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CHARACTERISTICS OF SMALL HOLDER TEA FARMERS AND THERE EFFECT ON AGRICULTURAL VALUE CHAIN FINANCING IN KIAMBU COUNTY-KENYA

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Abstract

In Kenya, small holder farmer information levels and access to agricultural value chain financing is less than optimal. This study sought to investigate the effect of small holder tea farmer characteristics on the effectiveness of value chain financing in Kiambu County. Purpose of this study was to analyze the effect of borrowers' characteristics on credit access in the tea industry value chain financing in Kiambu County. A cross-sectional study with systematic sampling approach of 384 smallholder farmers who supplied tea to 6 KTDA factories was conducted. 234 (66%) males and 120 (34//%) females were interviewed. 6% respondents were below 30 years, 31% between 31-40 years, 38% between 41-50 years, 17% between 51-60 years and 8% for 60 and above years. (86%) of the respondents were married, 10% were single while 4% were divorced. Fourteen percent (14%) of the study participants had been planting tea for less than 5 years when the data was collected, 25% had been tea farmers for between 5-10 years while

61% of all respondents had planted tea for more than 10 years. The mean number of years the respondents had been planting tea was 12.5 years (SD 6.3 years) whilst the mean acreage per farmer was 2 acres (SD 0.66 acres). Age group 41-50 years (OR =6.6, 95% CI 2.25-19.29, p=0.001) and age group 51-60 years (OR =6.6, 95% CI 2.33-18.49, p<0.001) were 6.6 times more likely to receive loans compared to individuals below the age of 40 years and those above 60 years. Individuals who had no education at all had a 27% higher chance of their loan requests being declined compared to the other levels of education (OR =0.27, 95% CI 0.08-0.93, p=0.038). Individuals with land less than 1 acre had a marginal 23% chance of their loan requests being declined compared to those who had more than 1 acre (OR =0.23, 95% CI 0.051-0.997, p=0.050) and individuals in formal employment had a 13% higher chance of getting credit facilities compared to those who did tea farming (OR 0.13, 95% CI 0.026-0.631, p=0.012). The study concluded that farmer age, education level, acreage and primary source of income were associated with the success of credit application processes

Keywords: Tea Farming, Small Holder Farmer, Farmer Characteristics, Value Chain, Value Chain Financing, Credit Access, Kiambu County - Kenya

INTRODUCTION

Tea is the World's second most popular and lowest cost beverage drink with over three billion cups consumed worldwide (SSI, 2014). In 2010, 1.7 million tonnes (43%) of the 3.9 million tonnes of tea were produced globally (EPC Kenya) and traded on the international market (Bordoloi, 2012). China (36%), India (25%), Kenya (10%), Sri Lanka (8%) and Turkey (5%) account for over 75% of global production and 71 % of global export (EPC Kenya, 2015; Bordoloi, 2012). Kenya is the biggest producer of standard-compliant tea, contributing 40% (compared to India (18%), Malawi (9%), Indonesia (8%), and China (6%)) by volume (SSI, 2014) and the leading global exporter of black tea (World Bank, 2013). As the 2nd largest contributor to the Gross Domestic Product (GDP) with 24%, agriculture is the mainstay of the Kenyan economy.

Tea outputs contribute 11% of the 25% the agriculture sector contributes to the Gross Domestic Product (GDP) (Government of Kenya, 2013). Additionally, the industry supports directly and indirectly approximately 5 million people, making it a major source of income for many households in Kenya (Tea Board of Kenya, 2014; Pelrine, 2009). However, although the agricultural sector is the biggest contributor to Kenya's GDP, private credit to the sector is minimal compared to other sectors (Central Bank of Kenya, 2013). Over 60 percent of Kenyan tea is produced by smallholder farmers (FAO, 2013), faced with credit constraints since the

majority have no collateral to support loan application (Government of Kenya, 2010). In Kenya, 66% of the tea produced is grown in KTDA farms. KTDA has 550,000 smallholder tea farmers cultivating over 126,000 hectares of lands. These farmers supply tea to 66 factories owned by the 54 companies under KTDA Holdings Ltd. KTDA's largest buyer for tea destined for the international market is Unilever, one of the three biggest multinationals in the global tea market, and buys 30 percent of KTDA's annual production (KTDA, 2014).

Agricultural value chains are a good avenue to address the rapidly changing market requirements like increasing demand, diverse tastes and lifestyles, high international product standards, use of technology, financial engineering innovations and government policies (Webber and Labaste, 2010). Value chain finance refers to financial products and services that flow to or through any point in a value chain that enable investments that increase actors' returns and the growth and competitiveness of the chain (USAID, 2007; Micro Links, 2010). The Food and Agriculture Organization (FAO), states that value chain finance is a comprehensive approach that analyzes linkages within it, borrowers and financial flow (FAO, 2015).Well-organized, sustainable, tailor-made and accessible rural agricultural financial system remains a developmental challenge in all agricultural sub-sectors (Kalunda, 2014; Nyikal, 2007). The World Bank (2008) reported that financial needs of tea farmers are still unmet and tea production remains way below its optimal levels

RESEARCH METHOD

Study Site

The study was conducted in Kiambu County-located in the central region of Kenya. The County's climate is such that long rains occur between March and May followed by a wet and cold season between June and August then short rains between October and November. The average rainfall received by the county is 1,200 mm per annum. The mean temperature is 26^0C with a range of 7^0C in the upper highlands to 34^0C in the lower midlands. Informed consent for study participation was obtained from respondents who were residents of Kiambu County, practicing tea farming on small scale and not registered as a company. Ethical approval for the study was obtained from the United States International University - Chandaria School of Business.

Sampling

A systematic random sampling approach was used. The 10th eligible farmer who supplied tea to the 6 KTDA listed factories in Kiambu was sampled. In cases where the 10th respondent did not meet the inclusion criteria or declined to participate, the next respondent meeting the inclusion

criteria was selected and the 10th respondent interval restored. Table 1 shows an average 25 respondents per factory were sampled (range of 23 to 27) to generate a sample size of 384 respondents.

Table 1: KTDA managed Factories and Sample Size

KTDA Factories	Number of Respondents
1. Kambaa	61
2. Kagwe	85
3. Theta	70
4. Kuri	45
5. Gachege	56
6. Mataara	67
Total	**384**

Statistical Analysis

In order to establish small holder tea farmer profiles and how their characteristics affected loan application outcomes, descriptive analysis was conducted. Positive loan outcomes and small holder farmer characteristics were compared by Chi^2 testing. Logistic regression was conducted to compare odds of a positive loan application outcome and specific small holder farmer characteristics. Data were analyzed using SPSS Version 22 (Armonk, NY: IBM Corp. USA).

ANALYSIS AND RESULTS

Farmer Characteristics

A total of 354 individuals were interviewed in this study: 234 (66%) males and 120 (34%) females. At the time of the study, 5% of the respondents said that they did not have any form of education, 26% and 44% said they had completed primary and secondary education respectively. 20% and 3% had a certificate/diploma and undergraduate degree respectively while 2% were in possession of a post graduate degree.

The age distribution of the respondents was: 6% below 30 years, 31% between 31-40 years, 38% between 41-50 years, 17% between 51-60 years and 8% for 60 and above years. A majority of the respondents (86%) were married, 10% were single while 4% were separated or divorced. The median number of children per respondent (for those who had children) was 3 (inter quartile range 2-5 years). Fourteen percent (14%) of the study participants had been planting tea for less than 5 years when the data was collected, 25% had been tea farmers for between 5-10 years while 61% of all respondents had planted tea for more than 10 years. The mean number of years the respondents had been planting tea was 12.5 years (SD 6.3 years) whilst the mean acreage per farmer was 2 acres (SD 0.66 acres).

91% respondents lived in their own personal houses while the remainder (9%) lived in a rented house. 30% respondents lived in their own personal houses reported staying in a permanent house, 43% reported staying in a semi-permanent house while 27% said they lived in mud/timber walled structures. A vast majority of the respondents (88%) cited tea as their main source of income while 11% and 1% listed formal employment and coffee as their main sources of income. 82% owned the land in which they were using for farming while 18% had either leased it or were temporarily using the land in which they carried out farming at the time of the study. At the time of the study, 77% said that they had taken a loan for farming purposes while 23% had never taken a loan. The median amount of loan taken was 114746.38 (IQR KES 0 – KES 5,000,000).

Farmer Characteristics and Loan Outcomes

Results in Table 2 shows that there was no statistical association between sex (males and females) and whether an individual got a credit/loan facility. However, there existed a statistically significance association between a respondent's age and the likelihood of an individual having received a loan (χ^2= 19.413, d.f =1, p=0.001). Similarly, a respondent's level of education was significantly associated with likelihood of obtaining credit facilities (χ^2= 16.186, d.f =5, p=0.006).

Neither the respondents' marital status nor the years they had planted tea were statistically related to their increased or diminished chances of getting a lone. Even though there doesn't exist a relationship between getting a loan and owning land, the analysis results show that the average acreage owned by a borrower was a factor associated with the likelihood of receiving credit facility (χ^2= 6.659, d.f =2, p=0.036). A significant relationship also exists between the source of income and the prospects of getting a credit facility (χ^2= 22.475, d.f =2, p < 0.001).

Table 2: Chi Square tests for loan outcome and farmer characteristic

Predictor variable	**Outcome variable: Ever received credit facility? Frequency (%)**		**D.F**	**Chi-Square.**	**P-values (95% CI).**
	Yes	No			
A. Sex of respondents					
Male	158 (86)	25 (14)	1	2.108	0.165
Female	74 (80)	19 (20)			
B. Age of respondents					
21-30 years	11 (69)	5 (31)	4	19.413	0.001
31-40 years	77 (90)	9 (10)			
41-50 years	94 (90)	11 (10)			
51-60 years	36 (78)	10 (22)			
Above 60 years	13 (56)	10 (44)			

Table 2...

C. Education level					
None	7 (50)	7 (50)	5	16.186	0.006
Primary	63 (88)	9 (12)			
Secondary	107 (88)	15 (12)			
Certificate/Diploma	44 (79)	12 (21)			
Undergraduate	6 (86)	1 (14)*			
Post graduate	5 (100)*	0 (0)*			
D. Marital status					
Single	23 (82)	5 (18)	2	0.100	0.951
Married	199 (84)	38 (16)			
Separated/Divorced	9 (82)	2 (18)*			
E. Years of growing tea					
Less than 5 years	27 (71)	11 (29)	2	5.611	0.060
5-10 years	60 (87)	9 (13)			
More than 10 years	145 (86)	24 (14)			
F. Acreage owned by borrower					
Less than 1 acre	87 (88)	12 (12)	2	6.659	0.036
1-3 acres	112 (79)	30 (21)			
More than 3 acres	30 (86)	5 (14)			
G. Source of income					
Employment	17 (55)	14 (45)	2	22.475	<0.001
Tea farming	213 (88)	30 (12)			
Coffee farming	2 (100)	0 (0)*			
H. Own land on which farming is done					
Yes	189 (83)	38 (17)	1	0.608	0.523
No	34 (89)	11 (92)			

* Cells have values less than 5 hence not included in computation

Odds of Loan Outcomes and Specific Farmer Characteristics

Logistic regression was conducted to determine which specific age group were more likely to get credit facilities, holding for age group 21-30 years as reference, age group 41-50 years (OR =6.6, 95% CI 2.25-19.29, *p=0.001* where OR refers to the Odds Ratio, C.I is Confidence Interval and p is probability) and age group 51-60 years (OR =6.6, 95% CI 2.33-18.49, *p<0.001*) were 6.6 times more likely to receive loans compared to individuals below the age of 40 years and those above 60 years (Table 3).

While there was overall significant relationship between the level of education and obtaining credit facilities, logistic regression analysis show that in actual sense, individuals who had no education at all had a 27% higher chance of their loan requests being declined compared to the other levels of education (OR =0.27, 95% CI 0.08-0.93, *p=0.038*). Undergraduate and postgraduate individuals were used as reference as very few respondents had these levels of education.

Collectively, the acreage a farmer had was associated with the chances of securing credit facilities. However, individually, only those that had land less than 1 acre had a marginal 23% chance of their loan requests being declined compared to those who had more than 1 acre (OR =0.23, 95% CI 0.051-0.997, *p=0.050*). Lastly, individuals in formal employment had a 13%

higher chance of getting credit facilities compared to those who did tea farming (OR 0.13, 95% CI 0.026-0.631, *p*=0.012).

Table 3: Logistic regression tests for loan outcome and farmer characteristic

Variable	Levels	Exp(β)	95% CI for Exp(β)		P-value
			Lower	Upper	
Age	21-30 years	Ref	-	-	-
	31-40 years	2.308	0.569	9.359	0.242
	41-50 years	6.581	2.245	19.289	0.001
	51-60 years	6.573	2.337	18.492	<0.001
	Above 60 years	2.769	0.939	8.170	0.65
Education level	None	0.273	0.080	0.930	0.038
	Primary	1.783	0.139	2.563	0.312
	Secondary	1.909	0.741	4.917	0.180
	Certificate/Diploma	1.945	0.843	4.490	0.119
	Undergraduate	-	-	-	-
	Post graduate	Ref	-	-	-
Acreage	Less than 1 acre	0.226	0.051	0.997	0.050
	1-3 acres	0.439	0.093	2.069	0.298
	More than 3 acres	Ref	-	-	-
Source of income	Employed	0.128	0.026	0.631	0.012
	Tea farming	0.301	0.059	1.544	0.150
	Coffee farming	Ref	-	-	-

DISCUSSION

A quarter of global land under farming is in Africa yet it generates only 10% global crop output (UNDP, 2012), leading to inherent non-profitability since most African farmers are small holders with limited or no access to financial services, farm inputs, right knowledge and skills set to optimize their productivity and increase their earnings (Hazell *et al,* 2007).At the 3rd Agribanks Forum (2008) themed “Africa Agricultural Value Chain Financing”, and whose objective was “to enhance awareness on successful models and approaches for using the resources and linkages of the value chain to increase financial service provision and efficiency to rural producers, traders and agribusinesses”, Kimathi *et al* (2007), describe rural farming as characterized by higher transaction costs for both the financial institutions and farmers hence inadequate value chain finance, higher systemic risks, more volatile cash flows; as well as lower risk-bearing ability and higher vulnerability due to higher incidences as well wide spread and depth of poverty. At the forum, farmer characteristics and their effect on access to agricultural value chain financing. It was a good learning platform for farmers to know how their profile came into account during financing. Access to financial services for small holder farmers, while not a means to an end, plays a critical role in providing funds for farm investments in productivity,

smooth household cash flow, enable better access to markets and promote better management of production and post-harvest risks.

In the current study, the ratio of male to female respondents was 2:1 (66% males and 34% females) an indication that most small tea holder farming is done by males even though women form the majority of rural population. Similar respondent proportions were also found in the study of "economic efficiency of resource use among smallholder tea producers in selected counties of Kenya" by Kiprono (2013); 64% males and 36% females. Kiprono's study was done in Kiambu and Kericho counties. The median age of farmers in this study was 45 years (IQR 37-48 years), which compares with the mean age of 47 years in Kiprono's study, Meeme (2013) study on factors influencing access to formal credit by small scale women tea farmers in Kenya" and 48 years in a study of farmer organisations in small holder tea in Malawi (Chirwa & Kydd, 2005). Kiprono also cited Adeyemo *et al* (2010) as having 53% of respondents as being above 50 years in a study of economic efficiency of small scale farmers in Nigeria. This trend points to rural farming being a preserve for individuals who were just beyond their youth (age 35 years and below) and either approaching or in their retirement age (50 years and above). In this study, the most frequent age group was 41-50 years (38%) and 86% of the respondents were married. Pearson Chi Square tests show that while there was no relationship between sex & marital status and the outcome of loan applications, age group (p = 0.001) and education level (p = 0.006) were statistically associated with loan application outcome. Further logistic regression tests showed that individuals aged 41-50 years (p = 0.001) and 51-60 years (p < 0.001) had a 6 fold greater chance of having their loans successfully processed compared to those below 40 years and those above 60 years. On the contrary, even though there were no significant differences in loan application outcomes and all the levels of education (primary, secondary, certificate/diploma, undergraduate and post graduate), 27% of individuals who had no education at all were more likely to have their loan applications rejected compared to all the other levels of education. Unlike in the current study where 80% of women who applied for credit received approval, Ekasiba *et al* (2014) in their study of factors influencing the outcome of formal credit requests by small-scale rice farmers in Teso District, found that 66% of female applicants were likely to have unsuccessful loan applications meaning a skewed credit service process in favor of men. Other studies such as Dzadze (2012) while investigating the factors determining access to formal credit among smallholder farmers in Ghana, reported that the education level had significant positive influence on farmers' access to formal credit. The findings of Ekasiba *et al's* study also contrast the current findings that indicate marital status was not associated with successful loan applications; they found that married individuals held a significant likelihood of credit approvals than individuals not in any unions. Whilst this study's findings concur with that

of Ekasiba *et al* that age was significantly associated with the outcome of credit application, it differs with that study on the exact age group. This study lists 41-50 years and 51-60 years while Ekasiba *et al* list 30-39 years and 40-40 years implying that their study credit outcome was 10 years lesser than the current study.

Analysis results of the current study showed that there was a statistically significant relationship between the education level and the profitability of tea production implying that the education level affects both the loan outcome and subsequent productivity and profitability of tea production among smallholder farmers in Kiambu County. Hussein (2007) explained that the education level of farmers is important because it increases the information base and decision making abilities, including the ability to compare the advantages and disadvantages of various credit facilities and cash crop production technologies.

Well-organized, sustainable, tailor-made and accessible rural agricultural financial system remains a developmental challenge in all agricultural sub-sectors (Kalunda, 2014; Nyikal, 2007). The World Bank (2008) reported that financial needs of tea farmers are still unmet and tea production remains way below its optimal levels-regardless of how long some farmers may have been practicing agriculture. This study also established that there wasn't any relationship between the years the farmers had been growing tea with the outcome of their loan applications. However, Ekasiba *et al* (2014), found statistical association between reported experience among small holder rice farmers in Teso and success of their loan applications: with farmers who had more than 10 years of experience in rice cultivation more likely to be positively considered.

In the current study, individuals who had formal employment had a 13% higher chance of getting successful credit applications compared to those who did tea farming. These findings agree with that of Pearce (2003) who noted that access to formal credit was significantly linked to applicants' ability to repay their loans, an indicator measured by the borrower's average income.

In the current study, ownership of land was not associated with the successful outcome of loan application. This finding is contrary to that of Ekasiba *et al* (2014) which statistically associated the success of applications for credit by rice farmers to the type of land tenure: those rice farmers who owned land solely were 2.6 times more likely to have their applications successful than those farming on rented land. In the current study, there wasn't any difference in loan application outcome and the acreage for those who had between 1-3 acres and those who had more than 3 acres. However, individuals who had less than 1 acre were marginally disadvantaged with up to 23% of such farmers likely to have their credit requests turned down.

In their study, Ekasiba *et al* (2014) determined that rice farmers owning 2.5 to 2.9 acres of land were about 2.3 times more likely to have successful credit requests than those owning less than 1 acre of land. Implying that the size of land owned by farmers influences the chances of their credit requests being successful; thus, the larger the land size the greater the chances that credit requests will be successful.

CONCLUSIONS

There is need for financial institutions, serving smallholder tea farmers, to improve loan effectiveness and efficiency through customized financial services and products. There is need for increased education and training of smallholder farmers to equip them with the necessary information and expertise on agricultural value chain financing. A holistic capacity building approach of farmers will lead to improved productivity, increased adaptability in the face of climate change and market dynamics, and facilitates diversification of livelihoods to manage risks associated with the tea subsector. Government in conjunction with banks should develop tailored credit facilities that not only address the larger agricultural sector but those that are specific to small holder farmer needs like non-collateral based loans through signing agreements with tea factories to pay banks directly after tea processing while providing for a grace period before payment amongst other initiatives that would encourage smallholder credit uptake.

The current study does conclusively establish the factors that are associated with credit access. However, due to the unique nature of Kiambu County given its proximity to Nairobi city and the urban, semi-urban and rural inhabitants, it is not clear if the findings from the current study would hold true for other tea growing areas that are mostly inhabited by rural folks. The authors therefore recommend further investigation of the listed factors in other tea growing areas that are not similar to Kiambu like Kericho and Kapsabet to ascertain if their findings are consistent with those of the current study.

AUTHOR'S CONTRIBUTIONS

Musuva conceptualized and designed the study, conducted literature review, collected data and drafted the manuscript. Lewa and Achoki provided guidance on study design, reviewed the analysis and manuscript and provided key comments on manuscript revision. Luciani conducted cleaning of the data, data analysis and proof lead final manuscript. All authors read and approved the final manuscript.

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