World Journal of Social Science Research
ISSN 2332-5534
Vol. 1, No. 1, 2014
www.scholink.org/ojs/index.php/wjssr

Original Paper

Trade Impediments and Market Transaction Arrangements for Maize and Rice in Tanzania

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Abstract

This research paper is focused on the exploration of the impediments to beneficial trade and their resultant market transaction arrangement in maize and rice. The study therefore was confined to the following three specific objectives to first, explore perceptions and experiences on the impediments to beneficial trade among rice and maize growers and their socio-economic impacts for farmers and food security in the study area. Second, to identify production and marketing models and describe their structure, conduct and performance; and thirdly, to describe transaction costs and related impediments in the value added chain for both crops in Tanzania. Survey was done in three regions: Shinyanga region representing rice growing regions and Ruvuma and Iringa regions representing maize growing regions of Tanzania. The study involved a sample of 100 smallholder rice farmer traders and 131 maize farmer traders. This study adapted Williamsonian Transaction Costs Economics (TCE) approach (as applied in Pitelis (1993) and Furubotn et al. (2000) to identify market arrangements based on transaction costs of producing and trading in the two grain crops. Based on the observed farmers' perception and experiences with prevailing trade impediments, this study has proposed five stylized market arrangements referred to in this paper as Cereal Transaction Arrangements (CTAs). Each of these CTAs was found to have strengths and weaknesses—hence no single trade policy could be more appropriate across all CTAs. The paper recommends that the government should reduce transactions costs in CTA4 and also CTA5 which involve more progressive commercial farmers by putting in place pro-poor trade policies. Such transaction costs include cost of identifying weighing devices, constructing warehouses, corruption, levies and quantitative trade restrictions.

Keywords

maize, rice, trade impediments, transaction costs, transaction arrangements

1. Introduction

Maize and rice form the main staple grain food crops in Tanzania. Most smallholder farmers produce maize and rice not only for household consumption but also for sale. As such the two crops have

become important cash crops for smallholder farmers. In the process of trading, smallholder farmers have faced state trade impediments especially when it involved grain trade across borders in the good faith of ensuring food security. As a result the government has also been putting in place trade policies, regulations and standing orders for these staples (URT, 2005). Although such policies may have favoured some farmers, it's likely that some others are hardly hit by the same policies. The negative impact of such policies is also reflected in the thinness of the grain market over years, increasing food insecurity amongst vulnerable groups and increasing income poverty among grain farmer traders in the country. This calls for repeated review of the policy induced trade huddles and propose means to cope with them and/or propose better pro-poor polices. Numerous researches have been carried out in the country with regard to rice and maize production and marketing in Tanzania (Amani et al, 2003; ESRF, 2004; Kilima, 2006; Oxfam, 2008, RLDC, 2008; Kagira, 2009). Focus of these researches has been varied but in one way or another at least each of the researches has been able to identify the major barriers to beneficial trade in grain products. The commonly identified potential barriers in the rice sub sector include, *inter alia*, insufficient input suppliers and extension workers; inadequate storage capacity; high post harvest losses due to poor post-harvest handling and uses of inefficient milling machines. With regard to maize, the study reports that, the sub sector channels are characterized by lengthy breakage services dominating at village, district, and national urban markets. With regards to transactions, the studies reveal that, rice transactions tend to be negotiated between buyer and seller on a one off basis or to result from a formal public sector procurement process, which is complex and time consuming. As a result, they require a great deal of additional specification and often intense negotiation. In other words they incur large transaction costs and are inherently more risky.

Another form of barrier as identified by the report is in form of market protocols. The prevailing market protocols, which apply in the rice trade, differ from global to region. The market protocols which exist in Tanzania are also quite different for maize and rice. It has been revealed that, no formal commodity exchange exists in the country, so the work of setting trading terms and conditions is performed by other means. Approximately 14% of the maize traded in the nation (Estimated at 1.4 million tons in 2009) purchased either by the WFP and/or with National Food Reserve Agency. Trading with these two institutions requires conformance with the procurement terms, which they mandate. Thus, this trade comes close to structured trade. Also the large domestic traders, namely Mohammed Enterprises, S.S. Bakhresa & Co and Export Trading, Olam (T) Ltd and Fidahussein have developed broad buying networks of their own within the country and their purchases from local farmers, traders and farmer associations are rule based as well. Although the prices offered are amongst the lowest, farmers and local traders continue transacting with them.

Studies conducted by FAO (FAO, 2009) across the continent reveal that it is only in Tanzania where there exists application of food crop taxation. This is at the local government level where the Authority taxes both export and food crops. The effect of taxation is the reduction of farmers' revenue from crop sales because traders buy at lower prices to compensate for the taxes. The level of taxation varies

across districts because taxes are collected by Local Government Authorities (LGAs). LGA's levies or cess were partly responsible for the low shares of producers' income from trade. In the 1992 Finance Act, the Government directed LGAs not to tax agricultural products in excess of 5 percent of farm-gate selling price. A World Bank (2009) study on regional maize market and marketing costs reported that:

- Protectionist measures through export bans lead to lost opportunities for farmers and traders, who then reduces their investment in production in subsequent seasons leading to overall reduction in food production;
- Apart from reducing potential outputs, arbitrary bans on selling of cereals leads to reduction in quality, quantity and value, causing losses to the economy as a whole; and
- The export bans and other trade restrictions scare away private sector development and investments in the food sub-sector, leading to sluggish growth in the sub-sector, and lost opportunities for farmers and consumers.

1.1 Maize Marketing

Maize is a key staple food for the majority of Tanzanian households. Production of maize is carried out in almost all regions in Tanzania, though levels of production differ. Maize is largely farmed under rain-fed conditions by smallholders. Although exports of almost all agricultural commodities are liberalized, maize exports continue to be subject to occasional export bans. The main maize surplus region in Tanzania is the southern highlands, including the regions of Mbeya, Iringa, Rukwa, and Ruvuma. Because the southern highlands borders on northern Zambia and Mozambique, which are maize deficit zones, there is a strong economic incentive for maize exports, particularly during June and July when the southern highlands harvest takes place. Government policy is to allow the export of maize only when all regions of the country can be declared to be food secure. In practice, however, there is almost always a problem of food security in some part of the country, particularly in the semi-arid central region. Thus, in practice, maize exports are banned on an almost continual basis. The effect of this policy is to make the prices of maize in the southern highlands lower and more volatile than they would otherwise be. For instance, maize prices in Songea and Mbeya are lower and more volatile than in other parts of Tanzania. At the same time, the export ban presumably keeps the price of maize lower in deficit regions that it would otherwise be (Minot, 2010).

With the failure of the National Milling Corporation (NMC) in late 1980s, the Strategic Grain Reserve (SGR) was established in 1991. The objectives of the SGR are to advise the government on food security policy, supply food for emergency assistance, and stabilize staple grain prices. The SGR engages in procurement and distribution operations through seven depots, three in surplus zones in the southern highlands and four in deficit zones (Dar es Salaam, Arusha, Dodoma, and Shinyanga). The capacity of the SGR is 150 thousand tons, but in practice the quantities in storage have generally been in the range of 50-80 thousand tons. The SGR has not been successful in stabilizing grain prices. The volume of purchases and sales in a given year is generally less than 50 thousand tons, which is negligible compared to the volume of Tanzanian grain production (5 million tons) or even marketed

surplus (roughly 1.25 million tons). In addition, the SGR suffers from bureaucratic procedures, political interference, under-utilization of capacity, and chronic operating deficits due to pricing policies that do not allow cost recovery. On the other hand, the global food crisis has increased the political support for tools to manage staple food price volatility (Mndogo, 2008; Minot, 2010).

1.2 Rice Marketing

Rice is Tanzania`s second most important staple good (ESRF, 2004; Kilima, 2006). Rice is mainly produced by small-scale farmers and marketed by the private sector and large scale production is under the National Food Company (DAEA, 1999). Due to long distances, information from Dar es Salaam's wholesale market about prices and information about improved means of production rarely reach farms and actors on the small-town level. This information asymmetry leads farmers to sell their products at lower prices than they could acquire and to produce irrational amounts (DAI, 2003). The rice sub-sector is not heavily regulated. The main areas where regulation occurs is for exports (regulated by the Strategic Grain Reserve) and at the district cess. Export permits are required for anyone who desires to export rice from Tanzania. The Director of the Strategic Grain Reserve (SGR) issues these permits. A cess is charged at the district level on each bag of rice leaving the district, which varies by each district (ESRF, *ibid*).

The paper thus focuses on principle root causes for the existing impediments with a view to provide working policy recommendations. This study therefore was confined to the following three specific objectives:

(i) To explore perceptions and experiences on the impediments to beneficial trade among rice and maize growers and their socio-economic impacts for farmers and food security in the study area.

(ii) To identify production and marketing models and describe their structure, conduct and performance.

(iii) To describe transaction costs and related impediments in the value added chain of both crops in Tanzania.

The paper is divided into four main parts. The first part covers introduction, followed by the review of the methodological approaches. The third section covers research findings and finally conclusion and recommendations are covered in section four.

2. Methodological Approach

A descriptive research design was employed in this study where mainly qualitative approaches were used. Sample populations of farmers for this study were selected through identification of areas that are known as high producers of rice and maize. Farmers were sampled from two villages in Kahama district in Shinyanga, two villages from Songea rural district, and two villages from Iringa rural district in the southern highlands zone. Three major data collection tools namely Questionnaires, Interviews and Focus Group Discussion were used. Multiple sources of evidence were taken into account so as to

validate the obtained information. A total of 100 smallholder rice farmers were involved in the Survey in Kahama district whereas 131 maize farmers did respond to the survey questionnaire in both Songea and Iringa. In order to obtain additional information interviews were conducted with 25 farmers and traders in Songea, five in Iringa and seven in Kahama. The interviews were deep, covering all the prescribed variables and indicators. The interviews facilitated easy gain of information that came out from personal views, opinions and perspectives. Most of the interviewees were key informants with basic knowledge about production and marketing of the crops. This study adapted Williamsonian Transaction Costs Economics (TCE) approach as applied in Pitelis (1993) and Furubotn et al. (2000) to identify and examine transaction costs of producing and trading in the two grain crops. Knowing that the traditional theoretical models like S-C-P Market Model, Transaction Cost economics or even the neoclassical perfect competition models cannot be very reliable when applied independently, a mixture of all these theoretical foundations to explaining markets were applied to come up with the five different transaction arrangements for the two staple crops.

3. Findings and Discussions

3.1 Socioeconomic Attributes of Surveyed Farmers

3.1.1 Demographic Characteristics of Sample Farmers

It is indicated in table 1 that male farmers dominate the two crops compared to their female counterparts where 83.8% and 83.0% were males maize and rice farmers respectively. This explains that although pre-harvest activities could be mainly a female business, the males dominate the postharvest processes, including marketing and related crop negotiations. Table 2 indicates that the average age of farmers was about 43 years and 40 years respectively for maize and rice farmers. This implies that the farming population in these staples generally comprises of youths and it is likely that youths are engaged in these crops mainly for commercial purposes i.e. production of surplus for sales income.

Table 1. Farmers distribution by gender

Gender	Crops	Frequency	Valid Percent
Male	Maize	109	83.8
	Rice	83	83.0
Female	Maize	21	16.2
	Rice	17	17.0

Sample size: Maize Farmers (131) and Rice (100)

Table 2. Distribution of farmers by age (in years)

age	Crops	Range	Minimum	Maximum	Mean
Age of respondent	Maize	59	20	79	43.39
	Rice	51	21	72	40.15

Majority of farmers for both crops were educated up to primary school level. About 88.6% maize farmers and about 97.0% of rice farmers had either no formal education or no education at all (Table 3). This signifies farmer's inability to effectively negotiate with well informed traders, some of whom are exporters. There is thus asymmetric access to market information between farmers and buyers of grains.

Table 3. Distribution of farmers by their education level

Education level	Crops	Frequency	Valid Percent
No formal education	Maize	32	24.6
	Rice	31	31.0
Primary education	Maize	84	64.6
	Rice	66	66.0
secondary school	Maize	10	7.7
	Rice	3	3.0
Post secondary, vocational or college	Maize	4	3.1
	Rice	-	-

Sample size: Maize Farmers (131) and Rice (100)

3.1.2 Farm Sizes

Table 4 indicates that unlike rice, maize is dominated by smallholder farming. Farmers owning less than 5 ha of land were 64.9% for maize whereas it was about 1% for rice. About 40% of rice farmers owned over 20 ha compared to only 4.6 maize farmers who owned over 20ha. This implies that rice production is more commercialized compared that of maize. That is, maize farmers are more subsistent compared to rice farmers.

Table 4. Number of acres owned by farmers

Farm size	Crops	Frequency	Valid percent
Valid 0-5 Acres	Maize	85	64.9
	Rice	1	1.0
6-10 Acres	Maize	25	19.1
	Rice	34	34.0
11-20 Acres	Maize	15	11.5
	Rice	40	40.0
Over 20 Acres	Maize	6	4.6
	Rice	17	17.0

Sample size: Maize Farmers (131) and Rice (100)

3.1.3 Means of Crop Transportation

The major means of transport for maize and rice were also found to slightly differ (Table 5). It was found that about 26.5% of maize farmers transport their crop on foot as compared to only 6% for rice farmers using same means of transport. It was further found out that motorcycles and bicycles were very common in transporting rice compared to transporting maize, and that use of tracks was common with maize farmers. The use of bicycles and motorcycles in Shinyanga is very common due to its landscape having no slopes as compared to Southern highlands. In addition maize is less voluminous but heavier compared to paddy hence need for trucks.

Table 5. Means of Transport to the market place

Transport means	Crops	Frequency	Valid percent
On foot	Maize	30	26.5
	Rice	6	6
Motorcycle/Bicycle	Maize	27	23.9
	Rice	58	58
Commuter bus/Pick ups	Maize	28	24.8
	Rice	-	-
Trucks	Maize	21	18.6
	Rice	10	10
Other means of transport	Maize	7	6.2
	Rice	26	26

Sample size: Maize Farmers (131) and Rice (100)

3.1.4 Farmer's Perception on Maize and Rice Income Levels

Table 6 indicates that about 67.0% of both maize and rice farmers perceived incomes from these crops as satisfying their household's income demand. Almost a higher proportion of farers in both subsectors did indicate that incomes from other crops were also providing satisfying incomes to the households. This is due to the fact that farmers in both study areas were also involved in the production and marketing of other crops like beans, rice, tea etc for Southern Highlands and also cotton, maize, sunflower and livestock for Shinyanga region.

Table 6. Farmer perception on relative satisfaction levels of sales to household's income demand*

Crops		Very Satisfying	Satisfying	Don't Know	Not Satisfying	Not Satisfying at all
Maize sales		16(12.4)	55(42.6)	5(3.9)	41(31.8)	12(9.3)
Rice sales		38(38.0)	29(29.0)	-	29(29.0)	4(4.0)
Sales from other crops	Songea/Iringa	5(16.7)	12(40.0)	4(13.3)	8(26.7)	1(3.3)
	Kahama	40(40.0)	34(34.0)	1(1.0)	20(20.0)	-

* Figures in parentheses are percentage of the frequency distributions

Sample size: Maize Farmers (131) and Rice (100)

3.2 Farmers' Perceptions and Experiences on the Impediments to Beneficial Trade

3.2.1 Farmers' Perception on Importance to Farmers of Different Buyers of Rice and Maize

It was noted from the survey that farmers did perceive importance of various crop buyers differently. Table 7 shows that very important buyers of rice were other farmers (87%), nearby traders (71.0%) and anonymous buyers (40%) whereas for maize government department (45.3%), anonymous buyers (29.1%) and traders from neighboring countries (28.0%) and other farmers (22.9%) were found to be most important buyers. It is implied from table 6 that government department (through Food security department) is more important buyer of maize than of rice. It can also be noted from the table that unlike rice farmers, maize farmers do not have a distinctively one or few traders as the most important but perceive almost all evenly. This is a sign of more market fragmentation to maize compared to rice.

Table 7. Farmers perception on relative importance of various buyers

Attribute	**Crops**	**Very important**	**Important**	**Don't Know**	**Not Important**	**Not at all Important**
Other Farmers	Maize	30(22.9)	25(19.1)	8(6.1)	32(24.4)	36(27.5)
	Rice	87(87.0)	1(1.0)	-	29(29.0)	4(4.0)
Anonymous Buyers	Maize	37(29.1)	44(34.6)	6(4.7)	27(21.3)	13(10.2)
	Rice	40(40.0)	34(34.0)	1(1.0)	20(20.0)	5(5.0)
Nearby Traders	Maize	41(32.3)	27(21.3)	6(4.7)	27(21.3)	26(20.5)
	Rice	71(71.0)	16(16.0)	1(1.0)	7(7.0)	5(5.0)
Truck Owners	Maize	31(25.0)	20(16.1)	5(4.0)	30(24.2)	38(30.6)
	Rice	18(18.0)	44(44.0)	1(1.0)	27(27.0)	10(10.0)
Government	Maize	58(45.3)	9(7.0)	-	25(19.5)	36(28.1)
Department	Rice	7(7.0)	12(12.0)	4(4.0)	36(36.0)	41(41.0)
Milling Companies	Maize	30(23.8)	22(17.5)	6(4.8)	40(30.5)	28(22.2)
	Rice	1(14.0)	23(23.0)	4(4.0)	30(30.0)	29(29.0)

Traders From	Maize	35(28.0)	16(12.8)	5(3.8)	33(26.4)	36(28.1)
Neighboring Countries	Rice	8(8.0)	16(16.0)	4(4.0)	30(30.0)	42(42.0)
Food Processors	Maize	28(22.4)	18(14.4)	8(6.4)	39(31.2)	32(25.6)
	Rice	10(10.0)	7(7.0)	1(1.0)	34(34.0)	48(48.0)
Cooperative Societies	Maize	23(18.4)	11(8.4)	10(8.0)	40(32.0)	41(32.8)
	Rice	5(5.0)	4(4.0)	4(4.0)	34(34.0)	53(53.0)
Input Suppliers	Maize	20(15.5)	15(11.6)	9(7.0)	44(34.1)	41(31.8)
	Rice	3(3.0)	5(5.0)	4(4.0)	38(38.0)	50(50.0)
Exporters	Maize	21(16.8)	15(12.0)	10(8.0)	40(32.0)	39(31.5)
	Rice	23(23.0)	39(39.0)	3(3.0)	29(29.0)	6(6.0)
Any Other Buyers Not	Maize	23(20.0)	23(20.0)	4(3.5)	23(20.0)	42(36.1)
Listed above	Rice	17(17.0)	3(3.0)	1(1.0)	30(30.0)	46(46.0)

*Figures in parentheses are percentage of the frequency distributions

Sample size: Maize Farmers (131) and Rice (100)

3.2.2 Farmers' Perception on Marketing Activities in the Value Added Chain of the Crops

Tables 8 and 9 illustrate the perception of farmers on the importance of various marketing activities and their implied costs respectively. It can be noted that famers indicated that almost all marketing activities that add value to their crops were not important to them. This implies that the marketing activities were not done by the farmers and were perceived to be buyers' responsibilities. This suggests that farmers can rarely attract high prices of their commodities as they seem to sell primary, unprocessed crops. For maize, this includes selling maize farms before maturity or before harvesting. Rice farmers normally sold dehusked paddy to traders. In both maize and rice, rarely were farmers capable of owning storage facilities that would add value to their crops during shortage.

Table 8. Farmers perception on relative importance of marketing activities

Attribute	**Crops**	**Completely unimportant**	**Unimportant**	**Important**	**Very important**
Weighing and assembling	Maize	59(45.7)	21(16.3)	45(34.9)	4(3.1)
	rice	56(56.0)	9(9.0)	31(31.0)	4(4.0)
Transportation	Maize	44(34.6)	24(18.9)	47(37.0)	12(9.4)
	rice	52(52.0)	4(4.0)	38(38.0)	6(6.0)
Storage	Maize	55(45.1)	23(18.9)	39(32.0)	5(4.1)
	rice	53(53.0)	5(5.0)	41(41.0)	1(1.0)
Grading and classification	Maize	69(57.0)	24(19.8)	23(19.0)	5(4.1)
	rice	84(84.0)	1(1.0)	15(15.0)	-

Processing	Maize	73(61.9)	21(17.8)	19(16.1)	5(4.2)
	rice	89(89.0)	1(1.0)	10(10.0)	-
Packaging	Maize	56(46.7)	23(19.2)	37(30.8)	4(3.3)
	rice	90(90.0)	1(1.0)	9(9.0)	-
Distribution and retailing	Maize	59(49.6)	28(23.5)	29(24.4	3(2.5)
	rice	86(86.0)	1(1.0)	13(13.0)	
Other stages	rice	4(4.0)	82(82.0)	1(1.0)	13(13.0)

Figures in parentheses are percentage of the frequency distributions

Sample size: Maize Farmers (131) and Rice (100)

One of the reasons for not undertaking such marketing activities was the cost implications of the undertakings. However, Table 8 implies that most farmers were not feeling the cost of undertaking the marketing activities. Majority indicated that the marketing activities were not significant costs to them. This is true due to the fact that farmers were not incurring these costs. The failure to undertake these activities leads to farmers earning very low market prices since value is added by buyers not sellers.

Table 9. Farmers perception on cost implications of marketing activities*

Attribute	Crops	Highly costly	Somewhat costly	Not significant cost	No cost involved at all
Weighing and Assembly	Maize	38(30.9)	36(29.3)	31(25.2)	18(14.6)
	Rice	-	37(37.0)	63(63.0)	-
Transportation Stage	Maize	35(29.2)	40(33.3)	24(20.0)	21(17.5)
	Rice	2(2.0)	43(43.0)	55(55.0)	-
Storage Stage	Maize	18(15.3)	45(33.3)	34(28.8)	21(17.8)
	Rice	1(1.0)	41(41.0)	58(58.0)	-
Grading and Classification	Maize	34(28.6)	30(25.2)	35(29.4)	20(16.8)
Stage	Rice	1(1.0)	12(12.0)	87(87.0)	-
Processing Stage	Maize	29(26.1)	33 (25.2)	32(29.7)	17(15.3)
	Rice	1(1.0)	8(8.0)	91(91.0)	-
Packaging Stage	Maize	31(27.0)	28(24.3)	40(34.8)	16(13.9)
	Rice	1(1.0)	8(8.0)	91(91.0)	-
Distribution and Retailing Stage	Maize	19(16.4)	34(29.3)	33(28.4)	30(25.9)
	rice	1(1.0)	11(11.0)	88(88.0)	-

***Figures in parentheses are percentage of the frequency distributions**

Sample size: Maize Farmers (131) and Rice (100)

3.2.3 Farmers' Perception on Trade Impediments Affecting Rice and Maize Marketing

Tables 10 indicate that farmers perceive differently the existence of the listed trade impediments. Majority of maize farmers seemed to have felt the government policies, existence of inadequate storage facilities, and existence of price controls, credit controls and local levies to be existing in their areas. Maize farmers perceived most of the listed impediments in table 9 as either somewhat existing or not existing at all. On the other hand, rice farmers found Crop transportation, quantitative restrictions, price setting and controls, inadequate storage facilities, credit constraints, lack of market information an inflation of local currency as highly existing. Unlike maize farmers, majority of rice farmers (65%) perceived government policy impediments not existing. Likewise maize majority of farmers did not perceive the following impediments as existing in their business; government policy impediments, trade licensing, exchange rate and inflation rate. This finding implies that rice farmers are more prone to facing inflation of the shilling more than their maize counter parts. With regard to border controls farmers in both study areas did not perceive them as existing, implying that majority were not trading across borders. The cross border trade seemed to have been a business carried out by traders (middlemen) that add value to farmers produce by performing marketing activities that conform to foreign market conditionality.

Table 10. Perception of farmers on existence of trade impediments*

Attribute	Crops	Not existing at all	Somehow not existing	Existing	Highly existing
Government Policy Impediments	Maize	38(29.9)	36(28.3)	35(27.6)	18(14.2)
	Rice	65(65.0)	12(12.0)	15(15.0)	8(8.0)
Trade Licensing	Maize	36(29.3)	32(26.0)	44(35.8)	11(8.9)
	Rice	70(70.0)	6(6.0)	21(21.0)	3(3.0)
Crop Transportation	Maize	27(21.8)	37(29.8)	48(36.6)	12(9.7)
	Rice	18(18.0)	5(5.0)	71(71.0)	6(6.0)
Quantitative Restrictions	Maize	36(29.0)	32(25.8)	44(35.5)	12(9.7)
	Rice	36(36.0)	9(9.0)	51(51.0)	4(4.0)
Rigid and Uncertain Regulations	Maize	32(26.0)	33(26.8)	42(34.1)	16(12.2)
	Rice	58(58.0)	12(12.0)	22(22.0)	8(8.0)
Price Setting and Controls	Maize	47(37.3)	21(16.7)	48(38.1)	10(7.9)
	Rice	29(29.0)	12(12.0)	50(50.0)	9(9.0)
Impediments to Buyers	Maize	43(35.2)	29(23.1)	42(34.4)	8(6.6)
Competition	Rice	65(65.0)	13(13.0)	15(15.0)	7(7.0)
Inadequate Storage Facilities	Maize	25(20.7)	36(29.8)	46(38.0)	14(11.6)
	Rice	36(36.0)	11(11.0)	39(39.0)	14(14.0)

Credit Constraints	Maize	27(22.9)	32(27.1)	44(37.3)	15(12.7)
	Rice	17(17.0)	9(9.0)	65(65.0)	9(9.0)
Lack of Market Information	Maize	39(33.9)	33(28.7)	33(28.7)	10(8.7)
	Rice	24(24.0)	17(17.0)	51(51.0)	8(8.0)
Exchange Rate Fluctuations	Maize	47(50.5)	20(21.5)	18(19.4)	8(8.6)
	Rice	76(76.0)	6(6.0)	15(15.0)	3(3.0)
Shilling Inflation	Maize	35(35.5)	29(29.0)	24(24.0)	12(12.0)
	Rice	27(27.0)	14(14.0)	53(53.0)	6(6.0)
Border Controls	Maize	38(31.7)	31(25.8)	37(30.8)	14(11.7)
	Rice	74(74.0)	5(5.0)	14(14.0)	6(6.0)
Local Levies	Maize	22(19.0)	39(33.6)	49(42.2)	6(5.2)
	Rice	76(76.0)	5(5.0)	13(13.0)	6(6.0)

***Figures in parentheses are percentage of the frequency distributions**

Sample size: Maize Farmers (131) and Rice (100)

3.2.4 Farmers' Perception on Benefits of Various Crop Buyers

Farmers were asked to assess their perception on the importance they attach to various crop buyers in the market. Unlike rice farmers, maize farmers perceived farm gate buyers as highly beneficial crop buyers. Other buyers who were perceived as beneficial to maize farmers were exporters, maize brokers, cooperative unions, neighboring countries and warehouse receipt systems. Only about 39% and 24% of rice farmers perceived farm gate buyers and cooperative unions respectively as not beneficial to trade with. The list of beneficial/non beneficial traders was used to model the marketing channels (models) to be explained the later sections of this paper. The presence of many beneficial traders suggests that these markets are somehow not very controlled by the state but also very fragmented and not easy to coordinate.

Table 11. Perception of farmers on benefits of trading with different types of crop buyers*

	Crop	**Not at all beneficial**	**Not beneficial**	**Beneficial**	**Don't Know**	**Highly beneficial**
Farm Gate Buyers	Maize	30(23.3)	14(10.9)	13(10.1)	7(5.4)	65(50.4)
	rice	36(36.0)	5(5.0)	37(37.0)	20(20.0)	2(2.0)
Licensed Buyers	Maize	10(7.9)	16(12.6)	27(21.3)	15(11.8)	59(53.5)
	rice	7(7.0)	21(21.0)	60(60.0)	12(12.0)	-
Trading with Contractual	Maize	20(15.5)	21(16.0)	40(31.0)	11(8.5)	37(28.7)
Buyers	rice	9(9.0)	12(12.0)	21(21.0)	57(57.0)	-
Cooperative Unions	Maize	6(4.7)	21(16.4)	23(18.0)	15(11.7)	63(49.2)

	rice	3(3.0)	4(4.0)	24(24.0)	69(69.0)	-
Milling Companies	Maize	9(7.0)	17(13.3)	27(21.1)	21(16.4)	54(42.2)
	rice	1(1.0)	8(8.0)	74(74.0)	17(17.0)	-
Buyers from the Cities	Maize	14(10.7)	15(11.5)	30(22.9)	10(7.6)	62(47.3)
	rice	8(8.0)	8(8.0)	77(77.0)	6(6.0)	.
Exporters	Maize	9(7.0)	11(8.6)	27(21.1)	14(10.9)	67(52.3)
	rice	2(2.0)	3(3.0)	37(37.0)	58(58.0)	-
Local Market Place	Maize	20(15.5)	21(16.3)	40(31.0)	11(8.5)	37(28.7)
	rice	5(5.0)	7(7.0)	73(73.0)	15(15.0)	-
Neighboring Countries	Maize	6(4.7)	21(16.4)	23(18.0)	15(11.7)	63(49.2)
	rice	1(1.0)	7 (7.0)	27(27.0)	65(65.0)	-
Maize Brokers	Maize	9(7.0)	15 (11.7)	28 (21.9)	13(10.2)	63(49.2)
	rice	16(16.0)	12(12.0)	66(66.0)	6(6.0)	-
Warehouse Receipt Systems	Maize	7(5.5)	12(9.4)	34(26.6)	18(14.1)	56(43.8)
	rice	1 (1.0)	4 (4.0)	12(12.0)	83(83.0)	-

***Figures in parentheses are percentage of the frequency distributions**

Sample size: Maize Farmers (131) and Rice (100)

3.3 Market Models and Associated Transaction Costs for Rice and Maize

Survey descriptive study findings were used to lead further detailed interviews and observations of the existing trade arrangements for both crops. The study revealed that there was no single and dominant market system (arrangement or channel) through which trade transactions between buyer and sellers of both crops were carried out. The intensity of market competition varied with the transaction arrangement concerned, and each arrangement was found to be efficient in its own ways. Based on the S-C-P theoretical model, field data were used to come up with five market channels for both staple grain crops. Figure 1 illustrates that the final consumer of grain (from smallholder farmer's point of view) were milling companies, exporters and urban markets. These final consumers receive grain from any of the five different sources and some may acquire grain from more than one of these channels. For the purpose of this study we termed the 5 channels as Cereals Transaction Arrangements (CTA 1-5) through which the cereals (maize and rice) reach various final consumers in the marketing chain. We have briefly describe the five models of transaction arrangements in the subsequent sections.

3.3.1 Farmer–Village Buying post–Grain Dealers–Milling Company (CTA 1)

From the qualitative findings of this study, it is evident that the most common channel is through village buying posts (CTA1) whereby there are many buyers involved (middlemen, stockers and commission agents). Almost all farmers (95.1%) had access to this marketing channel. It was at this channel where various foul plays are made through self destructive competition amongst buyers. Since there are many sellers and buyers of crop during the harvest period in these markets, farmers do market

part of their stock only to have finance to meet short term family expenses, whereas buyers have to camp in local areas to collect small volumes on daily bases. Thus very small volumes are sold in these markets by individual farmers and hence the weighing devices used are not official. Quality of the grain is not certain in these markets since the transactions are complete where the personal relationships between buyer and seller end after the exchange. Many poor farmers are coned in these markets by the well informed urban anonymous buyers. There are many small transactions occurring between two transacting partners not known to each other increases transaction risks and costs of engaging in these markets. The small holders, if not guided, may end up selling all their food stocks in the hands of middlemen seeking for more volumes at any cost. It is in this channel that the government policy needs to focus and rescue poor farmers from selling their food stocks to the many competing buyers.

3.3.2 Farmer–Cooperatives–Government Grain Reserve—Registered Traders—Milling Companies (CTA 2)

Cereal Transaction Arrangement 2 is more closely linked to CTA1. The only difference is that this unlike CTA1, CTA2 is involving farmer cooperatives/union/organization. The Farmer cooperative society buys members' crops and does all the marketing activities that the society can afford and pays the farmer the prevailing market. When interviewed some farmers were associating their marketing problems with lack of strong cooperative unions. However it was found out that the government through national grain reserve was procuring grain from cooperatives and other middlemen such as brokers (CTA 2) before the same reaches final consumers. This transaction arrangement was found beneficial in coordinating smallholder farmers and also in shielding them from unlawful traders. This transaction arrangement was found more common in maize than in rice transactions and it was only about 29.5% of farmers who were found to have used this channel. The low preference by farmers for this channel is attributed to the poorly managed cooperatives where members have always been ill treated by their own cooperatives such as inability to pay arrears on time. The policy options here would be for stakeholders to strengthen farmer cooperatives and farmer groups through empowering groups with necessary education and skills.

3.3.3 Farmer— Commission Agents/Stockers—Milling Companies (CTA 3)

CTA3 is the case where final grain buyers receive grain procured by various middlemen including commission agents and stockers. With CTA 3 the grain might have changed hands between stockers/commission agents who could have also bought same from farmers or from cooperatives. Most of these stockers do hold storage facilities at village, ward or division levels. The stockers sometimes keep grain for final buyers but charge fees (commission) for storage and transportation. It was found that only 16.2% of farmers were transacting their grain through CTA 3. The difference between CTA1 and CTA3 is that the latter involves long term relationship between farmers and the traders. This is due to the fact that traders do invest in long term fixed assets like storage facilities. However, due to smallness and inappropriate quality of storage faculties only a handful of the produce is handled. The possible policy intervention in CTA3 would be for the government and other

stakeholders to invest in standard storage facilities (godowns) which would increase capacity of farmers to increase crops' shelf life and also add time value of the produce. Traders involved in CTA3 are highly affected by any trade policy that restricts movements of grains outside the village or district boundaries since the restriction may not significantly stabilize food security to the poor smallholder farmers facing food shortages.

3.3.4 Farmer—Other Farmers—Milling Companies (CTA 4)

CTA 4 is the channel whereby some large farmers do purchase grain from other (relatively) smaller farmers. However these larger farmers are not stockers but can afford to sell the maize to final buyers in urban centers. The farmers buying maize from other farmers have access to market information and in most cases do invest in long term personal/social relationships with the remote, ill informed small farmers. Farmers engaged in buying other farmers produce and were selling the same to final consumers were found to be more progressive farmers, who were investing in social relationships neighbouring farmers. In this channels, its where such relatively larger farmers were buying farms owned by other farmers when the crop is at blooming stage. The poor farmers would be receiving financial credit from these relatively larger farmers in small installments and agree to sell the whole farm at prevailing market price. Possible policy intervention in this case would be to educate farmers on how to manage financial flows throughout the year so that they do not become "employees" of their neighbours. The compliance costs to these arrangements are very costly to default. Ting farmers. Such means of contract enforcement that were reported in the study areas were coercive means, threats to report to the police, and sometimes threats to bewitch the defaulting or enforcing partners. CTA 4 was used by about 6.9% of smallholder farmers, and it was perceived to be an increasingly popular marketing model especially in rice.

3.3.5 Farmer—Milling Companies (CTA 5)

CTA 5 represents procurement channel where milling companies/exporters or city markets buy cereals directly from farmers or where farmers themselves supply their crop to the milling companies/exporters/city markets without any middlemen involved. This channel is very commonly used in areas where these final buyers are located within the proximities of the farmers where transport cost is very minimal. This channel is also used by specialized commercial farmers and majority have strong social network with the markets. These include progressive farmers who undertake vertical integration path by producing, adding value and market the grains themselves. These farmers are large and are actually ones that need modern technology of production (like fertilizers and mechanized production), they are more educated and are capable of searching for markets in and outside the district, including markets across borders. Such farmers need to be promoted by reducing trade huddles. Trade restrictions to farmers using CTA5 are very unhealthy and it takes them a step back. These are farmers which would be beneficiaries of programmes like Kilimo Kwanza. This channel was however, found to be not very common and it was found to comprise of only about 1.6% of smallholder farmers.

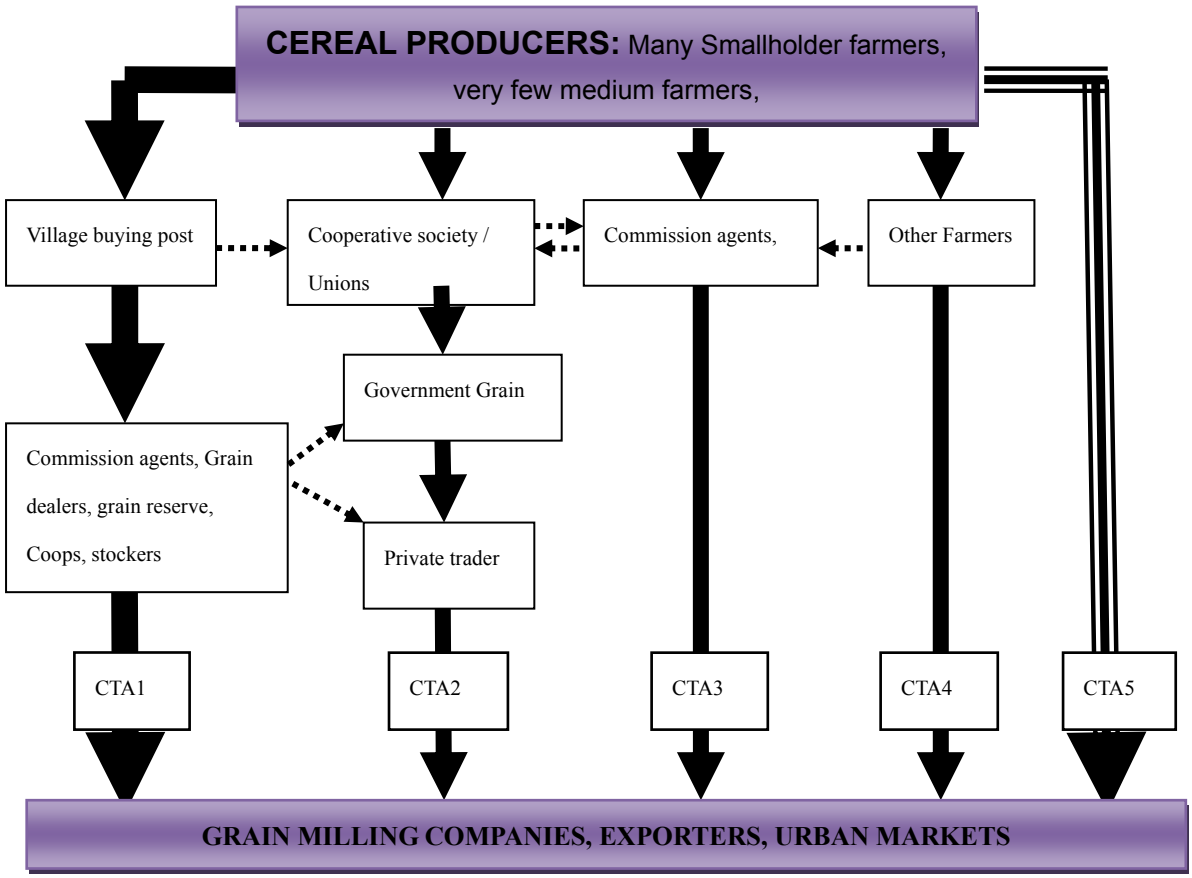

Figure 1. Marketing channels for grain in Tanzania

3.4 Transaction Costs and Related Impediments in the Value Added Chain of Maize and Rice

It was observed that as grain marketing huddles increase with transaction cost from CTA1 to CTA 5. Farmers would be expected to gain more market bargain in channel 5 but due to high transaction costs resulting from persistent marketing impediments farmers have not used CTA5 much more as they have used other channels. When compared, it is obvious that Rice farmers use more of CTAs 3-5 and less of CTAs 1-2 whereas maize farmers sell their grains mainly through CTAs 1-2. Table 14 summarizes some of the quantifiable transaction costs resulting from persistent market impediments. Majority of transaction costs are not quantifiable e.g. frustration, fear of theft, loss of reputation/trust, etc… They can be summarized into three main categories as outlined in table 12.

a) *Search transaction cost* - the cost of searching for the most reliable/profitable buyer of grain due to lack of access to market information (urban market price), low education levels and remoteness of farmers (distance to markets)

b) *Cost of effecting the transaction*- the cost incurred during the actual exchange of commodity for cash e.g. assembling, grain packaging, weighing, levies, storage and transport charges

c) *Cost of complying with policies and trade conditions*- The cost resulting from repercussions of breaching of the existing huddles like trade restrictions outside the district

boundaries posed by local governments, fear to lose trust, forceful acceptance to use tempered with weighing devices etc.

This study has revealed a long list of transaction cost as shown in table 12. It was also noted from the field that whether quantifiable or non quantifiable, all forms of transaction cost existed to significantly influence market decisions. The existence of different forms of trade impediments results into different forms of transaction costs. For instance farmers incurred transaction costs such as frustration, postharvest losses, theft etc due to their failure to easily identify reliable buyers. This is due to the existence of such trade impediments like lack of perfect information about the potential traders, market prices etc. Likewise monitoring incomplete transactions, especially when a farmer sells grain on credit, results into transaction cost of enforcing such contracts such as theft, witchcraft threats, unofficial storage charges etc. These costs do exist due to the existence of such impediments like poor assembling facilities, lack of storage facilities etc. The mechanisms used to sanction defaulters are also a source of transaction costs. For instance witchcraft consequences were believed to be an instrument to threaten one who would either be enforcing for being paid or those who would not want to pay. The informal mechanisms do exist because of the existing impediments such as corrupt legal system and police force, trade restrictions etc. All these, if significant, were impeding effective trade of the two grains to the extent that some traders would abscond any dealings with certain farmers for fear of the unknown consequences.

Table 12. Trade impediments and their associated transaction costs in the study areas

Costs	Impediment	Transaction cost
Cost of searching/screening potential/reputable transacting partner	• lack of access to market information (urban market price) • low education levels • remoteness of farmers	• *Frustration* • *Postharvest losses* • *Theft(grain + cash)* • *Low prices* • *Cheating on weight* • *High transport*
Cost of monitoring contractual agreements to avoid loss or breach	• Poor assembling, • Lack of storage facilities • Grain packaging,	• *Weighing charges,* • *Local levies,* • *Storage charges* • *Transport charges* • *Theft (cash)* • *Witchcraft/death*
Cost of enforcing the contract when contracts are breached	• Trade restrictions outside the district boundaries • Corruption • Lack of best alternative to livelihood	• *fear to lose trust,* • *Run away* • *Low prices* • *Coercive threats* • *Crop switch* • *Witchcraft/death*

It can also be seen in table 13 that transaction costs increase with CTAs. It is likely that transaction cost for searching potential buyers by farmers was negligible for CTA1 compared to higher levels of similar cost for CTA5. Similarly CTA1 seemed to have no transaction, neither cost for monitoring contracts nor for enforcing contracts as the transactions involved small volumes of grain and were complete (cash transactions). CTA5 on the other hand seemed to have higher costs of monitoring and enforcing contracts due to existence of interdependence between farmer and trader which results from large volumes involved and incompleteness of contracts.

Table 13. Perceived transaction cost for each CTA

Costs	CTA1	CTA2	CTA3	CTA4	CTA5
Cost of searching/screening potential/reputable transacting partner	*Very Low*	*Low*	*Medium*	*medium*	*High*
Cost of monitoring contractual agreements to avoid loss or breach	*NA*	*low*	*High*	*low*	*Very high*
Cost of enforcing the contract when contracts are breached	*NA*	*Low*	*Very high*	*low*	*Very*

3.5 Cereal Transaction Arrangements (CTAs) in the Structure-Conduct-Performance (S-C-P) Market Model for Maize and Rice

Using the S-C-P market model, it was possible was used to illustrate how the five CTAs were linked to the market structure, market conduct and market performance for maize and rice marketing. Table 14 shows that the market structure for CTA1 is characterised of numerous (small) transactions and that it is easier to enter the market and transact through CTA1 compared to CTA5. As noted before, only 1.6% of farmers were transacting through CTA5 whereas majority of farmers (95.1%) were trading through CTA1. The market conduct was observed through recognition of interdependence between farmers and traders. It was evident that extent of recognition of interdependence increased from CTA1 to CTA5. This is explained by the fact that trading in CTA1 could not provide room for long term interpersonal relationship as transactions were almost complete. With CTA5 long contractual agreements would be made between farmer and buyer and majority of the contracts would be incomplete hence need for interdependence between the two sides. As also explained earlier the market performance measured in terms of perceived technical efficiency, progressiveness and earnings, transacting through CTA5 was found to higher levels of these indicators compared to other CTAs. Majority of farmers were trading through CTA1 although it seemed to have the lowest levels of market performance.

Table 14. SCP of the CTAs in the grain markets: Supply side view

	Cereal transaction arrangement (CTA)				
Behaviour Attributes	**CTA1**	**CTA2**	**CTA3**	**CTA4**	**CTA5**
Market Structure					
number of transactions	Numerous	Less numerous	Few	Few	Very few
Entry conditions	Easy	Membership	Moderate	Moderate	Difficult
Product differentiation	Undifferentiated Grain	Undifferentiated	Some differentiated	Variable	Variable
Market Conduct					
Recognition of interdependence	Unrecognized	Recognized	Recognized	Highly Recognized	Highly Recognized
Optional strategies	NA	Yes	Yes	Yes	Yes
Market Performance					
Technical efficiency	Very low	High	Moderate	moderate	High
Progressiveness	Very low	Low	low	Variable	High
Earnings	Very low	Normal	low	normal	Above normal

Table 15 summarizes some of the indicators of quantifiable determinants of transaction costs. For instance though it was not common for maize, in rice some farmers were renting the farms to a tune of up to TSh 150,000 per acre per season. However, the interviews indicated that access to farm land wasn't a big huddle. The nominal prices for both crops from 2009 to 2012 seem to have risen but the percentage increment has been smaller compared to inflation rate between the two seasons. For instance the average prices per 100Kg bag of maize between 2009 and 2012 seemed to have risen by 49.8% i.e. from TShs 25,500 in 2009 to TSh 38,200 in 2012. However, the inflation rate between the same period has more than tripled (> 300%) i.e. from about 6% in 2009 to over 18% in 2012. Some farmers were found to increase net revenues by increasing acreage and sale crops at relatively higher (inflated prices) to buyers who were exporting to neighbouring countries to offset declining real prices, keeping other factors unchanged. However, the negative impact of increasing inflation was also noted from farmer interviews due to the fact that inflation was associated with increased transport costs, which eventually lowered profit margins.

Table 15. Descriptive statistics of transaction costs determinants in marketing rice and maize

Attribute	Crops	Range	Minimum	Maximum	Mean
Payment per acre per season	Maize	-	-	-	-
	Rice	150000	0	150000	13,100
Number of bags in 2011/2012	Maize	3	1	4	2.64
	Rice	3	1	4	2.92
Price per 100Kg bag of crop in 2009	Maize	37500	12500	50000	25,500
	Rice	80000	0	80000	31,400
Price per 100Kg bag of crop in 2010	Maize	37500	12500	50000	27,800
	Rice	60000	0	60000	34,600
Price per 100Kg bag of crop in 2011	Maize	45000	15000	60000	33,800
	Rice	85000	0	85000	40,100
Price per 100Kg bag of crop in in 2012	Maize	20000	30000	50000	38,200
	Rice	95000	0	95000	30,700
Distance to reach market (km)	Maize	220	0	220	21.40
	Rice	39.5	.5	40.0	8.195
Time (hours) spent to reach the market	Maize	4000	0	4000	153.08
	Rice	3.5	.5	4.0	1.420
Transport of 100kg bag of crop to market place	Maize	59500	500	60000	4722.40
	Rice	5000.00	.00	5000.00	1,476
Payment per season for storage facility (TShs)	Maize	149800	200	150000	11,200
	Rice	30000	0	30000	554.56

It was also noted that access to market places, irrespective of CTA was a significant determinant of transaction cost. On average a maize farmer would travel up to 21 Km and 8km for rice farmer to reach a nearby market. This implies that volume of transactions has to be small due to transport costs and also due to lack of reliable transport means. Other determinants of transaction costs as indicated in Table 15 were storage cost, but as noted before, storage was only done CTAs1-5 and more so for CTA5. Such costs were minimal or legible for CTA1 due to completeness of trade contracts and lack of interdependence between transacting partners.

4. Conclusion and Recommendation

Literature on obstacles and impediments to beneficial trade in rice and maize crops in Tanzania is by far well documented. Irrespective of the fact that each of the previous studies have recommended—seemingly, pro poor policy interventions by both government and private sector, it is likely that they have not solved the core problem of lack of beneficial trade. In fact the withdraw of the

state controls of the market for these commodities is viewed to have negatively affected production and hence benefits to the smallholder farmers. This paper has adopted a different approach by examining the root causes of the existing obstacles in form of transactions costs. It was not the intention of this paper to reveal exactly what is already known in literature as obstacles to beneficial trade. The methodology adopted in research that came up with this paper, and the presentation style is an added value to the existing literature.

This paper has alerted policy makers to understand that the markets for these staple grains are fragmented. There are many stylized markets referred to in this paper as Cereal Transaction Arrangements (CTAs). This paper has revealed five CTAs for rice and maize and that all these are happening at the same time and place, and sometimes involve same individuals. Each of these CTAs has its own strengths and weaknesses hence no single policy can be more appropriate across all CTAs. It is the responsibility of all involved in ensuring that crafted trade policies do not favour some CTA at the expense of others. For instance, whereas it could be justifiable to impose trade restrictions beyond village borders for CTA1 (where uninformed poor farmers may end up selling food stocks), the same policy is a serious hurdle for farmers engaged in CTA5, who seem to be knowledgeable and progressive. Thus the policies must be as heterogeneous to reflect heterogeneity of smallholder farmers hence market transactions arrangements.

It is also recommended that more research should be done to model markets for food crops in Tanzania. It is evident that the traditional theoretical models like S-C-P Market Model, Transaction Cost economics or even the neoclassical perfect competition models cannot be very reliable when applied independently. This paper has applied a mixture of all these to come up with the five different transaction arrangements for the two staple crops. Other researchers should therefore undertake more research to quantitatively study the applicability of the identified market models. Further studies too need to inform policy makers on specific policies that can be applied to meet demands of the various markets (CTAs) within one locality.

This paper has, like other previous studies on this topic such as that of Fafchamps (2004), found more or less similar trade hurdles. However, the paper argues that the hurdles are in themselves an opportunity for some other traders and farmers. It was found that some traders and farmers could transform trade hurdles into opportunities by exploiting those farmers and traders hardly hit by the hurdles in place. For instance relatively larger and wealthy farmers trading under CTA3 (Farmer—Farmer—final buyer) were utilizing their close proximity to poor farmers who could not afford to transport the grain to distant markets. The larger farmers would be able to store excess grain, transport and sometimes able to access potential buyers from the nearby urban markets. These farmer traders were viewed by surrounding poor farmers as the most important buyers and some wished that the government could enable them (farer traders) to avoid anything that could affect their businesses. The government, in this case ought to reduce transactions costs to such farmers engaged in CTA4 and also CTA5 that results from cost of constructing warehouses, corruption, levies and trade restrictions.

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