

# Determinants of Tea Marketing Channel Choice and Sales Intensity among Smallholder Farmers in Kericho District, Kenya

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## Abstract

The aim of this study was to determine the socio-economic and institutional factors influencing smallholder farmers' choice on tea marketing channel in Kericho District. A semi-structured and pre-tested questionnaire was used to collect data from smallholder tea farmers through face to face interview. Multistage sampling procedure was employed to contact 155 respondents. The study used Heckman two stage model to identify factors that determine tea growers' choice of marketing channel and sales volume decisions once a marketing channel has been selected. The results showed that age, gender, education in years, farming years and second payments significantly affected the participation in marketing channel. Tea production, farming years, age and second payment significantly affected the intensity of participation. The results of the study provide an insights to the policy makers on what needs to be done to promote and improve farmer-market linkages hence improve farmers' incomes from their farming and marketing activities.

**Keywords:** Tea, Marketing channel, socioeconomic factors

## 1.0 Introduction

Kenya's economy relies heavily on agriculture for employment, foreign exchange earnings and rural incomes all of which are important such that any broad-based improvement in rural living standards requires substantial growth in productivity (Nyoro and Jayne, 2005). Agriculture accounts for about 26% of Kenya's Gross Domestic Product (GDP) and 60% of the total export earnings. It also contributes indirectly to 27% of GDP through linkages with manufacturing, distribution and service sector (TRFK, 2011).

Tea farming in Kenya dates back to 1903. The early settlers restricted tea and coffee growing to large-scale farmers and multinationals, mainly to maintain quality. However, the main reason was to lock out locals from the then very lucrative cash crop farming. Kenya's attainment of independence in 1963 saw the passing of various land reform bills which had an impact on agriculture. Tea farming, for instance, was made open to the local farmers. The crop has since spread across the country and is currently an important economic mainstay for many smallholder farmers (SOMO, 2006). In the year 2010, the Country produced 399 metric tons of made tea earning Ksh. 97 billion in foreign exchange. This represents 26% of total export earnings and about 4% of the GDP (TRFK, 2011).

Tea is the most popular drink in the world after water (Wal, 2008). Although tea production and trade plays a crucial role in the lives of many poor families, tea prices have been falling. The growth in world tea production with sluggish demand has been largely responsible for the fall in prices. While tea prices have been falling, the cost of production has been on the rise, decreasing profitability (Oxfam, 2000). The price trend until recently has been downward. There is no single world price for tea, but rather different prices at different auctions (Agritrade, 2008). World Bank figures suggest that between 1970 and 2000, tea prices fell by 44% in real terms. The FAO composite price index, a world indicator price for tea, shows that tea prices have been slowly increasing since 2002. Farmers benefit from high prices when marketing and processing costs are kept low. It is therefore expected that farmers would be guided by price factor in the output market in order to make decisions in the allocation of inputs and hence they would be priced efficiently in their operations (Owuor, 2005).

The tea supply chain begins in a smallholder farm or plantation where tea leaf is plucked. The green leaves are then transported to a factory for processing. Tea must be processed hours of its being picked in order to maintain quality. After being processed, tea is taken to auction center, where prices are determined on a day-to-day basis. Kericho District is one of the highest tea producing both in small-scale and large scale. Tea farming is among the major sources of income and employment to many rural people. Employment ranges from casual work in the farm to white collar jobs in the tea factories. Therefore, tea has a major export crop holds the potential of improving small-scale farmers' living standards. It is estimated that 3 million people or ten percent of Kenyan population make a living through tea (Wal, 2008).

Previous studies conducted in tea growing areas portray a gloomy picture with a large portion of people living below the poverty line. The Central Bureau of Statistics, 2005, reported cases of people living below rural poverty line (daily incomes of equivalent to 1US\$/day) to average at 50.3% of those living in tea growing areas. An improvement in the household income in rural Kenya would improve food security. This is due to the fact that households rely on income from tea sales to buy food for their families (Nyangito, 1999).

Unlike other crops grown in Kenya, tea marketing has been the exclusive role of KTDA. This was provided by the KTDA order under agricultural act (cap 318) laws of Kenya. Despite the success of smallholder tea sub-sector, problems started to emerge in the late 1980s due to government interventions and KTDA's institutional organization (Nyangito, 1999). The belief behind the introduction of structural adjustment programs was that if the government freed market channels and prices, private processors would automatically bid up formally depressed agricultural prices (Chepngenoh et al., 2010).

Furthermore, the limited ownership and decision making by smallholders on processing, marketing and distribution of profits at the factory levels failed to provide incentives to produce quality tea and reduce operational inefficiencies in tea collection and processing. The liberalization process implemented in 1999 had the sole aim of removing constraints to the industry's growth. Through the process, the government withdrew from controlling services such as extension, processing and marketing to allow private sector to take over, restructured KTDA to a private entity (Kenya Tea Development Agency) and removed restrictions on foreign exchange to allow exporters to keep earnings in foreign currency (Nyangito, 1999).

Although K.T.D.A still dominates the provision of services to smallholder farmers, a parallel system has emerged where farmers sell green leaf directly to private companies or middlemen for immediate payments. In this system there are no other contractual arrangements between farmers and green leaf tea buyers in the provision of services except for sale agreement and if this practice is encouraged it is likely to lead to low tea production as a result of lack of inputs and services to smallholder farmers (Nyangito, 1999). Prior to smallholder tea sector liberalization in 2000, all smallholders sold their tea leaf through Kenya Tea Development Authority (KTDA). The liberalization of the smallholder tea sector led to the emergence of new marketing channels. This implies that smallholder farmer now has a choice of market outlet to deliver his or her green leaf.

The performance as well as the benefits of these new marketing systems remains unclear (Nyangito, 1999). Smallholder tea farmers in Kericho district have a number of marketing channels available when selling their green leaf tea. Typically these include selling to KTDA managed factories, private processors or middlemen. Farmers can choose to sell all or proportion of their produce through any one of these channels. Farmers have been inconsistent in the use of a particular market outlet; this has not only resulted in the variability of returns but also under-utilization of factory capacity. Some farmers continue to sell their tea leaf through KTDA, others sell to private processors and some use both systems. In addition to these formal outlets, there are informal outlets which include tea hawking. These compose of middlemen who buy green leaf from farmers and resell it to formal outlets. However the legality of this marketing channel is not clear. In general the farmer first decides to participate in the marketing channel when it's profitable to do so and then decides how much to sell and to which channel. Structural changes in green leaf marketing system have taken place after liberalization. However a number of issues with respect to green leaf marketing are not clear. For instance little is known about the nature of tea marketing in post liberalization era in Kericho district.

Sharma et al. (2007), found that market access is not uniform across different categories of household because households may face different transaction cost to market participation, risks associated with price and contract arrangement, human capital (age, education, gender, training) and financial capital. . The choice of marketing channel to use by the producer at any time is dependent on several factors. The study, therefore, endeavors to identify the factors affecting tea producer's participation in the market and particularly the choice of marketing channel to use.

## **2.0 Material and methods**

### **2.1 The study area**

Kericho District occupies a total of 2,110 sq. km. Out of the total land area, 90% is cultivable land. The District has seven divisions namely Ainamoi, Belgut, Sigowet, Soin, Chilchila, Londiani and Kipkelion, which are further divided into 49 locations and 170 sub-locations. The District has three parliamentary constituencies namely; Belgut, Ainamoi and Kipkelion (Kericho District strategic plan). The mean annual rainfall varies from 1400mm-1800mm. The population of the district increased from 366,913 in 1989 to 468,493 in 1999, giving an absolute increase of 27.7% and a growth rate of 2.4% per annum over the intercensal period. The district has a population of approximately 785,339 people (2009, census). The district had a total labour force of 261,708 in year 2002. Majority of the labour force are males. About 48% of the labour force has attained over 8 years of formal education while 30% works for pay while the rest are either unemployed or are unpaid workers in family business. The income from the district is basically derived from the sale of agricultural products such as tea, Irish potatoes, maize, beans and milk products.

### **2.2 Sampling procedure**

The target population of the study was smallholder tea farmers. Multistage sampling procedure was used in the study. First step involved purposive selection of the two divisions (Belgut and Ainamoi) among the seven divisions in the district. Belgut and Ainamoi are the main tea growing divisions. Locations were selected randomly using

simple random sampling. Key informers along the green leaf marketing chain were used which resulted in a sample of 155 farmers.

### 2.3 Analysis framework.

The producers' market channel choice can be conceptualized using a random utility model (RUM). The model is particularly appropriate for modeling discrete choice decisions such as market channel choices. It's an indirect utility function where an individual with specific characteristics associates an average utility level with each alternative channel in a choice set. The decision on whether to participate or not to participate in green leaf tea marketing channel is based on the general theory of utility framework. We assume that a huge potential for green leaf tea markets exists and that farmers exploiting this opportunity will be well-off in terms of welfare as indicated by their income status. We also assume that the decision to participate in tea marketing channel is predicted to be higher in anticipation of higher expected utility than not participating.

An interaction of these two decisions will be reflected on the welfare status subsequently. The decision on whether or not to participate in green leaf tea markets is considered under the general framework of utility (Norris and Batie 1987; Pryanishnikov and Katarina 2003). Within this framework, smallholder tea farmers will decide to participate in markets if the perceived utility or net benefit from this choice is significantly greater than is the case without it. Although utility is immeasurable and cannot be observed directly, the actions of tea farmers are observed through the choices they make. Suppose that  $U_j$  and  $U_k$  represent a farmer's utility for two choices, which are denoted by  $Y_j$  and  $Y_k$  respectively. The linear random utility model could then be specified as:

$$U_j = \beta_j X_i + \varepsilon_j \text{ and } U_k = \beta_k X_i + \varepsilon_k \dots\dots\dots (1)$$

where  $U_j$  and  $U_k$  are perceived utilities of participating in tea market and not participating, choices  $j$  and  $k$ , respectively,  $X_i$  is the vector of explanatory variables that influence the perceived desirability of each choice and  $\varepsilon_j$  and  $\varepsilon_k$  are error terms assumed to be independently and identically distributed (Greene, 2000). In the case of green leaf tea market, if a farmer's decides to use option  $j$ , it follows that the perceived utility or benefit from option  $j$  is greater than the utility from other options (say  $k$ ). This can be illustrated as:

$$U_{ij} (\beta_j X_i + \varepsilon_j) > U_{ik} (\beta_k X_i + \varepsilon_k), k \neq j \forall i \dots\dots\dots (2)$$

The probability that a farmer will choose to participate in tea market channel choice, i.e. choose option  $j$  instead of  $k$  could then be defined as:

$$\begin{aligned} P(Y = j | X) &= P(U_{ij} > U_{ik}) \\ P(\beta_j X_i + \varepsilon_j - \beta_k X_i - \varepsilon_k > 0 | X) \\ P(\beta_j X_i - \beta_k X_i + \varepsilon_j - \varepsilon_k > 0 | X) \\ P(X^* X_i + e^* > 0 | X) &= F(\beta^* X_i) \dots\dots\dots (3) \end{aligned}$$

Where  $P$  is a probability function, and  $X_i$  are as defined above,  $\varepsilon^* = \varepsilon_j - \varepsilon_k$  is a random disturbance term,  $\beta^* = (\beta_j - \beta_k)$  is a vector of unknown parameters that can be interpreted as a net influence of the vector of independent variables influencing participation, and  $F(\beta^* X_i)$  is a cumulative distribution function of  $\varepsilon^*$  evaluated at  $\beta^* X_i$ . The exact distribution of  $F$  depends on the distribution of the random disturbance term,  $\varepsilon^*$ . Depending on the assumed distribution that the random disturbance term follows, several qualitative choice models can be estimated (Greene, 2000). Any household/farmer decision on the alternative choices is underpinned by this theoretical framework.

The data was collected from the respondents through face-to-face interview using a semi-structured and pre-tested questionnaire. A semi-structured questionnaire was used to collect primary data in the selected households. The questionnaires were completed through schedules with the household heads or in his/her absence the most senior member or the member of the household responsible for the farm. Observation method also played a critical role in data collection. Data from the field was edited, coded, entered into a computer and cleaned to ensure accuracy, consistency and uniformity. Both SPSS and STATA computer programs were used to process the data.

To address objective 2 and 3 Heckman two stage model was used to assess the factors influencing marketing channel choice and sales volume decision. The farmer's choice of a particular channel was modeled in a logical sequence starting with decision to participate in a particular marketing channel then followed by intensity of participation. The marketing channel choice decision is build on the random utility model. A farmer would participate in a marketing channel that would yield higher utility than other channels. The first decision, which forms the first step of the model, was estimated using probit as follows:

$$\Pr(Z_i = 1 | w_i, \alpha) = \Phi(h(w_i, \alpha)) + \varepsilon_i \dots\dots\dots (4)$$

Where  $Z_i$  is an indicator variable equal to unity for smallholder tea farmers that participates in the marketing channel,  $\Phi$  is the standard normal cumulative distribution function, the  $w_i$  is a vector of factors affecting the decision to choose a marketing channel, the  $\alpha$  is a vector of coefficients to be estimated, and  $\varepsilon_i$  is the error term assumed to be distributed normally with a mean of zero and a variance  $\sigma^2$ . The variable  $Z_i$  takes the value of 1 if the marginal utility the household  $i$  gets from participating in marketing channel is greater than zero, and zero otherwise. From equation 1 we have

$$Z_i^* = \alpha w_i + u_i \dots\dots\dots (5)$$

Where  $Z_i^*$  is the latent level of utility the smallholder tea farmers gets from participating in the marketing channel,  $u_i \sim N(0,1)$  and,

$$Z_i = 1 \text{ if } Z_i^* > 0 \dots\dots\dots (6)$$

$$Z_i = 0 \text{ if } Z_i^* \leq 0 \dots\dots\dots (7)$$

In the second step, an additional regressor in the sales equation was included to correct for potential selection bias. This regressor is Inverse Mills Ratio (IMR). IMR is computed as:

$$\lambda = \frac{\phi(h(w_i, \vec{\delta}))}{\Phi(w_i, \vec{\delta})} \dots\dots\dots (8)$$

Where  $\phi$  is the normal probability density function. The second-stage or sales equation is given by:

$$E(Y_i | Z = 1) = f(x_i, \beta) + \gamma \frac{\phi(h(w_i, \vec{\delta}))}{\Phi(w_i, \vec{\delta})} \dots\dots\dots (9)$$

Where  $E$  is the expectation operator,  $Y$  is the (continuous) sales volume, or the quantity of tea leaf sold,  $x$  is a vector of independent variables affecting the quantity of tea leaf sold, and  $\beta$  is the vector of the corresponding coefficients to be estimated.

So  $Y_i$  can be expressed as following:

$$Y_i^* = \beta'x_i + \gamma \lambda_i + u_i \dots\dots\dots (10)$$

Where  $u_i \sim N(0, \sigma_u)$

$Y_i^*$  is only observed for those farmers tea farmers who participates in the marketing channel ( $Z_i = 1$ ), in which case  $Y_i = Y_i^*$ .

The model can thus be estimated as follows; in the first step of deciding whether to participate in a marketing channel or not. This can be specified as:

$$P_{(0,1)} = \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \dots\dots\dots \beta_n X_n + e \dots\dots\dots (11)$$

Where participation is denoted by 1 and non participation is denoted by 0,  $\beta_0$  is a constant,  $\beta_1, \dots, \beta_n$  are parameters to be estimated.  $X_{is}$  are vector of explanatory variables.

The Second step which involves a decision on the level of sales was estimated by use of an OLS as follows;

$$Y = \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \dots\dots\dots \beta_n X_n + e \dots\dots\dots (12)$$

Where  $Y$  denotes the sales intensity, measured by the proportion of marketed tea leaf. The other variables on the right hand side are as described above.

### 3.0 Results and discussion

**Table 1: Categorical Socio-economic and Institutional characteristics of the household heads in Kericho District**

| Characteristics  | Category                | NON-   |        | Overall | Chi-sq | Sig          |
|------------------|-------------------------|--------|--------|---------|--------|--------------|
|                  |                         | KTDA % | KTDA % |         |        |              |
| Education        | None                    | 5.6    | 0      | 3.2     | 15.146 | 0.004**<br>* |
|                  | Primary                 | 55.6   | 33.8   | 46.5    |        |              |
|                  | Secondary               | 36.7   | 56.9   | 45.2    |        |              |
|                  | College                 | 0      | 3.1    | 1.3     |        |              |
|                  | University              | 2.2    | 6.2    | 3.9     |        |              |
|                  | Total                   | 58.06  | 41.94  | 100     |        |              |
| Occupation       | Farming only            | 91.1   | 76.9   | 85.2    | 7.695  | 0.021**      |
|                  | Farming with business   | 5.6    | 7.7    | 6.5     |        |              |
|                  | Farming with employment | 3.3    | 15.4   | 8.4     |        |              |
|                  | Total                   | 58.06  | 41.94  | 100     |        |              |
| Gender           | Male                    | 77.8   | 69.2   | 25.8    | 1.44   | 0.230        |
|                  | Female                  | 22.2   | 30.8   | 74.2    |        |              |
|                  | Total                   | 58.06  | 41.94  | 100     |        |              |
| GroupMembershi P | Member                  | 97.8   | 87.7   | 93.5    | 6.361  | 0.012**      |
|                  | Non-member              | 2.2    | 12.3   | 6.5     |        |              |
|                  | Total                   | 58.06  | 41.94  | 100     |        |              |

\* indicates significant at 10%; \*\* significant at 5% and \*\*\* significant at 1%

In order to identify the characteristic of the farmers and their activities in Kericho District, a comparison of the farmers using KTDA and non- KTDA marketing channels was made. The demographic characteristics which include the age of the household head, the gender of the household decision maker, education level, farming experience, household size are presented in Table 1. These aspects are important because the main household activities are coordinated by the household head and the head's decisions are most likely to be influenced by these demographic aspects (Makhura, 2001).

From table 1 in terms of education 5.6% of KTDA farmers did not attend school, while 55.6% went to primary school, 36.7% went to secondary school and only 2.2% went up to university level. Among non-KTDA farmers 33.8% went to primary school while 56.9%, 3.1% and 6.2% went to secondary, college and University respectively. The chi square test shows that education level was statistically significant at 1%. This implies that KTDA farmers were more educated than non-KTDA farmers.

In terms of occupation, majority were primarily farmers. Among the KTDA farmers 91.1% were primarily farmers while 5.6% were engaged in farming with business and another 3.3% did farming with employment. 76.9% of non-KTDA farmers were farmers only while 7.7% and 15.4% were farmers with business and employment respectively. The result of the chi square shows that occupation was statistically significant at 5%.

In terms of gender 77.8% of KTDA farmers were male while 22.2% were female. Among the non-KTDA farmers 69.2% and 30.8% were male and female respectively. Chi square test showed that gender was statistically insignificant. African women are marginalized and have lower access to critical recourses such as land. The inherent inequalities in resource ownership between men and women diminish female farmer's ability to participate in a marketing channel.

In terms of group membership 97.8% of KTDA farmers were members of a farmer group while 2.2% were non-members. While among non-KTDA farmers 87.7% were members of a farmer group, 1.23% were non-group members. The results of the chi square showed group membership was statistically significant at 5%. This shows that more of the KTDA farmers belong to farmer group organizations than non-KTDA farmers. Membership in an organization is considered a proxy for information access. It is expected that members are more likely to participate in a marketing channel and have increased supply intensity.

### 3.1 Socio-economic characteristics of the KTDA and non-KTDA farmers in Kericho District

The mean age of KTDA farmers was approximately 47 years while that of non-KTDA was approximately 45 years. The results in table 2 show that there is no significant difference in terms of age between KTDA and non-KTDA farmers. This means that both groups of farmers have almost similar number of years in term of age. Most of the farms are managed by mature personnel. According to Owuor (2005), most of the parents are unwilling to subdivide to their children pieces of tea holdings. This creates less incentive for the youngsters to work on tea farms. Age of the household head is an important aspect in agriculture because it determines experience one has in farming. In addition household heads age influence the decision making process.

In terms of education, the mean number of education was approximately 9 years for KTDA farmers while that of non-KTDA was approximately 11 years. The two-tailed result was significant at 1 percent, indicating that non-KTDA farmers were more educated than KTDA farmers. The highest level of education level determine the human capital level of the household and the ability to interpret information. Furthermore, investment in education can be seen as a strategy to improve agricultural productivity.

In terms of the farming years the mean number of farming year for KTDA farmers was approximately 16 years while that of non-KTDA was approximately 14 years. The KTDA are not different to non-KTDA farmers with respect to farming years with a p-value of 0.134 showing that there is no significant between the two groups in terms of the farming years.

**Table 2: Summary of continuous socio-economic characteristics of the KTDA and non-KTDA farmers in Kericho District**

| Variable                | Mean      |          | Overall | t-ratio | Sig      |
|-------------------------|-----------|----------|---------|---------|----------|
|                         | KTDA      | NON-KTDA |         |         |          |
| Age                     | 47.20     | 45.35    | 46.63   | -1.096  | 0.275    |
| Education(Years)        | 8.82      | 10.73    | 9.63    | 3.822   | 0.000*** |
| Household Size(Numbers) | 5.62      | 5.03     | 5.37    | -2.321  | 0.022**  |
| Experience(Years)       | 15.78     | 13.95    | 15.01   | -1.506  | 0.134    |
| Farm Size(Ha)           | 1.79      | 1.5      | 1.67    | -2.358  | 0.020**  |
| Non-tea Income(KES)     | 151403.56 | 157904.6 | 154130  | 0.447   | 0.655    |
| Size of land tea(Ha)    | 0.57      | 0.46     | 0.52    | -2.117  | 0.036**  |
| Distance(Km)            | 1.57      | 1.22     | 1.42    | -2.563  | 0.011**  |

\* indicates significant at 10%; \*\* significant at 5% and \*\*\* significant at 1%

The mean household size of KTDA farmers was approximately 6 members while that of non-KTDA is



approximately 5 members. Two-tailed test results shows that household size was statistically significant at 5 percent. Household size is an indicator of family labor availability. Household size is an important determinant of farmer's participation in tea markets. Household labor is critical especially during time sensitive activities such as tea plucking whereby untimely plucking may result in substantial loss.

On the land size under tea, results indicate KTDA farmers had 1.79 Ha of land while non-KTDA had 1.5 Ha. Results of two-tailed test showed that farm size was statistically significant at 5 percent. Relative large farm size may be an indication of high output if all other are favorable and hence farmers are expected to have relatively high returns at the end of the farming season.

### 3.2 Results of Heckman-two step procedure

To identify the socio-economic and institutional factors affecting a farmer's decision to participate in a marketing channel, a probit model was estimated (Heckman selection equation). The results are presented in Table 3. The table shows the estimated coefficients (values), marginal effects and the standard error of the independent variable in the model. The coefficient values measure the expected change in the probit for a unit change in each independent variable, all other independent variables held constant (Gujarati, 2007). The sign of the coefficient shows the direction of influence of the variable on the probit, meaning that a positive value indicates an increase in the likelihood that a household will participate in the marketing channel used. A negative value indicates that the household is less likely in the marketing channel. Five variables age, gender, education, farm years and Bonus (second payment) were found to significantly affect a farmer's decision to participate in a marketing channel.

The age of the household head was found to be statistically significant at 10 percent and this had a positive impact on the decision to participate in a marketing channel. A change in the age of the household age by 1 unit increases the probability of participation by 0.0305. Older farmers were more likely to sell to KTDA than younger farmers. This is expected because younger farmers are more receptive to new ideas and are less risk averse (Barret et.al, 2007). According to Arega et.al. (2007), market participation declines with age. These indicate the characteristic of older farmers such as reluctance to adopt new technology, risk aversion and long trust with the buyer that would enable them to trade at lower transaction costs.

The gender of the household head significantly and positively affected the participation in a KTDA marketing channel with a marginal effect of 0.4327. Gender represents differences in market orientation between male and female heads of households. A study by Reyes et al., (2012) revealed that male-headed household was richer than their counterparts. They concluded that male headed household was more likely to sell potatoes, owning productive assets and have access to extension services.

The education level in years was found to be statistically and negatively influence the participation in a KTDA marketing channel. It was statistically significant at 10 percent with a marginal effect of -0.1059. The interpretation of this is that a 1 percent increase in education years decreases the decision to participate in KTDA marketing channel by 0.1059 percent. Education levels affect the interpretation of market information and hence influence the level of participation (Jari, 2009). It's assumed to enhance the farmer's ability to access and process information.

Farming years which is a proxy of farming experience was also found to be significant at 5 percent and had a negative effect on the decision to participate in a KTDA marketing channel. A 1 percent increase in farming years decreases the decision to participate in a KTDA marketing channel by 0.0698. Relative long years of farming is likely to expose tea farmers to experience in tea farming and marketing activities.

**Table 3: Empirical results of the determinants of participation**

| Variable          | dy/dx   | Coeff   | Std. Err. | z     | P> z     |
|-------------------|---------|---------|-----------|-------|----------|
| Age               | 0.0305  | 0.0991  | 0.0159    | 1.92  | 0.055*   |
| Gender            | 0.4327  | 2.2196  | 0.2362    | 1.83  | 0.067*   |
| Education Years   | -0.1059 | -0.3439 | 0.0598    | -1.77 | 0.077*   |
| Farming years     | -0.0698 | -0.2266 | 0.0347    | -2.01 | 0.044**  |
| Bonus             | 0.0845  | 0.2744  | 0.0230    | 3.67  | 0.000*** |
| Collective action | 0.2071  | 0.9981  | 0.2141    | 0.97  | 0.333    |
| Number visits     | 0.1336  | 0.4337  | 0.0850    | 1.57  | 0.116    |
| Mills lambda      | 1.4158  | 0.7705  | 1.84      |       | 0.066*   |
| Rho               | 1.000   |         |           |       |          |
| Sigma             | 1.4158  |         |           |       |          |

\* indicates significant at 10%; \*\* significant at 5% and \*\*\* significant at 1%

Tea price is a significant determinant in tea marketing channel. The second payment (Bonus) was significant at 1 percent and positively influences the decision to participate in a KTDA marketing channel. The interpretation is that on average an additional Kenyan shilling increases the propensity to participate by 8.45 percent. This was as expected because economic theory suggests that higher prices are incentive to the producer to sell the produce to that marketing channel because it will determine the profitability of the farm enterprise. Price

increases incentive to participate.

### 3.3 Factors affecting the intensity of participation in KTDA marketing channel

**Table 4: Intensity of participation**

| Variable          | Coef.   | Std. Err. | z     | P> z     |
|-------------------|---------|-----------|-------|----------|
| Age years         | 0.0716  | 0.0203    | 3.53  | 0.000*** |
| Gender            | 0.3644  | 0.4716    | 0.77  | 0.440    |
| Education Years   | 0.0616  | 0.0689    | 0.90  | 0.371    |
| Farming years     | -0.0628 | 0.0358    | -1.76 | 0.079*   |
| Tittle deed       | -0.1963 | 0.3405    | -0.58 | 0.564    |
| Size Land Tea Ha  | -0.5917 | 1.3445    | -0.44 | 0.660    |
| Collective Action | 1.2089  | 0.9654    | 1.25  | 0.210    |
| Tea production    | 0.0001  | 0.0000    | 1.96  | 0.050*   |
| Bonus             | 0.2164  | 0.0355    | 6.10  | 0.000*** |

\* indicates significant at 10%; \*\* significant at 5% and \*\*\* significant at 1%

Age significantly and positively influence the extent of participation in KTDA marketing channel. Older household heads sell more tea to KTDA marketing channel than younger household heads. This result may imply that older farmers prefer KTDA because of the long trust they have built with the buyer.

Tea production significantly influences the extent of participation in KTDA channel at 10 percent. A positive relationship was found between KTDA channel and the amount of green tea leaf sold. This implies that the more the amount of green leaf sold the more a farmer was more likely to sell to KTDA channel. Tsourgiannis *et.al.* (2002) found that the volume of milk produced was highly significant in determining marketing channel choice and farmers that preferred to market their milk produce to big dairies were large scale milk and livestock producers.

Farming years which is a proxy of farming experience was also found to be significant at 10 percent and had a negative effect on intensity of participation in a KTDA marketing channel. A 1 percent increase in farming years decreases the degree of participation in KTDA marketing channel by 0.0628. This may be attributed to experience gained in tea farming and marketing activities due to long years of farming.

The second payment (Bonus) was significant at 1 percent and positively influenced the extent of participation in a KTDA marketing channel. On average an additional Kenyan shilling increased the extent of participation by 3.55 percent. This was as expected because economic theory suggests that higher prices are incentive to the producer to sell the produce to that marketing channel because it will determine the profitability of the farm enterprise.

## 4.0 CONCLUSION AND RECOMMENDATION

### 4.1 Conclusion

Tea farm households use different marketing channels to sell their tea, although the amount of tea sold and reason for selling to each channel differs. According to this study two marketing channels were identified from the survey results, that is the KTDA and non-KTDA marketing channel. Tea farmers can choose to sell all, a portion or none through any one of these marketing outlets.

Delivering tea through KTDA marketing channel is the most patronized market outlet in the studied area. Many factors contribute to this scenario; KTDA pays second payment which commonly referred to the bonus, many farmers who have supplied tea through KTDA for many years opted to sell through KTDA market outlet because of long trust with the buyer. Different socio-economic characteristics of KTDA and non-KTDA farmers were determined. Factors like age, gender, tea farming years, education and second payment (bonus) positively affected marketing channel choice. Age was positively significant, it was evident from the study that older farmers were likely to sell to KTDA than younger farmers. This was expected because younger farmers are more receptive to new ideas. Education in years positively and significantly plays a major role in marketing channel choice. This can be explained by the fact that education enhances farmer's ability to access and process information. Education levels affect the interpretation of market information and hence influence the level of participation. Farming years (a proxy of experience) also plays a crucial role in marketing channel choice. This is because relative long years of farming expose tea farmers to experience in tea farming and marketing activities. Second payment (bonus) was significant in determining tea marketing channel. This was expected because economic theory suggests that higher prices are an incentive to the producer to sell the produce to that marketing channel because it will determine the profitability of the farm enterprise. Price also increases the incentive to participate.

Four factors were found to be significant in influencing the intensity of participation in a marketing channel. Age, farming years, tea production and second payment (bonus) had a positive influence on the intensity of participation (sales volume) in a chosen marketing channel

The majority of smallholders had a low level of education. Passing technical information through bulletins may not help them. The situation is likely to change with time because younger and better-educated farmers are

gradually replacing older farmers

#### 4.2 Recommendation

Based on the results majority of smallholders were primarily farmers, they did not have any other occupation apart from tea farming. This demonstrates that there is a need to put in place policies that ensure smallholder tea production and marketing is sustainable. A collapse in the tea sub-sector can lead to losing of livelihood and unemployment among many Kenyans. Price variable an important factor observed to influence both marketing channel choice and intensity of participation. This implies that with knowledge of prices farmers are more likely to participate in tea marketing and choose wisely on the appropriate channel. Tea price information, therefore, should be made available to farmers at all times.

#### 4.3 Further research

The study determines the factors affecting tea marketing channel choice and sales intensity among small-scale farmers so as to identify policies that are likely to improve income from tea and hence help in poverty reduction. However, the study recommends that studies need to be done to identify ways of reducing marketing costs in the marketing channel so as to improve the profitability of tea enterprise at the farm gate.

#### 5.0 Acknowledgement

I wish to acknowledge the support and guidance of my research supervisors Prof. Benjamin Mutai and Prof Lawrence Kibet. The Agricultural Economics department of Egerton University, and 2010 class students for their support and encouragement. I must also thank AERC for their financial support through CMAAE program. Last is to parents and siblings for being the source of my strength. The views expressed in this paper are those of the authors.

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