



# Institutional and Operational Bottlenecks in the Rice Value Chain and Export in Tanzania

The Case of Mbeya Rice Producers and Traders

---

Idil Ires

Published for:

REPOA

157 Migombani/REPOA Streets, Regent Estate,

P.O. Box 33223

Dar es Salaam.

Suggested citation:

Ires, Idil. 2022. "Institutional and Operational Bottlenecks in Rice Value Chains and Export in Tanzania: The Case of Mbeya Rice Producers and Traders." Dar es Salaam, Tanzania.

Research Report

Suggested Keywords:

Rice Value Chains, Export, Tanzania.

**@REPOA, 2022**

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means without the written permission of the copyright holder or the publisher.

This publication was produced with the financial support of the European Union, through the EU-ACP TradeCom II Programme, as part of the Targeted support to strengthen capacity of policymakers, exporters, and trade associations to assess and review trade and related economic policies to promote trade competitiveness and diversification for widening trading opportunities with the EU" project implemented by REPOA and ISS-Erasmus. Its contents are the sole responsibility of the research team and do not necessarily reflect the views of the European Union, the EU-ACP TradeCom II Programme, REPOA or ISS-Erasmus. The Member States of the European Union have decided to link together their know-how, resources and destinies. Together, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance, and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

# Table of Contents

Abbreviations

Conversion of Currencies

Executive Summary ..... vi

**1. Introduction ..... 01**

1.1. Goals of the EU-ACP TradeCom II Programme

1.2. Background

1.3. Research Approach

**2. Major Producers and Traders in the Rice Value Chain in Mbarali ..... 07**

**3. Institutional and Economic Barriers to Improved Rice Production ..... 13**

3.1. Input Supply and Costs

3.2. Existing Land and Water Institutions as Production Barriers

**4. Transaction Costs and Challenges in the Rice Value Chain and Export ..... 20**

4.1. Tanzania's Rice Export Markets

4.2. Quality and Quantity Limitations on the Supply Side

4.3. Transaction Costs in Contract Farming

4.4. Transaction Costs in Export

4.4.1. Searching and Information Costs

4.4.2. Risks, Uncertainties, and Informalities in Border Crossing

4.4.3. Bargaining and Contract Enforcement Costs with Export Buyers

**5. Impacts of Trade Regulations on Rice Value Chains and Export in Tanzania ..... 33**

**6. Conclusion and Recommendation ..... 39**

Annex: List of Informants



## Abbreviations

<b>ACP</b>	African, Caribbean and Pacific Group of States
<b>AGRA</b>	Alliance for a Green Revolution in Africa
<b>ASDP</b>	Agricultural Sector Development Program
<b>DAICO</b>	District Agricultural and Irrigation Cooperative Officer
<b>EAC</b>	Eastern African Community
<b>ETG</b>	Export Trading Group
<b>EU</b>	European Union
<b>FAO</b>	Food and Agricultural Organization of the United Nations
<b>HEL</b>	Highland Estates Limited
<b>ITC</b>	International Trade Centre
<b>IRRI</b>	International Rice Research Institute
<b>JICA</b>	Japan International Cooperation Agency
<b>JKT</b>	Jeshi la Kujenga Taifa (Army to Build a Nation)
<b>NMB</b>	National Microfinance Bank
<b>NRDS</b>	National Rice Development Strategy
<b>RBWB</b>	River Basin Water Bureau
<b>REPOA</b>	Research on Poverty Alleviation
<b>RGL</b>	Rafael Group Limited
<b>SAGCOT</b>	Southern Agricultural Growth Corridors of Tanzania
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>UNDP</b>	United Nations Development Program
<b>URT</b>	United Republic of Tanzania
<b>USAID</b>	United States Agency for International Development

## Conversion of Currencies

Tanzanian shilling (TZS) to the United States dollar (\$) conversion rate on 15 November 2021

Selling TZS1,000 \$0.43 Buying TZS1,000 \$0.44

Source: OANDA (2021)

# Executive Summary

---

The second most important staple food and a commercial crop in Tanzania, improving the production and trade of rice can substantially contribute to agricultural growth and rural welfare. Based on this rationale, the government of Tanzania designed two national rice development strategies in 2009 and 2019, aiming to double production through commercialization and introduce Tanzanian rice to new export markets. Production increase has succeeded to a great extent. However, this success primarily stemmed from an expansion of the area under irrigated rice cultivation rather than from the envisioned land productivity increase. Moreover, rice export lagged behind the envisioned levels.

In explaining why productivity remained limited, several studies pointed to low fertilizer use, lack of access to credit, and infrastructural weaknesses as some of the most significant problems. Still, transaction costs and institutional bottlenecks in value-chain coordination between diverse actors are under-researched. In order to contribute to addressing this gap in the literature, this study focuses on exploring searching and information, bargaining, and enforcement costs in operational stages of rice value chains and how macroeconomic regulations, such as import and export bans, influenced these transaction costs.

The research is driven by a qualitative and exploratory agenda. Primary data collection mainly drew from interviews, document analysis, and observations during fieldwork. Fieldwork was conducted in October 2021, focusing on Mbarali (Usangu) in the Mbeya Region, and reached 32 informants in total. Key results include: the lack of access to credit significantly stems from a collateral gap in the absence of formal land institutions on the production level. Zero-tariff rice imports and irregular export bans substantially damaged both smallholder and corporate producers by abruptly halving market prices, creating significant uncertainties. To low prices and high production costs, smallholders sought to adapt by shifting back to low-investment and low-return paddy farming instead of pushing for high yield.

The overall quality and quantity of rice supply are sufficient to meet the regional demand but not the international market, such as the EU. Some processor-trader companies have taken initial steps to install the machinery necessary to expand into these distant markets, but significant operational challenges (e.g., erratic power supply) abound. Once these challenges and transaction costs are successfully addressed, the competitive prices and high-quality and -quantity of its rice will provide Tanzania with a comparative advantage in export markets.





# 1. Introduction

## 1.1. Goals of the EU-ACP TradeCom II Programme

This study is conducted as part of the EU-ACP (the European Union-Africa Caribbean and Pacific Group of States) TradeCom II Programme at Research on Poverty Alleviation (REPOA). The overall objective of the programme is to contribute to sustainable economic development and poverty reduction in ACP countries (EU-ACP 2021). It seeks to achieve this goal by supporting ACP countries to design and implement trade policies that will boost their participation and integration in the global economy through a diversified export commodity base and increased market competitiveness.

In Tanzania, the TradeCom II programme implemented by REPOA runs under the title “Strengthening Capacity of Exporters to Sustainably Enhance Export Competitiveness and Diversification.” In order to boost the competitiveness of Tanzanian enterprises in regional and global markets, REPOA pays specific attention to improving the quality, quantity, and range of products in five strategically selected value chains, namely, horticulture, rice, seaweed (for Zanzibar), leather, and logistics, falling under three sectors (agriculture, manufacturing, and services). To help boost these value chains, REPOA seeks to develop appropriate trade policy frameworks by collaborating with government ministries, departments, and agencies. Moreover, it addresses the existing knowledge gaps through crosscutting research and offering workshops to private-sector stakeholders to improve their production and trade capacities.

As part of this broader project, the objective of this specific study is exploring transaction costs and institutional bottlenecks in the rice value chain that undermine the competitiveness of Tanzania-based enterprises in domestic and export trade. This study draws insights from empirical research to capture the perspective of some of the key enterprises in rice production and trade in the country. The leading research question is as follows:

- What underlying transaction costs in diverse stages of the rice value chain from production to trade impact the competitiveness of Tanzanian producers and traders in export markets?

The study of transaction costs matter: transaction costs aggravate risks and uncertainties in economic decision-making, preventing producers and traders from effectively diversifying their products, minimizing monetary costs, and maximizing profits and, thereby, restricting their competitiveness. Appropriate institutions and regulations must be designed and monitored on multiple levels to address them and unlock Tanzania’s relative advantage in export markets. Building on the empirical insights in this context, this study provides feasible recommendations for policymakers to design appropriate policy frameworks to help alleviate transaction costs and craft an enabling business environment.



## 1.2. Background

The rice subsector has long been a strategic priority in Tanzania due to its relevance for improved food security and income for rural settlers (USDA 2021). Around 90 percent of Tanzania's rice is produced by smallholder farmers, holding 0.5 to 3 hectares of land and 1.3 hectares on average (URT 2019). The demand for rice has substantially increased over the years, with accelerated population growth since the 1950s and rural-urban migration in the 1970s (Sekiya et al. 2020). In the 2010s, urban rice consumption rose to 1,800,000 tons from 94,000 tons in the 1960s as a result of the improved purchasing capacity of food consumers and the shift in food consumption behaviours from traditional staples, such as maize and tubers, to rice—the second most important staple food and commercial crop (Wilson and Lewis 2015; Lazaro, Sam, and Thompson 2017; Sekiya et al. 2020). To meet the demand of the growing population while expanding into export markets, a further increase in rice production is necessary.

To boost production and trade in the rice subsector, the government of Tanzania designed the National Rice Development Strategy (NRDS) I in 2009 and updated it into the NRDS II in 2019. This strategy seeks to commercialize the subsector, which is vastly subsistence-oriented, to sustain national self-sufficiency in rice and become a market leader in the East African region (IRRI 2018). To achieve this, the strategic policy focus has been improving access to agricultural inputs, machines, and credit, introducing new seed varieties, reducing postharvest losses, expanding irrigation areas,

disseminating cultivation knowledge, and supporting the small- and medium-scale enterprises (SMEs) in the rice value chain (URT 2009). Overall, the 2009 strategy aimed to double rice production until 2018, and this goal was met to some extent: from 2000 to 2019, the average production increased from 780,000 to 3 million tons, and export volumes from 8,360 to 50,000 tons (Mdoe and Mlay 2021), making Tanzania the second-largest rice producer in eastern and southern Africa after Madagascar (IRRI 2018). However, despite this significant progress, not all subsectoral policy goals have been met.

The increase in rice production has mainly stemmed from the expansion of the cultivation area rather than increased productivity: while the cultivated area expanded ninefold from 100,000 hectares in the 1960s to 960,000 hectares in 2016, the average rice yield increased only 1.8 times, from 1.2 to 2.2 tons per hectare (compared to an average increase from 2.1 to 4.8 tons per hectare in Asian countries during the same period) (Sekiya et al. 2020). Scholars associated the slow productivity increase with prevalent underuse of new improved seeds (Kangile, Gebeyehu, and Mollel 2018; Kitilu, Nyomora, and Charles 2019) and fertilizers and pesticides (Kilimo Trust 2014; Wilson 2018); poor irrigation management (Kangile and Mpenda 2016; Senthilkumar et al. 2018); erratic weather and intensified droughts linked with climate change (Nasrin et al. 2015; Mkonda and He 2016); limited access to extension services (Kitilu, Nyomora, and Charles 2019); and unreliable markets (Kangile, Gebeyehu, and Mollel 2018; Wilson 2018; Mdoe and Mlay 2021).

The NRDS II (2019–30) seeks to address these issues to achieve the NRDS I goals. Yet, differently from NRDS I, it emphasizes climate adaptation in agriculture, enhanced regional trade competitiveness of Tanzanian rice, and sustainable intensification and expansion of the rice system (URT 2019). The new goals are doubling the area under rice cultivation from 1.1 to 2.2 million hectares, doubling rice production from 2 to 4 tons per hectare, and reducing postharvest losses from 30 to 10 percent from 2018 to 2030 (URT 2019). There has been some progress toward the achievement of these goals: in 2021/22, milled rice production increased by about 13.6 percent to 2.4 million tons and the harvested area by 4 percent to 1.3 million hectares (USDA 2021).

While most available studies looked into the challenges in increasing production, research on the trade aspect of the rice value chain remains limited. Especially, institutional problems in horizontal and vertical coordination between diverse value-chain actors (e.g., producers, input suppliers, banks, and processor-trader enterprises) and export are under-researched. Scant evidence shows that unprecedented import and export regulations limited the competitiveness of Tanzanian rice producers and exporters. For example, in terms of import, though Tanzania applies the EAC Common External Tariff of 75 percent, influenced by large-scale importers lobbying for cheap rice imports from Asia (Andreoni, Mushi, and Therkildsen 2021; Mdoe and Mlay 2021), in 2013, it imported 80,000 tons of rice from Pakistan at zero tariff. Together with the existing massive

illegal imports through Zanzibar, this import led domestic rice prices to dip, inducing loss for Tanzanian producers and traders<sup>1</sup>. In terms of export, the grain export bans enacted in 2016 and 2017—though Tanzania had committed to trade liberalization in 2012—led to an abrupt decline of grain prices, landlocking domestic producers and undermining their competition with imports from Asia. More recently, in 2020, with COVID-19 trade restrictions, rice export from Tanzania within East Africa is estimated to have halved to 15,000 tons (USDA 2021). In this context, whether Tanzanian producers and traders have recovered from these trade restrictions and what needs to be done to address them require attention.

### 1.3. Research Approach

In order to investigate what transaction costs impact the competitiveness of Tanzanian rice producers and traders in export markets, this study deploys a transaction costs economics approach, closely linked with new institutional economics. Institutions are understood as the rules of the game which define the actions required, prohibited, or permitted in transactions (North 1990; Ostrom, Gardner, and Walker 1994). In theory, clearly defined and sanctioned institutions increase the effectiveness of market transactions by alleviating transaction costs (North 1987).

---

1 With production increase and new import restrictions (in September 2018 and March 2020), cheap rice imports from Asia are expected to drop significantly by 27.7 percent to 130,000 tons (USDA 2021), which is favourable for domestic producers. The biggest rice importer to Tanzania is Pakistan, followed by Thailand, India, China, the United States (mainly for food aid), and Myanmar. The highest regional demand for rice in the East African region is from the Democratic Republic of Congo, Kenya, Malawi, Rwanda, Uganda, and Zambia.



Transaction costs are “the costs of specifying and enforcing contracts that underlie exchange” (North 1984: 7). In the context of value-chain coordination, based on the theoretical propositions of economist Oliver Williamson, transaction costs arise when making product and production decisions and enforcing them (Williamson 1971, 1985; Peterson, Wysocki, and Harsh 2001).

The three underlying transaction costs, which are also central to this study, are: (1) search and information costs: costs arising during searching for the desired quality and quantity of the product obtainable at the desired price for mutual gains between buyers and sellers, and costs of gathering information about markets where producer and trader enterprises can have an advantage; (2) bargaining costs: costs associated with negotiating the terms and conditions of exchange between actors, time spent at meetings and for communications, and uncertainties preventing them from making and accepting the most profitable decision for themselves; and (3) enforcement costs: costs of ensuring all transacting actors follow the exchange agreements, deliver the agreed quality and quantity of a commodity on time, and make payments mutually decided upon as per price determination.

In exploring these three categories of transaction costs, this study uses a two-level analysis: operational and macroeconomic levels. The operational-level analysis focuses on the searching and information, bargaining, and contract enforcement costs that influence diverse value-chain actors in making product, production, and trade decisions, and on value-chain-external biophysical and socioeconomic conditions that this study

has found to be significant in this context. Meanwhile, the macroeconomic-level analysis explores the effects of trade regulations and customs on diverse stages of value chains, from production to export logistics. The scope of the analysis is limited to understanding perspectives of the private-sector and farmer informants in the value chain regarding whether and what transaction costs influence their production and trade decisions and outcomes.

Methods include empirical exploratory research and a case study approach. The case study area is the Mbarali cluster of the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) in the Mbeya Region. SAGCOT is a public-private partnership platform initiated in 2010, with about 100 official partners (the government, investors, input suppliers, processors, traders, banks, and donors) (SAGCOT 2018). It seeks to industrialize agriculture and transform about 70 percent of the Tanzanian population from low- to middle-income status (SAGCOT 2011; EU 2015). It operates in an extensive area (300,000 km<sup>2</sup>), consisting of six clusters (Ihemi, Mbarali, Kilombero, Rufiji, Ludewa, and Sumbawanga). The Mbarali cluster (corresponding to Usangu basin in the Great Ruaha River Basin) is one of the main rice-producer areas and a grain basket in the country. Therefore, boosting rice value chains in Mbarali through public and private investment is one of SAGCOT’s priorities. The primary data collection tools are semi-structured interviews and focus group discussions (FGDs), conducted with 32 informants in total (government officials, chairpeople of farmers’ and traders’ associations, producer and trader enterprises, and farmers) in October 2021 (Annex: list of informants).

This report is structured as follows: Section 2 describes the informants reached during fieldwork. The operational-level analysis begins with Section 3, which looks into value-chain-external biophysical, socioeconomic, and institutional barriers. Section 4 explores the value-chain-internal transaction costs arising during

coordination between value-chain actors. The macroeconomic-level analysis examining the effects of trade regulations and practices on diverse stages of value chains is elaborated in Section 5. Finally, Section 6 discusses the results and provides recommendations for further research and policymaking.







## 2. Major Producers and Traders in the Rice Value Chain in Mbarali

The informants reached during fieldwork in Mbeya could be divided into five categories as follows:

1. Government officials from Tanzania Rice Council, the district agriculture and irrigation officer of the Mbarali district, and agricultural research institute in Uyole;
2. The private sector: owners and general managers from Highland Estates Limited (a producer-trader enterprise), the Export Trading Group (a producer-trader enterprise), Hu Feng (a processor-trader enterprise), Raphael Group Limited (a processor-trader enterprise), NMB bank officials, and YARA fertilizer salespeople;
3. Partnership officials from SAGCOT and Kilimo Trust who link farmers with the private sector;
4. Farmers' and traders' associations: Mbuyuni farmers' organization, Mbeya High Quality Rice Growers Association, and Mbeya Rice Traders' Association; and
5. Farmers.

Kilimo Trust is a key organization linking all types of value-chain actors toward improved value chains. It is a non-profit organization and operates in five countries: Kenya, Uganda, Burundi, Rwanda, and Tanzania. In Tanzania, it has offices in Dar es Salaam and Mbeya focused on: (1) offering workshops to farmers on cultivation strategies to increase productivity, (2) building linkages between farmers and private-sector stakeholders, such as input suppliers and financiers, and (3) improving access

to markets. The Mbeya branch of the organization reported that Kilimo Trust benefitted more than 20,000 farmers in Mbeya.

Regarding the private sector, specific attention is paid to two types of enterprises in value chains: producer-traders and processor-traders. Producer-trader enterprises hold farmlands to produce paddy, process it into rice, and trade rice. Meanwhile, processor-trader enterprises are not involved in paddy production; they purchase paddy from producer enterprises and farmers that they process into rice and trade. This study reached two producer-trader enterprises: the Export Trading Group (ETG) and Highland Estates Limited (HEL). The ETG is based in Dar es Salaam and has diverse subsidiaries engaged in import and export trade, including agribusiness. It bought the Kapunga farm in Mbarali in 2006. The size of this farm is currently 5,500 hectares, though it used to be larger (7,370 hectares) (the company gave a part of its land to local settlers in 2017). An 800-hectare farm held by local smallholders (called Kapunga smallholder project) is annexed to the ETG's private farm. Both private and smallholder farms take water from the Chimala River through a 14-kilometer main canal controlled by the ETG: based on the interviews with the ETG farm manager, the canal carries 6 cubic meters of water per second, and 1.5 cubic meters of this is allocated to the smallholder project, while 4.5 cubic meters enters the private farm and is diverted into 17 secondary canals.

The Kapunga farm practices systematic rice intensification and is relatively advanced in mechanization compared to other farms in Mbarali.

While harvesting is fully mechanized, the company owns transplanter machines (but

also hires local laborers for transplanting). The harvest average can be considered high: in the 2020–21 agricultural year, the private farm produced 25,000 tons of the semi-aromatic SARO5 paddy variety, and the average harvest stood at 7.1 tons per hectare.

**Figure 1: Producer- and Processor-Trader Enterprises in Mbeya**



Note: Upper left and right, Kapunga farm seedling production and processing facility; lower left and right, Raphael Group Limited compound and processing facility. Source: Author's.



Highland Estates Limited owns the Mbarali and Ubaruku farms around Rujewa. It is engaged in large-scale paddy production, with about 3,500 hectares in total, and is another high-quality rice producer in Tanzania. The company also owns maize, cashew, and sisal plantations in Morogoro and Pwani regions, in addition to several nonagricultural subsidiaries, such as real estate, drinking water bottling, and oil businesses. Based on interviews with the general manager, about 70 percent of the Ubaruku and Mbarali farms is held by local farmers: some of them sign lease seasonally and produce paddy independently, while others are contract farmers (they receive inputs, such as seeds, fertilizers, other agrochemicals, and cash in advance to return a pre-agreed amount of the harvest to the company as payment). The rest, 30 percent of the land, the company farms itself; agronomists and other permanent workforce supervise all production stages and hire laborers during transplantation. Harvesting is fully mechanized. Its overall production has increased by about 15 percent in the last few years: from 5.6–6 to 7.5 tons per hectare. The HEL sold only paddy locally until recently. But, in 2021, it was setting up a processing facility as it saw an opportunity in selling rice due to the rising export demand after the pandemic.

On the production level, contract farming (called “the consortium model” by SAGCOT and Kilimo Trust officials) begun in Mbarali upon the official inauguration of the Mbarali cluster in 2017. It is practiced at both smallholder irrigation schemes and private farms, with slight differences in its practice. At smallholder irrigation schemes, five key partners are involved: the government

as the enabler and facilitator, YARA as the fertilizer supplier, NMB as the bank, the Private Sector Agriculture Support Program for microinsurance services, and processor-trader enterprises providing farmers with inputs and collecting paddy after harvesting. Transactions between farmers and these partners have two stages. In the first stage, NMB issues loans for farmers’ organizations (not to individual farmers), delivered in two parts: cash and farm inputs worth about TZS2.5 million per hectare. While farmers use the cash to cover cultivation costs, such as labourer wages, machine user fees, and storage costs, YARA delivers the noncash part, fertilizers. Leaders of farmers’ organizations distribute the cash and inputs to farmers who applied for contract farming and collect the paddy amount stated in contracts from them, delivering to the partner processor-trader enterprise. The enterprise, after collecting and milling the submitted paddy, pays the organization’s loan to the bank and sends off the rice to domestic and export markets.

Private farms similarly exercise contract farming, but their coordination slightly differs: the HEL and ETG provide their outgrowers with seeds and agrochemicals. Outgrowers are responsible for cultivation until harvesting, which is mechanized and done by these companies. The ETG imports own fertilizers from India, while the HEL purchases them from YARA; both provide SARO5 only.

After harvesting, farmers submit a part of their paddy to pay for inputs and combine harvester use. The price determining the amount of paddy they must submit is negotiated between them and companies before production.



Through contract farming, companies ensure high quality and quantity of paddy without overseeing the whole production, while farmers retain a part of the harvest for income generation; both parties benefit.

Regarding processor-trader companies, the fieldwork reached Raphael Group Limited (RGL) and Hu Feng—both practice contract farming with smallholder farmers and purchase their crops through instant market transactions. The RGL is situated in Mbeya on the southern export route of the growth corridor and is an official SAGCOT partner. It is one of the leading rice processor-traders in the Mbeya Region: founded in 1995, it was rebooted in 2014 with a matching grant fund of \$450,000 from donors (which it shared with another rice processor-trader in Dodoma) (FoodTrade ESA 2015). After that, the company grew rapidly in a short time and begun trading other crops, such as beans, though rice still is 50 percent of its business. Interviews with the company showed that it increased its milling capacity from 150 to 220 tons per day from 2016 to 2021. It has five warehouses in Mbeya, with 15,000-ton storage capacity each, and one in Morogoro, with 5,000 tons, and has been building new ones in Mbeya. The machines installed in Morogoro will produce an additional 70 tons per day. The RGL has more than 8,000 rice contract farmers and is aiming to increase this number by beginning to contract further farmers in Morogoro from 2022 onward. Besides contract farming and purchasing paddy from all over the region, the RGL compound in Mbeya town serves as a marketplace. Farmers mill their paddy in the compound at a milling cost, and the company sometimes

buys their rice (in 2021, it paid TZS1,100–1,300 per kilogram of rice, depending on the grade).

Hu Feng is a processor-trader enterprise founded in 2018 by a Chinese investor who leased the land and set up a milling and warehouse facility. The investor reported during interviews that he used to produce plastic bags before shifting to agribusiness. He invested in rice, expecting that this crop would offer a resilient business and good profit since it is staple food with uninterrupted demand. The company buys paddy from smallholder farmers and trades rice domestically and in the regional and international markets. Its biggest buyers currently are Chinese shops and restaurants in Tanzania. Nevertheless, the investor suggested that he considered selling the company and shifting to shoe manufacturing due to facing high transaction costs during export and not making as much profit as he had expected.

The focus group discussion (FGD) involved farmers from the Mbuyuni irrigation scheme. This is a 1,500-hectare irrigation scheme that abstracts water from the Kimani River, a subsidiary of the Great Ruaha River. The farmers' organization that runs this scheme has been one of the first organizations engaged in contract farming in 2017, along with the inauguration of the Mbarali cluster (the others were the Uturo, Isenyela, Itapagwa, Majengo irrigation schemes), and provided paddy to the RGL (Ires 2021a). As in other farms in Mbarali, most paddy from this scheme is marketed unprocessed to rural collectors and processor-traders through contract and market transactions.

Lastly, the Mbeya High Quality Rice Growers Association is an umbrella organization of all paddy-producing farmers' organizations in Mbeya and seeks to improve paddy production and

market access. Meanwhile, the Mbeya Rice Traders Association additionally has processors and traders as members, searching for new profitable domestic and export markets.





# 3. Institutional and Economic Barriers to Improved Rice Production

## 3.1. Input Supply and Costs

Improved export starts at the production level: abundant surplus production is necessary for Tanzania to enter new export markets and increase its revenues while not compromising national food security. Moreover, increased supply is often accompanied by decreased production costs and thus prices, which matter for competitiveness in those markets. Since production increase plays such an important role in improved trade, this section dives into exploring some of the most significant economic and institutional bottlenecks that the Mbarali rice producers have encountered in increasing production.

The seed promoted across Mbarali and other parts of Tanzania to double paddy production (as targeted by NRDS 2009 and 2019) is SARO5—a semi-aromatic hybrid variety technically termed TXD306, with TXD (Tanzania Cross Dakawa), indicating its origins (the national agricultural research institute in Dakawa). This institute also bred salt-prone versions of Saro5—Sato1 and Sato9—to help farmers combat salt-affected soils. Other major institutes, such as the Kilombero Agricultural Research Institute in Ifakara, Morogoro, which has received donor support for seed research since the 1980s, bred different highly productive varieties. However, these varieties have not been as successful as SARO5 due to

their insufficient aroma. The agricultural research institutes of Igurusi and Uyole have promoted SARO5 in Mbeya and succeeded in these efforts. Private- and public-sector informants and farmers confirmed that most rice farmers today cultivate this variety only.

Demonstration plots using SARO5 seeds showed that under some conditions, this seed could indeed double the yield from pre-commercialization paddy average of 3-4 tons per hectare to 8-9 tons per hectare under irrigation. Under systematic rice intensification<sup>2</sup>, harvest levels sometimes even exceeded 10 tons per hectare. In comparison, traditional high-aromatic seed varieties have been yielding paddy in an average of 1–3 tons per hectare under rainfed farming. While traditional varieties are naturally selected and relatively prone to droughts, SARO5 requires irrigation. The high productivity of this seed under reliable irrigation has driven the government to plan on expanding irrigated rice farming and reach a paddy harvest average of 8–9 tons per hectare (JICA 2018; URT 2019). Nevertheless, interviews with officials and irrigation farmers showed that despite a production increase, this envisioned level is not achieved: the average paddy harvest was 5 tons per hectare for smallholder irrigation schemes (also, the Mbuyuni irrigation scheme) and 7 tons for private farms (also, Kapunga and Mbarali farms).

2 SRI was invented in Madagascar, spread across Asia during the Green Revolution in the 1960s. It requires paddy cultivation according to a specific formula that involves counting seeds and transplanting according to a linear pattern. Farmers must observe an exact distance between seeds instead of sowing randomly as is standard. They also need to address topographic hindrances by leveling the land. These requirements make SRI expensive and labor-intensive cultivation technique.



Several factors have driven the production levels to remain below the target. One problem with SARO5 is that despite its favoured productivity features, it requires lots of fertilizers to provide high yield, and farmers consider fertilizers expensive. Tanzania does not have a strong fertilizer industry; fertilizers are imported at a high cost. The lead fertilizer company is YARA, an agrochemical giant from Norway, which constructed a fertilizer terminal at the Port of Dar es Salaam upon becoming a SAGCOT executive partner in 2011 and dominated the domestic market. Though alternatives exist, farmers prefer this brand due to its alleged good quality, while it is also actively promoted by YARA agents and government extension officers. The recommended amount is to use seven units of four different fertilizers that have different prices. Interviews with farmers and YARA agents showed that most farmers try to follow this recommendation to increase the paddy yield. However, the advised fertilizer formula doubled production costs from about TZS1–1,5 to TZS2.5–3 million per hectare, which farmers found challenging to afford.

Fertilizer prices soared during the Covid-19 pandemic, further inflating production costs (Box 1). As a result, instead of buying the recommended amount of fertilizers and following the instructions, farmers began economizing and experimenting on their use, which influenced the average paddy harvest to remain at 5 tons per hectare in Mbarali. Decreased fertilizer use due to high costs also compromised the quality. Kilimo Trust officials argued that, due to less fertilizer use, the harvested paddy did not have the desired nutrition status. Nutrition is not only crucial for strengthening national food security and ending malnutrition but is also a price determinant: rice with higher nutrition values have higher demand and price in domestic and export markets. High fertilizer prices as a significant production setback influenced the leaders of farmers' organizations in Mbarali to gather with the Mbeya High Quality Rice Growers Association and the Tanzania Rice Council in October 2021 to discuss an exit strategy but found no immediate solution.

### Box 1: Fertilizer Prices in 2021 (based on FGD with Mpendakazi YARA agrodealers)

Mpendakazi Agrodealers is a registered agrodealer and a YARA fertilizer agent. Company salespeople also consult farmers on good agricultural practices.

Based on a FGD with five company salespeople, the fertilizers that YARA recommended and that they promoted in Mbeya were and cost as follows:

- YARA Otesha for base application, applied shortly before and after transplantation– TZS92.000
- YARA Vera Amidas for plant growth–TZS86.000
- YARA Vera Sulfan for plant growth– TZS58.000
- Booster (bottle, one litre)–TZS20.000

The recommended fertilizer use for one-hectare paddy cultivation is two bags Otesha (TZS184,000), two bags of Amidas and Sulfan each (TZS288,000), and two bottles of booster (TZS40,000). In total, fertilizers cost about TZS500,000 in 2021. Farmers additionally needed to purchase agrochemicals (herbicides and pesticides). Before the pandemic, the most expensive fertilizer, Otesha, used to cost TZS52,000, and other fertilizers were also cheaper.

The company salespeople confirmed that demonstration plots following this formula successfully yielded 8 tons per hectare. However, the average production outside these plots remained low at 5 tons per hectare because most farmers could not afford the required amount. They also suggested that fertilizer use know-how among farmers was limited, and instructions were not accurately followed, which influenced the production levels to remain lower than expected.

Apart from incurring high fertilizer costs, another problem with SARO5 is that its grains are physically less resistant to mechanical processing, such as harvesting and milling, and easier to yield low quality than the traditional varieties. Due to the higher nitrogen content, SARO5 grains break easier. Higher brokenness means a lower grade and lower price that is little competitive in export markets since export buyers usually demand nonbroken (premium) rice. Moreover, SARO5 requires more time and labor

during water management; irrigation has to be well-monitored. The seeds need more water than the traditional varieties, while excessive water use causes crop loss since the plants are short and easily drown. Also, the interviewed official from the Uyole agricultural research institute warned that SARO5 plants are more susceptible to prevalent rice diseases, such as the rice yellow mottle virus.

The higher water requirement of SARO5 is often a challenge also because droughts recur periodically, every 3–4 years, in Mbarali (Ires 2021b). Research has shown that these recurrent drought episodes have intensified over the years, which scholars associated with climate change: rains have been starting later and ceasing earlier, with decreased precipitation throughout the season (Komba and Muchapondwa 2015; Elum, Modise, and Marr 2017; Serdeczny et al. 2017; Baarsch et al. 2020; Tanzania Meteorological Agency 2021). In addition, water regulations enacted by the government in river basins have been increasingly strict and influencing SARO5 production adversely, as the interviewed farmers pointed out. These restrictions in agricultural water abstractions in Mbarali in the upper Great Ruaha River Basin have sought to improve the downstream water flows into the Ruaha National Park (conservation and tourism sectors) and dams (for hydroelectricity generation) (Lankford, Tumbo, and Rajabu 2009; England 2019; Ires 2021a). The advantage of the SARO5 seed in the context of such hydrological restrictions is nuanced: though it requires more water, its crops mature faster, thus enabling adaptation to shortened rainfall and irrigation periods as long as water supply during these periods is secure.

To different and rapidly changing agroecological and soil conditions in Mbeya, SARO5 is not the best responding variety. SAGCOT and the private-sector informants suggested that soil across Mbeya has different pH values and nutrition requirements, and research on input and soil compatibility is missing. “Agriculture is both science and business,” as the SAGCOT officer suggested; “the exact soil nutrition status

has to be known to raise production in different areas” (Interview 3). As Mpendakazi agronomists also pointed out, SARO5 was bred in the 1990s and officially registered in 2002, and seed research has not significantly progressed since then. Not many varieties exist and offer better adaptation to diverse agroclimatic conditions, with improved productivity, aroma, and physical durability. To the said gap in research and development, the Uyole agricultural research institute official responded that several new seeds were recently bred and would soon replace SARO5: Komboko, TARI1, and TARI2, in addition to SATO (the salt-resistant version of SARO). Reportedly, in 2019, this institute began introducing these seeds to rice farmers in Kilimanjaro and Pawaga. Nevertheless, this official addressed that these seeds have not yet been widely adopted since “farmers are researchers and want to observe if there is profit and what others are doing” (Interview 5). Farmers needed about 4 years until they are convinced of the yield capacity and aroma of new varieties and began adopting them. Still, the interviewed farmers in Mbarali were not even aware of these new breeds and claimed not to have heard of their names.

Similarly, the fertilizer amount and formula advised by YARA and extension officers did not provide consistent yield across Mbeya, which farmers associated with soil variability. Mpendakazi agrodealers suggested that YARA normally adjusts its fertilizer instructions according to diverse soil conditions in Mbeya. Reportedly, it advises about 65 kilograms per acre of fertilizer use in Kyela due to the high soil infertility, 40 kilograms in Kamsamba (Sumbawanga), and 50 kilograms in Mbarali.



Yet, according to Kilimo Trust officials, soil characteristics differ substantially even in neighbouring plots and villages, and the advised type and amount of fertilizers rarely provide similar results. Some of the interviewed farmers backed up these statements, arguing that applying fertilizers above certain thresholds according to YARA's instructions did not boost plant growth and yield. As stated in the Mbuyuni FGD, "the soil pH is unknown. We must know this to optimize fertilizer use, but the measuring is expensive—we cannot afford this. The advised formula is irrelevant for our soil" (FGD 3). This experience influenced them to experiment with fertilizer use. The Mbarali DAICO indicated that the district government regularly tested the soil, but this was not done frequently and everywhere due to budget restrictions. Hence, statements are officially confirmed that data regarding the soil nutrition status and tailored recommendations are missing.

Overall, despite the widespread shift to hybrid rice seeds and intensified fertilizer use to double paddy production, the effectiveness of this shift regarding adaptation to the rapidly changing climatic and soil conditions is disputed. Production levels have generally increased, but due to high production costs and the lack of research-based input recommendations compatible with soils, farmers have not reached their target levels necessary to increase their incomes considerably. Moreover, with the recently peaked fertilizer prices and production costs, the inability to sustain and increase income disincentivized investments into commercial farming, driving farmers to orientate toward subsistence and stagnating production increase in turn.

### **3.2. Existing Land and Water Institutions as Production Barriers**

The existing land and water rights in the Great Ruaha River Basin pose institutional bottlenecks to increased production. While water uncertainties remain significant, farmers suggested that the water user fees that the Rufiji River Basin Board (RBWB) collected for the basin-level cost recovery are too high (FGD 3). In some irrigation schemes, such as Madibira, water fees went up to TZS200,000 per year, which is high (Ires 2021a). Fees add to production costs, which farmers cope with by economizing on inputs, which, in turn, adversely influences production. But farmers also indicated that despite the successful fee collection, the broken and congested canals and river outlets remained undermaintained in the past, leading to water problems. This led farmers in some irrigation schemes, such as Mbuyuni, to stop paying these fees, which resulted in conflicts with authorities and created a precarious production environment.

The water rights system has adversely influenced production also at private farms. To the open-ended question of the biggest challenge to increased production, informants from HEL and the ETG responded addressing insufficient water. The Kapunga farm manager stated that the ETG cultivated only 3,500 of 5,500 hectares of its land and not the rest because the amount of water permitted by the RBWB was sufficient to farm only that extent. Accordingly, this permitted amount (4.8 cubic meters per second today) used to be even less, 3.3 cubic meters per second a few years ago, which the company succeeded in increasing after long negotiations with the government.



The manager added that despite the timely fee payments, the RBWB did not monitor water abstraction upstream of its farm canal from the Chimala River. This canal is long, and though it is under the ETG's jurisdiction, farmers from the nearby villages allegedly accessed it illegally, which evoked tensions frequently. The HEL informant also reported a similar situation in Rujewa: hundreds of people upstream would take water from the farm's long canal from the Mbarali River, which led to intense conflicts. Both companies indicated that due to these unauthorized abstractions, the actual amount of water reaching their farms was less than what they were permitted and paid for. They even switched in the police and district officials, whose interventions were nonetheless ineffectual. Moreover, while less water entered the Kapunga farm than allowed, no water exited it. The farm manager indicated that the downstream catchment area that is supposed to catch and return water from the farm's drainage system to the Great Ruaha had been dried off for years, which shows that despite strict restrictions, the formal water rights system is not yielding the expected results.

Access to financing for farmers to be able to afford high production costs in commercial paddy farming is limited, and the lack of private-formal land rights plays a significant role in this context. While production costs have substantially increased, smallholders lack capital and collateral to access loans. The land is the underlying and most common collateral in agriculture. As economists have extensively addressed, by making the land a sellable property with market value, private land rights as collateral

help farmers access loans (Feder, Onchan, and Raparla 1988; Feder and Feeny 1991; Ostrom 2008). By improving loan access and speeding up agrarian commercialization, land rights also play a central role in the poverty alleviation debate (Banerjee and Duflo 2011; De Soto 2000; Acemoglu and Johnson 2005).

In Tanzania, with land rights being vested in the state, most farmers lack formal rights, which, in turn, prevents them from accessing loans and obtaining commercial farm inputs and equipment (Stein et al. 2016; Maganga et al. 2016). All informants, including farmers, government officials, and private-sector representatives, agreed that the Tanzanian government supported the NMB, CRDB, and TADB (Tanzanian banks) to issue loans to smallholder farmers to help them tackle high production costs, but the lack of collateral nevertheless prevented access. Apart from access to farm inputs, the collateral deficiency also limited the progress in mechanization and machine ownership. For instance, in the early 2010s, a Kilimo Kwanza project sought to mechanize agriculture by importing state-subsidized tractors from India and selling them to farmers at concessional rates. But since farmers lacked land rights and other confiscable properties to show as collateral for loan amortization, many tractors were not sold and remained unused in the warehouses of SUMA-JKT (Shirika la Uzalishaji Mali la Jeshi la Kujenga Taifa) (The Guardian 2010). These insights show that land and water institutions play important roles in commercialization and can lead crop production and rural capital accumulation to lag behind the envisioned levels.





## 4. Transaction Costs and Challenges in the Rice Value Chain and Export

This section begins with casting light on Tanzania’s rice export markets and continues with analysing the underlying transaction costs and institutional challenges that some of the key producer and trader enterprises face on the production and postproduction levels and during export, while targeting these markets.

### 4.1. Tanzania’s Rice Export Markets

Tanzania aspires to become a trademark in rice export and has recorded significant progress in this context. Data from the International Trade Centre (ITC) showed that Tanzania’s rice export represented 0.5 percent of world exports, ranking nineteenth, in 2020 (ITC 2020). This year, the value of rice exports amounted to almost \$142 million. The quantity exported was almost 350,000 tons. Moreover, the five-year growth rate from 2016 to 2020 was drastic: a 206 percent rise in exported rice quantity and 209 percent in exported

value. Though Tanzania used to focus on domestic supply, export to neighbouring countries has increased. Uganda, Rwanda, and Kenya have become the three biggest importers. In 2020, the value of Tanzania’s exported rice only to Uganda (\$77 million) totaled to almost half of its world exported rice value. This value was followed by Rwanda with almost \$35 million and Kenya with \$27 million. According to their rice imports from Tanzania, other following countries were Burundi, the Democratic Republic of Congo, and Zambia, with substantially lower export quantity and value (Figure 2). The biggest export to overseas markets was India, with \$146,000 in export value, followed by Belgium, the United States of America, and Oman, with substantially lower figures. Belgium taking the EU-market lead by importing only 25 tons of Tanzanian rice in unit value of \$800,000 shows that Tanzania is currently not strong in the EU market.

Figure 2: Importing markets for rice exported by Tanzania, 2020





Compatible with the ITC data, the interviewed processor-trader enterprises in Mbeya indicated targeting the regional market within the Eastern African Community but only to a limited extent. As of 2021, the RGL sold about 70 percent of its rice within Tanzania. It wholesaled rice from its Mbeya compound, and its buyers were chiefly from Dar es Salaam, Zanzibar, Tanga, Kilimanjaro, Arusha, and Dodoma. The RGL had only a few shops in Mbeya and Dar es Salaam, selling its own-brand rice in various sizes of packaging in a minimal capacity. The RGL manager argued that demand for wholesaled rice was higher than branded rice: since its buyers wanted to do the branding themselves, the company would lose customers and profit if it sold branded products. The rest of the rice from the RGL, 30 percent, is exported to Kenya, Zambia, and Malawi. Allegedly, since 2015, big buyers started coming from Kenya, demanding large quantities yearly. This increased demand from Kenya increased the RGL's rice exports from 10 to 30 percent by 2021. Similarly, Hu Feng's owner stated that it mainly supplied the domestic market, with limited export to Kenya, Zambia, and Malawi, but this export capacity increased. Both the RGL and Hu Feng representatives stated that they were interested in expanding to the EU market and were approached by a French buyer, though there were major setbacks in the demanded rice quality and coordination.

The ETG, one Tanzania's biggest producer-trader enterprises, is a success story in export: the Kapunga farm manager claimed that though the enterprise used to supply 80 percent of its rice in domestic markets until 2020, after the Covid-19 pandemic, the gears shifted to trade 80 percent in export markets

and 20 percent in domestic. Apart from owning the largest rice farm in Tanzania, the significance of the ETG is that it is one of the few enterprises that run the entire value chain: after production, it mills, packs, and exports its own brand of rice. The harvesting and milling steps are fully mechanized and specialized with the Buhler machinery from Europe for sophisticated processing to obtain the highest-quality rice. The manager pointed that the enterprise spearheaded industrialization in the rice subsector. Diplomatic visitors from the Western Province (Zambia) had visited the farm and processing facilities to inspect its business model and implement it back home. Moreover, the manager stated that the SARO5 variety that the ETG produced "captured the Kenyan market," as in a high number of Kenyan buyers have been contacting the enterprise to supply rice to them (Interview 2). The Highland Estates Limited representative confirmed this alleged massive demand in the regional market and the current mass supply in Tanzania, indicating that it planned to expand its business and start milling its own paddy and exporting rice in 2022.

#### **4.2. Quality and Quantity Limitations on the Supply Side**

Despite the Tanzanian rice is proven to have a price advantage in export markets and is competitive, significant quality and quantity shortcomings limit improved rice value chain and export. Informants from SAGCOT, Kilimo Trust, and the private sector converged on the opinion that though rice export to the EU and other distant markets is possible in the future, this potential has yet remained dormant due to these shortcomings.

In terms of quantity, the hybrid variety SARO5, which provides abundant yield and is also dubbed “the export variety,” has demand mainly in regional export markets and not international. In the regional market, the relatively low price of this variety is an advantage, strengthening competitiveness. During the early marketing season of 2021 (June–July), SARO5 paddy was sold at TZS400 per kilogram in Mbeya, while traditional paddy cost more, about TZS500 per kilogram. Regional export buyers usually purchased rice (milled paddy) at TZS1,000–1,100 per kilogram. In comparison, traditional rice cost TZS1,300–1,500 per kilogram. Low SARO5 prices are an advantage for traders in export markets. Such lower prices did not necessarily harm producers as long as they could harvest 7–8 tons per hectare and above that this variety has proven to yield on demonstration plots (the yield of traditional varieties range at 3–4 tons per hectare on average). Due to the potential of increasing profit through mass production, irrigation farmers opted for this hybrid variety. However, exporters targeting distant markets had other preferences.

Though SARO5 succeeded in some regional markets, not all traders targeting regional and international markets are interested in this rice. As a result, despite the overall production increase domestically, the quantity remains yet insufficient to provide international markets with Tanzanian rice. The interviewed processor-trader enterprises looked for traditional varieties that have full aromatic features and higher demand in export markets instead of SARO5. As Hu Feng’s owner stated, “SARO5 rice is cheap but not good for doing international business. It simply does not taste good” (Interview 9). The

owner indicated that a French buyer had requested this company to supply a traditional variety (Kamsamba) that was difficult to procure from farmers in mass amounts to fulfil the buyer’s quantity demand (due to the overall low yield of traditional varieties). The buyer did not accept SARO5 though this variety would have been easy to supply in mass. The owner added that some regional buyers also requested traditional varieties only. The SAGCOT official also argued that several buyers from Arabic countries were interested in importing rice from Tanzania but demanded mainly traditional varieties and above the existing supply capacities. For example, a Saudi Arabian buyer wanted to purchase 20,000 tons of rice weekly, a massive amount that Tanzania could not yet supply. Though SARO5 has been promoted for export, the demand for traditional varieties remained higher in export markets.

Another significant challenge is improving the rice quality, denoting its brokenness, colour, and contamination aspects, among others. As the interviewed producer- and processor-trader enterprises agreed, the domestic rice is usually 15–18 percent broken (the standard), which has the highest demand in domestic markets. Premium rice (max 5 percent broken) is not yet viable in the domestic and regional markets due to its higher price, above what consumers in these markets are willing to pay, though international buyers require this quality. For example, the Saudi Arabian buyer that the SAGCOT official stated had wanted 20,000 tons of rice weekly only in premium quality. Moreover, contamination and postharvest losses remain high. Mpendakazi agrodealers argued that farmers stored paddy at homes, with sacks piled on the floor, without spacing,

humidity, and temperature controls. Packaging materials were of poor quality; sacks were contaminated and moulded. Hence, the policy goal to decrease postharvest losses below 30 percent (FAO 2020; HELVETAS 2020; IPP Media 2020) was not achieved in Mbeya.

Apart from its relatively high brokenness and contamination percentages adversely impacting entry into international markets, domestically produced rice lacks colour uniformity. SAGCOT and the private sector informants addressed that the EU market is very selective regarding colour. Most of the Tanzanian processor-traders are not equipped with necessary machines to pursue advanced colour sorting as these machines are expensive and add to production costs. Among the Mbeya processor-traders, the RGL and Hu Feng negotiated with a French buyer to expand into the EU market and installed two machines to meet its quality specifications: a polisher and a colour sorting machine. The sample container that the RGL shipped to France successfully met the buyer's requirements, so the enterprise was preparing to start exporting by early 2022. The RGL manager addressed that the relatively higher price induced by additional production costs is not a disadvantage in the EU market since consumers there are willing to pay more and can afford higher prices for highest-quality aromatic rice. Nevertheless, the manager argued that most Tanzanian processor-traders are reluctant about installing such high-cost machines for the highest-quality rice without consistent support from the government in marketing and assurance that sudden export bans as frequently happened in the past will not materialize.

Trader-processor enterprises have taken successful steps in minimizing quality losses. For example, the RGL reported that it improved the brokenness of its rice to 10 percent, which it sought to retain, from the standard of 15–20 to up to 30 percent broken. Moreover, the contamination percentage of its rice decreased, from 8–10 percent to 2–3 percent, which the manager considered still high and desired to lower to 1 percent. To reduce contamination, the company has provided workshops to farmers on good agricultural practices and warehousing techniques. However, as the SAGCOT official and Mpendakazi agrodealers agreed, most quality problems arise at the production level as farmers lack such know-how and skills, which, in turn, poses a barrier for processor-traders to enter new export markets beyond the EAC. “If farmers are informed about the existence of export buyers and the quality criteria they wanted, they will be more motivated to learn and invest in achieving them since they will then sell at better prices,” Mpendakazi agrodealers stated.

The paddy quality and quantity are significantly influenced by diverse infrastructural restrictions. As the Mbarali DAICO suggested, farmers need to mechanize harvesting and use combine harvesters to prevent high brokenness and achieve harmonious harvest results. But the progress in mechanization has been slow. Combine harvesters and spare parts are costly in Tanzania, while the government-granted machines at smallholder irrigation schemes are heavily undermaintained.

Farmers in the Mbuyuni FGD stated that due to undermaintenance, out of ten combines they received from the government, only three were operational.



They pointed out that these “combine harvester worked well for two years. But we used them for five years and also for different purposes, even for construction. So they are not functioning well” (FGD 3). They wanted to sell these combines, add money, and buy new ones, but “it is not easy to sell the government property. We do not have the mandate. You have to find the person who assigned that machine to you and go through a long process.” Some wealthy local farmers owned combines and rented them to others, but the prevalence of such private ownership was limited.

Another infrastructural challenge influencing quality was the erratic power supply. While the cost of electricity is considered high by farmers and processor-traders, power cuts happened frequently during milling, compromising quality. This is a problem for especially SARO5 rice since this variety is highly susceptible to mechanical processing. Moreover, irregular blackouts often caused delays in milling and prevent processor-traders from preparing and shipping large quantities for export buyers on time, as the RGL manager addressed. Hence, unanticipated quality losses triggered by infrastructural shortcomings translated into time and profit loss and disadvantages in domestic and export markets.

Agricultural policies in the past had a top-down but effective approach to address problems affecting rice quality and quantity according to informants’ view. The Agricultural Sector Development Program (ASDP) I (2006/07–2013/14) had a centralized budget called the ASDP Basket Fund, the largest government-controlled fund in Tanzania. The

government centralized all public and donor support into this budget at the national level and allocated funds to district governments for participatory planning and decentralized implementation (URT 2012, 2016). At the district level, the funds fell into two budgets, the District Irrigation Development Fund and the District Agricultural Development Program, through which the district government identified priority investment areas and invested into irrigation and marketing infrastructure. However, with the ASDP II (2017/18–2027/28), the focus has shifted from public investment to partner with donors and the private sector. According to the Mbarali DAICO, this has driven a significant lack of coordination in investment and resolving infrastructural weaknesses:

“Previously, the investment goals were clear and consistent. We identified a challenge and spent money on resolving it. But now, every development partner comes with a different objective; there is no consistency or harmony. Most are coming for low-cost things, such as capacity building, knowledge generation, and social goals, and do not address costly issues, such as the infrastructure. Also, everyone is investing in a different field. We have been trying to bring these investments into focal points, but the policy is causing a lack of coordination.” (Interview 7)

Consequently, while the existing hybrid seeds have not extensively succeeded in distant export markets, quality and quantity drawbacks have not been sufficiently addressed through strategic and consistent investment to improve the

rice value chain and export.

### 4.3. Transaction Costs in Contract Farming

In Mbeya, contract farming has been one of the few and feasible options for smallholders to gain access to farm inputs and for processor-traders to secure certain varieties and quantities of paddy. This system worked through processor-trader enterprises assuring banks of collecting paddy from contract farmers and paying back loans on their behalf, as banks innately lack such logistics and sanctioning capacities. However, several problems arose during paddy submissions by farmers to these enterprises, incurring significant transaction costs, which this section explores.

Interviews showed that aggregating the agreed quantity of paddy had been one challenge for processor-trader enterprises. For instance, the Raphael Group Limited (RGL) manager indicated that every year, about 10 percent of contract farmers violate their contract obligations by not delivering the agreed amounts of paddy. Allegedly, they hid paddy, claiming to have had crop failures and low harvest, and defaulted on contracts. Some default tendencies were driven by urgent livelihood needs that required farmers to sell all of their crops immediately instead of submitting a portion to the company. Others defaulted as they wanted to sell their crops to other buyers at higher prices than the RGL paid. Kilimo Trust officials stated that the length of quality control processes following crop submissions encouraged

such default: enterprises sometimes took up to 3–4 weeks to confirm that the submitted paddy met the required quality criteria. Since such criteria were sometimes not instantly met (e.g., due to crops being heavily contaminated, mixed with excessive dirt and earth, and not well-dried), farmers had to reserve another portion of their harvest to provide as replacement<sup>3</sup>. But since not all farmers waited so long for quality approvals with a spare stock, they failed to supply replacement when companies requested. As a result, companies often could not collect the calculated amount of paddy despite contracting.

Sanctioning mechanisms designated to discourage contract default were not strong. As the Kilimo Trust officials pointed, the primary sanction was that defaulters would not receive new loans in the following seasons—seldom effective in preventing default and protecting banks and processor-trader enterprises. Measures designated to prevent and sanction loan default were mainly on the farm level and drew from informal institutions in three steps (Ires 2021a). In the first step, the leaders of farmers' associations warned contract farmers and negotiated with them whether and when they planned to submit paddy. In the case of delayed harvesting, crop submission deadlines were extended. Second, when deadlines were missed, farmers and leaders formed a sanctioning committee to visit defaulters at their homes and on the street to re-negotiate or demand immediate payment in paddy or cash. Third, when default persisted, farmers were approached in two distinctive ways: if they had crop failures and lacked any

<sup>3</sup> In the contract farming practice in Mbarali, farmers generate cash by selling the surplus harvest remaining from the contracted amount of paddy submissions and are not paid salaries by processor-trader enterprises.

for the deficit to be replaced in the following year. But if farmers did not convince the visiting committee and showed evasive tendencies, they were threatened with property confiscations and social ostracism. These methods were successful only to a limited extent, and default remained a problem.

A further problem in contract farming was that only irrigation farmers (producing SARO5) are allowed to become contract farmers due to their relatively secure harvest under irrigation, though processor-trader enterprises typically require traditional varieties (due to their high aroma) for export to the eastern African countries and beyond. Rainfed farmers cultivating these traditional varieties are not contracted because contract-farming partners consider them to have higher harvest insecurity and a higher risk of loan default. Indeed, in Mbuyuni, a few rainfed farmers were contracted in the past but did not ensure sufficient harvest levels. Failed crop submissions turned into a conflict, as the leaders of the farmers' organization completed the missing crop submission by taking paddy from others' stocks in the scheme warehouse. Rainfed farmers are no longer contracted due to such problems, but this means processor-trader enterprises can no longer ensure the mass supply of traditional varieties through contracting and have little confidence in closing export deals that require massive supply. As the RGL manager stated, only about 30 percent of all paddy farmers in Mbeya are allowed to participate in contract farming due to this reason, which is "bad for business" since the RGL could otherwise collect more paddy, have a

higher export capacity, and decrease the searching and information costs in obtaining traditional paddy (Interview 4). Moreover, without legal instruments such as contracts deployed, farmers are not obliged to sell their crops to any specific buyer even if they are verbally committed to. Therefore, any processor-trader that wants to deal in traditional paddy has to negotiate the supply volumes and prices on the spot, which adds to bargaining costs.

Interviews found that though farmers showed interest in contract farming when the Mbarali cluster was inaugurated (2017), this interest has declined over the years. Farmers considered the loan costs (i.e., interest rate, administration, and insurance fees) high. High costs lowered the prices per sack of paddy, requiring more sacks as payment, though these prices reflected the market price average to some extent<sup>4</sup>. For example, as Mpendakazi agrodealers stated, if the mutually agreed upon base price is TZS55,000 per sack, the loan costs lower this price to TZS53,000 per sack. So, instead of submitting paddy sacks at this price, some farmers default on their contracts by selling their crops to other buyers at the market average of TZS55,000 per sack. Meanwhile, those who did not default and paid for their loans did not prefer to participate in contract farming again due to such lower prices.

Another challenge in contract farming was the delayed cycles of loan issuance by the bank in subsequent agricultural years, which posed uncertainties for farmers.

---

<sup>4</sup> The exchange price embedded a formula: it had to be equal to or higher than the minimum market price. So, the price was fixed after harvesting and when market prices were certainly known.



Contracts are signed for one year, and while paddy production takes about seven months, the minimum loan window designated by banks is eight months. Farmers cannot submit crops earlier than eight months; even if they do, the interest charged by the bank is not less. So, instead of submitting their paddy in July (after harvesting in June–July), they could wait four more months until the end of one loan cycle in December for market prices to rise (since the base price in contract farming is flexible and adjusted according to the average market price), even though this also meant a higher interest. So, while some farmers submitted their crops in June to avoid a higher interest, others waited until December, speculating on higher prices. Such differentiated times in crop submissions caused a chain of delays as loans are issued in the name of farmers’ organizations, and banks wait for complete submissions to conclude one contract cycle even if only a dozen farmers submit crops in December. However, since banks need months to issue new loans, the following cycle cannot start immediately in December. For instance, in Mbuyuni, loan distributions were delayed into February in the past, which had catastrophic outcomes because farmers were not informed about this delay and could not begin cultivation on time. Such delays were a further coordination problem, putting off participation in contract farming.

#### **4.4. Transaction Costs in Export**

Several restrictions on the borders impeded trade flows, increasing transaction costs and discouraging Tanzanian traders from entering and expanding in export markets, as examined in this section.

##### *4.4.1. Searching and Information Costs*

Interviews revealed significant searching and information costs regarding quantity and quality of paddy supply for exporting. These transaction costs were related to the lack of reliable data on production and the lack of information among value-chain actors on rice quality standards and examinations in export markets.

Informants agreed that production has been increasing over the years in Mbeya, but the exact increase in different areas of the region is not well-monitored by the government. Reliable data on how much rice and what varieties are produced and stocked is missing, which increases searching and information costs for processor-traders to locate and purchase specific types and amounts of paddy. Mpendakazi agrodealers suggested that weak monitoring partly stemmed from poor linkages between multilevel stakeholders in the rice value chain, including the government and the private sector. Accordingly:

“People are making decisions and policies there, in Dar es Salaam; for example, [people] from the Rice Council of Tanzania. But they do not really know what is happening in Kamsamba, the other end of the country. It is an important rice producer area in Mbeya. They do not know what problems farmers are facing and have no solutions. But also, they did not establish an effective monitoring system. As a result, no reliable data is available on production statistics and trade volumes.” (FGD 2)

The prevalence of illegal export also exacerbates the monitoring problems and the unreliability of data regarding production and trade. Informants pointed out substantial illegal bush export (the panya route) from Sumbawanga and Tunduma to Zambia. Also, allegedly, people from the islands (Zanzibar) bought rice in Mbeya and exported through the permeable marine borders. A report published by the United States Department for Agriculture confirmed the critical importance of monitoring and controlling illegal trade in establishing accurate information database regarding stocks and making informed food and trade policy decisions (USDA 2017).

Producers and processor-traders claimed to possess little information about the quality standards in international markets. The Kapunga farm manager stated that SARO5 succeeded in Africa because food consumption preferences and buying capacities are relatively similar across the continent. But the EU is a different market: the aroma, colour, and morphological preferences are more demanding. Therefore, cheap and semi-aromatic varieties like SARO5 did not succeed there. Even the interviewed Tanzanian authorities and research institutes lacked information regarding what varieties and quality features could succeed in the European market. As the Uyole agricultural research institute officer addressed:

“We did not work on the European market and do not know what standards they expect. About horticultural crops, such as avocado, we know more, but not about grains. If we knew what grain quality they [European buyers] wanted, we could discuss and see if we could fulfill it. But also, the soil

and agroecological conditions differ in every area. If we know about the quality standards and specifications they expect, we would test different areas and build new irrigation schemes in optimal environments to fulfill these expectations. Otherwise, it is impossible to produce certain qualities everywhere no matter how much fertilizer you put into the soil.” (Interview 5)

According to this viewpoint, steps to fulfil specific quality requirements for distant and new markets, such as Europe, starts from identifying suitable geographies instead of tailoring seed and fertilizer use formulas to be used everywhere. For instance, this Uyole official added that the overused and infertile soil in Mbarali will be unlikely sufficient to meet the EU’s advanced quality requirements regardless of the cultivation practices promoted in Mbarali. Because of the knowledge gap regarding these requirements and what geographies were best and required to fulfil them, grain export to Europe was unlikely to rise above one percent of the domestic production in the near future, in his opinion.

Small- and medium-sized processor-traders faced high costs in searching for export markets. Mbeya Rice chairperson claimed that most millers in Mbeya lacked connections and did not know which companies would be interested in buying their crops. As a result, most of the trade was to Kenya (the biggest buyer in the eastern African region), with Kenyan buyers usually coming to Mbeya, aggregating and shipping Tanzanian rice to the country. According to the chairperson, Kenyans were accomplished in trade since the Kenyan government established a free-trade environment and

supported all of its producers and traders with clear market information and education to do business in foreign countries with confidence (unlike the Tanzanian government). Moreover, branding was done in Kenya, and allegedly, Kenyan traders sometimes faked the Tanzanian origins of the rice in their packaging and branding, exporting it overseas as Kenyan rice. As a result, Tanzania did not earn as much in export revenues as it potentially could by exporting its own rice to distant markets. Its rice remained less spotted and spoken in the international market than it could.

Such information costs about the quality standards and demand in regional and international markets discouraged smallholder farmers from organizing to aggregate, mill, and export their rice collectively. Mpendakazi and Mbeya Rice informants argued that collective marketing from farms to neighbouring countries was unrealistic since apart from lacking information on quality standards, farmers did not have the sources and technologies to follow the interseasonal price fluctuations and aptly speculate on the most profitable selling time and develop strategies to benefit from specific markets.

Moreover, allegedly, farmers could not yet assess the overall business and political climate in Tanzania and destination countries to decipher how instabilities in this context might influence trade flows and price fluctuations. As the chairperson of the Mbeya High Quality Rice Producers Association suggested, due to these uncertainties, farmers were hesitant to invest in elevating their position in the value chain by processing paddy and branding and selling their own rice collectively. He added that “if the stock value of rice is TZS100 million, the additional charges such as obtaining

a certificate from the Tanzania Bureau of Standards and export permits might go up to 15 percent, TZS15 million, which is too much” (Interview 10). In summary, high information and searching costs abated Tanzania’s relative advantage in export markets.

#### *4.4.2. Risks, Uncertainties, and Informalities in Border Crossing*

Logistical and border issues pose high costs and uncertainties in rice export. The interviewed enterprises, SAGCOT, and government officials agreed that export logistics and meeting bureaucratic requirements were costly, while border officials sought informal income and created difficulties on the borders. For example, the owner of the Hu Feng reported that a Kenyan border authority had once found fault in packaging sizes (despite being officially standard) as an excuse to spurn the whole shipment. The owner stated: “Even if we do everything they say, the next time, they will find a new excuse” (Interview 9). The RGL also addressed that in 2016–17, when borders were open and it had planned to export rice to Malawi, Malawian officials had so many arbitrary requests that in the end, the company was forced to transport back the rice to its Mbeya warehouse, losing its buyer and money.

Complications in the borders also cost time: products are loaded off trucks, inspected, and reloaded for days and up to weeks. Though time is especially a critical issue for perishable crops, such as avocado, rice too has to move and be delivered to the export buyer within the promised time frame for payment deadlines to count valid. With delayed delivery, payments by buyers are often delayed too, which is a problem for traders.



The interviewed processor-traders pointed out that they have to be well-connected to accurately estimate the additional costs in border crossing and resolve the related nuisances within hours. The Kapunga farm manager addressed that enterprise size mattered. Allegedly, big firms could establish extensive business networks and devise effective methods for tackling border complications easier, unlike smaller firms that lacked resources and were quickly discouraged from exporting, fearing the slightest inconvenience. The same was also said for farmers' organizations. The chairperson of the Mbeya High Quality Rice Growers Association asserted that even if farmers were interested in aggregating, milling, and exporting their rice collectively, they lacked the kind of connections and capital that large businesses had to ensure the exporting to run smoothly and were put off. As he continued, "we do not know how long the export will take, and what complications will arise. Also, borders close and open, and prices change quickly. If we take risks and bear high costs, we will harm farmers instead of benefitting them" (Interview 10). Such border-related transaction costs prevented smallholder farmers and traders from elevating their position in the value chain through trade and increasing their income, though some donors (e.g., USAID) had spent efforts to build capacities in this regard.

Beyond informal income generation and delays in the borders, a Tanzanian exporter stated to perceive hostility from foreign border officials, especially, Kenyans, toward Tanzanian traders. The Kilimo Trust officials also suggested that some processor-trader companies had encountered hostile situations; border patrol had not wanted to authorize the

import of Tanzanian products. Allegedly, this hostility stemmed from the opinion that massive quantities of agricultural and nonagricultural commodities entered Kenya from Tanzania wrecking its domestic economy. Kilimo Trust officials also reported cases of Kenyan authorities not allowing transit for Tanzanians to move their commodities to South Sudan and other northern African countries, to which Tanzania does not have borders. In some of these cases, the border authorities asked for higher informal payments. In others, in Kilimo Trust officials' view, they sought to force Tanzanians to sell their rice to Kenyan traders for the practice of faking the Tanzanian rice's origins as Kenyan rice before exporting further. Although the EAC agreements sought to ease regional trade and Kenya has become the biggest buyer of rice from Tanzania, potential aggressive competition between neighbouring countries will likely weaken their broader trade outreach despite their comparative advantages in export markets.

#### *4.4.3. Bargaining and Contract Enforcement Costs with Export Buyers*

Transaction costs in bargaining with and sanctioning export buyers were exceptionally high. Companies (e.g., the RGL) sometimes sold rice on credit: the buyer paid an amount, about 40 percent, in advance, and the rest, 60 percent, later, after delivering trucks. But, as the RGL manager stated, "buyers sometimes find it difficult to pay, and say 'we will pay today or tomorrow' but do not keep their promise when the time comes" (Interview 4). As a result, the RGL bore extra costs to sanction timely payments. Its representatives sometimes travelled to these companies abroad to negotiate with them, which led to agreements that

companies would pay a percentage in cash immediately to the visiting representative and another in the following 2–3 weeks. In the end, finalizing the payment took up to 3–4 months, and meanwhile, cash flows were interrupted, adversely affecting the processor-trader's paddy procurement and milling operations. Such uncertainties in payment collections should be considered significant bargaining and contract enforcement costs.

Due to these costs, despite recently expanding into the EU market, the interviewed Tanzanian processor-traders found it unrealistic to export their own-brand rice (instead of wholesaling) to European buyers. The RGL took financial and logistics responsibility only until the Port of Dar es Salaam; after that, the French buyer covered the port fees and transported its rice to Europe. This was mainly because the RGL could not wait for 20–30 days for the shipping to arrive and sell in the European market; it needed to liquidate its products immediately after processing and create capital to sustain paddy procurement and processing. As the RGL manager said, “cash has to flow. It is key to our business growth. Receiving money today and 30 days later is not the same.” Moreover, contract enforcement costs were high since the company could not simply send its representatives to another continent, to Europe, for negotiations as it did to the neighbouring countries: visa requirements are difficult to fulfil, travel fares are expensive, and negotiation dynamics and sanctioning mechanisms substantially differ from Tanzania.

A bargaining cost arose in the context of Hu Feng's export negotiation with the

French buyer, putting off this Tanzanian-Chinese trader. The enterprise owner addressed that he had sent a sample container of 25 tons to France, which met the buyer's quality criteria. So the buyer wanted to procure 100 tons per month (1,200 tons per year), a quantity much above Hu Feng's capacity (it milled and stocked only 800 tons per year). So, the enterprise agreed to supply only 800 tons, but a disagreement in payment mode led to failure in finalizing this export deal: the buyer offered to pay only 25 percent of the agreed price in advance and 75 percent after selling the rice in France, which collided with Hu Feng's priorities as it needed a higher percentage of cash in advance to ensure rapid cash flows. As the Hu Feng owner stated, “much money is required to buy paddy from farmers and supply 100 tons per month—impossible without secure cash flows” (Interview 9). Reportedly, in 2020, the Hu Feng owner had bargained with this buyer to increase the advance payment to 50 percent, which the buyer did not accept, leading him to turn down the export request. This case shows that export transactions involving loans are not feasible for Tanzanian businesses since they typically rely on rapid cash flows to remain operational and grow.







## 5. Impacts of Trade Regulations on Rice Value Chains and Export in Tanzania

Tanzania has a history of irregularly enacting trade regulations that impact rice producers and traders adversely. In the past, the government used to ban grain export frequently—sometimes many times a year—whenever it estimated the precipitation and food production to decrease. Between 2003 and 2006 alone, it declared five rounds of export bans, followed by new ones in 2008–10 and 2011 (UNCTAD 2015). As a result of such frequent export regulations, market prices often abruptly declined, driving a situation known as “the food policy dilemma”: bans seeking to protect consumers by keeping food abundant and prices affordable in domestic markets usually harm farmers and producer companies that rely on selling food for cash (Timmer, Falcon, and Pearson 1983). Besides, price oscillations caused disorientation among farmers in marketing whether they should store crops to wait for market prices to rise and when would be the best time to sell. These problems had led president Kikwete to announce at the G8 Summit of 2012 that Tanzania would abolish trade bans for good (UNCTAD 2015). In the same year, the country committed to trade liberalization, assuring the World Trade Organization that it would not impose any new barriers. However, this commitment lasted only a few years until 2015.

After the 2015 elections, president Magufuli followed a different trade approach and began enacting new export bans, driven by two events: the 2015–16 drought and the 2020 Covid-19 pandemic. In 2015, “the worst El Nino” until then prompted a severe drought in southern Tanzania (FAO 2016: 1), which

was extended into 2017. This drought led to massive crop losses, driving food prices to rise dramatically (FAO 2016). In only one year, from January 2016 to 2017, grain prices doubled in Arusha, rose by 25 percent in Dar es Salaam, and generally reached high levels across the country (FAO 2017). Forecasts of food shortage influenced the government to introduce a sequence of grain export bans in 2016. In 2017, further regulations followed the lack of data on rice stocks countrywide as a cautionary measure. Prime minister Majaliwa declared that the ban would not be lifted until the government had sufficient data on stocks despite opposition from donors and Eastern African Community grain importers (the Citizen 2017).

As a consequence of the 2015–17 bans, market prices for the SARO5 rice variety, cultivated mainly for export, drastically declined, harming its producers. In Mbarali, wholesale paddy prices halved from TZS1.1 million per ton (\$476) in 2014–15 to TZS0.55–0.6 million per ton (\$238–260) at the beginning of 2016. During the early marketing season (June–July 2017), prices slightly increased again but remained low, TZS0.75 million per ton average (\$325). The maximum price reached TZS1.1 million per ton (\$476) toward the end of the marketing season (November 2017–January 2018), with recurrent but brief dips throughout the entire marketing season (June 2017–January 2018) due to interseasonal price fluctuations. As a result, though farmers of SARO5 were promised profit through mass production if they shifted to this variety, they were badly impacted by the export ban. As a result, in addition to

the steeply declined production levels induced by the drought, many could not sustain income because of low-ranging market prices. Some SARO5 farmers switched back to traditional varieties due to their slightly higher price (traditional varieties have higher domestic demand due to their high aroma); the bans caused disorientation in seed choice. Others encountered debt and had to abandon farming and seek employment, though the government had sought to curb such crises by enacting bans (Ires 2021b).

Apart from export bans, diverse import regulations have had detrimental consequences for Tanzanian producers and traders. For imported rice, Tanzania applies the EAC Common External Tariff of 75 percent. But in 2013, the government decided to import 80,000 tons of cheap rice from Pakistan at zero tariff. According to some scholars, this decision was influenced by successful lobbying efforts of large-scale import businesses in Tanzania (Andreoni, Mushi, and Therkildsen 2021; Mdoe and Mlay 2021). Coupled with massive illegal imports from Asia through Zanzibar, this regulation had a hammering effect on the domestic sector: rice prices dipped, which some producer and trader companies did not survive. For example, the Kilombero Plantation Limited (KPL), a large-scale (5,800-hectare) rice and maize producer and a SAGCOT showcase for rice outgrower model, folded in 2019 due to this decision (Africa Confidential 2019). The KPL had deployed advanced technologies, producing the highest-quality rice in Tanzania at exorbitant production costs. The farm had survived on the implementation of the EAC Common External Tariff on rice imports and could not compete with cheap rice imports from Asia, experiencing fiscal

deficits and going bankrupt in 2019. The Kapunga farm of the ETG was similarly adversely impacted by the regulation, though it recovered upon re-enactment of import restrictions in 2018 (IPP Media 2018), which the farm manager confirmed during interviews.

The second significant export disruption in Tanzania's rice trade was driven by the Covid-19 pandemic. Though Tanzanian borders remained open throughout 2020, export was restricted, with other countries going into lockdown. Generally, Tanzania's economic growth has not decelerated as much as other EAC countries during this period. In fact, at the peak of the crisis in May 2020, it recorded a trade surplus due to the export of high-value minerals (e.g., gold) rising by more than 100 percent (Bank of Tanzania 2020; UNECA 2021). Generally, agriculture has been one of the few sectors where the pandemic's economic impact was relatively limited (UNECA 2021). However, disrupted input imports caused significant problems, considering in Tanzania, most agricultural inputs are imported: 80 percent of fertilizers, 60 percent of seeds, and nearly all agrochemicals (AGRA 2020). Disturbances in regional and international logistics curtailed the shipment of agricultural inputs into the country (AGRA 2020), driving the dramatic increase in fertilizer prices in 2020–21 and inflating production costs to producers' disadvantage.

A further strike on producers during border lockdowns was the dipped paddy prices due to the increased domestic stock in rice. While farmers had complained about low wholesale paddy prices, at the average of TZS0.75 million per ton in June 2017, and reaching TZS1.1 million

per ton (\$476) at the end of the same year season, prices decreased even further in 2020.

Mbuyuni FGD showed that in 2020, farmers sold paddy at the range of TZS0.4–0.45 million per ton (\$173–194). Until June 2021, prices slightly rose to TZS0.45–0.5 million per ton (\$194–216), while farmers estimated prices to reach the maximum of TZS0.8 million per ton (\$346) in November–December 2021. Since today's peak price was the lowest four years ago, income generation has become more challenging for producers.

Interviews with Mbarali DAICO and Kilimo Trust officials revealed that export restrictions and low-ranging prices had a counterproductive impact on rice producers' willingness to invest. Smallholder farmers shifted to low-investment, low-return production to adapt to low prices and high fertilizer costs, which has been a step back in commercialization. Farmers in the FGD at the Mbuyuni irrigation scheme pointed out that “today one bag fertilizer costs more than one sack paddy,” and intensifying fertilizer use to obtain higher paddy yields is no longer rewarding for some of them. Indeed, in 2021, one unit of different fertilizers cost TZS58–92,000, while one sack of paddy was sold at TZS50,000. They needed to purchase seven units of fertilizers (cost about TZS0.5 million in total) in order to ensure five to six tons of paddy (brings about TZS0.2–0.3 million in total), making a loss even when reasonably good harvest levels was reached. Such high costs and low prices encouraged farmers to lower investments.

Even during periods when bans were lifted, farmers and enterprises considered

the trade environment highly unstable and unpredictable. Frequent bans in the past remained as uncertainties today as farmers felt insecure whether these bans would return, which influenced their decision-making. For instance, as the Mbuyuni FGD showed, farmers often sold their paddy at low prices instead of waiting for market prices to rise because they were uncertain whether the government would enact new and unadvertised export bans, leading prices and incomes to fall even lower.

On the production side, a further ramification of border closedowns was that low market prices and closed-down export gates influenced producers to stock paddy instead of selling it, which decelerated the movement of rice through the value chain. Disrupted food export and limited transportation coupled with a bumper harvest from the previous year led to large carryover stocks, which has been a problem due to limited storage capacities (UNDP 2020). Research found that storing rice in mass, some enterprises stopped buying paddy from farmers or decreased the purchased quantities, driving farmers to sell their crops to small middlemen at below-average prices (AGRA 2020). The manager of the RGL confirmed that the enterprise had multiplied its stocks though it continued purchasing paddy. Many farmers stored paddy from previous years at homes, waiting for prices to start rising, but inappropriate storage conditions exacerbated postharvest losses. Overall, despite the increased production, rice could not move up in the value chain due to the slowed-down trade flows.



On the trade side, one immediate effect of Covid-19-driven border closures and delays on rice trade was the cancellation of orders by export buyers, impacting revenue generation by Tanzanian processor-traders severely (UNDP 2020). According to the SAGCOT official, several Covid-19 requirements, such as certificates and PCR test results, had to be provided at the borders. Preparing for border-crossing required more administrative work and a longer time than before. Additionally, the checking of these certificates by border patrols took time. As the RGL and SAGCOT representatives suggested, extended periods of border-crossing during the pandemic were detrimental for cash flows since buyers expected cargos to be delivered by deadlines. “Businesspeople have no time,” the SAGCOT official said, “earlier if one week was enough to deliver a consignment, now you need only two weeks to prepare” (Interview 3). Some buyers used delays as an excuse to renegotiate prices and payment dates. In some cases, they even cancelled the shipment last minute, saying the delay was too long and that they found another, a quicker resource within the country. Consequently, the loss incurred to exporter enterprises and countries was enormous. Only at the Namanga border, Tanzania and Kenya lost about \$38 million per week due to delays caused by truck impasses and prolonged border-crossing during pandemic (BlueBox GmbH 2020).

Despite the unprecedented consequences of export and import regulations in the last half-decade, some processor-trader enterprises maintained a positive trade outlook. Both HEL and the ETG reported making a loss during mass rice imports from Asia and export restrictions. Company representatives indicated that they

survived the crises by allocating capital to their farms from their nonagricultural subsidiaries—an insurance that enterprises engaged in only agriculture, such as the KPL, lacked. With re-opening borders, the ETG’s export capacity has increased above pre-pandemic levels. Furthermore, bureaucracy has been eased by the government through online registration systems and speeded up permit issuances. As the RGL manager addressed, “if getting export permits and licenses used to take two months, it takes a single day only nowadays” (Interview 4). The competitiveness of Tanzanian rice in export markets also depends on what trade regulations other countries enacted. For example, as the ETG manager indicated, countries applying low tariffs on rice imports from Asia challenged the entry of their rice in those markets.

In designing a better enabling environment for trade, government officials and enterprises stated that policy formulations would need to change: rice should be seen as a commodity, not food. The SAGCOT official stated that “how policies frame things matter. Speaking off rice as a commodity will attract investments” (Interview 3). Similarly, the Mbarali DAICO argued that “if something is not considered a business in the first step, there is no way and vision for business expansion. ‘Food’ does not provide room and incentive to invest. Investors are led by profit.

Only if you say rice is business will people put money into it. Rice is food anyway; how you formulate it brings a lot but does not stop you from eating it” (Interview 7). According to the RGL manager, “they [government authorities] are imposing bans to ensure food security. But we as businesspeople do not like that.

Even when there is not enough food in the country, they should allow us to do business. The export revenue could still be used to import food—rice, maize, or something else. I do not have to eat what I produce” (Interview 4). ). Thus, according to this perspective, farmers can also be

ensured of buyers and potentially higher prices. Overall, there is a consensus among the interviewed enterprises that bans affect rice production and export adversely, and the government should eliminate any intervention into the free market.







## 6. Conclusion and Recommendation

This study sought to explore the underlying transaction costs in different stages of the rice value chain—from production to trade—and understand how the recent agricultural and trade policies and regulations influenced them. Based on the theoretical departure of this study, the three main transaction costs central to empirical investigation were the searching and information costs, bargaining costs, and enforcement costs. The analysis focused on identifying these transaction costs on the operational level. Based on the findings, this section offers recommendations that are not conclusive given the limited period and scope of this study. Nevertheless, they will help researchers, development partners, and policymakers engage in a critical debate and discuss feasible ideas to be integrated into agricultural and trade policies. Moreover, these recommendations reflect the private-sector interviewees' perspective to a great extent: what they consider necessary to overcome diverse value-chain obstacles they encounter daily. By conveying their opinions, this section builds a bridge between value-chain stakeholders in rural areas and national decision-makers.

Findings showed that significant progress was recorded on the production level in increasing paddy yield over the last decade. Public and private sector investments were made to upskill farmers regarding the new cultivation techniques, spread the use of hybrid seeds, and intensify fertilizer use toward commercializing paddy farming to achieve these results. Nevertheless, despite these efforts, interviews with farmers and farmers' associations showed that due to the high and recently further increased fertilizer costs and low-ranging market

prices, farmers were hesitant to invest in commercial paddy farming. Some of them were inclined to return to subsistence farming and ensure minimal surplus to sustain livelihoods instead of engaging in high-risk, high-return farming. An issue in this context was weak access to loans. Though the government motivated farmers to take loans and capacitated several national banks for this purpose, the lack of collateral was widespread and prevented farmers from accessing loans. These findings reveal that despite the overall production increase, farmers' financial shortcomings on the production level have yet remained unaddressed. As a result, the major transaction costs on this level arose in the context of searching for affordable farm inputs, bargaining with local financiers, and accessing market information.

Cultivation recommendations and formulas developed by agricultural institutes and the private sector must be tailored according to the economic capacities of smallholders. The current extension curriculum promotes intensive use of expensive fertilizers, which farmers struggle to afford. To address this issue, the government should consider allocating more budget into agricultural research or collaborate with donors and the private sector in this regard on the one hand. Seed research and development are required to breed semi-aromatic and productive seeds comparable with SARO5 with less fertilizer requirement. Besides, recurrent research is needed in soil testing for farmers to calibrate fertilizer use according to soil nutrition requirements. On the other hand, addressing the collateral issue is imperative.

SAGCOT and the government could support financial innovation and engage microinsurance companies, such as the Private Agricultural Sector Support. Further attention in this context is needed on land formalization (i.e., issuing private and common-property rights to land) that could potentially empower smallholders and advance commercialization as long as the process is fair and their informal-customary rights are taken into consideration during this process.

On the postproduction level, the interviewed processor-trader enterprises consistently pointed to business-threatening low prices during export bans. Moreover, concerns were raised about meeting the required export supply quality and quantity and access to information about standards in export markets in this regard. In addition, processor-trader enterprises, especially the small- and medium-sized ones, found cross-border nuisances, such as informal fees charged by custom officers and hostility from foreign border authorities, challenging to tackle.

In terms of supply to international markets, the interviewed producer- and processor-trader enterprises converged on the opinion that the demand for Tanzanian rice has risen, for example, from the EU. However, international buyers usually requested massive amounts of rice of the highest quality that Tanzania could not yet supply. Installing and operating special machines for advanced processing, targeting the European market, incurred additional costs to processor-traders. However, the final prices were still competitive since consumers in this market have a higher

purchasing capacity than consumers in Tanzania and, generally, the East African region.

In the context of milling and trading high-quality rice, various transaction costs are present. Processor-trader enterprises suggested feeling uncertain about whether the Tanzanian government would introduce export bans even when politicians committed to liberalizing trade. These enterprises feared an abrupt closure of export gates after they prepared and warehoused massive quantities of highest-quality rice for particular buyers, as they would fail to sell it domestically and regionally due to their relatively higher prices, potentially going bankrupt. Moreover, bargaining costs matter. Tanzanian processors required rapid cash flows to continue purchasing paddy from farmers and process it without interruption. Therefore, they are not willing to sell massive quantities on credit or wait for several months to get paid by export buyers. Refusing such payment modalities sometimes cost traders new export deals. Besides, both in international and regional trade, government protection is missing. For instance, Kenyan buyers defaulted on contracts last minute despite sometimes shipments being already underway in some cases. In others, they paid later than agreed with traders. These incidences show that enforcement costs during cross-border trade are high.

In order to improve the rice value chain and export, this study advises policymakers to pay particular attention to three issues. One, loan access should be improved for processor-trader SMEs to purchase

the machinery required for sophisticated milling and grading. Loans are also crucial for them to ensure rapid cash flows and close new export deals since then they can continue procuring and processing large quantities of paddy and bear high logistical costs to export buyers.

Two, the government should designate a system to protect businesspeople in regional and international trade. New bilateral agreements are required in the region to address border informalities. In this context, a suggestion came from the RGL manager that the government shall assign Tanzanian authorities on the other side of regional borders to monitor and assure swift trade flows and minimize the occurrence of delays and informal payment situations. These agreements with neighbouring countries should also include providing Tanzanian traders with easy passage to non-neighbouring countries in Africa. In the international context, Tanzanian and generally African traders should be protected by extended laws.

Three, a reliable and free trade environment will protect farmers and enterprise owners from border closures and abrupt price drops, incentivizing them to increase investment into commercial farming and trade. Various informants emphasized the need for the government to regard rice as food and a commodity and integrate this viewpoint into agricultural policies. In this context, the government needs to monitor the existing production and milling capacities better and keep accurate statistics. The lack of reliable data on food stocks has been an important driver of export bans, such as in 2016–17, when the fear of food crises prompted export regulations. The bans substantially lowered rice prices,

damaging producers. Such reliable stock data will likely decrease the need to enact new bans, protecting both producers and consumers.

On the policy level, challenges that diverse value-chain actors encounter at the production and postproduction levels are inadequately captured. Further specification is needed in agricultural policies and the National Rice Development Strategy regarding how various operational and institutional bottlenecks will be exactly addressed. For instance, the government has encouraged farmers to take loans from banks to increase farming investment, but the collateral gap in the widespread absence of formal land rights and confiscable properties among smallholder farmers is neglected. Specification and detail will help address these problems systematically. Also, agricultural research and extension services lack an integrated approach needed to offer tailored cultivation solutions to different cultivation challenges under different agroclimatic environments and consider the needs of smallholder farmers. As a result, the policy is not as supportive on the ground as it should be.

Moreover, partnerships with the private sector matter in terms of improving production and trade, but without accompanying sufficient public investment, infrastructural challenges, such as damaged irrigation canals, broken-down farm machinery, and erratic power supply, will remain unaddressed. Therefore, the government still needs to play a proactive role in facilitating value-chain development and allocating more budget into agriculture.



Overall, findings showed that production costs of Tanzanian rice are relatively low, which leads to competitive prices in export markets. Nevertheless, small farmers and processors in the rice value chain do not have sufficient capital to invest in advanced commercial production and processing. Moreover, transaction costs in value-chain coordination remain too high, incurring high risks that neither producers nor processor-trader enterprises are willing to take. This study

took a step toward identifying some of these transaction costs in the rice value chain; nevertheless, further research in this field, seeing beyond operational and infrastructural obstacles, is necessary. Without these operational and institutional bottlenecks being addressed through measures supported by evidence-based research, rice export to the international market, including the EU, is unlikely to leap forward in the next decade.







## 7. Literature

- Acemoglu, Daron, and Simon Johnson. 2005. "Unbundling Institutions." *Journal of Political Economy* 113 (5): 949–95. <https://doi.org/10.1086/432166>.
- Africa Confidential. 2019. "Farming Gamble Fails | Africa Confidential." 2019. [https://www.africa-confidential.com/article/id/12602/Farming\\_gamble\\_fails](https://www.africa-confidential.com/article/id/12602/Farming_gamble_fails).
- AGRA. 2020. "A Rapid Analysis of the Impact of the Covid-19 Pandemic on Selected Food Value Chains in Africa."
- Andreoni, A., D. Mushi, and O. Therkildsen. 2021. "Tanzania's 'Rice Bowl': Production Success, Scarcity Persistence and Rent Seeking in the East African Community." Working Paper 34.
- Baarsch, Florent, Jessie R Granadillos, William Hare, Maria Knaus, Mario Krapp, Michiel Schaeffer, and Hermann Lotze-campen. 2020. "The Impact of Climate Change on Incomes and Convergence in Africa." *World Development* 126: 104699. <https://doi.org/10.1016/j.worlddev.2019.104699>.
- Banerjee, Abhijit, and Esther Duflo. 2011. *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*. New York: Public Affairs.
- BlueBoxGmbH. 2020. "COVID-19 Trade Impact Review-Kenya and Tanzania." Oberägeri, Switzerland.
- BoT (Bank of Tanzania). 2020. "Economic Statistics Publications."
- Elum, Zelda A., David M. Modise, and Ana Marr. 2017. "Farmer's Perception of Climate Change and Responsive Strategies in Three Selected Provinces of South Africa." *Climate Risk Management*. <https://doi.org/10.1016/j.crm.2016.11.001>.
- England, Matthew I. 2019. "Contested Waterscapes: Irrigation and Hydropower in the Great Ruaha River Basin, Tanzania." *Agricultural Water Management* 213 (February 2018): 1084–95. <https://doi.org/10.1016/j.agwat.2018.08.018>.
- EU. 2015. "The New Alliance for Food Security and Nutrition in Africa."
- FAO. 2016. "Rapid Agriculture Needs Assessment in Response to the 'El - Niño' Effects in the United Republic of Tanzania."
- — —. 2017. "Monthly Report on Food Price Trends." *Food Price Monitoring and Analysis Bulletin* 1 (February): 18. <http://www.fao.org/3/a-i6829e.pdf>.
- — —. 2020. "10,000 Rice Farmers in Iringa to Benefit from EU and FAO Funded Warehouse and Harvesting Equipment Worth Nearly TZS800 Million." 2020. <https://www.fao.org/tanzania/news/detail-events/es/c/1364712/>.
- Feder, Gershon, and David Feeny. 1991. "Land Tenure and Property Rights: Theory and Implications for Development Policy." *The World Bank Economic Review* 5 (1): 135–53.
- Feder, Gershon, Tongroj Onchan, and Tejaswi Raparla. 1988. "Collateral, Guaranties and Rural Credit in Developing Countries: Evidence from Asia." *Agricultural Economics*. [https://doi.org/10.1016/0169-5150\(88\)90005-9](https://doi.org/10.1016/0169-5150(88)90005-9).
- FoodTrade ESA (East and Southern Africa). 2015. "Raphael Group Bean Marketing Center." 2015. <http://foodtradeesa.com/portfolio-items/raphael-group-bean-marketing-center-rgbmc/>.



- HELVETAS. 2020. “Rice Postharvest Management Marketing | RIPOMA-Project | Helvetas.” 2020. <https://www.helvetas.org/en/tanzania/what-we-do/how-we-work/our-projects/Africa/Tanzania/Tanzania-rice-postharvest-management-marketing-RIPOMA-project>.
- IPP Media. 2018. “Kapunga Rice Project Breaks Even after State Control of Rice Imports.” 2018. <https://www.ippmedia.com/en/business/kapunga-rice-project-breaks-even-after-state-control-rice-imports>.
- — —. 2020. “Reducing Postharvest Loss and Waste among Smallholder Rice Farmers.” 2020. <https://www.ippmedia.com/en/features/reducing-postharvest-loss-and-waste-among-smallholder-rice-farmers>.
- Ires, Idil. 2021a. Brokering Development? The Private Sector and Unalleviated Poverty in Tanzania’s Agricultural Growth Corridors. Transcript Verlag.
- — —. 2021b. “Intensive Agriculture as Climate Change Adaptation? Economic and Environmental Tradeoffs in Securing Rural Livelihoods in Tanzanian River Basins.” *Frontiers in Environmental Science* 9. <https://doi.org/10.3389/fenvs.2021.674363>.
- IRRI. 2018. “International Rice Research Institute in Tanzania.” 2018. <https://www.irri.org/where-we-work/countries/tanzania>.
- ITC. 2020. “Trade Map - List of Importing Markets for the Product Exported by Tanzania, United Republic of, in 2020.” 2020. [https://www.trademap.org/Country\\_SelProductCountry.aspx?nvpm=1%7C834%7C%7C%7C1006%7C%7C%7C4%7C1%7C1%7C2%7C1%7C1%7C2%7C1%7C1%7C1](https://www.trademap.org/Country_SelProductCountry.aspx?nvpm=1%7C834%7C%7C%7C1006%7C%7C%7C4%7C1%7C1%7C2%7C1%7C1%7C2%7C1%7C1%7C1).
- JICA. 2018. “The Project on the Revision of National Irrigation Master Plan in the United Republic of Tanzania.”
- Kangile, R.J., and Z.T. Mpenda. 2016. “Price Competitiveness of Smallholder Rice Farmers under Cooperative Irrigation Schemes in Coast and Morogoro Regions, Tanzania.” *Journal of Agricultural Extension and Rural Development* 8 (4): 47–55. <https://doi.org/10.5897/JAERD2016.0763>.
- Kangile, Rajabu Joseph, Setegn Gebeyehu, and Herman Mollel. 2018. “Improved Rice Seed Use and Drivers of Source Choice for Rice Farmers in Tanzania.” *Journal of Crop Improvement* 32 (5): 622–34. <https://doi.org/10.1080/15427528.2018.1483457>.
- KilimoTrust. 2014. “Expanding Markets for Rice in the East African Community Region.”
- Kitilu, M.J.F., A.M.S. Nyomora, and J. Charles. 2019. “Growth and Yield Performance of Selected Upland and Lowland Rainfed Rice Varieties Grown in Farmers and Researchers Managed Fields at Ifakara, Tanzania.” *African Journal of Agricultural Research* 14 (4): 197–208. <https://doi.org/10.5897/AJAR2018.13611>.
- Komba, Coretha, and Edwin Muchapondwa. 2015. “Environment for Development Centers Adaptation to Climate Change by Smallholder Farmers in Tanzania.” *Environment for Development*.

- Lankford, Bruce, Siza Tumbo, and Kossa Rajabu. 2009. "Water Competition, Variability and River Basin Governance: A Critical Analysis of the Great Ruaha River, Tanzania." In *River Basin Trajectories: Societies, Environments and Development*, edited by Francois Molle and Philippus Wester, 171–95.
- Lazaro, Edith, Abdoul G. Sam, and Stanley R. Thompson. 2017. "Rice Demand in Tanzania: An Empirical Analysis." *Agricultural Economics* 48 (2): 187–96. <https://doi.org/10.1111/agec.12325>.
- Maganga, Faustin, Kelly Askew, Rie Odgaard, and Howard Stein. 2016. "Dispossession through Formalisation: Tanzania and the G8 Land Agenda in Africa." *Asian Journal of African Studies* 40.
- Mdoe, Ntengua, and Glead Mlay. 2021. "Agricultural Commercialization and the Political Economy of Value Chains: Tanzania Rice Case Study." Working Paper 57.
- Mkonda, M., and X. He. 2016. "Efficacy of Transforming Agriculture for Survival to Commercial Agriculture through 'Kilimo Kwanza' Initiative in Tanzania." *Natural Resources and Conservation* 4 (4): 43–50. <https://doi.org/10.13189/nrc.2016.040401>.
- Nasrin, Sultana, Johanna Bergman Lodin, Magnus Jirström, Björn Holmquist, Agnes Andersson Djurfeldt, and Göran Djurfeldt. 2015. "Drivers of Rice Production: Evidence from Five Sub-Saharan African Countries." *Agriculture & Food Security* 4 (1): 12. <https://doi.org/10.1186/s40066-015-0032-6>.
- North, Douglas. 1984. "Transaction Costs, Institutions, and Economic History." In *New Institutional Economics, A Collection of Articles from Journal of Institutional and Theoretical Economics*, edited by Eirik Furubotn and Rudolf Richter. Tübingen: Mohr.
- . 1987. "Institutions, Transaction Costs, and Economic Growth." *Economic Inquiry* 25 (3): 419–28. <https://doi.org/10.1111/j.1465-7295.1987.tb00750.x>.
- . 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Ostrom, E., and L. Kiser. 1982. "The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches." In *Strategies of Political Inquiry*, edited by E. Ostrom. SAGE Publications.
- Ostrom, Elinor. 2005. *Understanding Institutional Diversity*. Princeton University Press.
- . 2008. "Property Rights and Land Policies." *Science*.
- Ostrom, Elinor, Roy Gardner, and James Walker. 1994. *Rules, Games and Common-Pool Resources*. The University of Michigan Press. <https://doi.org/10.4135/9781452270388.n313>.
- SAGCOT. 2011. "Southern Agricultural Growth Investment Blueprint."
- . 2018. "List of Partners at Southern Agricultural Growth Corridor of Tanzania."
- Sekiya, Nobuhito, Nobuaki Oizumi, Theodore T. Kessy, Kitilu M.J. Fimbo, Motonori Tomitaka, Keisuke Katsura, and Hideki Araki. 2020. "Importance of Market-Oriented Research for Rice Production in Tanzania. A Review." *Agronomy for Sustainable Development* 40 (1). <https://doi.org/10.1007/s13593-020-0611-1>.

- Senthilkumar, Kalimuthu, Bonaventure J. Tesha, Jerome Mghase, and Jonne Rodenburg. 2018. "Increasing Paddy Yields and Improving Farm Management: Results from Participatory Experiments with Good Agricultural Practices (GAP) in Tanzania." *Paddy and Water Environment* 16 (4): 749–66. <https://doi.org/10.1007/s10333-018-0666-7>.
- Serdeczny, Olivia, Sophie Adams, Florent Baarsch, Dim Coumou, Alexander Robinson, William Hare, Michiel Schaeffer, Mahé Perrette, and Julia Reinhardt. 2017. "Climate Change Impacts in Sub-Saharan Africa: From Physical Changes to Their Social Repercussions." *Regional Environmental Change* 17 (6): 1585–1600. <https://doi.org/10.1007/s10113-015-0910-2>.
- Soto, Hernando De. 2000. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. First Edit. Basic Books.
- Stein, Howard, Faustin P. Maganga, Rie Odgaard, Kelly Askew, and Sam Cunningham. 2016. "The Formal Divide: Customary Rights and the Allocation of Credit to Agriculture in Tanzania." *Journal of Development Studies*. <https://doi.org/10.1080/00220388.2016.1146701>.
- The Citizen. 2017. "Tanzania: Govt Insists a Ban On Maize Export Won't Be Lifted ." 2017. <https://allafrica.com/stories/201706300127.html>.
- The Citizen. 2017. "Tanzania: Govt Insists a Ban On Maize Export Won't Be Lifted ." 2017. <https://allafrica.com/stories/201706300127.html>.
- The Guardian. 2010. "Kilimo Kwanza Issue 24." 2010. [https://issuu.com/kijf/docs/kilimo\\_kwanza-24/5](https://issuu.com/kijf/docs/kilimo_kwanza-24/5).
- Timmer, Peter, Walter Falcon, and Scott Pearson. 1983. *Food Policy Analysis*. The John Hopkins University Press.
- TMA. 2021. "Data Analysis Tool (Maproom)." 2021. <https://www.meteo.go.tz/>.
- UNCTAD. 2015. "Welfare Effect of Cereal Export Bans in the United Republic of Tanzania." [vi.unctad.org/tap/docs/other/tanzania.pdf](http://vi.unctad.org/tap/docs/other/tanzania.pdf).
- UNDP. 2020. "Rapid Socio-Economic Impact Assessment of COVID-19 in Tanzania." New York, USA.
- UNECA. 2021. "Waving or Drowning? The Impact of Covid-19 Pandemic on East African Trade."
- URT. 2009. "The National Rice Development Strategy Final Draft." Dar es Salaam, Tanzania.
- — —. 2012. *Agricultural Sector Review (ASR) and Public Expenditure Review (PER) for FY 2011/12*. Ministry of Agriculture, Food Security and Cooperatives (MAFC), Tanzania.
- — —. 2016. *Agricultural Sector Development Programme Phase Two (ASDP II)*.
- — —. 2019. "National Rice Development Strategy Phase II, 2019-2030."
- USDA. 2017. "Grain and Feed Annual: 2017 Tanzania Corn, Wheat and Rice Report." Global Agricultural Information Network (GAIN) Report.
- — —. 2021. "Grain and Feed Annual 2021." [https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain and Feed Annual\\_Mexico City\\_Mexico\\_03-15-2021](https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Grain and Feed Annual_Mexico City_Mexico_03-15-2021).
- Wilson, T.R., and I. Lewis. 2015. "The Rice Value Chain In Tanzania. A Report from the Southern Highlands Food Systems Programme." [www.fao.org/publications](http://www.fao.org/publications).
- Wilson, Trevor. 2018. "The Rice Value Chain in Tanzania." *International Journal of Agricultural Innovations and Research* 7 (2).



## Annex: List of Informants

In-text Citation	Company/ Organization	Informant	Informant Number	Date
Interview 1	Highland Estates Limited	General manager	1	30/09/2021
Interview 2	The Export Trading Group	General manager	1	30/09/2021
Interview 3	SAGCOT Mbarali office	Partnerships officer	1	04/10/2021
Interview 4	Raphael Group Limited	General manager	1	05/10/2021
FGD1	Kilimo Trust	Field officers	3	05/10/2021
FGD2	Mpendakazi agrodealers	YARA salespeople and agronomists	5	05/10/2021
Interview 5	Uyole Agricultural Research Institute	Agronomist	1	05/10/2021
Interview 6	Rufiji Basin Water Office	Accountant and water engineer	2	06/10/2021
Interview 7	Mbarali district government	District agriculture and irrigation officer	1	06/10/2021
Interview 8	Highland Estates Limited	Accountant	1	06/10/2021
FGD3	Mbuyuni irrigation scheme	Farmers and chairperson of the farmers' organization	6	06/10/2021
Interview 9	Hu Feng rice miller	Owner and general manager	2	07/10/2021
Interview 10	Mbeya High Quality Rice Growers Association	Chairperson	1	07/10/2021
Interview 11	NT rice miller	General manager	1	07/10/2021
Interview 12	Kapunga farm	Agronomist	1	07/10/2021
Interview 13	Rice Council of Tanzania	Executives	2	08/10/2021
Interview 14	Mbeya Rice traders' association	Chairpersons	2	08/10/2021
TOTAL INFORMANTS			32	

\*Further data is collected during a Mbeya rice producers' meeting in Igurusi, Mbeya, on 08/10/2021. About 50 farmers participated in the meeting.



157 Migombani/REPOA streets, Regent Estate,  
PO Box 33223,  
Dar es Salaam, Tanzania.  
Tel: +255 (22) 2700083  
Mob: +255 (0) 784 555 655  
Website: <https://www.repoa.or.tz>  
Email: [repoa@repoa.or.tz](mailto:repoa@repoa.or.tz)

Branch Office  
2nd Floor Kilimo Kwanza Building 41105 Makole  
East, Kisasa, Dodoma, Tanzania