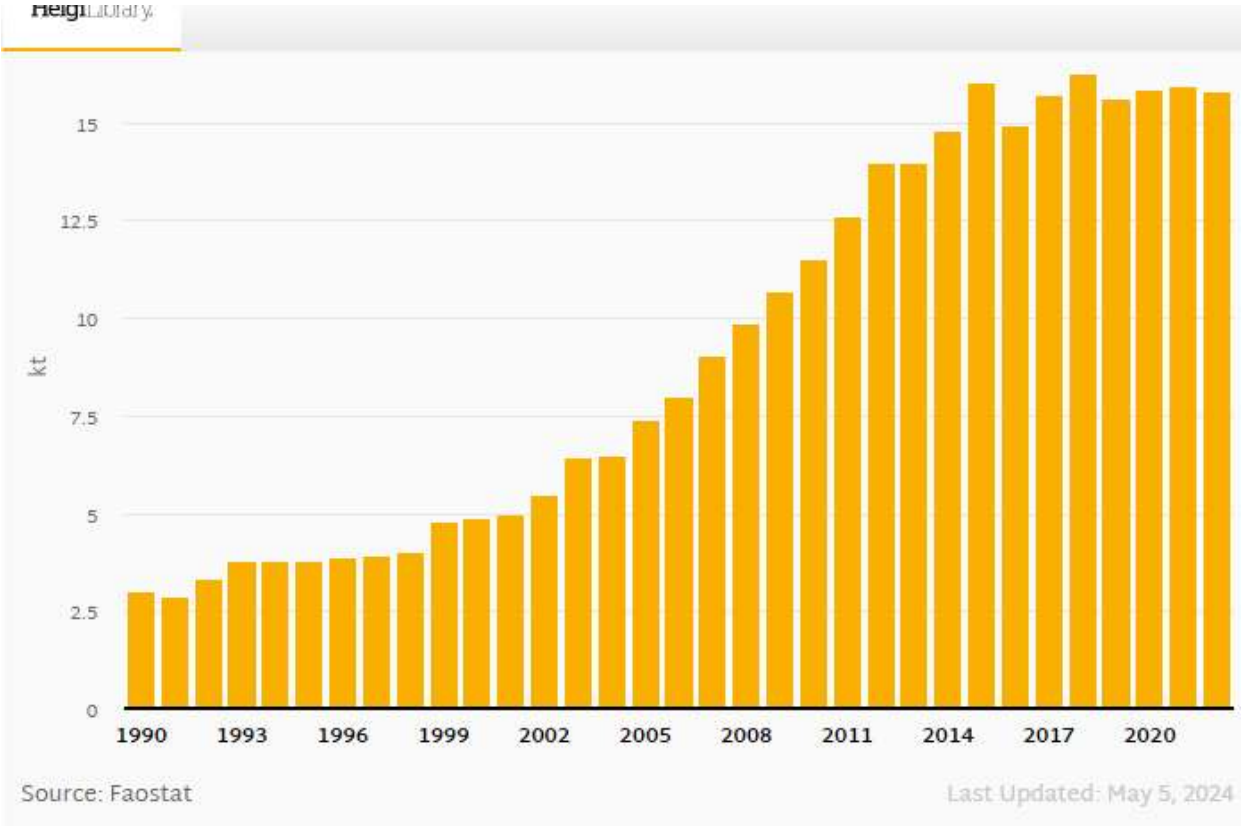

Figure 3: Historical production quantity of chilies in Tanzania from 1990 to 2020

Chilies export market from Tanzania has significantly grown within 2019 to 2023, with the export value rising from USD 20 million in 2019 to USD 35 million in 2023, with USD 4.5 million worth of exports in 2023 going to China (FAOSTAT, 2024; Tanzania-Invest, 2022). China therefore is emerging as another potential market for Tanzanian chilies amongst other markets like Japan, UK, US, India and South Africa.

Opportunities for commercialization of Chilies production in Tanzania:

There are several promising opportunities for the commercialization of Chili production in Tanzania which includes:

1. **Organic Chili Production**: There is a growing demand for organic spices, including Chilies, in both local and international markets. Tanzanian farmers can capitalize on this by producing certified organic Chilies, which can fetch higher prices.
2. **Export Markets:** The international market for Chilies, especially dried varieties like African bird's eye Chilies, is expanding. By meeting export standards and volume requirements, Tanzanian producers can tap into lucrative markets in Europe, Asia, and the Middle East.
3. **Value Addition:** Processing Chilies into products such as Chili powder, sauces, and pastes can significantly increase their market value. Investing in processing facilities and training can help farmers and cooperatives add value to their produce.
4. **Local Market Growth:** The local demand for Chilies is also on the rise, driven by the increasing popularity of spicy foods. This presents opportunities for farmers to supply to local markets, restaurants, and food processors[3].
5. **Support from NGOs and Development Agencies**: Organizations like Farm Africa have been involved in projects to strengthen the Chili value chain in Tanzania. These projects often provide training, resources, and market linkages to help farmers improve their production and profitability[2].

6. **Climate and Soil Suitability:** Tanzania's climate and soil conditions are favorable for Chili cultivation, which can lead to high yields and good quality produce [4].

By leveraging these opportunities, Tanzanian Chili producers can enhance their competitiveness and profitability in both local and international markets.

3.3.3 Return on investments (ROI)

This section is based on findings from Keedo growers Farmer group, located in Katavi Region, one of the big small scale farmer groups of chili growers that brings together a total of 218 smallholder farmers with farm sizes ranging between 0.5 to 10 acres. The farmers grow bird eye chilies individually but sale collectively as a group. One of the challenges these farmers face is in accessing high quality seeds and therefore they will normally depend on the buyer of the produce to bring them the seeds. The farmers get training from the village agricultural extension officers on GAP's for chili production covering nursery management to harvest.

In terms of production costs, the biggest cost goes towards irrigation as most of the farmers depend on petrol powered pumps to pump water into the farm whose costs can be as high as 500,000 Tzsh per season. Harvesting is another activity that takes a big portion of the costs due to the fact that very few farm workers agree to harvest chilies due to its pungent smell and fluids that irritate the eyes and nose. Therefore, chili farmers will usually have to pay a premium with the costs for harvesting, grading and sorting getting as high as 600,000 Tzshs/acre. The total cost of production comes to 1,600,000 Tzshs/acre with farmers yielding between 800 to 1000kg/acre. The group mostly sale to buyers exporting to Rwanda and Uganda and currently do not export to China. The farmers currently sale 1kg of dried chili at 5000Tzshs but they would prefer a price of 7000 Tzshs as that would give them better profits.. Below is a summary table illustrating the return on investments for the Keedo farmer group. Chili production is a profitable venture for the Keedo farmer group and does not seem to have stringent restrictions/regulations for growing unlike for other export market which require special certification processes.

Table 7: Return on investment for chili production in Tanzania

Farm Activity	Cost per acre (TZSHS)
Land Preparation, weeding, pests and disease management and transport	500,000
Irrigation	500,000
Harvesting, Sorting, and grading	600,000
Total Costs	**1,600, 000**
Selling price	**4,000,000**
Profits	**2,400,000**

3.3.3.1 Cost of Chili Production

The cost of chili production in Tanzania varies depending on factors such as farm size, input costs, and farming practices. Key cost components include:

- **Seeds:** High-quality chili seeds are essential for optimal yields and can be a significant expense.
- **Fertilizers and Pesticides:** Proper soil nutrition and pest management are critical, necessitating the use of fertilizers and pesticides.
- **Labor:** Costs associated with land preparation, planting, weeding, harvesting, and post-harvest handling.
- **Irrigation:** In regions with inadequate rainfall, investment in irrigation systems may be necessary, adding to production costs.

3.3.3.2 Factors Affecting ROI

Chili farming can be profitable for Tanzanian farmers, offering a favorable return on investment when managed effectively. Factors influencing ROI include:

- **Yield per Acre:** With proper agronomic practices, farmers can achieve substantial yields, enhancing profitability.
- **Market Prices:** Chili prices fluctuate based on demand and supply dynamics both locally and internationally. Farmers who time their harvests to coincide with peak demand periods can secure better prices.
- **Value Addition:** Processing chilies into products like chili powder or sauces can increase earnings compared to selling raw produce.

3.3.4 Challenges to chili production and export to China

While chili production in Tanzania is increasing, the potential of export to Tanzania is faced with several challenges amongst them being competition from other export markets like Europe and the neighboring countries like Uganda and Rwanda. Discussions with horticultural export experts and consolidators revealed that the Chinese market remains largely unfamiliar to farmers. The complex bureaucracy involved in obtaining traceability codes discourages them, leading many to prefer markets they already understand and trust. Below is a summary of some the challenges identified.

Challenges that may limit Chilies export to China include:

1. **Pest and Disease Control**
   Tanzania faces challenges in meeting phytosanitary standards due to inadequate pest and disease control measures. For Example: Exporters faced rejection of chili shipments to China due to the presence of False Codling Moth (FCM), which required extensive monitoring and preventive measures. Some of the rules established to manage FCM may also seem to be unrealistic and even discourage production for China exports, for example the requirement to have 7km between growers.

2. **Bureaucratic Delays**
   Regulatory inspections and permit approvals take significantly longer in Tanzania compared to neigbouring countries like Kenya, delaying export processes. Lengthy procedures discourage farmers and exporters, creating uncertainty in business operations. Streamlining the regulatory process would enhance efficiency and competitiveness.

   Example: Export inspections in Kenya take seven days, while in Tanzania, they can take over a year.

3. **Limited Pack House and Cold Room Facilities**
   One of the requirements to export chilies to China is the registration of packhouses and coldroom facilities. However, the current situation reveals very limited pack houses which also limited space. This forces farmers to leave produce outside, exposing it to the elements. For chilies this is a big challenge especially during the rainy season that requires extra care to keep the Chilies dry and fresh.

   Example: Peppers left outside during rainy weather develop mold, rendering them unsuitable for export. This would require anyone thinking of exporting to China to setup packhouses and cold storage facilities. This lack of infrastructure reduces the quality of produce, increasing the likelihood of rejection by export markets. Larger, well-equipped pack houses would enable proper storage and processing of produce.

4. **Lack of Capacity Building**
   Farmers require training on best agricultural practices, pest control, and export requirements. Regular training programs would improve productivity and ensure that farmers meet export standards. This would also help them adopt modern farming techniques for better yields.

   Example: Farmers requested more training on irrigation systems and pest control.

5. **Lack of Export Market Information**
   Farmers lack information on the standards, permits, and requirements needed for export to China, making them hesitant to pursue these markets. Without clear guidance on the necessary certifications and quality requirements, farmers risk having their produce rejected. This discourages smallholders from engaging in export activities.

   Example: Some farmers reported paying for permits only to be told later that their produce still did not meet the standards.

6. **High Permit Fees**
   The permit fees imposed on exporters are excessive, discouraging small-scale farmers from exporting their produce. The high costs create a barrier to entry for many farmers, particularly those with smaller operations. This limits their ability to participate in lucrative export markets and reduces overall agricultural competitiveness.

   Example: The fees for containers and permits make the entire export process financially unviable.

7. **High value addition requirements to compete with other countries exporting to China**
   Other advanced countries like Mexico offer competition for export to China. Such countries also have better infrastructure and capabilities to innovate value added products other than just dried chilies like mango with chilies etc.

3.3.5 Investment opportunities for Chilies

Tanzania offers significant investment opportunities in chilly production and value addition driven by domestic and international demand, favourable climatic conditions and government support for agribusiness. The opportunities cut across the value chain.

- Tanzania has suitable agroecological zones which favours high quality chilly farming. Key investment areas include;
    1. Large scale commercial chilly farming by utilizing modern irrigation and greenhouse technologies for year round production.
    2. Contract farming by partnering with smallholder farmers to ensure consistent supply.
    3. Venturing to production or supplying high yield hybrid seed varieties such as birds eye chilly, habanero, cayenne which offers higher productivity.
    4. Organic chilly farming by tapping into the growing global demand for organic spices
- Value addition and processing opportunities; Chilly processing can significantly increase profitability by meeting export standards and extending shelf life. Key value addition areas includes the following;
    1. Provide drying facilities for renting to producers and exporters of Chilies since the number of driers available is not enough to support existing production.
    2. Provide packhouse facility services where exporters can use for packaging prior to the export.
    3. Dried chilly powder by using installed solar drying and mechanical processing for export marker.
    4. Chilly paste and sause by producing ready to use products for local, regional markets.
    5. Chilly oil and oleoresin extraction by producing high quality oils.

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4 TANZANIA'S AGRICULTURAL EXPORT POLICY AND REGULATORY FRAMEWORK

4.1 Current Policies

Tanzania's agricultural export policies prioritize enhancing productivity, competitiveness, and market-oriented agriculture. Key initiatives include:

- **National Agriculture Policy (2013)**: Promotes market-oriented agriculture, emphasizing efficiency, competitiveness, and sustainable practices (REPOA, 2021).
- **Agriculture Sector Development Program (ASDP II)**: Aims to boost productivity and commercialization through investments in infrastructure, research, and extension services (REPOA, 2021).
- **Tanzania Agricultural Export Promotion Strategy**: Focused on increasing exports by improving infrastructure, logistics, and market access (REPOA, 2021).
- **Regional Trade Agreements**: Tanzania's membership in the East African Community (EAC) and other regional blocs provides preferential market access and trade benefits (Trade.gov, 2023).

4.1.1 The STREPHIT Project

On September 18, 2024, Tanzania's Ministry of Agriculture officially presented market access dossiers for eight key crops, including Avocados and Chilies, to meet the phytosanitary entry standards of 14 international markets. This initiative is part of the Strengthening Plant Health Services in Tanzania for Enhanced Food Safety (STREPHIT) project, which aims to enhance the quality of exports, boost foreign exchange earnings, and foster the growth of the agricultural sector.

The STREPHIT project includes efforts to train plant health inspectors, upgrade facilities, and establish robust detection and traceability systems, ensuring compliance with international standards. These efforts are expected to unlock economic opportunities worth USD 3.5 billion, including access to the European Union, the USA, and other international markets.

STREPHIT is a four-year initiative launched in 2022 to ensure that Tanzania's agricultural produce, both from mainland Tanzania and Zanzibar, meets the phytosanitary standards and protocols required for export to EU and international markets.

Key activities within the STREPHIT project include:

- Training plant health inspectors at export and import posts.
- Upgrading facilities such as minilabs and incinerators.
- Establishing detection and traceability systems using harmonized HS codes within the Tanzania National Crop Information System (TANCIS) and Agricultural Trade Management Information System (ATMIS).

As part of its implementation, STREPHIT has:

- Established four accredited laboratories.
- Rehabilitated 19 border-post minilabs.
- Secured vehicles for surveillance.
- Developed innovative data collection practices to ensure compliance with international standards.

In Zanzibar, plant health laboratories have been enhanced, along with an upgraded Laboratory Information Management System. Additionally, field plant protection and surveillance providers are being equipped with the necessary skills and tools, while raising awareness of the services offered by the Plant Health and Biosafety Intelligence Unit at the Tanzania Plant Health and Pesticide Authority (TPHPA).

4.2 General Challenges and Recommendations Identified from the In-depth study

Despite these policies, several challenges hinder Tanzania's agricultural export potential. Based on the key stakeholder engagements, it is clear that the challenges and opportunities that exist cut across all three crops. Below is a summary of the key findings on the challenges and opportunities.

4.2.1 Challenges

1. **Regulatory and Bureaucratic Barriers**
   - Inconsistent enforcement of regulations and bureaucratic hurdles make it difficult for exporters to comply with export requirements.
   - Delays in obtaining permits, traceability codes, and farm inspections hinder timely exports.
   - Limited government support in negotiating trade agreements slows market access.
   - **Example:** A farmer in Tanzania waited two years to obtain a traceability code from the Ministry of Agriculture, delaying their ability to access export markets like China and the EU.
2. **Infrastructure and Logistics Constraints**
   - Poor road networks, lack of cold storage, and limited packhouses increase post-harvest losses.
   - High transportation costs and inadequate direct flights make exports expensive and less competitive.

   Example:
   Exporters transporting produce over 1,000 km without adequate cold storage see significant quality deterioration before reaching markets.

   Avocado farmers in Tanzania struggle to meet export standards due to the lack of cold chain storage, which affects shelf life and quality.
3. **Strict Phytosanitary and Quality Standards**
   - Exporters must comply with stringent phytosanitary regulations, requiring pest-free produce and costly certifications.
   - Failure to meet standards leads to rejected shipments and financial losses.

   Example:
   Tanzania chili farmers faced export challenges due to requirements for isolation distances between chili farms, which small-scale farmers couldn't meet.

   Justin Goy, an exporter, lost four tons of produce in France because the shipment did not comply with False Codling Moth (FCM) requirements, leading to financial losses.
4. **Limited Value Addition and Market Dependency**
   - Tanzania mainly exports raw agricultural commodities instead of processed goods, reducing revenue potential.
   - Heavy reliance on a few markets (e.g., Europe and China) increases vulnerability to economic and political changes.

   Example:
   Tanzania exports raw Cassava to China, where it is processed into starch and other products, fetching higher prices. Establishing local processing plants could increase national revenue.

   The recent Red Sea crisis affected the shipping routes to Europe, leading to delays and increased costs, significantly reducing Avocado exports.
5. **Financing and Smallholder Farmer Challenges**

- Limited access to affordable credit prevents smallholder farmers from investing in improved production and meeting export standards.
- Farmers lack knowledge of good agricultural practices, post-harvest handling, and export procedures.

Example:
Farmers often store produce under trees due to a lack of collection centers, exposing goods to damage and reducing their export value.

6. **Market Access and Trade Barriers**
   - Non-tariff barriers such as quotas, import licenses, and complex regulatory requirements restrict exports.
   - Lengthy processes for trade agreements and bilateral negotiations delay entry into new markets.

   Example:
   In 2019, efforts to open the Chinese Avocado market began, but it took three years for exporters to receive permits, delaying market expansion.

   Only one company in Australia completed the export process for Avocados to China due to the lengthy finalization of trade protocols.

7. **Climate Change and Pest Control Issues**
   - Extreme weather events impact agricultural production and exports.
   - Inadequate pest and disease control measures lead to rejected shipments and increased monitoring costs.

   Example:
   Exporters faced rejection of chili shipments to China due to the presence of False Codling Moth (FCM), requiring extensive monitoring and preventive measures.

8. **Trust Issues and Payment Risks**
   - Some buyers in foreign markets engage in fraudulent practices, causing financial losses for Tanzanian exporters.
   - Lack of market information leads to unfair pricing and exploitation.

   Example:
   In the Middle East, some buyers pay for the first shipment but progressively reduce payments in subsequent deals, eventually taking all products without paying.

9. **Language Barriers and Communication Challenges**
   - Communication with Chinese buyers is difficult, as most do not speak English or French, creating misunderstandings and complicating negotiations.
   - **Example:** Chinese buyers expect transactions to be conducted in Mandarin, leaving African exporters without translators at a disadvantage in business discussions.

10. **Smallholder Farmers' Capacity**
    - Smallholder farmers lack knowledge of modern post-harvest handling practices, which affects the consistency and quality of produce for export.
    - **Example:** Farmers often store produce under trees due to a lack of collection centers, exposing goods to damage and reducing their export value.

4.2.2 Recommendations

1. **Improve Infrastructure and Logistics**

- Establish certified packhouse (parkhouse) facilities in key agricultural zones through public-private partnerships.
- Develop and maintain cold chain infrastructure, including cold storage and direct cargo flights, to support perishable exports.
- Improve rural road networks and irrigation systems to enhance market access and productivity.

2. **Enhance Farmer Training and Support**
   - Provide training on Good Agricultural Practices (GAP), post-harvest handling, and compliance with export standards.
   - Increase access to improved seed varieties through subsidized seed distribution programs and regional seed multiplication centers.
   - Set up collection centers to help smallholder farmers maintain produce quality and meet export requirements.
3. **Strengthen Compliance and Certification Processes**
   - Streamline farm inspections and certification procedures to reduce delays.
   - Establish government-supported compliance training centers and offer financial grants to help small-scale farmers meet phytosanitary standards.
   - Strengthen scientific testing laboratories and export certification systems to counter misinformation and meet international quality requirements.
   - Set up certified fumigation facilities and enhance pest control surveillance programs to comply with international regulations.
4. **Facilitate Market Access and Trade Agreements**
   - Establish dedicated export negotiation units to fast-track bilateral trade agreements and market entry processes.
   - Strengthen government involvement in trade missions and economic diplomacy to secure better trade opportunities.
   - Diversify export markets beyond Europe by enhancing trade with China, the Middle East, and regional African markets.
5. **Leverage Technology and Information Sharing**
   - Develop a centralized digital platform where exporters can access market data, export regulations, and pricing trends.
   - Promote regular engagement between exporters, regulatory bodies, and industry associations for better transparency.
6. **Increase Value Addition and Processing**
   - Invest in Agro-Processing Zones (APZs) and provide tax incentives to encourage local processing industries.
   - Promote value-added exports such as dried fruits and Avocado oil to increase competitiveness in premium markets.
7. **Improve Payment Security and Trade Facilitation**
   - Establish trusted export platforms where exporters can connect with verified buyers.
   - Promote the use of escrow payment systems to protect exporters from fraud.
8. **Address Bureaucratic Challenges and Harassment**
   - Streamline the process of obtaining traceability codes and other export permits to reduce waiting times.
   - Set up grievance mechanisms to address harassment and bureaucratic delays faced by exporters.
9. **Enhance Communication and Language Support**
   - Provide translation services and encourage exporters to hire trade representatives fluent in key export market languages, such as Chinese.
10. **Improve Infrastructure and Logistics**

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12. **Strengthen Compliance and Certification Processes**
    - Streamline farm inspections and certification procedures to reduce delays.
    - Establish government-supported compliance training centers and offer financial grants to help small-scale farmers meet phytosanitary standards.
    - Strengthen scientific testing laboratories and export certification systems to counter misinformation and meet international quality requirements.
    - Set up certified fumigation facilities and enhance pest control surveillance programs to comply with international regulations.
13. **Facilitate Market Access and Trade Agreements**
    - Establish dedicated export negotiation units to fast-track bilateral trade agreements and market entry processes.
    - Strengthen government involvement in trade missions and economic diplomacy to secure better trade opportunities.
    - Diversify export markets beyond Europe by enhancing trade with China, the Middle East, and regional African markets.
14. **Leverage Technology and Information Sharing**
    - Develop a centralized digital platform where exporters can access market data, export regulations, and pricing trends.
    - Promote regular engagement between exporters, regulatory bodies, and industry associations for better transparency.
15. **Increase Value Addition and Processing**
    - Invest in Agro-Processing Zones (APZs) and provide tax incentives to encourage local processing industries.
    - Promote value-added exports such as dried fruits and Avocado oil to increase competitiveness in premium markets.
16. **Improve Payment Security and Trade Facilitation**
    - Establish trusted export platforms where exporters can connect with verified buyers.
    - Promote the use of escrow payment systems to protect exporters from fraud.
17. **Address Bureaucratic Challenges and Harassment**
    - Streamline the process of obtaining traceability codes and other export permits to reduce waiting times.
    - Set up grievance mechanisms to address harassment and bureaucratic delays faced by exporters.
18. **Enhance Communication and Language Support**
    - Provide translation services and encourage exporters to hire trade representatives fluent in key export market languages, such as Chinese.
19. **Investment in solar driers:** This would be a cost effective post-harvest management solution for Cassava and Chili growers.

4.3 Conclusion

In conclusion, Tanzania's favorable agro-ecological conditions, including suitable soil, altitude, and climate, position it as a prime location for year-round production of Avocado, Cassava, and Chili, with significant export potential to China facilitated by bilateral trade agreements. The government's proactive policies, including the promotion of smallholder farming and finalized export protocols, create a robust framework for market access. Notably, Avocado production has surged to approximately 70,000 metric tonnes, driven by high-demand varieties like Hass and Fuerte, while Cassava benefits from virus-resistant varieties enhancing productivity. Actionable steps include leveraging these trade agreements by rapidly scaling up farmer training and market linkage programs to capitalize on China's demand, particularly for Avocado and Cassava.

Significant investments in Cassava research have yielded improved, virus-resistant varieties, which are being multiplied and distributed nationwide to bolster commercial production. Similarly, Avocado farming is supported by abundant rainfall, irrigation infrastructure, and a national program to register and certify nurseries, ensuring high-quality planting materials and traceability. These advancements underscore Tanzania's commitment to quality and scalability in crop production. To maximize impact, stakeholders should prioritize the distribution of improved Cassava varieties to smallholder farmers and accelerate nursery certification processes to maintain Avocado quality standards, enabling consistent supply to export markets.

While trade agreements for Chili exports to China are established, commercial adoption lags due to low farmer engagement. Efforts are underway to incentivize Chili production, but greater focus is needed to unlock its potential. To address this, targeted campaigns should be launched to raise awareness among farmers about Chili export opportunities, coupled with technical support and access to quality seeds. By aligning production with market needs and building on the success of Avocado and Cassava, Tanzania can diversify its export portfolio, strengthen smallholder livelihoods, and enhance its position in the global agricultural market.

In summary;

- Tanzania has significant potential for Avocado, Cassava, and Chili production due to its favorable soil, altitude, and climate, enabling year-round harvesting and market supply.
- Bilateral agreements between Tanzania and China facilitate trade for these crops, with finalized production and export protocols ready for implementation.
- The government actively promotes smallholder farmers to engage in Cassava, Avocado, and Chili farming to supply the Chinese market.
- Significant investments have been made in Cassava research, resulting in virus-resistant varieties that improve productivity and quality.
- Improved Cassava varieties are being multiplied and distributed nationwide to support commercial production.
- The government encourages Avocado farmers to grow Hass and Fuerte varieties, which are in high demand in China.
- Due to government efforts and supportive policies, Avocado production has reached approximately 70,000 metric tonnes, with continued expansion as new farms are established.
- Tanzania's abundant rainfall and water bodies support irrigation, ensuring high-quality Avocado production.
- A national program is underway to register and certify Avocado nurseries, ensuring traceability and high-quality planting materials.
- Although trade agreements for Chili exports to China are in place, commercial adoption remains low. Efforts are being made to encourage more farmers to invest in Chili production for export.

Overall, Tanzania's government initiatives, natural advantages, and growing market opportunities position the country as a key player in the export of Avocados, Cassava, and Chilies.

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6 GALLERY

Figure 4: Figure 4:Figure 1: Far right, our team with Prof. John Ndunguru, Director General at Tanzania Plant health and Pesticides Authority (TPHPA). Pictures showing his previous projects and research on cassava

Figure 5: Figure 2: Our team at Tanzania Horticultural Association (TAHA), Fresh Field Manyatta and at meeting with George of Lupembe farm (Asta member), Emmanuel Macha of Arru Capital and Hon. Halim James Mdee, member of parliament, Avocado farmer and Asta members

Figure 6: Focus Group Discussion with Avocado Farmers in Njombe Region

ANNEX 1: FOCUS GROUP DISCUSSION DATA COLLECTION TOOL

A. GROUP CONSENT FORM FOR INTERVIEW

Introduction to the Group Discussion- Farmers,

Welcome, and thank you for joining this group discussion today. My name is ....., and I will be guiding you through the session.

The primary purpose of this session is to collect insights from you, the participants, concerning a detailed market research study focusing on crop production and related practices in Tanzania. This study will investigate several aspects, including farmer segments, food safety standards, post-harvest management, export readiness, and Return on Investment (ROI). Your input is invaluable, and your feedback will contribute significantly to understanding the current situation in the agriculture sector and supporting future interventions.

To ensure you are fully informed and comfortable before we start, I will outline key points about this interview session.

Study Purpose and Scope

The goal of the market research is to collect detailed data that will help understand how smallholder farmers in Tanzania produce certain crops, the challenges they face, and how they manage those crops, especially with respect to quality standards, export readiness, and overall profitability. We will cover a broad range of topics, including crop production patterns, farmer needs, food safety standards, processing capabilities, and post-harvest handling practices. The findings from these discussions will help identify challenges and opportunities in the agriculture sector and lead to actionable recommendations that will help improve farming practices, market access, and ultimately the livelihood of farmers.

Your input is critical to these insights, as this session aims to capture the diversity of views on the subject.

Confidentiality and Use of Information

We want to assure you that the responses shared during this interview will remain confidential. No personal information that could identify you will be included in any final reports. Only aggregated and anonymized data will be shared, strictly for the purpose of this research.

Rest assured, your privacy will be respected, and no personal identifiers will be linked to your contributions. Any opinions or data you provide will only be used in the context of our study to inform broader findings and recommendations.

Voluntary Participation and Consent

This group discussion is entirely voluntary. You are not obligated to answer any question, and you may choose to withdraw from the session at any time without facing any consequences. Your decision to take part, to not take part, or to withdraw will not influence your current or future relationships with the research team or affiliated institutions.

If at any point during the discussion you feel uncomfortable or wish to refrain from answering a question, please feel free to do so. You may skip any question, and there will be no consequences for your choice.

Recording and Documentation

For accurate data collection, the discussion will be recorded. This recording will allow me to focus on our conversation rather than taking extensive notes. The recording will only be used for transcribing and data analysis, ensuring the accuracy of the findings. Please note, all recordings will be kept confidential, and any direct quotes used in the report will remain anonymous.

Duration of the Interview

The group discussion is expected to take approximately [**60 minutes**]. We appreciate your time and participation in advance and hope the session will be valuable and informative for all involved.

If at any point you need to take a break or step away, please feel free to do so. We understand that everyone has their own level of comfort with discussions, and we want you to feel at ease throughout the session.

Participant's Rights

As participants in this group discussion, you have the right to:

- Share your opinions freely without judgment.
- Remain anonymous in any reports produced.
- Withdraw from the session at any time with no consequences.
- Have all questions answered clearly if you require clarification.

This interview has been designed to promote open and honest dialogue, and we encourage everyone to contribute equally.

Questions and Clarifications

Now that the key information has been shared, I would like to check if you have any questions or if there's anything unclear about the session or your involvement. It's important that you feel comfortable and well-informed before we proceed.

Do you have any questions about this process or how your data will be used?

B. FGD CONSENT CONFIRMATION

By signing below, you are confirming that you:

- Understand the purpose of this interview and how your data will be used.
- Agree to participate voluntarily in this group discussion.
- Consent to the recording of the interview and understand that confidentiality will be maintained throughout the process.
- Acknowledge that you can withdraw at any point without any repercussions.

Thank you for your participation and cooperation.

Participant Confirmation

By signing below, each participant confirms their consent to take part in the interview and fully understands the details mentioned above.

No.	Participant Name:	Signature:
1		
2		
3		

Date: _____

Interviewer Confirmation

I confirm that all participants have received adequate information and have given their informed consent to participate in the group discussion.

Interviewer'sName:_____ **Signature:**_____

Date: _____

C. GROUP DISCUSSION QUESTIONS

Section A: General Questions on Crop Production

1. **What crops are most commonly grown in your area, and why do you think these crops are popular?**
   Prompt for Discussion: Does everyone grow the same types of crops, or is there a variety across different farms? What are the factors that influence crop choice?
2. **What challenges do you collectively face in crop production?**
   Prompt for Discussion: Are there any common issues that everyone experiences, such as access to land, water, or technology? How do these challenges vary by region?
3. **How do the seasonal changes impact your crop production, and does this differ for each of you?**
   Prompt for Discussion: Do you all depend on rain-fed farming, or do some of you use irrigation? How does the climate affect crop yield?
4. **How have climate changes affected your farming practices?**
   Prompt for Discussion: Can anyone share a specific example of how climate change has affected crop yields or farming activities in your area?
5. **In your experience, what are the most effective methods for pest and disease management?**
   Prompt for Discussion: Does everyone have access to similar methods, or are there variations in pest management depending on resources or knowledge?

Section B: Farmer Segmentation and Needs Assessment

6. **How would you describe your farm type? Is it similar to other farms here, or do you each have different approaches?**
   Prompt for Discussion: What size are your farms, and what factors most influence how you run your operations? Do you think there's a difference between large, medium, and smallholder farms?
7. **What are some specific needs or challenges you face in your farming operations?**
   Prompt for Discussion: Are there common struggles related to finance, land, or technology that affect you all? How do these challenges change depending on farm size or region?
8. **Do any of you belong to a farmer association, and how has that helped you in managing your farm?**
   Prompt for Discussion: What benefits have you seen from being part of such groups? How does collaboration impact your success in farming?

Section C: Food Safety and Quality Standards

9. **What food safety practices do you follow on your farms to ensure the quality of your crops?**
   Prompt for Discussion: How do you make sure your crops meet both local and international food safety standards? What are some challenges around quality control?
10. **In what ways do quality standards affect your farming processes? Do you all face the same challenges in meeting these standards?**

Prompt for Discussion: How do different markets or buyers' requirements influence the way you grow, store, or process your crops?

Section D: Post-Harvest Management

11. **What challenges do you face with post-harvest handling, such as storage and transportation?**
    Prompt for Discussion: Are there shared issues regarding storage space, spoilage, or transportation that you all face? How do you each manage post-harvest losses?
12. **What are some practices that could help reduce post-harvest losses, and do any of you currently apply such practices?**
    Prompt for Discussion: How does your community tackle food wastage, and what improvements do you think could help preserve crops after harvest?

Section E: Aggregation and Processing Capabilities

13. **How effective are the collection centers or cooperatives in your region in terms of handling crops?**
    Prompt for Discussion: Are there enough processing or collection centers in your area? How do they help or hinder your ability to sell or process crops?
14. **Do you feel your current aggregation systems are sufficient, or is there room for improvement?**
    Prompt for Discussion: Are these systems working well, or do you think they need more support in terms of infrastructure or capacity?

Section F: Export Readiness and Market Access

15. **Do any of you export your crops? What challenges do you face in making your crops export-ready?**
    Prompt for Discussion: If anyone has experience with export markets, what steps are needed to ensure crops meet export quality standards? How do these standards differ from local market demands?
16. **How do you collectively approach market access, whether for local or international markets?**
    Prompt for Discussion: Do you all sell your products at the same places, or are there different markets for different groups? What obstacles exist in accessing better or more profitable markets?
17. **What resources or support would make it easier for you to meet export readiness standards or access new markets?**
    Prompt for Discussion: Is there a lack of infrastructure or support from government or private sectors that could make exporting easier?

Section G: Challenges, Opportunities, and ROI Analysis

18. **In your opinion, what are the biggest challenges you face as a group in crop production and marketing?**
    Prompt for Discussion: Do these challenges change with market conditions, weather, or farm size? How does each of you overcome them?
19. **What do you see as the greatest opportunities for improving crop production and farming in your region?**
    Prompt for Discussion: How can everyone benefit from tapping into these opportunities? Are there certain crops or practices that have more potential for profitability?
20. **How do you evaluate the success of your farm? What factors help determine your ROI (return on investment)?**
    Prompt for Discussion: How does each of you measure success? Is it through crop yield, profitability, or market access? Are there other ways to look at ROI?

ANNEX 2: KEY INFORMANT DATA COLLECTION TOOL

A. KEY INFORMANT INTERVIEW CONSENT FORM

Introduction

My name is ....., and I am conducting a market research study on agricultural practices in Tanzania as part of a project aimed at analysing key crops in the region. This study will focus on critical issues such as crop production, food safety standards, post-harvest management, export readiness, and more. I greatly appreciate the opportunity to speak with you and learn from your experiences. Your insights are extremely valuable for our research, which will contribute to the future of agricultural development in Tanzania.

Purpose of the interview

The purpose of this interview is to gather expert insights from professionals, farm managers, agricultural stakeholders, government officials, and others who have deep knowledge of farming practices and market conditions in Tanzania. Your expertise will help us understand the realities and challenges faced by smallholder farmers, as well as identify opportunities for growth, particularly in the context of exporting agricultural products.

Research Objectives and Scope

- Understand crop production patterns, yields, and geographic distribution.
- Identify the challenges faced by farmers, especially in terms of inputs, access to land, pests, climate challenges, and market access.
- Analyse food safety and quality standards relevant to both local and export markets.
- Evaluate aggregation infrastructure, processing facilities, and post-harvest management.
- Assess the export readiness of crops and improve smallholder farmers' opportunities in international markets.
- Calculate return on investment (ROI) for farmers engaged in these key agricultural sectors.

Voluntary participation

I want to emphasize that your participation is voluntary. If at any point during the interview you feel uncomfortable or wish to stop, you are welcome to do so without any negative consequences. You also have the right to skip any question you don't wish to answer.

Confidentiality

All the information you provide during this interview will be kept confidential. Your name and any personal identifying details will not be shared or made public. Data from all interviews will be reported in aggregate form, ensuring your privacy is maintained. The only people who will access the information are the research team members, and it will solely be used for analysis purposes related to this project.

How your data will be used

Your insights will be used to better understand Tanzania's agricultural challenges and opportunities. This research will inform decisions around policy-making, farmer support systems, and the strategies necessary to help farmers access international markets. The final report will include general findings and recommendations for enhancing agricultural practices and value chains. Your comments and suggestions will help shape actionable steps to address existing gaps in production and market access.

Interview Process

- **Duration**: The interview is expected to last about **[45 Minutes],** depending on the depth of our discussion.
- **Recording**: With your consent, we would like to record the interview to ensure that all the information is captured accurately.

Your Rights as a Participant

- You may refuse to answer any question or leave the interview at any time.
- You may request clarification on any point or question before proceeding.

Risk and Benefits

There are no foreseeable risks in participating in this study. However, by sharing your knowledge and experiences, you will contribute to improving agricultural policies, practices, and systems in Tanzania. The findings of this study could potentially help improve farmers' access to markets and provide strategic guidance on post-harvest management, quality control, and export readiness.

Consent to participate

If you agree to participate in this interview, please sign and date below. Your participation is much appreciated, and your views will make a significant contribution to the success of this study.

Participant Consent:

Participant Name: _____

Organization/Position: _____

Date of Interview: _____

Consent for Recording (tick):

☐ Yes, I consent to the audio recording of my interview.

Participant Signature: _____ **Date:** _____

Researcher's Details:

Researcher's Name: _____ **Researcher's Signature:** _____

Date: _____

B. KEY INFORMANT INTERVIEW QUESTIONS

Section A: Background Information

1. **Please introduce yourself and your role within your institution or organization. How long have you been involved in the agricultural sector?**
   Prompt for Discussion: What is your current role and responsibility in relation to crop production or supporting farmers?
2. **How do you interact with or support the farming community in your region?**
   Prompt for Discussion: Do you directly engage with farmers, or do you work in partnership with other stakeholders? What do those interactions typically look like?

Section B: Agricultural Practices and Trends

3. **What types of crops are most commonly grown by farmers in your region, and why do you think these crops are particularly important or popular?**
   Prompt for Discussion: Is there a noticeable trend in terms of crop diversity, and what factors—such as climate, market demand, or farmer education—are driving these trends?
4. **In your view, do farming practices vary significantly between smallholders and larger-scale farms in your region?**
   Prompt for Discussion: What unique farming methods, tools, or systems do different farm types use to manage production?
5. **How do seasonal changes affect crop production in your region? Do farmers face specific difficulties with seasonality?**
   Prompt for Discussion: How do farmers cope with seasonal shifts, and do you see any solutions or adaptations that help manage these challenges?
6. **What impact, if any, have climate changes or environmental shifts had on farming methods and crop yields?**
   Prompt for Discussion: Can you provide any examples of how climate-related issues have affected specific crops or farm productivity?

Section C: Key Challenges in Crop Production

7. **What do you consider to be the most significant challenges faced by farmers in your region, both locally and nationally?**
   Prompt for Discussion: Are the challenges more focused on market access, climate change, technology availability, or something else? How do they impact different types of farmers?
8. **How would you assess the access to resources like land, water, technology, or financing among farmers in your region?**
   Prompt for Discussion: Are there particular barriers that hinder access to these resources? How does your organization or institution address these gaps?
9. **What initiatives or programs, if any, have been implemented to address these common challenges?**
   Prompt for Discussion: Can you share some success stories of programs aimed at overcoming challenges faced by farmers?

Section D: Pest, Disease Management, and Food Safety

10. **What pest and disease management practices are most commonly implemented by farmers, and how effective are these methods?**
    Prompt for Discussion: Are there improvements or resources that are needed to boost pest control and disease management practices among farmers?
11. **How does your institution or organization support farmers in ensuring food safety and meeting relevant quality standards?**
    Prompt for Discussion: What are the primary difficulties faced by farmers in meeting food safety standards, and how are these challenges managed?

Section E: Post-Harvest Handling, Storage, and Infrastructure

12. **What are the main challenges farmers face regarding post-harvest handling and storage?**
    Prompt for Discussion: Do farmers struggle with issues like spoilage, storage facilities, or transportation? How does your organization support farmers in overcoming these issues?
13. **What role do cooperatives, farmer groups, or collection centers play in post-harvest management? Do these support systems work efficiently?**
    Prompt for Discussion: What has been the overall impact of such systems, and what improvements are needed in post-harvest infrastructure?

Section F: Market Access, Export Readiness, and Support

14. **What challenges do farmers face in accessing local or export markets?**
    Prompt for Discussion: Do market demands differ for local versus international customers, and how do farmers meet these expectations?
15. **Does your institution assist farmers in meeting export standards or improving market access?**
    Prompt for Discussion: What role does your institution play in helping farmers export crops? What barriers do farmers face when trying to access export-ready markets?
16. **What types of resources or support would enable farmers to be better prepared for exporting, both in terms of logistics and meeting quality standards?**

Prompt for Discussion: How important is support from government or NGOs in this area, and what additional support would help farmers compete in international markets?

Section G: Organizational Support and Future Outlook

17. **What are some ongoing or future plans from your organization to support farming communities and improve production and livelihoods in your area?**
    Prompt for Discussion: How are you addressing issues like climate change, market access, or resource limitations in these plans?
18. **What role do community leaders, NGOs, or government departments play in the success of agriculture in your region?**
    Prompt for Discussion: Are there sufficient efforts being made at these levels to support the farming community, and what improvements are needed?
19. **What opportunities do you foresee in the future for farmers in your region, and what steps can be taken to maximize these opportunities?**
    Prompt for Discussion: Do you see emerging opportunities in certain crops, technologies, or market areas? How can farmers capitalize on these?
20. **How do you measure the impact of your efforts and the broader agricultural initiatives in improving farmers' livelihoods?**
    Prompt for Discussion: What metrics or indicators are used to determine success, and what successes can be highlighted from the past?