

PRIMARY RESEARCH

Competitiveness analysis of Tanzanian agricultural exports: Trends and challenges

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Although Tanzania's agricultural sector contributes over 26% of GDP and employs about 60% of the workforce, it is crucially important for the country's economy but struggles in foreign markets. Analyzing important exports including coffee, tea, cashew nuts, and sisal using Michael Porter's Diamond Model and a mixed-methods approach to assess Tanzania's agricultural trade competitiveness. Results show a competitive advantage ($RCA > 1$) in food, live animals, and raw materials; however, low value addition, post-harvest losses, inadequate infrastructure, and strict international standards cause limit performance even in these areas. Despite these obstacles, regional trade agreements (EAC, SADC), agro-processing investments, digital agriculture, and market diversification create potential. While pointing up hazards like climate change and trade restrictions. To improve competitiveness, recommendations include infrastructure development, value addition, trade facilitation, technology adoption, and closer worldwide alliances. Deeper integration into world markets and sustainable economic development could be achieved by addressing these sectors, therefore releasing Tanzania's agricultural potential.

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INTRODUCTION

With so many natural resources and rich land, Tanzania's economy is mostly based on agriculture, a sector that still forms the backbone of the country's economic structure. Among Tanzania's primary economic sectors, agriculture is one that shapes the nation's economic path most importantly. With around 60% of the workforce employed and about 26% of Tanzania's GDP coming from agriculture, it is clearly important for this sector to support livelihoods especially in rural areas. This industry not only makes a major contribution to GDP but also gives millions of Tanzanians work chances, thereby supporting economic stability and expansion (World Bank, 2021).

Tanzania features a varied array of agricultural products, ranging from commercial crops such coffee, tea, and cashews to staple crops including maize and rice as well as animal husbandry operations. The export of these goods has made Tanzania a major actor in world and regional agricultural markets. For example, the Tanzania Coffee Board (2022) notes that, mostly

from markets in Europe and North America, coffee exports create about \$150 million yearly. Another important export is cashew nuts; thanks to value addition techniques emphasizing local processing, the Tanzania Cashew Board (2021) notes that this industry makes major contribution to foreign exchange revenues.

The GDP of the agriculture industry highlights its importance in furthering stability and economic growth. It remains the largest single contributor to Tanzania's GDP. For millions of Tanzanians, particularly in rural areas where around 70% of the population depends on farming activities for their living, agriculture is the main source of income. This connected involvement in agriculture underlines the sector's capacity for expansion and development, therefore stressing its possibilities to increase the national economic wealth (United Nations Conference on Trade and Development (United Nations Conference on Trade and Development, 2022).

Using Tanzania's excellent geographical location to access both

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regional and worldwide markets, agricultural commerce is vital for the country's economic plan. For example, Tanzania is one of the top producers of cloves, a high-value export crop, mostly grown in Zanzibar, so exports of agricultural products especially in coffee, cashew nuts, sisal, and tea growing help Tanzania's integration into the global economy in addition to generating large incomes. Among the top five global producers of cloves, Tanzania is helping significantly to boost export revenues for the country, according to the (United Nations Conference on Trade and Development, 2022).

Tanzania's agriculture sector struggles to completely realize its possibilities in the worldwide market even with its achievements. Although the country is well-known for manufacturing goods including cloves, coffee, tea, sisal, and cashew nuts, it struggles to meet worldwide quality criteria, especially those set by wealthy nations. The agricultural sector is still under development; so, it is not yet clearly established whether global agricultural markets exhibit a constant growth pattern. Rising global agricultural product quality requirements present one of the main issues; some Tanzanian goods fall short because of inadequate infrastructure and technology developments (Food and Agriculture Organization, 2021).

Knowing Tanzania's agricultural competitiveness is important since it's the industry, which sustains most of the people and makes major economic contribution, has been losing worldwide market share while still exporting primarily low value, raw

goods. Two key objectives of this study are to analyze current changes in agricultural exports from Tanzania including coffee, tea, and cashew nuts and to find what is either hindering or could increase their competitiveness in foreign markets. At the study examines possibilities such regional trade agreements and value addition as well as difficulties including inadequate infrastructure, significant post-harvest losses, and tight import policies. This study is important since it will enable policymakers to develop better trade rules, direct farmers in enhancing their methods, and show traders access to more profitable markets. Addressing these problems can enhance Tanzania's agriculture sector in becoming more competitive internationally and therefore boost the national economy. Based on their degree of competitiveness, the trend of agricultural products exports in Tanzania is investigated. Table 1, shows Tanzania's agricultural export structure, which shows notable variations in many product categories (SITC classifications) from 2014 to 2022. According to the figures, export performance has been erratic and no clear rise or decrease trend for any one category. SITC 0 (Food and live animals) for example saw a huge rise in 2018 (782,430) but decreased drastically in following years; SITC 2 (raw materials) stayed very constant compared to other categories. This volatility suggests possible competitiveness problems, maybe resulting from supply chain interruptions, external market shocks, or reliance on a small number of important commodities.

TABLE 1. Tanzania's agricultural export structure

SITC	2014	2015	2016	2017	2018	2019	2020	2021	2022
SITC 0	253,212.6.29	237,325.8.1	175,123.2	166,2155.31	782,430.118	150,3361.94	165,1502.74	196,6082.05	193,8259.6
SITC 2	235,4511.26	212,7640.7	190,903.5	148,8344.2	399,011.035	136,8134.51	163,9895.48	160,4045.97	198,5117.99
SITC 3	957,35.656	128,545.43	422,34.62	474,54.8852	325,40.6285	105,617.462	664,70.6349	685,92.2 039	256,408.853
SITC 4	195,331.35	253,381.07	154,208.6	253,996.617	141,115.842	189,199.089	152,705.939	203,816.519	229,127.054
SITC 5	182,3653.54	151,9479.6	100,412.6	115,0243.29	303,591.79	106,8967.39	123,5480.88	149,3082.93	132,4094.45

With ranges from 105,617 (2019) to 957,356 (2014), SITC 3 (fuels) shows the most extreme variations implying instability in this sector. SITC 4 (Animals) and SITC 5 (Chemicals and related products) show moderate changes meanwhile; the former shows a little upward trend by 2022. These trends suggest that the degree of agricultural export competitiveness of Tanzania differs greatly depending on product type; certain categories show more resilience than others.

Moreover, it is becoming more and more necessary to find and use agriculture sector competitive advantages to improve trade performance. Emphasizing the need of knowing the elements influencing Tanzania's trade competitiveness, scholars have acknowledged the competitive advantages and disadvantages of her agricultural product trade. Macroeconomically, it

is imperative to evaluate Tanzania's agricultural exports' competitiveness and create appropriate development policies that support an environment fit for agricultural businesses.

LITERATURE REVIEW

This paper expands on two important theoretical models: Porter's Diamond Model, which examines competitive drivers including factor conditions and company strategy (Porter, 2001), and the Revealed Comparative Advantage (RCA) index, which evaluates Tanzania's export specialization (Balassa, 1965). In this study RCA Index is used to evaluate the competitiveness of Tanzania's agricultural products. Agricultural product in Tanzania shows notable competitive benefits in traditional cash crops like coffee, tea, and cashew nuts. the above

sectors continuously reported RCA values larger than one, demonstrating their excellent competitiveness in the worldwide market. Tanzania's competitive advantage increased from 25 to 27 product classes between 2014 and 2021, with a significant emphasis on food, livestock and raw materials, which rule the agricultural sector. Tanzania has highly competitive advantages in some agricultural products, but many industries are seeing diminishing RCA values, according to economic indicators that analyze trade data (Mkenda, 2014; Mwasha & Kweka, 2009). Long showing a competitive advantage in cash crop exports, especially coffee, tea, cashew nuts, tobacco, and sisal, Tanzania has Strong production capacity in the nation result from its pleasant climate, rich land, and labor availability, thereby attesting to its Revealed Comparative Advantage (RCA > 1) in these goods (Balassa, 1965). For example, Tanzania ranks among the top cashew nut growers in Africa; the crop greatly boosts rural incomes and export revenues (Food and Agriculture Organization, 2022). Likewise, extensive trade networks help its coffee and tea industries, especially in European and Asian markets (International Trade Centre, 2022). Though Tanzania has a competitive edge, its agriculture industry still mostly depends on raw exports and inadequate processing would lower possible income gains (United Republic of Tanzania, 2021).

Tanzania has constant difficulties that restrict its worldwide competitiveness even with its agricultural potential. Infrastructure shortcomings including ineffective port operations and inadequate rural road networks raise transportation expenses and post-harvest losses estimated at 30–40% for perishable items which affect perishable goods specifically. Low value-addition is still a major obstacle; most exports are sold raw because of poor agro-processing capacity, thereby prohibiting Tanzania from obtaining more margins in worldwide markets (United Republic of Tanzania, 2021). For instance, even if the nation grows premium coffee beans, almost 90% of them are exported unroasted, so foreign processors gain value (Mwinuka & Mwangoka, 2023).

Multiple linked elements affecting Tanzania's agricultural export performance fall under production, market, and institutional circles (World Bank, 2022). From a production standpoint, the nation gains from diversified crops and a mild temperature; yet, limited technology adoption and substantial post-harvest losses lower output quality and volume African Development Bank, 2021. While Tanzania has preferred trade agreements through EAC and SADC, market-related data suggest that many small-scale farmers fail to achieve international quality requirements and pay heavy transportation expenses (East African Community, 2023). Further restricting export po-

tential are institutional shortcomings including restricted access to credit (only 8% of farmers), poor extension services, and gaps in policy execution (United Republic of Tanzania, 2022). Additional risks are added by outside shocks such global price volatility and climate change Intergovernmental Panel on Climate Change (IPCC, 2022). Though systematic investments in infrastructure, processing capacity, and farmer support remain crucial for improving long-term export competitiveness, recent studies reveal chances for improvement through digital agriculture platforms and increased regional connectivity (Bandaru, 2022).

Existing research already shows Tanzania's great but under-used capacity for agricultural exports. With these commodities accounting for over 60% of agricultural export profits, studies often find the nation's competitive advantage in traditional cash crops including coffee (Kilima & Kurwijila, 2020) tea (Mramba & Mhando, 2020), cashew nuts (Isinika et al., 2021), and tobacco (United Republic of Tanzania, 2021). Scholars point out, however, that this advantage is still mostly unrealized given various ongoing issues. First, value addition remains low, with over 80% of exports sent as raw commodities (World Bank, 2021). For example, according to Katuli (2020) 90% of Tanzania's coffee exports are unroasted, so missing major potential income. Second, supply chain inefficiencies especially poor rural infrastructure and estimated 30–40% post-harvest losses for perishable items (Food and Agriculture Organization, 2021) very much lower competitiveness. Third, strict global standards especially EU phytosanitary rules cause smallholder farmers' market access to be hampered (East African Community, 2023).

Though some countries have achieved great progress, similar difficulties abound throughout Africa. For example, Kenya has substantially invested in tea processing to be dominant worldwide with branded goods. By use of cooperative models and direct trade agreements, Ethiopia has raised its coffee export revenues (Gebrehiwot et al., 2021). These cases draw attention to chances for Tanzania to improve its competitiveness by implementing best practices in agro-processing, climate adaptation, and trade facilitation.

RESEARCH METHODOLOGY

Using a mixed-methods research design, this study combines qualitative and quantitative methods to provide a comprehensive analysis of Tanzania's agricultural export competitiveness. Combining statistical trade analysis with policy and stakeholder insights helps to provide a stronger study of both observable trends and underlying causes affecting export success.

The study ensures reliability and depth by utilizing multiple

data sources. Drawn from the UN Comtrade database which offers comprehensive records of Tanzania's agricultural exports by product and destination market from 2014 to 2022 quantitative trade data is further enhancing this information with domestic output and export numbers are Ministry of Agriculture statistics and Bank of Tanzania annual reports. Documents on institutional and regulatory framework from government policies include Tanzania's Agricultural Sector Development Program (ASDP II) trade agreements under the East African Community (EAC) and Southern African Development Community (SADC) set background.

A Time-series analysis is used to evaluate export patterns by means of changes in export volumes, values, and market share for important commodities such coffee, cashew nuts, tea, and to-bacco. Two main indexes quantify competitiveness of Tanzanian Agricultural exports.

Index (RCA)

It measures a country's relative advantage or disadvantage in exporting products compared to the rest of the world. It is calculated by comparing the share of a product in a country's total export to the share of the product in global trade. Interpretations says that, if $RCA > 1$, the country has a comparative advantage in that product and if the $RCA < 1$, the country has a comparative disadvantage.

Formular [2]

$$C(i, t) = \sum_{j \geq 1} X(i, j, t) \quad (1)$$

Where:

- $j = \{0, 2, 3, 4, 5\}$ is the set of all products (with $i \in j$),
- $X(i, j, t)$ represents Tanzania's export of product i to partner j at time t .
- $\sum_{j \in n} X_{t,j}$ is Tanzania's total exports (of all products i in j),
- $X(i, t)$ is the world export of product i ,
- $\sum_{j \in n} X_{w,j}$ is the world's total exports (of all products i in j).

The RCA index is used to indicate Tanzania's competitiveness in agricultural products through a global comparison of its export performance. The study focuses on SITC categories of Agricultural products, SITC 0, SITC 2, SITC 3, SITC 4, and SITC 5 to evaluate its Revealed Comparative Advantage (RCA).

Micheal Porter's Diamond Model

The study integrates Tanzania's real circumstances and determines the best approach to assess Tanzania's agricultural product trade competitiveness. To provide the data foundation

for this study's empirical analysis, the study focuses on the integrating theory and practice by qualitative and quantitative analysis. To empirically investigate the degree to which the influencing factors affect Tanzania's agricultural products competitiveness. This study uses both qualitative and quantitative methodologies to assess the competitiveness of Tanzania's agricultural product trade, combining theoretical frameworks with empirical realities.

The primary framework employed is Porter's Diamond Model, which evaluates competitiveness through the analysis of four essential criteria. This is how the Model Operates in Tanzanian Context.

Factors condition: Tanzania possesses plenty of arable land and workforce, however, inadequate infrastructure characterized by substandard roads and limited irrigation, diminishes efficiency. The model assists in identifying these deficiencies.

Demand conditions: Local consumption trends and export demand, such as that from the EU for coffee, influence production incentives. The report evaluates Tanzania's compliance with global norms. High-end domestic demand promotes innovation and quality. The expanding urban middle class in Tanzania may enhance standards for processed goods, so indirectly improving export competitiveness. The prevailing weak domestic demand for value-added products, such as roasted coffee compared to raw coffee, sustains dependence on commodity exports.

Supporting industries: The absence of agro-processing industries results in exports remaining unprocessed and of low value. The model underscores this deficiency. A strong network of suppliers can enhance supply chain efficiency and promote innovation through collaboration. Competitive groups, such as coffee producers, processors, and logistics, generate cooperation. Tanzania's poor agro-processing sector, which contributes to agricultural GDP in other nations, shows a used chance to transform raw cashew and coffee exports into higher-margin products.

Government role: The government's role involves assessing policies such as export taxes and subsidies to determine their impact on competitiveness. The model highlights on the support provided by the government on agricultural competitiveness. Through laws, investments, and industrial support, government policies and actions can shape the competitive environment. The competitive environment may change depending on chance occurrences include changes in world markets or technological developments. These elements taken together build a dynamic framework that influences national and corporate competitiveness.

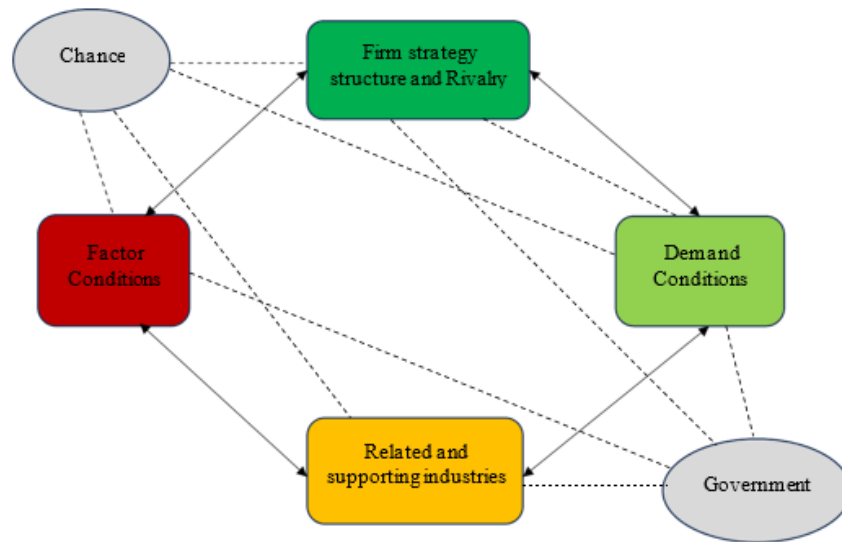


FIGURE 1. Micheal E. Porter's diamond model

The research employs quantitative data (e.g., export and import rankings) to assess Tanzania's agricultural performance, including its Revealed Comparative Advantage (RCA) in significant crops such as coffee, cashews, and tobacco. Qualitative analysis enhances this by assessing Tanzania's policies, poor infrastructures, and farmers' access to technology. By integrating both methodologies, the study determines which characteristics most significantly influence competitiveness. The application of Porter's model enables the study to identify shortcomings in Tanzania's agricultural commerce and propose specific enhancements, such as investment in irrigation and the modernization of supply chains. This mixed-method approach ensures that recommendations are both empirically grounded and culturally relevant to Tanzania's economy. Particularly in determining how infrastructure, trade regulations, and value-addition constraints affect competitiveness, qualitative insights from policy evaluations and case studies assist to explain quantitative results.

The mixed-methods approach ensures that the study captures not just statistical trends but also the actual difficulties and possibilities experienced by Tanzanian farmers, traders, and policymakers. While quantitative data shows what is happening in export markets, qualitative study clarifies why particular trends such as low value addition or market access restrictions exist and how they might be resolved. This approach offers a reasonable, evidence-based basis for assessing Tanzania's agricultural export potential and suggesting doable solutions.

Finally, within a vicious loop these linked gaps produce discouragement of private investment in value addition in underdeveloped supporting sectors, hence extending dependence on commodity exports and lowering funding for R&D and cluster

development. Changing this cycle calls for coordinated activities across all diamond determinants by improving variables using of agricultural technology, encouraging demand for processed commodities through export subsidies, and developing groups through special economic zones for agro-processing. Only methodical cooperation can convert Tanzania's potential benefits into steady RCA increase.

FINDINGS

Trends in Tanzanian Agricultural Exports

Reflecting its Revealed Comparative Advantage (RCA) indices below, Tanzania shows a substantial relative advantage in agricultural exports, especially in SITC 0 (Food and Livestock) and SITC 2 (Raw Materials). Coffee, mostly grown in the Kilimanjaro and Arusha areas, is the main export good from the nation; still a major foreign cash earner due to ongoing demand in European and North American markets. Tanzania also ranks among the top cashew nut growers in Africa, albeit a lot of them are sold raw to India, thereby missing chances for value addition and more export income. Focused on Mbeya and Kagera, tea production keeps growing in response to both home and foreign demand. Though their RCA values vary depending on weather instability and uncertain world prices, traditional cash crops as sisal and tobacco also help to generate exports. However, with this, the horticulture industry which includes avocados, spices, and other high-value crops offers a growing export diversification potential. Nevertheless, its expansion is constrained by post-harvest losses and difficulties fulfilling strict worldwide quality criteria. Improving supply chain efficiency, value addition, and manufacturing limitations addressing could help Tanzania's position in world agricultural markets to be even more strengthened.

TABLE 2. Tanzania's RCA trends 2014-2022 analysis

Year	SITC 0	SITC 2	SITC 3	SITC 4	SITC 5 3
2014	1.86	1.05	0.04	0.57	3.43
2015	1.54	1.09	0.07	0.69	2.47
2016	1.39	1.27	0.03	0.52	2.01
2017	1.42	1.07	0.04	0.90	2.49
2018	2.01	0.78	0.06	1.52	2.03
2019	1.48	1.04	0.08	0.76	2.75
2020	1.23	1.12	0.06	0.49	2.29
2021	1.54	0.96	0.04	0.71	2.81
2022	1.49	1.19	0.13	0.79	2.42

3 SITC (Standard International Trade Classification) categories: SITC0(food& livestock), SITC2(raw materials), SITC3(fuels and related products), SITC4(Animals), SITC5(chemicals). Data Source: UN COMTRADE Database. Calculations done by Researcher.

For instance, the Revealed Comparative Advantage (RCA) for SITC 0(food and livestock), SITC 2(raw materials), and SITC 3(fuel) in 2014 was calculated as shown on the table above and here are the results.

TABLE 3. Provided data: UN COMTRADE database for RCA calculations

SITC	Tanzania's Exports (Million USD)	World Exports (Trillion USD)
SITC 0	2,532,126.29	1,612,144,678.07
SITC 2	2,354,511.26	2,660,715,049.39
SITC 3	95,735.656	2,990,512,445.09
SITC 4	195,331.35	404,912,107.87
SITC 5	1,823,653.54	630,442,341.79

Revealed comparative advantage of Tanzania in Important Export Sectors 2014. The Revealed Comparative Advantage (RCA) index is a common tool for evaluating trade competitiveness since it shows sectors in which a nation has a relative export strength above the world average. Tanzania's RCA estimated for five main Standard International Trade Classification (SITC) categories in 2014 using data from the UN COMTRADE Database: Food and Livestock (SITC 0), raw materials (SITC 2), fuel and related products (SITC 3), animals (SITC 4), and chemicals and related products (SITC 5).

Results on the export competitiveness of Tanzania, food and livestock (SITC 0) RCA = 1.86 With an RCA well above the level of 1, Tanzania displayed a great relative advantage in exporting food and live animals. This implies that, given its plenty of fertile land and historical dependence on farming, the nation was more specialized in agricultural and cattle output than the global average.

Raw materials (SITC 2) RCA = 1.05, which was somewhat above 1, suggesting a minor comparative advantage. This suggests that although unprocessed mineral, lumber, and other natural

resource exports from Tanzania were competitive, they lacked the dominance of agricultural products. The near-breakeven RCA in this industry would suggest low value addition.

SITC 3 fuels RCA = 0.038, shows very low RCA for petroleum exports far less than 1 showcases a serious relative disadvantage. This fits Tanzania's non-oil-dependent economic situations, with low fossil fuel output in relation to other big world exporters.

With an RCA of 0.57 under SITC 4 (animals and vegetable oil) category, Tanzania shows a relative disadvantage that is, less than the world average percentage of animal and vegetable oils. Tanzania generates oilseeds (e.g., sunflower, cottonseed, palm oil), however much of this is either eaten locally or exported raw rather than refined. Possibly owing to limited processing capacity. Major exporters' competitiveness, large-scale producers (such as Indonesia and Malaysia for palm oil) predominate in global markets, so Tanzania finds it tough to compete. Also demand in the domestic market, Local consumption of edible oils might help to lower the excess ready for export.

The implications and policy suggestion on examining the RCA data emphasizes Tanzania's dependence on exports based on agriculture, which fits its economic situation at the time. Still, the lack of competitiveness in fuel exports and just a small benefit in raw materials point to chances for value addition and diversification. Policymakers should consider plans including investing in mineral beneficiation to increase the competitiveness of raw materials, enhancing agro-processing to move up the value chain in food exports, and investigating renewable energy exports (e.g., biofuels) to help to offset the weakness of the fuel sector. Finally, Tanzania's RCA profile highlights its strengths in main goods but also indicates the need of structural change to increase competitiveness in higher-value industries.

To ensure comparability and reliability of the results, the same methodological approach was used consistently across all SITC categories and years 2014–2022. Similarly, the RCA for SITC 4 (Animals) and SITC 5 (chemicals) were calculated respectively. This indicates that Tanzania is proficient in the production and exportation of food & livestock, raw materials, and horticultural goods which are essential for its agricultural commerce. Tanzania is most competitive in on the global stage, highlighting areas of strength and potential for further growth.

Export Markets

Tanzania's agricultural exports find distribution among numer-

ous important regional and international markets, each distinguished by different demand dynamics and trade links. Thanks in great part to preferential trade agreements that improve market access and lower tariff barriers, the East African Community (EAC) (notably Kenya and Uganda) and the Southern African Development Community (SADC) (especially South Africa) are regionally important export destinations. Beyond Africa, the European Union (EU) and North America remain key markets for high-value commodities including coffee, tea, and horticultural products; although exports to these areas are often limited by strict Sanitary and Phytosanitary (SPS) criteria, which demand compliance with rigorous quality and safety regulations. Though it confronts fierce competition from established producers like Vietnam (in coffee) and India itself (in cashews), who dominate worldwide supply chains, Tanzania sells large volumes of cashew nuts and tobacco to India and China in Asia. Driven by increasing consumer demand for tropical and organic products, the Middle East more especially, the United Arab Emirates (UAE) and Saudi Arabia has become a developing market for Tanzanian spices and horticulture products. Leveraging these possibilities, however, calls for Tanzania to solve ongoing issues with satisfying international certification criteria and enhancing supply chain efficiency if it is to compete successfully in these many markets.

TABLE 4. Tanzania's SITC market shares

Year	SITC 0 (%)	SITC 2 (%)	SITC 3 (%)	SITC 4 (%)	SITC 5 (%)
2014	0.00157	0.00089	0.00003	0.00048	0.00289
2015	0.00163	0.00116	0.00007	0.00074	0.00263
2016	0.00119	0.00109	0.00003	0.00044	0.00172
2017	0.00104	0.00078	0.00003	0.00066	0.00182
2018	0.00047	0.00018	0.00002	0.00035	0.00047
2019	0.00090	0.00063	0.00005	0.00046	0.00167
2020	0.00095	0.00087	0.00005	0.00038	0.00177
2021	0.00097	0.00060	0.00003	0.00044	0.00177
2022	0.00090	0.00072	0.00008	0.00048	0.001464

4 SITC0 (Food & Livestock), SITC2 (Raw Materials), SITC3 (Fuel), SITC4 (Animals), SITC 5 (Chemicals). World Trade Effect for Tanzania SITC market shares digit level commodities from 2014 to 2022. All trade values are reported in percentage. Data Source: UN COMTRADE Database & Calculations by researcher.

The market shares of Tanzania's exports across different Standard International Trade Classification (SITC) categories were assessed annually from 2014 to 2022. This formula was utilized to calculate the market share for each SITC category during the designated timeframe. The results offer a quantitative

assessment of Tanzania's export performance in comparison to worldwide exports across each product area.

The formula for calculating market share is as follows: Market Share = $\frac{x}{y} \times 100$

Where: x , is Tanzania's export of product i , y is World's export of product i

Tanzania's peripheral importance in world trade is revealed by its export market shares, for instance in 2014 0.0016% (food and livestock), 0.0089% (raw materials), and 0.00003% (fuel). These numbers capture both national economic structural lim-

itations and possibilities at the time.

Food and Livestock SITC 0: 0.0016% markets share. Tanzania's share of world food exports was small even with a comparative advantage ($RCA = 1.86$), because of low productivity.

The dominance of smallholder farming restricting economies of scale, Informal trade in food that is, trade between countries like Kenya and DRC often goes unrecorded in official statistics and weak value addition. Mostly unprocessed (raw coffee, cashews), exports fetching less than processed products.

Raw materials: SITC 2; markets share: 0.0089%. Although Tanzania's RCA of 1.05 implied equivalence with world standards, Resource Curse Avoidance caused its market share to stay small unlike other rivals like Kenya, Zambia. By diversifying its raw material exports that is, tobacco, cotton, sisal Tanzania helped to lower volatility. Another factor is missed opportunities and limited mineral beneficiation that is, shipping raw coffee instead of roasted or ground. This caps income potential. For example, downstream processing caused South Africa to have a 0.15% market share in raw materials.

SITC 3, fuel: 0.00003% Tanzania's almost zero share matched its lack of fossil fuel reserves resulting from energy dependency. The low share reflected dependence on imported fuels, hence taxing foreign reserves. However, at the same time Renewable Potential exposed Tanzania's reliance on fossil fuels' shortcomings and highlighted biofuels' (like sugarcane ethanol) potential.

By focusing on value addition, quality improvement, and market diversification, Tanzania may raise its shares of exports internationally. Tanzania can guarantee better profit margins and increase its competitiveness in foreign markets by turning raw agricultural products into higher-value commodities (e.g., roasted coffee, packaged tea, or processed cashew nuts). Moreover, improving adherence to international quality standards and extending trade agreements could help Tanzania to enter new markets and support its reputation as a consistent producer of agricultural products. The information in the table emphasizes the need of strategic investments in several industries to increase Tanzania's global market share and improve its agricultural trade. Particularly in the Middle East, Tanzania's agricultural exports have a specialized but important presence on world markets.

Growth and Decline in Tanzania's Agricultural Exports

Examining Tanzania's agricultural export performance over the study period exposes different trends of increase and decrease among important commodities groups. With Revealed Comparative Advantage (RCA) indicators reaching their peak in the 2018–2019, showing continued global demand and Tanzania's competitive posture in these key export sectors, coffee and

tea exports (SITC 2) showed remarkable resilience. Thanks to deliberate policy changes carried out by the Tanzanian government to increase value addition and boost market access, the cashew nut sector showed a notable post-2020 comeback. On the other hand, the export performance of raw materials (SITC 2) showed great instability and RCA values changed significantly. Two interrelated causes can mostly explain this instability: erratic price swings in global commodities markets and recurring climate shocks. For instance the severe drought conditions. These results underline the sector's sensitivity to external shocks as well as the possibility for policy-driven enhancement of export performance. Different paths across commodity groups imply that focused interventions in value chain development and climate adaptation could pay off greatly in improving Tanzania's agricultural trade competitiveness.

Challenges Affecting Tanzania's Agricultural Competitiveness

Supply side constraints: With only 6% of cropland under irrigation combined with the continuation of antiquated farming methods, Tanzania's agricultural industry has major production constraints mostly related to its excessive reliance on rain-fed agriculture. These elements lower the sector's resilience to climatic fluctuation and constrain production. Moreover, post-harvest losses which range between 20 and 30% for perishable goods attributed to poor storage facilities (e.g., lack of cold chains) and ineffective rural transportation networks that delay market access remain shockingly high. The associated inefficiencies set off a vicious cycle, delayed market access drives early crop harvesting at less than ideal maturity, therefore aggravating quality degradation and lowering shelf life. These supply-side shortcomings taken together not only limit domestic food security but also methodically compromise the quality consistency needed for competitive export participation, especially in controlled markets with rigorous phytosanitary standards.

Market access barriers: The industry deals with tight trade policies including shockingly high taxes (going up to 100% on some imported inputs including fertilizers), which raise production prices. Furthermore, limiting Tanzania's capacity to enter high-value markets are Non-Tariff Barriers (NTBs), especially complicated customs procedures and strict EU Sanitary and Phytosanitary (SPS) rules, which cause the rejection of over 20% of horticulture exports. Technical investigation revealed in the remaining cases these rejections mostly result from pesticide residue levels over EU maximum residue limits, insufficient phytosanitary certification documentation, and non-compliance with post-harvest handling practices. Together, these market access restrictions hinder Tanzania's capacity to enter profitable high-value markets, therefore direct-

ing over 65% of agricultural exports toward lower-margin regional markets. Despite their inherent agro-ecological benefits, the resulting export composition dominated by unprocessed commodities rather than value-added goods helps to explain Tanzania's lower end of global agricultural value chain position. Though their influence is still restricted by low small-holder involvement and uneven application, recent attempts to build SPS-compliant pack houses and apply Good Agricultural Practices (GAP) certification systems offer promise.

Logistics and infrastructure constraints: Manifested in poor rural road conditions and congestion at the Port of Dar es Salaam, transport bottlenecks delay timely shipments and raise trade expenses. Furthermore, erratic energy supply greatly reduces agro-processing capacity; for example, just 5% of cashew output goes through local processing, therefore compromising possible value addition and export earnings.

Policy and institutional challenges: Major agricultural projects (such as ASDP II, SAGCOT, and Kilimo Kwanza) suffer from fragmentation and overlap that results in inefficiencies in resource allocation in policy execution. Underfunded agricultural R&D compound this problem by producing inadequate extension services and restricted innovation (e.g., delaying adoption of drought-resistant crop varieties), therefore constraining sectoral development.

Environmental degradation and climate change: Rising temperatures and erratic rainfall endanger steady output of important exports including cashews, tea and coffee. Yield volatility in important export crops including coffee, the rising temperatures in conventional growing areas (such as Kilimanjaro slopes) are driving production to higher altitudes, hence driving expenses. Heat stress and pest outbreaks such as coffee berry borer are expected to cause a 30% drop in Arabica coffee yields by 2022, IPCC (2022). Tea, in Mbeya and Njombe areas, irregular rainfall has lowered output quality; tannin levels vary outside export criteria (International Trade Centre, 2022). Tea auctions in Tanzania today may suffer 15–20% price penalties for uneven taste profiles. Cashews, also extended droughts in southern areas (e.g., Mtwara) produced a 40% decline in nut size during the 2021 season, therefore relegating harvests to lower-value domestic markets (Tanzania Cashew Board, 2021). With 40% of Tanzania's soils now categorized as infertile, deforestation and soil degradation further lower arable land quality (African Development Bank, 2021).

DISCUSSION AND CONCLUSION

While Tanzania has a Revealed Comparative Advantage (RCA > 1) in major commodities including coffee, tea, and cashew nuts (SITC 0 and SITC 2), structural inefficiencies limit its capacity to

leverage on these strengths, therefore presenting a contradiction. Consistent with results the RCA study (2014–2022) validates that Tanzania's specialization in raw agricultural exports. However, low value addition, compromises this benefit since over 80% of exports including unroasted coffee, raw cashews are transported unprocessed (World Bank, 2021). This fits Porter's Diamond Model, which points out as major obstacles to improving Tanzania's position in global value chains, insufficient supporting industries (e.g., agro-processing) and factor circumstances (e.g., poor infrastructure) (Porter, 2001).

The study also demonstrates instability in export performance, particularly for SITC 2 (raw materials), related to climate shocks and worldwide price changes (IPCC, 2022). For instance, post-harvest losses (20–30%) due to poor storage and transport networks worsen quality variations, limiting access to high-value markets like the EU (Food and Agriculture Organization, 2021). This reflects findings by Hafner et al. (2020), who observe that Tanzania's failure to meet Sanitary and Phytosanitary (SPS) requirements resulted in the rejection of 20% of horticulture exports. Such issues are worsened by policy fragmentation while efforts like ASDP II and Kilimo Kwanza aim to enhance productivity, their implementation suffers from underfunding and overlapping mandates (United Republic of Tanzania, 2022). Notwithstanding these obstacles, chances exist. Participation of Tanzania in regional trade agreements (EAC, SADC) has enhanced market access for basics like beans and. Furthermore, providing opportunities for diversification are Middle Eastern and Asian growing demand for organic and tropical goods (IPCC, 2022). Still, using these prospects calls for clearing systematic barriers. Ethiopia's success in coffee exports using cooperative models (Gebrehiwot, 2021) and Kenya's branded tea products, for instance show the transforming power of value addition and cluster-based development strategies Tanzania could follow.

The results highlight the immediate need of focused policy actions to improve the agricultural export competitiveness of Tanzania. From raw commodity exports to more value products like roasted coffee or packaged tea, agro-processing infrastructure investments are vital. By means of better trade infrastructure including rural roads, port efficiency, and cold storage facilities post-harvest losses would be minimized and timely market access assured. By means of increased irrigation, financial availability, and Good Agricultural Practices (GAP) training, strengthening farmer support programs could help to raise output and adherence to international standards.

The main conclusion of this study is that Tanzania must start giving value-added and processed products top priority instead of basic agricultural commodities. The nation exhibits a robust

Revealed Comparative Advantage (RCA) in food and livestock (SITC 0) and raw materials (SITC 2), although its performance in processed foods and animal products is subpar. This emphasizes the need of funding agro-processing businesses to increase the value of agricultural exports and provide more job possibilities. Improving supply chain efficiency also helps to reduce post-harvest losses and ensure that goods reach foreign markets in perfect shape, particularly in transportation and storage.

Using Porter's Diamond Model, the study emphasizes how important both internal and outside variables are for determining Tanzania's agricultural trade competitiveness. The success of the sector is significantly influenced by internal elements including production capacity, technical innovations, and industry configuration including those of other sectors. Tanzania's rich natural resources and favorable climate provide a strong platform for agricultural output; nevertheless, limited access to new technologies and inadequate infrastructure compromise efficiency and production. Results are largely influenced by outside factors including trade policies, global market demand, and climate change. According to the research, Tanzania's reliance on rain-fed farming makes it particularly vulnerable to climate change, which reduces output and affects export quantities. Moreover, strict sanitary and phytosanitary (SPS) rules imposed by importing countries create major challenges to market access.

Limitation Of The Study

Several methodological and contextual limitations in this study of Tanzania's agricultural trade competitiveness should be acknowledged. First, data constraints greatly affected the study, especially inconsistent farmer-level output data supplied by several agencies and incomplete trade records from regional customs offices. East African Community (2023) estimates that informal cross-border trade accounts for 30–40% of regional agricultural commerce; however, depending just on secondary statistics from sources like UN Comtrade and the Tanzanian Ministry of Agriculture may not fully reflect this.

Second, limited resources and time limits the extent of fieldwork, so prohibiting thorough primary data collecting over Tanzania's several agro-ecological zones. Given the differences in agricultural techniques and infrastructure quality across areas such as the high-potential Southern Highlands and more arid central zones, this constraint is especially important.

Thirdly, the dynamic character of environmental elements cannot be fully captured with-in the competitiveness analysis even if the study notes climate change as a main obstacle. Likewise, the research period (2014–2022) coincided with extraor-

dinary global market volatility due to COVID-19 supply chain disruptions and the impact of the Ukraine conflict on fertilizer prices external shocks that may have momentarily distorted some RCA values but who's long-term effects demand more research.

Lack of constant monitoring data makes it impossible to quantitatively evaluate the difference between developed agricultural policies and their actual use. Examining projects like the Agricultural Sector Development Program II (ASDP II) and their real influence on smallholder competitiveness calls especially for this constraint.

These limitations indicate important areas for future research, especially in the development of more resilient data collecting systems and including climate adaption measures into competitiveness frameworks, therefore implying caution in generalizing results. Consequently, the results of the study should be seen as indicative rather than as comprehensive of the agricultural trade dynamics of Tanzania.

Future Research Directions

This study presents a comprehensive evaluation of Tanzania's agricultural export competitiveness and highlights significant factors influencing its performance. However, several areas require further investigation. Future research could build on the findings of this one to better understand the trends and challenges in Tanzania's agricultural sector, therefore providing more exact recommendations for policymakers and stakeholders.

Future studies should give top priority to a closer examination of value chains for Tanzania's main export crops coffee, cashew nuts, tea, and horticulture products building on the results of this one. Though Tanzania's Revealed Comparative Advantage ($RCA > 1$) in these goods, the study emphasizes ongoing issues like low value addition (e.g., of coffee shipped unroasted) and ineffective supply networks (e.g., post-harvest losses). Future research could break out every component of these value chains from manufacturing to export to find systematic constraints include poor agro-processing capability or scattered farmer cooperatives. Comparative case studies of Ethiopia's coffee cooperatives or Kenya's branded tea business, for example, can expose scalable models for Tanzania to migrate from raw exports to higher-margin processed goods.

Research should also look at how public-private cooperation may encourage local processing infrastructure investment in line with objectives of Tanzania's Agricultural Sector Development Program (ASDP II). Studies could investigate how specialized markets and value-added goods could enable Tanzania to become more competitive in the agricultural trade. This

study highlights chances for agro-processing and value addition; yet, a more thorough investigation of high-value commodities, such organic foods, specialty coffee, and horticulture items, is required. The study could look at the global market demand for these goods, the difficulties following international quality criteria, and the possibility to present Tanzanian agricultural goods as premium and sustainable. This might include case studies of effective value-added businesses and how they affect rural livelihoods and export income.

Another important area is how climate change affects export competitiveness. As the research notes, Tanzania's great reliance on rain-fed agriculture only 6% of cropland is irrigated makes its main exports vulnerable to droughts and variable rainfall. Future studies should measure how climate variability influences production stability and quality for crops such as cashews (which depend on steady rainfall) or coffee (which is susceptible to temperature changes). To forecast changes in Tanzania's RCA under various warming levels, methods could mix trade data analysis with climate projection models. Field studies could also evaluate how well adaptation techniques such as drought-resistant crop varieties or climate-smart irrigation methods in protecting export volumes and farmer livelihoods work. Given that climate threats aggravate already existing problems (e.g., price instability), this study should guide measures to improve resilience in Tanzania's agricultural export.

More research on how digital technology might help to reduce Tanzania's export restrictions is justified. Key obstacles identified by the study are logistical inefficiencies (e.g., bad ru-

ral roads, port delays) and market-access barriers (e.g., non-compliance with EU phytosanitary regulations). Future studies could assess how traceability solutions provided by blockchain technology could lower export rejections by proving conformity with global standards (such as pesticide residue limits). As shown in Kenya's horticulture industry, e-commerce sites could also enable smallholders to avoid middlemen and access worldwide purchasers straight-forward. Empirical data regarding their influence on lowering post-harvest losses and increasing competitiveness could come from pilot projects testing mobile-based advisory services (e.g., weather alerts, best practices) or digital market linkages (e.g., tying farmers to processors). Research might open the path for a more technologically enabled export ecology by combining these technologies with Tanzania's current trade systems including the EAC and SADC agreements.

Lastly, Future studies can also investigate how regional trade integration might improve the agricultural trade competitiveness of Tanzania. This paper emphasizes the need of regional trade blocs such as the Southern African Development Community (SADC) and the East African Community (EAC), which demand careful analysis of how Tanzania may use these accords to lower trade barriers and increase market access. Studies of the African Continental Free Trade Area (ACFTA) on Tanzania's agricultural exports and detail plans to maximize the advantages of regional integration. This could entail studies on regional value chains, the reduction of non-tariff obstacles, and standard harmonization.

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