



Factors influencing traders' participation in rice export market in Tanzania

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Abstract

A complex interplay of socio-economic, product attributes, market forces, and institutional factors influences the participation of rice traders in export markets. Despite many studies on rice traders' export market participation, the challenge of rice traders' engagement in rice trade and export activities, particularly in developing countries, is context-specific. This paper analyzed specific socio-economic and institutional factors affecting rice traders' decisions regarding export markets participation in Tanzania. Utilizing survey data from 150 randomly selected rice traders across eight distinct trading zones, the study employs binary regression analysis to examine these factors. Results indicate that gender, years of experience in rice trading, capital availability, and access to market information significantly impact traders' decisions to enter export markets ($P < 0.05$). The findings highlight that inadequate market information and insufficient capital are primary barriers to participation. The study concludes with a recommendation for government intervention to enhance access to market information and credit facilities, thereby boosting rice traders' involvement in export markets to meet the demand in neighboring countries. Also, the government should embrace a multi-stakeholder innovation platform for building and strengthening partnerships and collaborative learning among both public and private actors to improve marketing decisions among rice traders for attaining the Sustainable Development goals in the country.

Key words: *Export markets; market information; market participation; rice traders; Tanzania*

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Introduction

Rice is a staple food for more than half of the world's population, with a vital role in the diets of billions of low-income and food-insecure consumers (Zibae, 2013). Rice provides about 20% of the calories and is consumed by 31% of the population of low-income countries (Irshad et al., 2018). 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 (Repoa, 2022). Rice export allows producers in poor developing countries to enlarge their markets, seize the opportunities for trade, and benefit from economies of scale (FAO, 2021). Moreover, rice export is a source of foreign currency earnings, increases employment, income, and food security worldwide in turn promotes economic growth (Tonger, 2014). According to FAO and AUC (2021), an increase in rice export trade creates sustainable jobs, incomes, and livelihoods while improving long-term agricultural productivity and food security in Africa.

Tanzania is one of the largest rice producers in the East African region. Grown as a food-and-cash crop, rice farming is an important livelihood activity for several thousand smallholder farmers across Tanzania. Under its first phase of NRDS-I (2008-2019), Tanzania increased its rice production by 2.4-fold. Besides helping achieve self-sufficiency, the doubling of domestic rice production led to an increase in exports (by 12-fold). Hence, under NRDS-II, Tanzania has set a goal of becoming a 'regional' market leader by further doubling domestic rice production. Tanzanian rice is highly demanded in the EAC regional markets, given the unique features of domestic rice such as grain size, aroma, and taste (Lazaro et al, 2017). This provides a room for more rice traders to participate in rice export in Tanzania, given the increasing rice production in the country, which results in surplus. Moreover, despite the existence of strong consumer demand for Tanzanian rice in the neighboring countries, favourable trade policies within the EAC region, and high rice production potential in the country, Tanzanian rice traders have not been able to engage more in rice trade to meet the prevailing high export demand of rice

within the EAC region.

In East Africa, Tanzania is the leading rice producer with an average annual production of 1,700,000 MT (OECD, 2022). Given the second NRDS-II, Tanzania has set a goal of becoming a regional market leader by further doubling domestic rice production, hence rising exports. In Tanzania, rice is grown as both, food and a cash crop; therefore, rice export is an important livelihood activity for the majority of smallholder farmers across Tanzania. In the period 2008-2018, the EAC region produced a total of 24,469,000 MT, whereby Tanzania accounted for 83% of the total rice produced within the EAC region (FAOSTAT, 2019). Furthermore, rice export demand within the EAC region and to the neighboring countries such as Malawi, the Democratic Republic of Congo, South Sudan, and Zambia is rising at a faster rate compared to production (BOT, 2021). In 2017, export demand to the EAC region was approximately 51.8 million MT; however, rice export was only 620,000 MT, equivalent to 0.012% (FAOSTAT, 2019). Furthermore, favourable trade policies within the EAC region, such as the Common External Tariff of 75% charged on rice imported to the EAC region from non-member countries, provide an opportunity for rice traders within the region to exploit trade opportunities and participate more in rice export; however, participation of rice traders in export markets in Tanzania is low (Moono, 2015).

Bandhu (2014) reported that the participation of rice traders in export markets depends not only on adequate surplus, international prices, quality of product, and comparative advantage of producing the exportable commodities but also on domestic and international trade policy, such as the Common External Tariff (CET). CET intended to protect domestic producers within EAC, thus providing a room for rice traders within EAC and in Tanzania to participate more in rice trade to meet the high export demand of rice to the neighboring countries (Ayoki, 2012; RCT, 2015). Rice production in the year 2020/2021 was 2,629,519 MT, domestic demand was 1,091,778MT, while surplus was 1,537,741 MT which resulting in the increase of rice exports from 184,521 MT in 2020 to 441,909 MT in 2021, with the export value rising from 176.49 billion Tanzanian Shillings to 476.8 billion Tanzanian Shillings (BOT, 2022). Rice exports, therefore, were also conducted to other international

markets such as DRC 6,724.00 MT (1.41%), United Arab Emirates 551 Million Metric Tons (0.12%), India 234.20 MT, other countries 558 MT, Malawi 410 MT (0.86%), and Zambia 337.04 MT (0.00021%). Changes in government policies in Uganda in 2021 aimed to encourage only large-scale rice producers created temporal food shortage hence increase of rice export to Uganda in the year 2020/2021.

TANTRED (2023) reported that other factors that hinder rice traders' participation in export markets in Tanzania are informal trade conducted by traders at borders as a means to evade high bureaucracy and registration procedures for exporters by the government authority in the country. The factors that hinder rice traders' participation in export markets consist of: lack of capital for the rice traders, poor market information, and poor quality of the produced rice. High transport costs and transaction costs caused by the increase in oil prices worldwide, which raise the transport costs and production costs. Although there are high production volumes in the country, the export quantity to the neighboring countries is still very low, while the export value is also at a low rate compared to the export quantity. This indicates that there is a need to improve rice export quality and increasing more traders participating in export markets so as to widen the export trade and increase the export value (BOT, 2023).

Despite the sufficiency of the overall quality and quantity of rice supply to meet the regional demand, the participation of rice traders in export markets is still low. Once these challenges and transaction costs are successfully addressed, the competitive prices and high-quality and quantity of rice will provide Tanzania with a comparative advantage in export markets. This study therefore seeks to find out the ways for improving rice traders' participation in export markets in Tanzania so as to meet the high export demand to the neighboring countries, achieve economic growth, and develop the economy as a whole, hence alleviate poverty and attain the Sustainable Development goals in the country.

Previous studies may not focus on the inconsistency of rice traders' participation in export markets in Tanzania. Moreover, uncertainties in government policies and poor

implementation of trade policies in the rice subsector also discourage traders from joining on export trade in Tanzania. While extensive research has explored the rice industry, studies looking at the factors influencing rice traders' participation in export markets are still lacking. Past studies may not have focused on the influence of membership of cooperative societies, access to market information, and trade policies awareness towards market participation by rice traders in Tanzania. Furthermore, Tanzania's rice traders have not managed to grab trade opportunities within the EAC region by increasing rice traders' participation in export markets.

Therefore, this paper aimed to fill this knowledge gap by looking at the causes of the dynamics of rice traders' participation in export markets and how institutional factors influence market participation in export markets (Rabbi *et al.* 2017, Dawana *et al.* 2018). FAOSTAT (2023) reported that, overall quality and quantity of rice exports in Tanzania are sufficient to meet the regional demand and other neighboring countries, such as Malawi, Zambia, and South Sudan, but are deficient in the international market, such as the EU. Although some processor-trader companies in the country have taken initial steps to install the machinery necessary to expand into these distant markets, significant operational challenges such as erratic power supply and the world war oil crisis caused by Russian and Ukraine conflicts also resulted in the increase of transaction costs to the rice traders.

In order to contribute to addressing this gap in the literature, this study focuses on analyzing the factors influencing rice traders' participation in export markets in Tanzania by exploring information on how access to market information and credits to rice traders increases their involvement in export markets. Once these challenges facing rice traders in Tanzania 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 while enabling the country to become competitive in international markets, hence attain the government's goal of the country to reach a competitive economy.

Materials and methods

Research design

The study was based on primary data, whereby the cross-sectional data collected from 150 rice traders in Tanzania were used to analyze the factors affecting rice traders' participation in export markets.

Description of the study area

This paper used the data collected from regions with various rice traders, such as Dar es Salaam such as Ilala, Kinondoni districts, Kahama district in Shinyanga, Kilombero district in Morogoro, and Mbarali district in Mbeya. This study was conducted in Tanzania in different rice trading zones and all other regions that were found to have rice exporters, such as Shinyanga, Musoma, Dar-Es Salaam, Dodoma, Morogoro region, and Mbeya region (Mbabrali district), Maswa, Bariadi, Kahama district in Shinyanga region, Arusha, and Kilimanjaro regions.

Sampling procedure and sample size

The list obtained from the Ministry of Agriculture (MoA), Food Security Department, was used as a sampling frame for the study, and it contained 240 rice exporters. According to prior information

given by the Ministry of Agriculture concerning the trend of rice exporters, information shows that there are fluctuations in exports, thus exporters were not exporting regularly. Therefore, Simple Random Sampling was implemented according to (Israel, 1992) by generating random numbers in Excel and selecting 150 rice exporters, among which some are still exporting rice, while others at present are not participating in rice export, thus they have been regarded as non-participants. This is further illustrated in Table 1.

Table 1*Sample size showing participants and non-participants*

Region	District	Participant	Non-participant	Total
Shinyanga	Kahama	42	22	64
Dar es Salaam	Kinondoni	13	17	30
Dodoma	Dodoma	7	12	19
Kigoma	Kibondo	3	7	10
Mara	Musoma	6	5	11
Mwanza	Magu	3	6	9
Kagera	Bukoba	3	4	7
Total		77	73	150

The primary data were collected from 150 randomly selected rice traders in Tanzania. A list of 240 rice traders was obtained from the Ministry of Agriculture in Tanzania, Food Security

Department.

Table 2*Data Sources and description of the variables*

S/N	Data source	Variable/data	Description	Measurements
1.	Ministry of Agriculture, Food Security Department	Rice exporters	List of rice exporters in Tanzania (participants and non-participants in export markets)	Number of exporters
2.	Cross-sectional survey of rice traders in Tanzania	Factors influencing rice traders' participation in the export market	Sex (Dummy variable) Experience Membership of a cooperative society Access to market information Level of education Overall financial capital	1=Male 0=Female Years 1= Yes 0=No 1= Yes 0=No Years TZS

Binary logit model estimation and specification

Binary Logistic regression was used in analysing factors influencing participation in export markets by rice traders. This model was adopted due to the fact that, the dependent variable was binary variable which means that the variable stands for whether or not the rice trader participated in export markets. This model was used in determining the probability of rice traders participating in export markets. The dependent variable is binary, as there are participants and non-participants in rice export markets. Probability lies from 0 to 1, where 0 is for non-participants, while 1 is the probability given

to participants of rice traders in export markets. This model is appropriate for achieving this objective because the response of rice traders is dichotomous, as it takes one of only two possible values representing success and failure, where success is whether rice traders participated in the export market and failure is if they did not participate in the rice export market.

The specification of the binary logit model is as follows: The decision of a rice trader on whether to participate or not to participate in export markets is influenced by various factors (X_i); therefore, this can be represented in the regression equation 1

$Y^*_i = X'iB_k + \varepsilon_i$; $\varepsilon_i \approx$ Logistic distribution for binary logit model..... (1)

If $y_i=1$, then $Y^*_i > 0$ and if $y_i=0$, then $Y^*_i \leq 0$
 Meaning that if rice trader decides to participate in export markets, $Y^*_i=1$ and if rice trader will not participate in export market, $Y^*_i \leq 0$

The probability (P_i) that rice trader will participate in export market can be determined as follows:

$$P[y_i = 1] = P[P^* > 0] \dots \dots \dots (2) \dots$$

From equation 2 above, $Y^*_i = X'iB_k + \varepsilon_i$, therefore, by replacing y_i in equation 3, the new equation will be as follows:

$$P[y_i = 1] = P[X'iB_k + \varepsilon_i > 0] \dots \dots \dots (3)$$

$$\equiv P[y_i = 1] = P[\varepsilon_i > -X'iB_k] \dots \dots \dots (4) \dots$$

The logistic distribution is symmetric, such that

$$P[y_i = 1] = P[\varepsilon_i > -X'iB_k] \equiv P[y_i = 1] =$$

$$P[\varepsilon_i \leq B_k X'] = \Lambda X'iB_k$$

(5)

The cumulative function is given in equation 6.

$$P[y_i = 1] = \frac{e^{X'iB_k}}{1+e^{X'iB_k}} \dots \dots \dots (6) \dots$$

The probability of a rice trader who decides to participate in the export market is $P[y_i = 1]$ while the probability of a rice trader not participating in the export market $P[y_i = 0]$ is obtained by taking the difference between 1 and the probability of a rice trader participating in the export market $P[y_i = 1]$, as shown in equation 7.

$$P[y_i = 0] = 1 - P[y_i = 1] = \frac{1}{1+e^{X'iB_k}} = 1 - \Lambda(X'iB_k) \dots \dots \dots (7)$$

Table 3

Expected signs of the parameters to be estimated by the binary logit model

Code	Variable	Description	Measurement	Expected sign
X ₁	Sex	Sex of rice trader	1= male 0=female	+
X ₂	Education	Education level of rice traders	No of years in school	+
X ₃	Years of experience	Number of years of experience in the rice trade	Years	+
X ₄	Access to market information	Access to market information by rice traders	1=received marketing, 0=otherwise	+
X ₅	Membership	Membership of a cooperative by a rice trader	1=member in cooperative society, 0=otherwise	+
X ₆	Financial capital	Financial capital of the respondent	TZS	+

The ratio of the probability of a rice trader deciding to participate in the export market $P[y_i = 1]$ to the probability of a rice trader not participating in the export market is known as the odds ratio, and in logarithmic form, is known as the log odds ratio, which is represented as follows:

$$\ln \left[\frac{P[y_i=1]}{P[y_i=0]} \right] = X'iB_k = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \dots \beta_k X_{iK} + \varepsilon_i \dots \dots \dots (8)$$

By including all variables used in this study in the model, the binary logit model can simply be expressed as follows:

$$\ln \left[\frac{P[y_i=1]}{P[y_i=0]} \right] = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_i \dots \dots \dots (9)$$

Where: X_1 =Sex, X_2 =Education, X_3 =Years of experience, X_4 = Access to market information, X_5 = Membership in cooperative society, X_6 =Overall financial capital

Expected signs of the parameters to be estimated by the logit model

Table 3 describes the expected signs of the variables to be included in the model. If the sign is positive, the explanatory variable under consideration increases the probability of the rice traders participating in export markets, while if the sign is negative, it decreases the likelihood of rice traders exporting rice.

The sex of rice traders was expected to have a positive sign due to that, male rice traders are expected to engage in rice export markets more than female rice traders. This is because rice exportation involves many movements; thus, male traders can easily move, thus they are more likely to participate in rice export markets than female rice traders.

Financial capital

Financial capital of a rice trader was expected to have a positive sign, as the higher the financial capital, the higher the possibility of the rice trader to invest in rice exportation business, thus increasing the possibility of the rice trader being able to cover all necessary costs required in export procedures, such as export permits, taxes, and transportation costs. Therefore, it increases the probability of rice traders participating in export markets. Also, the availability of capital increases the likelihood of rice traders exporting more rice, as higher financial capital increases the bargaining power of rice traders in export markets due to the huge volume of rice traded.

Education

The education level of rice traders measured in the number of years of schooling was expected to have a positive sign since the more years spent in school, the more knowledgeable the respondent becomes. This makes it easier for them to comply with trade regulations and requirements, therefore increasing the possibility of rice traders participating in export markets.

Years of experience

Experience of the rice trader in conducting rice trade is expected to increase the likelihood of the rice trader participating in export markets. Years of experience were expected to have a positive sign as the more experience rice trader has in rice trade, the more aware they become of the regulations, procedures, market information, and skills required in exporting rice. Also, the more years of experience rice traders have in trading rice, the more knowledge they acquire regarding trading activities, thus increasing the probability of rice traders participating in export markets.

Access to market information

Access to market Information was expected to have a positive influence on rice traders participating in export markets, thus it was

expected to have a positive sign. Access to market information enables rice traders to be aware of the quality and rice preferences of their customers. Availability of market information also minimizes the transport costs that could be incurred by rice traders since they will be assured of the customer's availability in the countries of destination where there is high demand.

Membership in cooperative society

Membership in a cooperative society by a rice trader was expected to have a positive sign due to it increases the likelihood of the rice trader to acquire financial capital from other members in the cooperative, hence increasing the likelihood of participating in the export market. Membership in a cooperative increases solidarity among members in exporting rice, as they can be able to extend their social capital, hence they transport and sell their rice in bulk, which increases the probability of other poor traders in the group being able to export rice. Also, membership increases financial capital stability and the bargaining power in international markets, thus increasing the profit to the members henceforth increases the possibility of rice traders participating in export markets.

Results

Socio-economic characteristics of rice traders

Respondents of this study were rice traders categorized based on their education level, financial capital, years of experience, access to market information, membership in a cooperative society, and gender. A total of 150 respondents were involved in this study, whereby 116 (77.3%) traders were males, and 34 (22.7%) traders were females. Rice trade requires many movements, negotiations, and close follow-up with the customers to ensure rice is timely delivered and payments are made as required. Females in Tanzania play a major role in taking care of children, the sick, the elderly, and the family; this limits their participation in the rice trade (Stärken and Wandeln, 2009).

The majority of the respondents had a secondary school level of education (100 traders, approximately 66.7%). Further, the majority of respondents consider membership in a cooperative society (90 traders, equivalent to 60%) few are not members of a cooperative society (60 traders, equivalent to 40%). Moreover, the majority of rice traders were the ones experienced with 5-10 years in rice trade (73,48.3%), others had less than 5 years of experience in rice trade (26,17.3%), and more than 10 years in rice trade (51 traders, equivalent to 34%). The majority of rice traders had access to market information on export markets (82 traders, equivalent to 54.7%), while 68 traders didn't have information on rice export markets (68 traders, equivalent to 45.3%). Lastly, the majority of rice traders had financial capital between 5 to 15 million (72 traders, equivalent to 48%), others with less than 5 million overall financial capital (65 traders, equivalent to 43.5%), and those ones with more than 15 million overall financial capital (13 traders, equivalent to 8.7%)

Table 4

Socio-economic characteristics of rice traders

Socio-economic characteristics	Frequency (n=150)	Percentage (Total=100%)
Sex		
• Male	116	77.3
• Female	34	22.7
Education		
• Primary education		
• Secondary education	29	19.3
• University/College	100	66.7
• No formal education	21	14
	0	0
Years of experience		
• <5	26	17.3
• 5-10	73	48.7
• >10	51	34
Membership in cooperative society		
• Member of cooperative society	90	60
• Not member of cooperative society	60	40
Access to market information		
• Rice trader has access to market information	82	54.7
• Rice trader is not in access to market information	68	45.3
Overall financial capital		
• <5000 000	65	43.3
• 5 000 000-15 000 000	72	48.0
• >15 000 000	13	8.7

Education

Level of education, as measured in the number of years spent in formal education, is a very important attribute in assessing rice traders' participation in export markets in Tanzania. Education enhances skills and ability to utilize better market information, which reduces marketing costs, thus making it profitable to participate in export markets (Sigei *et al.*, 2014). The results show that 19.3% of the rice traders attended primary education, 66.7% attended secondary education, 14% attended college/university level of education, and none of the rice traders were uneducated. This shows that most of the rice traders have obtained some level of education, whereby a large percentage being rice traders with a secondary level of education. This enables them to read, write, as well as to communicate with other customers in other countries during rice exportation activities. 66.7%

of rice traders who attended secondary level of education imply that secondary education is likely to be useful in understanding, analysing, and making better decisions on business transactions (Table 4).

Years of experience

Years of experience in the rice trade are a very important aspect in identifying rice traders' participation in the export market. Experience in the rice trade enables traders to take risks as well as to bear with the challenges that may occur during rice export activities. Also, experience in rice trade increases awareness of the activities and procedures involved in rice trade, thus increasing rice traders' decision to participate in export markets. Results show that 17.3% of rice traders had less than five years of experience in rice trade, 48.7% had between 5 and 10 years of experience, while 34% of rice traders had more than 10 years of experience in rice trade. Whereby, out of 150

rice traders interviewed, 48.7% (73) of rice traders were seen to be experienced in rice trade between 5 and 10 years. The highly experienced rice traders are more likely to participate in rice export markets compared to others who do not have high experience in rice trade. Therefore, years of experience in the rice trade vastly influence rice traders' probability of participating in rice export markets (Table 5).

Membership in cooperative society

Membership in cooperative societies by rice traders increases the probability of capital availability to the rice traders, helps to reduce the transaction costs, and increases the bargaining power of rice traders in the rice trade. Rice traders who are members of cooperative societies are more likely to participate in export markets compared to those who are not members of a cooperative society. Results show that, among 150 rice traders interviewed, 60% were members of the rice cooperative society, while 40% of rice traders interviewed were not members of the cooperative society. This reveals that those who are members of cooperative societies have a high probability of obtaining capital from other members in the group, hence increasing the likelihood to participate in export markets. Furthermore, through cooperative societies, rice traders can easily obtain market information, thus they become aware of what is needed in the market. Also, cooperative societies increase the bargaining power of rice traders in rice trade as they can be able to sell and export rice in bulk, thus resulting in a high probability of rice traders' participation in export markets (Table 5).

Access to market information

In this study, market information was considered to be relevant in influencing the probability of rice

traders participating in export markets. Such information includes: market price, market demand, and consumers' preferences in terms of quality required. Through market information, rice traders become aware of the existing market price, quantity of rice demanded in international markets, and activities required in performing business transaction activities, thus increasing the likelihood of rice traders' participation in export markets. The results show that, among 150 rice traders interviewed, 54.7% of rice traders have access to market information, while 45.3% did not have access to the market information (Table 5). These results reveal that market information is very important when conducting rice trade due as that, those who had access to the market information are the ones who were highly participating in rice exportation.

Overall financial capital

Financial capital of rice traders is an important aspect in conducting rice trade, thus increasing the likelihood of rice traders' participation in export markets. A large amount of overall financial capital enables rice traders to invest in rice trade, cover the necessary costs, and undertake bigger risks in running business activities, thus increasing the likelihood of rice traders' participation in export markets. Results show that, among 150 rice traders interviewed, 43.3% of rice traders had less than TZS 5 000 000/= overall financial capital, 48% had overall financial capital between TZS 5 000 000/= to TZS 15 000 000/= and 8.7% of rice traders interviewed had overall financial capital of more than TZS 15 000 000/=. These results reveal that, large percentage of rice traders had an overall capital between TZS 5 million to TZS 15 million

Table 5*Socio-economic characteristics of rice traders*

Socio-economic characteristics	Frequency (n=150)	Percentage (Total=100%)
Sex		
• Male	116	77.3
• Female	34	22.7
Education		
• Primary education		
• Secondary education	29	19.3
• University/College	100	66.7
• No formal education	21	14
	0	0
Years of experience		
• <5	26	17.3
• 5-10	73	48.7
• >10	51	34
Membership in cooperative society		
• Member of cooperative society	90	60
• Not member of cooperative society	60	40
Access to market information		
• Rice trader has access to market information	82	54.7
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Overall financial capital		
• <5000 000	65	43.3
• 5 000 000-15 000 000	72	48.0
• >15 000 000	13	8.7

Discussion***Factors influencing rice traders' participation in export markets in Tanzania***

Results from the binary logistic model show that the Log-likelihood Ratio (LR) for all coefficients was found to be highly significant at $p < 0.01$ level of significance. This means the explanatory variables included in

the model jointly influenced rice traders' probability of participating in the rice export market in Tanzania. Overall, these results indicate a good model fit with the predictor likelihood of export market participation, suggesting that the model is well-fitted. Given the foregoing goodness-of-fit measures, it can be concluded that the binary logistic model employed is reliable and hence appropriate for this objective. These factors that influence rice traders' participation in export markets are illustrated in Table 6.

Table 6*Factors affecting market participation in the export markets in Tanzania*

Market participation	Coefficient	S.E.	Sig.	Exp(B)
Sex	1.748	0.775	0.024**	5.740
Education	-0.082	0.272	0.764	0.922
Years of experience	3.538	0.920	0.000***	34.407
Membership in a cooperative	-0.891	0.918	0.332	0.410
Access to market information	4.534	0.782	0.000***	93.087
Overall financial capital	1.125	0.4713	0.002***	1.000
Constant	-1.857	1.745	0.287	0.156

Numbers in parenthesis are standard errors. Significant at *** $P < 0.01$, ** $P < 0.05$, and * $P < 0.10$.

Table 6 shows that using binary logit model, among the seven variables tested; four variables are statistically significantly contributing to the likelihood of rice traders participating in rice export markets. The variables include sex, years of experience, access to market information, and overall financial capital with p-values of 0.024, 0.000, 0.000, and 0.002, respectively.

Sex

Sex has an implication on the roles and responsibilities in society and therefore influences rice traders' participation in export markets. Results display that 77.3% of the respondents were male traders, while only 22.7% were female rice traders. Results show that sex is statistically significant in influencing rice traders' participation in export markets at the 0.05 level of significance. The sex of rice traders increases the likelihood of participation in export markets by 1.748%. These results are similar to the study conducted by Dawana *et al.* (2018) also found that the age of the respondent was one of the factors influencing rice traders' participation in export markets in Ethiopia.

Years of experience

The number of years of experience that the rice trader has in rice trade had a positive expected sign, meaning that the higher the number of years of experience in rice trade, the higher the likelihood that rice traders will participate in rice export. Results show that 1 year of experience increase in rice trade rise the probability of rice traders to export more rice by 3.538% (*ceteris paribus*). Years of experience in rice trade by rice traders is found to be statistically significant at the 0.01 level of significance ($P < 0.01$). An increase

in the number of years of experience of rice traders in rice trade increases social capital and export network with other rice traders, hence simplifying the access to market information. Furthermore, this increases the awareness of the market stability, requirements, and procedures required in exporting rice, and together with export demand. This increases profit assurance by rice traders, thus increasing the likelihood of rice traders participating in rice export. These results correspond with the results of the study done by Mkuna (2014) who found that years of experience smooth trading activities within EAC, because the more traders are experienced in exportation, the more conversant they become in trading activities, together with the procedures required in engaging in EAC cross-border trade, therefore increasing the likelihood of rice traders to participate in export markets.

Access to market information

As expected, access to market information by rice traders has a positive influence on rice traders' participation in export markets. Access to market information is statistically significant in influencing rice traders' participation in export markets at the 0.01 level of significance, given the p-value of 0.000 ($P < 0.000$). The results show that access to market information increases the likelihood of rice traders participating in rice export by 4.534%. This reveals that the more the rice traders are aware of market information, such as market stability, export demand, and export price, the more likely rice traders participate in export markets. The more rice traders have access to market information, the more they will be aware of what is needed in the market. This increases awareness of the market potential, hence assurance of the profit to be obtained, thus increasing the probability of rice traders'

participation in export markets. Rice traders who receive market information before exporting their rice are more likely to participate in export markets than those who do not receive information before exporting rice. Rice traders will therefore export their commodities after they know the market potential and the possibility of generating profit. Furthermore, access to market information reduces the risk of loss in rice trade as rice traders become assured of obtaining potential buyers in the markets, thus high the possibility of participating in rice export markets. These results are similar with the results on the study done by Kyaw *et al.* (2018) who found that access to market information increases the likelihood of rice traders participation in rice exports due to that market information increases awareness on what is exactly needed in the market henceforth rice traders becomes aware with the customers' needs thus increases the chances of participation to the export market.

Overall financial capital

As expected, the overall financial capital of rice traders is statistically significant in influencing rice traders' participation in export markets at the 0.01 level of significance ($P < 0.01$). Results show that, increase in the overall financial capital of rice traders increases the odds ratio (likelihood) of rice traders to participate in export markets by 1.125% (*ceteris paribus*). This is because with higher capital, rice traders in Tanzania will be in a position to meet the requirements, such as an export permit, afford the transaction costs, such as transport costs, as well as to export large quantities of rice to the countries of destination, such as Rwanda, Burundi, Kenya, Uganda, and the Democratic Republic of Congo.

Conclusion

Empirical results and analysis presented show that participation in rice export markets by rice traders in Tanzania is driven by the sex of rice traders, years of experience, access to market information, and overall financial capital of rice traders. This means, access to market information by the rice traders in Tanzania should be improved so as to simplify information availability to the rice traders regarding export price, export procedures, and arrangements required, together with market information, thus increasing rice traders' participation to the export

markets.

Recommendations

The government should develop means to provide market information and credits to the rice traders in the country so as to increase traders' participation in export markets, hence increase rice export supply. Similarly, the government should embrace a multi-stakeholder innovation platform for building and strengthening partnerships and collaborative learning among both public and private actors in the country to improve marketing decisions among rice traders and achieve joint action, therefore being able to meet the high export demand of rice to the neighboring countries and to the world at large, therefore attaining the Sustainable Development goals in the country.

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