



## Transaction Costs and Market Participation Decisions of Maize Smallholder Farmers in Dodoma Region, Tanzania

Ismail J. Ismail<sup>1\*</sup>, Professor Madishetti Srinivas<sup>2</sup> & Dr Hawa Tundui<sup>3</sup>

<sup>1</sup>PhD Candidate in Business management, Department of Marketing and Entrepreneurship, School of Business, Mzumbe University, Tanzania

<sup>2</sup>School of Business, Mzumbe University, Tanzania

<sup>3</sup>School of Business, Mzumbe University, Tanzania

\*Corresponding Author

### Abstract

Binary logistic regression model has been used in this study to analyze the transaction costs of market participation decisions of maize smallholder farmers in Kongwa and Mpwapwa districts of Dodoma region, Tanzania. The study also used Chi-Square Model to test the model- goodness of fit with respect to the influence of transaction costs on market participation behaviors and therefore, the overall model fit statistic (omnibus test of model coefficients) is less than 0.05 and highly significant at ( $P < 0.001$ ). With reference to these findings, null hypothesis was rejected in favour of the alternative hypothesis that market transaction costs influence market participation decisions of maize smallholder farmers in Dodoma region at 5% level of significance. On the other hand, two variables out of four were found to be statistically significant to determine market participation, these were transportation costs ( $p < 0.030$ ) and middlemen costs ( $p < 0.002$ ).

**Key words:** maize smallholder farmers, maize, logistic regression model, transaction costs and Kibaigwa international grain market

### 1.0 Introduction

Maize is one of the most important food crop grown in Tanzania followed by sorghum, millet, cassava, sweet potatoes, bananas, pulses, paddy and wheat (Lyimo *et al.*, 2014). According to Zorya and Mahdi (2009), maize is grown in all regions of Tanzania in which a significant quantity of maize is produced by smallholder farmers. It is estimated that 4,086,555 ha, around four million or 70% of the land is used for maize production. Drawing data from the Tanzanian national sample census of agriculture for smallholder agriculture (2012), a number of households which plant maize in long rain season is 3,491,733 around three million which is 60.4% of the total crop growing households in Tanzania. Large to medium size growers represent only a small share of total production. Therefore, any attempt to improve maize smallholder farmers will mean improving majority of poor Tanzanians. However, this large group of growers in Tanzania is facing many challenges which increase their poverty levels. Badiane *et al.* (1997) documented that poor farmers are affected by existing marketing system which are typically characterized by high distribution margins and seasonal price variability.

All small growers in Tanzania are characterized by low productivity (Zorya and Mahdi (2009) and long distances from villages to the nearest market (Teravaninthorn and Raballand, 2009) and poor rural transport infrastructure. Others are weaknesses of cooperative societies, lack of maize farmers associations, inadequate number of maize competing buyers, price instability Eskola, (2005); Onumah(2007); URT (2008); Killick *et al.* (2000); presence of middlemen and perceived low prices in the formal market, weak institutional set-up dealing with maize agricultural marketing; poor developed socioeconomic variables, Eskola, (2005); URT, (2008) and inadequate maize market information (FAO, 2008; and URT, 2008).

These mentioned challenges have resulted into high transaction costs in rural areas which hinder maize smallholder farmers to participate in market effectively. According to (Sadoulet and de Janvry 1995), farmers will not enter markets when the value of participating is outweighed by the costs of undertaking the transaction. It is the bundle of transaction costs which smallholder farmers face that determines their market participation. In most cases, these transaction costs which can either be observed or hidden are experienced in transportation, middlemen costs and in various taxes charged in markets or by the government.

On the other hand, research work on market participation are still scanty especially in developing countries where important functions make certain questions paramount (Bellemare and Barret, 2006). Addition to that, the recent intensive literatures review by Ohen *et al.* (2014) and Hlongwane *et al.* (2014) identified that there is still a literature gap in the area of market participation especially on factors influencing the process. This therefore suggests that more studies in the area have to be undertaken to mitigate the knowledge gap. Therefore, this study analyzed the influence of transaction costs on market participation decisions of maize smallholder farmers in Dodoma region using transportation costs, middlemen costs, government taxes and market taxes as factors influencing market participation decisions of smallholder farmers, guided by the following key hypotheses:

- $H_0$ : The market participation decisions of maize smallholder farmers in Dodoma region is not influenced by market transaction costs.
- $H_1$ : The market participation decisions of maize smallholder farmers in Dodoma region is influenced by market transaction costs.

## 2.0 Empirical Literature Review

High transaction costs facing smallholder farmers in developing countries are mostly contributed by high transportation costs due to long distances from rural markets and poor road infrastructures, Key *et al.*, (2000) and Makhura *et al.*, (2001). These costs which are also related to searching and gathering information and services involve costs of bargaining and negotiating contracts as well as costs of monitoring and enforcement have for long weakened the decisions of smallholder farmers to participate in the market. Practically, these costs can physically be seen in transportation, paying taxes in government and in markets as well as in obtaining service from the middlemen.

### 2.1 Middlemen Costs

This kind of transaction cost is charged as observable and unobservable charges paid by smallholder farmers in order to access information and other market procedures. It is mostly used because most of smallholder farmers live long distances from the market with poor road infrastructures. This limits them to get timely market information about arrival of buyers and price rise. According to the Holloway *et al.*, (2000) and Makhura *et al.*, (2001) these barriers to market information have resulted to very low levels of market participation of smallholder farmers. In most rural markets in developing countries, the information about the arrival of the buyers or the price of the product is only known by the middlemen, therefore in order to access it, smallholder farmers have to pay either by direct cash per quantity sold or by reducing prices of the sold products.

### 2.2 Transportation Costs

According to Isinika *et al.*, (2003), smallholder farmers can be affected by transportation costs because in most of the developing countries, roads are underdeveloped especially rural feeder roads and communication; this makes transportation costs high. According to de Janvry, Fafchamps and Sadoulet (1991) a household's decision to be a seller in a given market is determined by a price band which depends on transportation costs to and from the market. On the other hand, the study done by Jagwe (2011) in Burundi, Democratic Republic of Congo and Rwanda, on the impact of transaction costs on the participation of smallholder farmers and intermediaries in the banana market indicated that, long distances to markets and poor ownership of transport facilities as among the causes of high proportional transaction costs, meaning that, those farmers living far away from the markets incur more transportation cost than those living nearby the markets and those who own improved means of transport facilities can save some incomes which could be paid to transporters.

### 2.3 Government Taxes

Taxes on agriculture produce, especially those currently imposed by District Councils have become a disincentive for the rural poor, driving smallholder farmers out of the markets. Therefore, smallholder farmers tend to prefer farm gate sales because they receive immediate payments and do not incur marketing costs such as transportation costs and tax payments, Isinika *et al.*, (2003) and Shiferaw *et al.*, (2006). It is documented that, the main contributor of this is the road blockers which are fixed on roads. These blockers have always reduced the income obtained in market sales. In most part of Tanzania, 1000 TSH is charged for every bag of maize passing across the road blockers.

### 2.4 Market Taxes

High trade taxes especially those charged at the market as fees and dues all along the produce marketing chain have caused small volume of products taken to the markets. For example according to VECO (2008); currently smallholder farmers face a minimum of three market related taxes, fees and dues in the process of marketing maize to the maize buyers in Kampala, Uganda. These are weighing scale fee, loading fees and produce tax. These taxes at market places though aim at improving the services; they reduce the net income of small agricultural producers and therefore discourage them from selling at markets.

## 3.0 Theoretical Framework

### 3.1 Theory of Transaction Costs

The general concept behind the theory of transaction costs is that smallholder farmers always tend to avoid participation in the market if transaction costs are high. Coase (1937, 1960) documented that, if trade in an externality is possible and there are sufficiently low transactions costs bargaining will lead to an efficient outcome in marketing system especially increasing market participation.

Past studies such as Key *et al.* (2000) and Kirsten and Vink (2005) explained that these transaction costs which are invariant to the volume of output traded and can affect smallholder farmers' market participation decisions directly are: (a) searching for a trading partner, (b) negotiating and bargaining, particularly when there is imperfect information about prices, and (c) enforcement of contracts and supervision, particularly when credit sales are involved. Also they are associated with transferring the output being traded, such as transport costs, middlemen cost and time spent delivering the product to the market. According to the theory, these costs are largely unobservable or cannot be easily recorded in a survey. Therefore, to realize or calculate them needs some skills which are not available to majority of smallholder farmers.

### 3.2 Analytical Framework: Model Specification

Decisions of maize smallholder farmers to participate in market involve two decisions, i.e. the discrete decision of whether to sell at market or at farm gate. According to Bahta and Bauer (2007), Onoja *et al.* (2012) and Ismail (2014), the best qualitative choice model in market participation is binary logistic regression model. While transaction costs are difficult to measure, using this model can be crucial since data used in this study combine both, continuous and categorical data. Also, the model fits if data are not normally distributed. Other reviewed literatures explained the processes and theory behind this model are Wuensch, (2006), Gujarati and Sangeetha, (2007) and Greene, (2003).

By using the logistic regression model, the probability of a result being in one of two response groups (binary response) was modeled as a function of the level of one or more explanatory variables. Thus, the probability whether or not the maize smallholder farmers from Hembahemba, Njoge, Makutupa, Tambi, Mwenzele and Mlembule villages participated by selling at Kibaigwa international grain market was modeled as a function of the level of one or more independent variables. For this study, the response variable is 1 when the farmer participated in Kibaigwa market and 0 when the farmer did not participate. The functional form of logistic regression model is denoted in equation one (1).

$$\ln \left( \frac{\phi_i}{1 - \phi_i} \right) = \beta_0 + \sum_{j=1}^K \beta_j X_{ij} + \varepsilon_i \tag{1}$$

Where:  $j$  is the response category (1 or 0),  $i$  conditional probability,  $\beta_0$  is the coefficient of the constant term,  $\beta_j$  is the coefficient of the independent variable,  $X_{ij}$  is the matrix of observed values: transportation costs, middlemen costs, government taxes and market taxes and  $\varepsilon_i$  is the matrix of unobserved random effects.

From the basic binary logistic question (1):

$$\frac{\phi_i}{1 - \phi_i}$$

Is odd and

$$\ln \left( \frac{\phi_i}{1 - \phi_i} \right)$$

Is the logarithm of odds

$$\frac{\phi_i}{1 - \phi_i} = \exp \left( \beta_0 + \sum_{i=1}^k \beta_i X_i \right)$$

Equation (1) can be manipulated to give the odds ratio using equation (2) above. The probability that maize smallholder farmers from Hembahemba, Njoge, Makutupa, Tambi, Mwenzele and Mlembule villages households participate in Kibaigwa international grain market can be calculated using equation (3) below

$$\phi_i = \frac{\text{Exp} \left( \beta_0 + \sum_{i=1}^k \beta_j X_{ij} \right)}{1 + \text{Exp} \left( \beta_0 + \sum_{i=1}^{k2} \beta_j X_{ij} \right)}$$

Equation (3) is intrinsically linear since the logit is linear in  $X_i$  (Gujarati and Sangeetha, 2007); it indicates that probability lies between zero and one and vary non-linearly with  $X_i$ .

#### 4.0 Variables used in the Model and their Measurements

Table 1: Operationalization of transaction costs

| SN | Explanatory variables | Measurement | Expected sign | Comment   |
|----|-----------------------|-------------|---------------|---|
| 1  | Constant              | Magnitude   | ?             | Large size means large effect   |
| 2  | Transportation costs  | Continuous  | –             | Increase in transportation costs means reduce income hence weaken market participation decisions of farmers |
| 3  | Middlemen costs       | Dummy       | –             | Increase in middlemen costs means reduce income hence weaken market participation decisions of farmers      |
| 4  | Government levy       | Dummy       | –             | Increase in government levy means reduce income hence weaken market participation decisions of farmers      |
| 5  | Market levy           | Dummy       | –             | Increase in market levy means reduce income hence weaken market participation decisions of farmers          |

Source: Theories and Literature reviewed.

Expected logistic regression model:  $\text{Logit} (P) = a - \beta_1(TC) - \beta_2(MC) - \beta_3 (GL) - \beta_4 (ML)$

Where:  $\text{Logit} (P)$  = Is a probability of market participation ranging from 0 to 1;  $a$  = constant term,  $\beta$  = coefficient of independent variable showing its effect on the dependent variable,  $TC$  = Transportation costs recorded as continuous variable,  $MC$  = Middlemen costs recorded as dummy variable perception toward middlemen (0=Not useful, 1= useful),  $GL$  = Government levy recorded as dummy variable, perception on government levy (0= Not useful, 1= Useful) and  $ML$  = Market levy recorded as dummy variable, perception towards market levy (0=Not useful, 1= Useful).

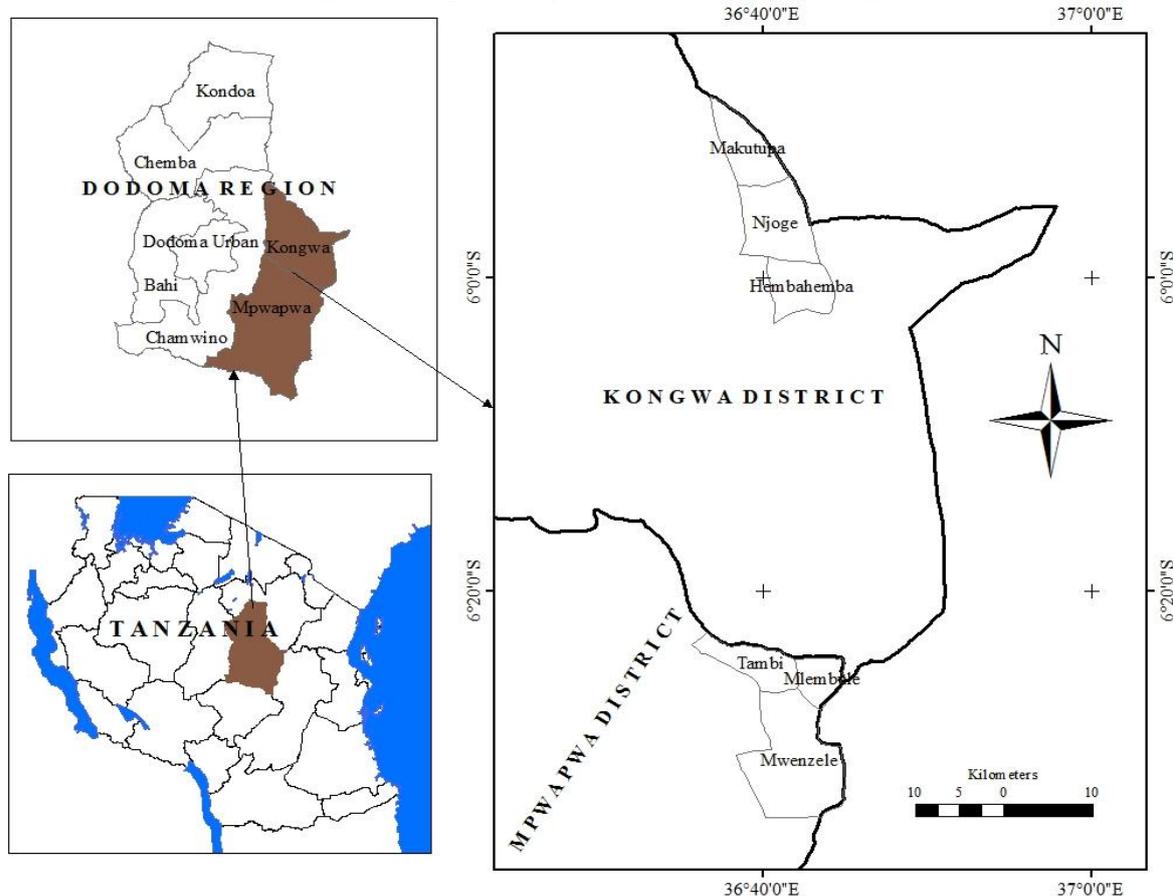
## 5.0 Research Methods

### 5.1 Study Area

This is based on a study conducted in Dodoma region in central Tanzania between May and July 2014. Specifically, the research was carried out in six villages of Kongwa and Mpwapwa districts named: Hembahemba, Njoge, Makutupa, Tambi, Mwenzele and Mlembule. These six villages were selected basing on the distances from Kibaigwa international grain market in which the maize market participation of smallholder farmers from these six villages was referred to.

The decision of selecting Kongwa and Mpwapwa districts was taken because the districts are among the leading maize producers in the region. Also, for comparison purpose, Kongwa district is closer to Kibaigwa international grain market (KIGM) and is more developed because of the presence of the main road compared to Mpwapwa district, therefore selecting these districts made it easy to compare market participation decisions. In addition, the study being one of the rare initiatives in smallholder farmers' market participation needs to restrict the interacting variables in a uniform environment. Therefore, the rationale for selecting a single market context rather than a multi-market study was to eliminate the macro environmental diversity that exists among markets. According to Saleh (2006), the collection of data in a fairly homogeneous environment is expected to further facilitate the control of plausible impacts arising from uncontrollable external variables.

**Figure 1: Map of Sampled Districts in Dodoma region**



Source: Remote Sensing & GIS, Tanzania Forestry Research Institute (TAFORI)

### 5.2 Design, Sampling and Data Collection Method

The study relied on primary sources of data from households of maize smallholder farmers where by the secondary data such as books, journal articles and online materials for this study were also considered as the key sources of the information. A structured questionnaire was used to obtain primary data which elicited responses on their levels of participation in Kibaigwa international grain market. Two out of seven districts in Dodoma region were purposively selected for the study. These were Mpwapwa and Kongwa districts. A randomized sampling procedure was also used to select sample respondents to identify factors of market participation among maize producing households. Thus, the total sample size of the study was 633 respondents. Hembahemba (86), Njoge (103), Makutupa (80) of Kongwa district, Tambi (125), Mwenzele (119) and Mlembule (120) of Mpwapwa district.

## 6.0 Results and Discussions

### 6.1 Binary Logistic Regression Model Fitness Attributes

Independent variables included in the model were market levy, government levy, middlemen and transportation costs. Chi-Square Model was used to test the model goodness of fit with respect to the influence of market practices on market participation and therefore, the Chi-Square Model statistic, which is the difference of the values of the two log likelihood functions, is 178.058. The P-value for the overall model fit statistic is less than the conventional 0.05 ( $p < 0.001$ ) indicating that at least one of the independent variables contributes to the prediction of the probability of market participation. The overall model fit statistic (omnibus test of model coefficient) is less than 0.05 and highly significant at ( $P < 0.001$ ) with 4 degrees of freedom ( $\chi^2$  (4 d.f) 20.867,  $p < 0.001$ ) indicating that at least one of the parameters in the equation is nonzero. The descriptive measures of goodness-of-fit, the pseudo  $R^2$  is also positive and

high approximately 0.136 which supports that the model fits the data well (Cox & Snell  $R^2=0.063$  and Nagelkerke  $R^2=0.136$ ) indicating that variations in probabilities of participating in Kibaigwa market was explained by about 14% of the covariates in the logistic regression model. The findings also indicate that the model with descriptors (PAC: 92.5) performs better than the null model (PAC: 90.6). Therefore with reference to these findings, null hypothesis was rejected in favour of the alternative hypothesis that market transaction costs equally influence market participation decisions of maize smallholder farmers in Dodoma region at 5% level of significance.

## 6.2 Results of the Logistic Regression Model for market transaction costs

**Table 2: Binary logistic regression analysis for market transaction cost**

| Variables            | $\beta$ | S.E. | Wald  | D.f | Sig.   | Exp( $\beta$ ) | 95.0% C.I. for EXP(B) |       |
|----------------------|---------|------|-------|-----|--------|----------------|-----------------------|-------|
|                      |         |      |       |     |        |                | Lower                 | Upper |
| Transportation costs | -1.638  | .755 | 4.709 | 1   | .030** | .194           | .044                  | .853  |
| Middlemen costs      | -1.400  | .805 | 3.024 | 1   | .002** | .247           | .051                  | 1.195 |
| Government levy      | -.977   | .851 | 1.318 | 1   | .251   | .376           | .071                  | 1.996 |
| Market levy          | .425    | .886 | .231  | 1   | .631   | 1.530          | .269                  | 8.690 |
| Constant             | 1.020   | .796 | 1.642 | 1   | .200   | 2.774          |                       |       |

Source: Analysis of field data, 2014

To determine the influence of market transaction costs on market participation of maize smallholder farmers, four independent variables were included in the model. Three variables (transportation cost, middlemen cost and government levy) were found to constrain the participation decisions and only one (market levy) was found to enable the process of market participation. Transportation costs, middlemen costs and government levy cost showed signs that are in tandem with theoretical expectations of the model except market levy. The following is the binary logistic regression equation developed from table 2 of the market transaction cost variables:

$$\text{Logit}(P) = 1.020 - 1.638 (TC) - 1.400 (MC) - 0.977 (GL) + 0.425 (ML)$$

### 6.2.1 Transaction Costs Tested Statistically Significant

#### 6.2.1.1 Transportation Cost

Transportation cost was found to have a negative regression coefficient of  $-\beta$  of 1.638 and the odds ratio (Exp  $\beta$ ) of 0.194. The results also found that, there is a statistical significance relationship between transportation costs and market participation of smallholder farmers in study area, with  $p < 0.030$  meaning that, this variable is a determinant of market participation across study villages. Since the regression coefficient is negative, it further means that, any unit increase in transportation cost by 1Tsh (price of transportation) will decrease the odds of smallholder farmers to participate in market by odd ratio of 0.194 times which is equivalent to 19.4% decrease in odd of market participation.

The study also identified two major related factors affecting transportation costs in the studied villages: i) Distances between villages and Kibaigwa market and ii) poor road infrastructures.

It was revealed that the longer the distances from the households to the market the higher the transportation costs. With respect to the distance, the transportation costs for a maize bag of 100kg was found to be high in Mpwapwa district with 5000 T.sh in Mlembule, 4500 T.sh in Mwenzele and 4000T.sh in Tambi villages while in Kongwa it was found to be 2500 T.sh, in Hembahemba village 2500 T.sh, in Njoge village and T.sh 3000 in Makutupa village. Smallholder farmers interviewed in Njoge villages commented that the low income earned being contributed by high transportation cost. This has for long time discouraged them to participate in Kibaigwa market. The problem of long distances between villages or farming areas and the marketing areas has been noted by various researches for example Manyong et al (2008) in the study of effects of transaction costs on market participation which included marketing costs like transport, market fees and license had noted a significant negative effect on farmers' market participations of maize supply and fertilizer demand. More so, Artukoglu et al. (2008) in the study of cooperative tendencies and alternative milk marketing channels noted that the higher the transport cost incurred by dairy farmers, the less the interest of participation in the channel.

On the other hand, Otieno et al. (2009) also pointed out that high transport costs which are associated with long distance significantly reduces the percentage of milk supplied to the marketing channel because they reduce farmers' gross margins earned.

Furthermore, the negative correlation of transportation cost was also conveyed to be contributed by the poor road infrastructures in the study area. Most of the interviewed maize smallholder farmers and the key informants explained that, their participation in Kibaigwa market has been negatively contributed by the poor road states and mostly the feeder roads which connect villages and Kibaigwa market. It was revealed that poor roads condition is much contributed by the rainfall and the large number of animals within and in nearby villages and this problem is much increasing because of the poor plans to repair them after rain season. This has also been reported by Oni and okanlawon (2006). The neglecting of these rural roads in the study area not only multiplies the cost of repairs for those owning the trucks but also sharply increases the cost of vehicle operations. It was further observed that this problem of poor feeder roads has resulted to inadequate transportation facilities which in turn has imposed a great constrains on mobility and maize smallholder

farmers' access to facilities especially Kibaigwa international grain market. The problem of rural roads has also been reported by Olomola (2003) while classifying various types of transportation problems in Nigeria to include, bad roads and high costs.

General, it was observed that high transportation cost in the study area is in large the outcome of the combination of poor roads infrastructures and the long distances between villages and rural markets. Fund for agricultural development (IFAD) (2001) also reported inadequate transportation being closely associated with rural poverty in many developing countries.

**Table 3: Relationship between market distance and transportation costs**

|                           |                                   | Market distance from home | Transportation cost |
|---------------------------|-----------------------------------|---------------------------|---------------------|
| Market distance from home | Pearson Correlation               | 1                         | .514**              |
|                           | Sig. (2-tailed)                   |                           | .000                |
|                           | Sum of Squares and Cross-products | 14162.790                 | 255852.665          |
|                           | Covariance                        | 44.537                    | 804.568             |
|                           | N                                 | 633                       | 633                 |
| Transportation cost       | Pearson Correlation               | .514**                    | 1                   |
|                           | Sig. (2-tailed)                   | .000                      |                     |
|                           | Sum of Squares and Cross-products | 255852.665                | 1.752E7             |
|                           | Covariance                        | 804.568                   | 55105.380           |
|                           | N                                 | 633                       | 633                 |

Source: Analysis of field data, 2014

Also, findings in table 3 indicate that there is a positive correlation between market distances and transportation cost meaning that, transportation costs increases with the increase in distance. Pearson correlation was found to be 0.514. Also the findings imply that, there is a statistical significance between the two variables with  $p < 0.001$  less than 0.05 (Table 3).

#### 6.2.1.2 Middlemen Costs

This variable showed negative correlation with dependent variable (market participation) with regression coefficient of -1.400 and odd ratio of 0.247 this indicates the possibility that a unit (1Tsh) increase in middlemen cost will decrease the odds of maize smallholder farmers to participate in market by odd ratio of 0.247 times similar to 24.7% decrease in odds. P value of 0.002 implies that influence of this variable as market transaction cost on market participation is significant, meaning that it is a determinant of market participation.

The study found that frequent change in prices of maize is much contributed by the middlemen and this was revealed by the PRA conducted in study villages. Key informants pointed out that, middlemen who are negotiating on behalf of traders have for long used the price information gap and the poor contacts between maize farmers and traders as a loophole to exploit the poor rural population. The tied relationships with particular middlemen also make farmers depend on information on availability and arrival of maize traders at the market. Since they do not have an option to trade with someone else if they are unhappy with the price they receive, being informed about the market price does not help them. These results give some support to the idea that the benefit of information to farmers will vary depending on what options available to them.

It was said that though the construction of Kibaigwa market reduced this exploitations compared to the one done at the villages, the existence of these middlemen in the marketing of maize still reduce their income. It was further revealed that, poor knowledge of smallholder farmers in maize processing especially understanding the moisture content of maize has resulted to low prices as middlemen usually convince farmers to sell at low price pointing high moisture content of maize to be a reason for the low price. Masters (2007 and 2008), assumed that middlemen are purely exploitative and show their presence can reduce the efficiency of markets.

It was observed that, in Kibaigwa market, middlemen do charge 2T.sh per each kilogram of maize sold at the market. On the other hand it was observed that, many activities done at the market in respect to the selling are conducted by the middlemen on behalf of farmers. Payments like market levies and pass way charges at exit gate which are supposed to be paid by the middlemen are paid by smallholder farmers.

#### 6.2.2 Transaction Costs Variables Tested Statistically Insignificant

##### 6.2.2.1 Government levy

This tax is charged by local government to smallholder farmers in villages who sell maize at Kibaigwa international grain market. The variable found to have negative correlation with market participation. With regression coefficient of -0.977 and odd ratio of 0.376, this means in additional increase (1Tsh) of government levy in the study area will likely reduce the decision of maize smallholder farmers to market participation by odd ratio of 0.376 times, which is 37.6% reduction of odds. The study further found the variable to have no statistical significant relationship with market participation with  $p > 0.251$ . This indicates that, the government levy is not a determinant of market participation among smallholder farmers in the study villages.

The discussion with maize smallholder farmers showed that, high levies of 10Tsh per kg of maize which are charged by the local government in the study villages have a direct negative effect on the decision to participate in Kibaigwa market as majority of smallholder farmers opt to sell their maize at home. It was observed that government levy on maize from these six villages which are in Kongwa and Mpwapwa districts has increased much as compared to the period when the market started. By then, Kongwa and Mpwapwa districts levies (*Ushuru wa halmashauri ya Kongwa*

na Mpwapwa) was 50 cents per kg of maize but has been increasing over years to TSh 2.5 per kg but with effect from January 2012, the rate was doubled to TSh. 5 per kg and currently the rate is 10 T.sh per kg.

During data collection, maize smallholder farmers were striking against the rise of this levy leading to the destructions of various properties around Kibaigwa market. When asked if increased government levy in relation to the increase in maize price has not affected their participation to Kibaigwa market, maize smallholder farmers pointed two reasons as to why they are still affected negatively by the increase in levy. First, the incidence of tax always falls to them although it is assumed that the levy is paid by buyers, maize buyers always ensure that this extra cost is passed on to farmers in terms of paying lower price that they would otherwise pay without it and secondly for a maize farmer whose price is already below production costs, any small deduction is burdensome.

#### 6.2.2.2 Market levy

Market levy is the only variable found to have positive regression coefficient of 0.425 and odd ratio of 1.530 among of the four market transaction costs. This indicates that, increasing market levy by one unit (1Tsh) will increase the odds of smallholder farmers to decide on participating to market by odd ratio of 1.530 times which is 53% increase in odds. However, the variable was statistically not significant with p value of 0.631 indicating that, the variable is not a determinant to market participation. The survey done at the market showed that this levy is charged by market management as market fee to facilitate various market operations and it is collected on a particular amount whenever maize is transacted within the market. Currently, the levy is T.sh 250 for a bag of 100kgs meaning T.sh 2.5 for any 1 kg of maize. The only reason for the positive correlation identified during the study is that, smallholder farmers believe that any additional market levy will mean improving quality of services at the market. In addition, it was revealed that, market management and other market users are participating in any change of this levy, this make the process of levy administration to be easy to manage. Though the study found a positive impact of the increase in market levy on market participation, it was found that, the number of maize smallholder farmers selling at the market could be increased if the market levy was decreased. This concurs with Pingali et al. (2005) who pointed out that smallholder farmers in most developing economies find it difficult to participate in markets because of numerous constraints and barriers. These are mostly reflected in the hidden costs that make it difficult to access input and output markets. The ministry of agriculture, food Security, and cooperative (MAFC 2009) also found that the agricultural tax regime is one of a number of factors explaining low agricultural investment due to poor participation in agricultural markets.

Generally, in absolute terms the levy was found to increase, but in relation to the maize price the market levy seems to be more or less constant.

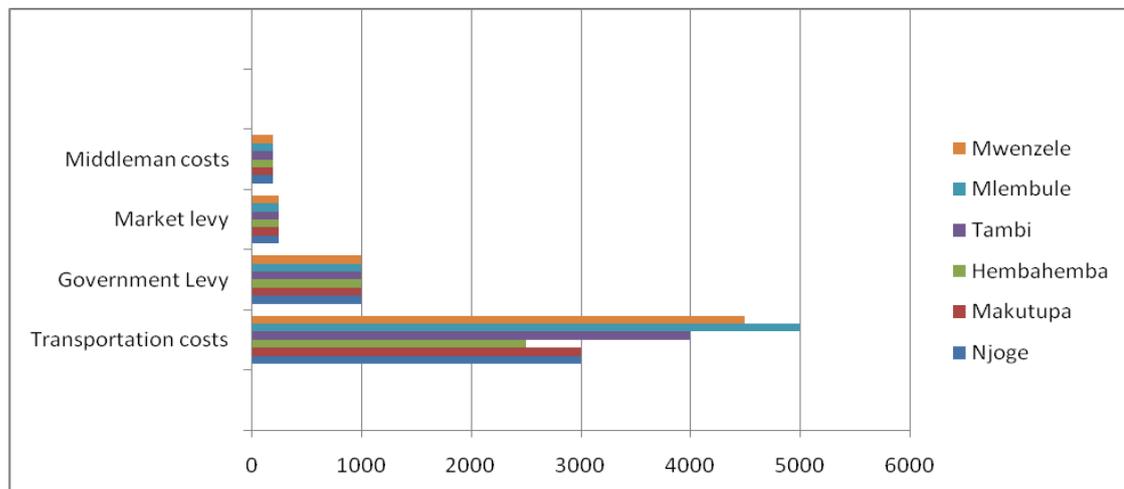
**Table 4: Trend of market levy at Kibaigwa international grain market**

| Year | Trend of maize price at Kibaigwa market (TSH/Kg) | Market levy rate (TSH/Kg) |
|------|--|---------------------------|
| 2004 | 130  | 0.5                       |
| 2005 | 150  | 0.7                       |
| 2006 | 208  | 1                         |
| 2007 | 135  | 1.5                       |
| 2008 | 293  | 2                         |
| 2009 | 342  | 2                         |
| 2010 | 304  | 2.5                       |
| 2011 | 359  | 5                         |
| 2012 | 503  | 2.5                       |
| 2013 | 500  | 2.5                       |
| 2014 | 265  | 2.5                       |

Source: Kibaigwa international grain market, 2014

Market levy paid by a maize smallholder farmer at Kibaigwa market was found to increase every year. The market started with market levy of 50 cents per kg of maize but has been increasing over years to TSh 2.5 per kg. Although in absolute terms the market levy has been increasing, in relation to the maize price the market levy seems to be more or less constant. Between 2004 and 2014 the maize price has ranged between 130TSH/Kg–265 TSH/Kg (Table 4).

**Figure 2: Market transaction costs in the study area.**



Source: Analysis of field data, 2014

The study indicates that, transportation cost variable is a bigger constrainer to market participation across all six villages. However, Mlembule and Mwenzele of Mpwapwa districts was found to have higher transportation costs (5000TSH/100Kg) and 4500TSH/100Kg respectively compared to other villages due to long distance and poor road infrastructures between the villages and the market (Figure 2).

## 7.0 Conclusion

Theoretically, the general findings of this study are in keeping with the theory of transaction costs which suggests that farm households evolve mechanisms to avoid participating in markets as much as possible when transaction costs are high. Coase (1937, 1960) attempted to define the relationship between the firm (In this case maize smallholder farmer households) and market participation by pointing that if trade in an externality is possible and there are sufficiently low transactions costs, bargaining will lead to an efficient outcome in marketing system especially market participation.

It was found that, maize smallholder farmers opt to sell at farm gate avoiding high transaction cost charged as a combination of all these costs and therefore, for maize smallholder farmers to effectively participate in the market; these invisible costs have to be reduced to the extent that they don't reduce income after the exchange process. On the other hand, while transaction costs are difficult to measure, understanding the influence they have on behavior is crucial as it can inform policy design aimed at reducing them.

## 8.0 Recommendations

- Reorganization of middlemen in thinking about other ways of getting income than depending on reducing prices to smallholder farmers
- Using alternative ways and reducing government levy in reducing taxes charged at the road blockers or finding alternative ways of collecting taxes
- Reducing market levy by having a minimum limits to taxes especially if the number of bags are few.
- Reducing transportation costs, improving road infrastructures and reducing distances between rural markets and villages.
- Improving socioeconomic variables through training so as to improve negotiation abilities of smallholder farmers.

## Acknowledgements

I wish to express my sincere gratitude to Professor Madishetti Srinivas and Dr. Hawa Tundui my Supervisors, whose valuable comments, guidance, constructive challenges and close supervision, have made this work possible. Moreover, grateful acknowledging the financial support by High Education Students Loan Board (HESLB) of the United Republic of Tanzania, my employer- the University of Dodoma (UDOM), maize smallholder farmers in Dodoma region and key actors in Kibaigwa international grain market for their assistance.

## 9.0 References

- Action Study by VECO (2008); increasing farmer benefit in the market chain in Uganda.
- Badiane, O., Goletti, F., Kherallah, M., Berry, P., Govindan, K., Gruhn, P. and Mendoza, M. (1997) "Agricultural input and output marketing reforms in African countries: Final report", IFPRI, Washington DC.
- Bahta, S.T. & Bauer, S. (2007). Analysis of the determinants of market participation within the South African small-scale livestock sector. Tropentag Paper, Tropentag, October 9 -11, 2007, Witzenhausen: Utilisation of diversity in land use systems: Sustainable and organic approaches to meet human needs
- Bellemore, M.F and Barret, C. (2006). "An ordered probit model of market participation; evidence from Kenya and Ethiopia". *American journal of agricultural economics*, Vol. 88 (2); 324 – 337.
- De Janvry A, Fafchamps M, Sadoulet E (1991) Peasant household behavior with missing market: some paradoxes explained. *Econ J* 101(409):1400-1417
- Diao, X., S. Fan, D. Headey, M. Johnson, A. Nin Pratt and B. Yu (2008). Accelerating. Africa's Food Production in Response to Rising Food Prices: Impacts and Requisite Actions.
- Dorosh, Paul, Schmidt, Emily. (2008). Mozambique Corridors: Implications of Investments in Feeder Roads. Unpublished manuscript. The World Bank, Washington DC

- Eskola, E. (2005). Agricultural Marketing and Supply Chain Management in Tanzania: A Case Study. ESRF Study on Globalization and East Africa Economies. Working Paper Series No. 16 Ethiopian Grain Market. Washington, DC: International Food Policy Research Institute.
- Eskola, E. (2005). Agricultural Marketing and Supply Chain Management in Tanzania: A Case Study. ESRF Study on Globalization and East Africa Economies. Working Paper Series No. 16 Ethiopian Grain Market. Washington, DC: International Food Policy Research Institute.
- Greene W H (2003). *Econometric Analysis*, Fifth edition. Pearson Education International, USA.
- Gujarati, D. N. & Sangeetha (2006). *Basic econometrics*. 6TH ed. New York: McGraw-Hill.
- Hlongwane et al (2014). Analyzing the factors affecting the market participation of maize farmers: A case study of small-scale farmers in greater Giyani Local Municipality of the Mopani District, Limpopo Province; *African Journal of Agricultural Research*
- Holloway, G., C. Nicholson, C. Delgado, S. Staal, and S. Ehui (2000) Agroindustrialization through Institutional Innovation: Transactions Costs, Cooperatives and Milk Market Development in East African Highlands, *Agricultural Economics* 23(3), September 2000.
- Isinika, A. C., Ashimogo, G. C. and Mlangwa, J. E. D. (2003). African in Transition: Macro Study Tanzania, Lund University (Sweden), African Food Crises: The Relevance of Asian Models, Final Research Report.
- Ismail (2014) Influence of Market Facilities on Market Participation of Maize Smallholder Farmer in farmer organization's market services in Tanzania: Evidence from Kibaigwa International Grain Market, G.J.B.A.H.S., Vol.3 (3):181-189
- Jagwe, J (2011). The impact of transaction costs on the participation of smallholder farmers and intermediaries in the banana markets of Burundi, Democratic Republic of Congo and Rwanda. University of Pretoria, Pretoria, South Africa
- Key N, Sadoulet E, de Janvry A (2000). Transactions costs and agricultural household supply response. *Am. J. Agric. Econ.* 82(1):245-259.
- Killick, T., Kydd, J. and Poulton, C. 2000. Agricultural Liberalisation, Commercialisation and the Market Access Problem in The Rural Poor and the Wider Economy: The Problem of Market Access. IFAD
- Kirsten, J, & Vink N. 2005. *The Economics of Institutions: Theory and applications to African agriculture*. Course study material, University of Pretoria Department of Agricultural Economics Extension and Rural Development, Pretoria, South Africa.
- Lyimo et al (2014), the use of improved maize varieties in Tanzania, Nairobi, Kenya
- Makhura, M. T. (2001). Overcoming transaction costs barriers to market participation of smallholder farmers in the Northern Province of South Africa. PhD dissertation, University of Pretoria, Pretoria. *Market Participation and Rural Poverty: Evidence from Tanzania and Ethiopia*.
- Masters, A (2007) "Middlemen in Search Equilibrium," *International Economic Review*, 48 (1), 343-62.
- Masters, A (2008), "Unpleasant Middlemen," *Journal of Economic Behavior and Organization*, October 2008, 68 (1), 73-86.
- Ministry of Agriculture, Food Security, and Cooperative, MAFC (2009) Impact Assessment of Tax Reforms. Tanzania
- Ohen, S.B et al (2014). Determinants of Market Participation by Cucumber Farmers in Odukpani Local Government Area, Cross River State, Nigeria, *Journal of Economics and Sustainable Development*
- Olomola, A. S. (2003) "Understanding Poverty in Nigeria: Highlights from NISER Review of Nigerian Development". In *NISEREEL*, the magazine of the Nigerian Institute of Economic and Social Research, No. 4&5, December, 2003. Ibadan.
- Oni, S, I. and Okanlawon, K. R. (2006) "Nigeria's Transport Infrastructural Development: An Integral Part of National Economic Empowerment and 307 Development Strategy (NEEDS)." *Journal of Social and Policy Issues* (3) 2: 7-13
- Onoja et al (2012) Determinants of Market Participation in Nigerian Small-Scale Fishery Sector: *The Journal of Sustainable Development* Vol. 9, Iss. 1 (2012), Pp. 69
- Onumah, G. E., Davis, J. R., Kleih, U. and Proctor, F. J. (2007). Empowering Smallholder Farmers in Markets: Changing Agricultural Marketing Systems and Innovative Responses by Producer Organizations. *ESFIM Working Paper 2*
- Pingali, P., Khwaja, Y. & Meijer, M., (2005). Commercializing Small Farms: Poverty and Agricultural Growth in Rural India." *Journal of Development Studies* 40(1):1-31.
- Shiferaw, B and Obare, G and Muricho, G (2006) *Rural Institutions and Producer Organizations in Imperfect Markets: Experiences from Producer Marketing Groups in Semi-Arid Eastern Kenya*. *Journal of SAT Agricultural Research*, 2 (1). pp. 1-41.
- Teravaninthorn, S. and Raballand, G. (2009). Transport prices and costs in Africa: a review of the international corridors", The World Bank, Washington D.C
- United Republic of Tanzania (URT), (2012) national sample census of agriculture sector, country report
- United Republic of Tanzania (URT). (2008). National agricultural marketing policy. Ministry of industry and Trade. Government printers, Dar es salaam.
- Washington, D.C., IFPRI Discussion Paper 00825.
- Wuensch, K. L. (2006). Curvilinear regression. In N. J. Salkind (Ed.), *Encyclopedia of measurement and statistics* Thousand Oaks, CA: Sage. : 211 - 215.
- Zorya, S and Mahdi, S (2009), high Marketing Costs and Inefficient Policies Maize Market, A Poverty Perspective