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SOCIO-ECONOMIC AND CULTURAL FACTORS INFLUENCING FARMERS' GROUP PARTICIPATION FOR COMMERCIALIZATION OF APICULTURE AMONG SMALL HOLDER FARMERS IN HOMA BAY COUNTY, KENYA

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ABSTRACT

In Kenya, many government policies target apiculture farmer groups as the vehicle for agricultural development. However, it has been realised that there is low level of membership to these groups both at individual and household levels with a marked regional dimension for apiculture farmers. As a result, commercialization of apiculture remains a major challenge. The objective of this study was to identify socio-economic and cultural factors that influence group participation for commercialization of apiculture among small holder farmers. The study used survey method. Five farmer groups were purposely selected for focus group discussion to capture various determinants of group participation among the apiculture small holder farmers. Data were collected through face-to-face interview technique. Analysis involved both descriptive and inferential whereby Statistical Package for Social Science (SPSS) version 24 was used to process and analyse the collected data. Descriptive statistics including measures of central tendency such as frequencies, means and standard deviation were applied to the data. For inferential statistics t-test, chi-square and regression of the independent variables was used to test the rate of influence of independent variables on dependent variable. Results unveiled that for every unit increase of socio-economic and cultural factors leads to an increase in commercialization of apiculture through group participation among small holder farmers by 0.741 (β= 0.741) units and was statistically significant ($p=0.007$, $p< 0.05$). Therefore, household income, farm size, age and family size were the major socio-economic and cultural factors that are significant and strongly influence group participation for commercialization of apiculture. From the findings, socio-economic and cultural factors influence farmer group participation most hence they should be addressed appropriately to enhance commercialization of apiculture.

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INTRODUCTION

Apiculture is considered of great importance for food security of countries, not only for the direct taking of products such as honey, pollen or royal jelly (Sánchez and Vandame, 2012). Most relevance lies in the effect on pollination of commercial crops. FAO (2006) estimated that nearly 100 crop species that provide 90 percent of food supplies, 71 are pollinated by bees. Insect pollination is considered vital for the maintenance of natural ecosystems. It is associated with reforestation projects and used as bioindicators. Honey production is therefore considered as a natural resource-conserving

and environmentally friendly activity (Yirga and Teferi, 2010). The beekeeping sub-sector is also creating job opportunities in both rural and urban areas through organizing jobless urban and landless rural youth and women to involve in bee equipment production and beekeeping activities (Gemechis, 2015). Having realized all these benefits of apiculture, there is need to commercialize production of honey to meet the ever-increasing demands. Farmer group approach has been encouraged among the apiculture farmers as a joint investment to facilitate commercialization of honey production. It involves group of farmers or people with common interest, organized to promote the social welfare of its members. It offers social and economic solutions to most rural problems; the synergized effect of group activities and influence affords benefit that may not be individually feasible for most of the rural poor (Agbonlahor *et al.*, 2007). Adong *et al.* (2013) posits that farmer groups form a means of reaching small holder farmers by government, private sector, and the development partners with an objective of enhancing agricultural productivity and food security. In Kenya, the use of farmer groups plays an important role in enhancing agricultural production. This is through credit access among farmers, pulling of resources and opening market linkages. Kilpatrick and Bell (2001) studied executive link farmer groups and revealed that groups are widely regarded as highly effective in supporting fundamental changes to farm management practices. Furthermore, according to Fafchamps (2004) farmer groups initiating collective action results in commercial production and better market power among farmers.

Literature also suggests that when farmers are organized in groups, the efficiency of service delivery to the community improve (Adong *et al.*, 2013). Farmer groups have been formed to facilitate access to better agricultural technologies (Gibson *et al.*, 2007); to improve access to better earning markets for produce (Aliguma *et al.*, 2007); facilitate produce transport to markets (Mwaura *et al.*, 2012); have better access to credit (Adong *et al.*, 2013); to invest in agricultural value addition and processing plants (Mbowa and Shinyekwa, 2012); in infrastructural development e.g. rural roads, small power generation projects, schools and health facilities (United Nations, 2010) and also in natural resources management and conservation (Baker and Eric, 2008).

In other developing countries such as Senegal, farmer groups represent one of the success stories mainly because of the existence of an organized institutional framework with the existence of several federations such as Federation of Non-Governmental Organizations in Senegal (FONGS) and National Council for Rural Dialogue and Cooperation (NCRDC) (Rondot and Collion, 2001). Rural leaders in the community are more likely to have a significant influence in encouraging participation in farmer groups even in the absence of external support ensuring that these groups are long lived and independent (Salifu *et al.*, 2020). Ghana is also one of those countries where farmer groups are widely used in agriculture development under the umbrella of Ministry of Food and Agriculture. In Zambia, Mickels-Kokwe (2006) observed that beekeepers in producer groups are often linked to longer value chains where success is attributed to beekeepers having group benefits. This includes access to products and services in the form of training, market linkages, information, communication and extension (Mickels-Kokwe, 2006; Lowore and Bradbear, 2015).

The Government of Kenya through the Ministry of Agriculture, Livestock and Fisheries Development has been facilitating follow up training for women beekeepers in Kenya on group management and modern beekeeping skills (Government of Kenya, 2004).

The government and Non-Governmental Organizations have made various attempts towards the strengthening of various farmer groups in Kenya. In addition to the success stories of group investment, there are empirical gap in knowledge on influence of participation in development of farmer groups such as farmers Savings and Credit Co-operatives Organizations (SACCO), table banking, and Merry-go-round among others (Olila, 2014). The same challenge had been observed among most small holders' apiculture farmers particularly in Kasipul South diminishing their efforts towards commercialization of honey production. Since limited emphasis was on factors influencing farmer participation in development groups, this study aimed to fill the aforementioned knowledge gap among small holder beekeepers in Kasipul South sub-county. Therefore, the study was conducted to establish the influence of socio-economic and cultural factors on group participation for commercialization of apiculture among small holder farmers in the study area.

METHODOLOGY

The study was carried out in Kasipul South sub-County which is located in southern part of Nyanza region. It lies within latitude of -0.507896$_o$S and longitude of 34.738167$_o$E. Average temperature of 21$_o$C with precipitation of about 1492mm per annum and has loamy type of soil. These favours adequate forage availability coupled with favourable and diversified agroclimatic conditions of forest with flowering plants which could support large number of bee colonies. This area was chosen for the study due to its potential for honey production (Omollo, 2013). Majority of farmers had not been participating in group honey production making the area to be under performing in terms of commercialization of apiculture farming. The population of study comprised of farmers' groups, individuals' farmers who are residents of Kasipul South and are involved in honey production, one sub-county Livestock Production Officer (C.L.P.O) and Non-Governmental Organizations (NGO) officials supporting apiculture. Kasipul South sub-county had a population of 130,212 with 30,990 households.

Sampling procedure

Cross- sectional survey design was used in the study to collect data from the study population. The study focused on individual apiculture farmers, apiculture farmers in group, sub-county Livestock Production Officer and apiculture groups' officials. The study applied simple random sampling to sample both farmers producing honey individually as well as those in groups being that the population of study was homogenous. Purposive sampling was used to select respondents as shown in Table 1.

Farmer groups were purposely selected from the two locations of the area of study which were West Kamagak (Wire hill) and Kodera South (Kodera Forest). The study was intended to have an interview with officials of the farmer group from each of the two selected areas as well as with the sub-county Livestock Production Officer.

Table 1. Study population and sample size extracted.

Name	Population size	Sample size
Individual farmers	84	40
Farmer groups	339	161
Leaders of apiculture groups	24	8
Livestock Production Officer	1	1

Sample size Determination

The study applied Fisher's formular to come up with a sample size. According to Mugenda and Mugenda (2003), Fisher's formula gives a derivation of a constant N which is the population size and is adjusted depending on the target population.

Fisher's formula was used to calculate the sample size based on the sample for proportions:

$$n = \frac{Z^2 P\ Q}{E^2}$$

Where;

n = the desired sample size

Z = the value corresponding to the level of confidence required (in this case 1.96 corresponding to 95% level of confidence)

P = estimated level of an attribute that is present in the population (0.1 variability)

Q% = estimated level of the attribute that is not present in the population

E% = desired level of precision (in this case 5%)

The adjusted minimum sample size was collaborated by use of the formula for correlation for finite populations. This was computed as:

$$\frac{1.96^2 x\ 0.5\ x\ 0.5}{0.05^2} = 384$$

Adjustment was done using the formula:

$$n_1 = \frac{n0}{1+n0/N}$$

Where;

n_1 = adjusted minimum sample size

N_o= minimum sample size as arrived at in the previous formula

N = the total known population

n_1 =384/1+ (384/423) = 201 (Sample size)

A simple random sampling technique was used in selecting the 201 both individual and group apiculture farmers to participate in the study, being within the minimum recommended by Kathuri and Pals. (1993) for survey research in social sciences.

Instrumentation

Questionnaire was used so as to provide the intended primary data first after which one on one interview was employed to reveal any other relevant information that could have been necessary in the study. Secondary data were collected from journals and reports from the Ministry of Agriculture Livestock and Fisheries Development as well as apiculture stakeholders in the study area. The questionnaire was pre-tested for reliability using Cronbach Alpha (α) approach with a sample of 54 farmers randomly selected from the study area. The instrument was further scrutinized based on validity measures using experts from the department of agricultural extension.

Data analysis

Data analysis involved both descriptive and inferential whereby Statistical Package for Social Science (SPSS) version 24 was used to process and analyze the collected data. Descriptive statistics including measures of central tendency such as frequencies, mean and standard deviation were applied to the data. For inferential statistics t-test, chi-square and regression were used.

RESULTS AND DISCUSSION

Analysis of influence of socio-economic and cultural factors on farmer's group participation

Among the factors that the researcher was investigating were the socio-economic and cultural factors influencing farmer's group participation for commercialization of honey production. The respondents were asked to rate how each of the factors influenced group participation among apiculture farmers. Respondents were asked to use a likert scale 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree. The findings of the study were as indicated in Table 2 below. Table 2 below represents the socio-economic and cultural factors that were considered under the study and their influence on farmer's group participation.

Table 2. Socio-economic and cultural factors influencing farmer's group participation.

Socio-economic and cultural factors	N	Mean	Std. Deviation	Std. Error Mean
Gender	162	2.19	1.105	0.087
Marital status	162	2.46	1.126	0.088
Social status	162	2.72	1.112	0.087
Education level	162	2.78	1.226	0.096
Age	162	3.15	1.209	0.095
Family Size	162	3.13	1.184	0.093
Household income	162	3.72	1.128	0.089
Farm size	162	3.71	1.096	0.086

From the findings, on average, four factors namely household income, farm size, age and family size strongly influenced group participation as indicated by mean 3.72, 3.71, 3.15 and 3.13 respectively. However, gender, marital status and social status of apiculture farmer had little influence on the decision to group participation among apiculture farming. According to Adong *et al.* (2013), farmers' education level and marital status statistically influenced farmers' decision to enrol in farmer groups. Due to high cost of apiculture equipment, low household income encourages famer's group participation with an aim of raising more resources for apiculture. Those with high income who are able to purchase all the resources needed in apiculture comfortably hence they do not see group participation to be a necessity. For farm size, farmers with small piece of land opt for group participation to enable them raise finance for purchasing land for apiculture sites or getting opportunity for using government sites. Farmers with large piece of land by having enough land are able to set aside some portions for apiculture site hence they do not involve more in group production. Sabates-Wheeler (2007) in her study on local strategies for survival and growth in Romania and Kyrgyz Republic also found the same case. Participation in groups was an avenue for these less endowed households and individuals to be able to achieve higher levels of production and manage risk. In relation to age, young farmers being stronger and more energetic than old farmers, they participate actively in group honey production similar to a case of Farmer

Field School groups in Uganda, Tanzania and Kenya (Davis *et al.*, 2010). In addition, young age is liable exploring efficient ways of investment and is also quick in decision making in relation to group practices. It was also noted that farmers with large family participate actively in group honey production for commercialization to meet family needs. The results contradicted Davis *et al.* (2010) as they found that larger household sizes in Kenya were less likely to participate than smaller household. However, key informant interview held with group officials revealed that more farmers who are educated opted for group production of honey as compared to uneducated ones. This is due to the fact that education enlightens farmers on the benefits of joint investment hence encourages farmer's group participation. This conforms to Benin *et al.* (2007) in looking at the factors that influence the decision for households to join National Agricultural Advisory Service (NAADs) groups. With regards to gender, women participation in apiculture groups was still lower than that of men. However, Benin *et al.* (2007) findings from research work done for farmer groups in Tanzania and farmer field groups in Uganda got mixed responses. Women often encounter social and cultural constraints that hinder them from performing apiary cultural practices (Qaiser *et al.*, 2013). Some of the constraints identified were lack of time, bee-sting phobia, inability to hoist and harvest from the traditional bee-hive (Qaiser *et al.*, 2013). Considering household size as a factor that influenced membership to farmer group, Davis *et al.* (2010) found that larger household sizes in Kenya were less likely to participate than smaller households. This contradicted the results obtained in this study since larger households have higher demand for money to meet the need hence opted for active group participation. Table 3 below illustrates the significance level of socio-economic and cultural factors on farmer's group participation for commercialization of apiculture.

Regression Model results on socio-economic and cultural factors on its influence on farmer's group participation for commercialization of apiculture among small holder farmers. As shown in Table 4 below, the R squared for model 1 is 0.516, indicating that 51.6% of the variation in commercialization of apiculture is explained by variation in the independent variable socio-economic and cultural factors among small holder farmers. The results indicated that there is a strong and positive correlation of 0.627 between the commercialization of apiculture and socio-economic and cultural factors on farmer's group participation.

Table 3. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.627a	0.516	0.010	0.27262

a. Predictors: (Constant), Socio-Cultural and Economic Factors

The ANOVA results in as portrayed in the Table 5 indicated that the effect of socio-economic and cultural factors on farmer's group participation for commercialization of apiculture among small holder farmers was statistically significant (F =2.630, p=0.001, $p < 0.05$).

Table 4. ANOVA.

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.588	1	.588	2.630	.001b
	Residual	35.740	160	.223		
	Total	36.327	161			

a. Dependent Variable: Commercialization of apiculture

b. Predictors: (Constant), Socio-cultural and Economic Factors

The standardized regression coefficients shown in table 6 below revealed that for every unit increase of Socio-economic and cultural factors it leads to an increase in commercialization of apiculture among small holder farmers by 0.741 (β= 0.741) units and was statistically significant (p=0.007, p< 0.05). This shows Socio-economic and cultural factors were statistically and positively correlated on group participation for commercialization of apiculture among small holder farmers.

Table 5. Coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.129	0.135		8.374	.000
	Socio-cultural and economic factors	.741	0.045	0.127	1.622	.007
a. Dependent Variable: Commercialization of apiculture						

From above, the model can there be rewritten as;
Commercialization of apiculture = 1.129 + 0.741*(Socio-Cultural and Economic Factors)
From the above findings, it is clear that socio-economic and cultural factors have a significant and positive influence on group participation for commercialization of apiculture among small holder farmers in the region. Therefore, we fail to reject the null hypothesis that socio-economic and cultural factors do not influence group participation for commercialization of apiculture among small holder farmers. The analysis indicates that socio-economic and cultural factors play a paramount role in group participation hence commercialization of apiculture among small holder farmers. Therefore, there is need to asses each factor in order to analyze their influence. Table 6 below therefore shows the regression analysis of individual factors and their influence on commercialization of apiculture.

Table 6. Regression analysis.

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.097	.195		5.620	.000
Gender	.032	.032	.087	.998	.000
Farm Size	1.255	.040	.122	1.389	.007
Family Size	-.042	.036	-.102	-1.146	.014
Education Level	.016	.036	-.041	-.452	.009
Social status	.051	.033	.133	1.532	.018
Marital Status	-.031	.034	-.079	-.906	.002
Age	-.041	.035	.092	1.165	.026
a. Dependent Variable: Commercialization					

The study sought to determine if socio-economic and cultural factors such as age of the farmer, gender, farm size, family size, educational level, marital status and social status influenced commercialization of the apiculture. From the findings, education was found to have a positive and significant influence on commercialization of apiculture among small holder farmers through group participation (p-value=0.009<0.05). This implies that education enlightens farmers on the benefits of joint investment hence encourages farmer's group participation. This conforms to Benin *et al.* (2007). Age was found to have a negative but significant effect on commercialization of apiculture among small holder farmers. This indicated that young farmers being more energetic than old farmers, they participate actively in group honey production hence facilitate commercialization of apiculture; a similar case of Farmer Field School groups in Uganda, Tanzania and Kenya (Davis *et al.*, 2010).
A two tailed t-test was done to determine which of the socio economic and cultural factors influencing farmer's group participation at 0.05 level of significance.
Table 7 below represents results obtained on the influence of the socio-economic and cultural factors on group participation for commercialization of apiculture.
The socio-economic and cultural factors above significantly influence farmer's group participation as shown by the two tailed significances of 0.00. T-values shown in table 4.4 elaborated further the rankings in terms of the level in which the same factors influence farmer's group participation. Based on this, variable number seven influence the study most as shown by t-value 41.965 followed by factor number six with a t-value of 31.808. Mulindwa (2012) also discovered that

farmer groups are voluntary member associations of farmers within particular localities formed to undertake common activities of interest to members with an aim of increasing incomes, acquisition of household assets, and availing agricultural services to members. It also offers various social and economic solutions to most rural problems; the synergized effect of group activities and influence affords benefit that may not be individually feasible for most of the rural poor (Agbonlahor *et al.*, 2007). Factor number four was ranked third in relation to how it influenced the topic of study with a t-value of 31.469. The ranking preceded with the third factor ranked fourth and the second factor became number five with their t-values of 31.455 and 30.606 respectively. Fifth factor was ranked number six with a t-value of 30.054. Factor eight with a t-value of 28.286 was found to be the second last in terms of least influencing farmer's group participation after which factor one became the least with a t-value of 21.918.

The study further investigated the influence of economic factors on farmer's group participation in apiculture project.

The researcher was interested in understanding the influence of financial institutions on farmer group formation. Table 8 shown below illustrates results obtained on the influence of financial institutions on farmer group formation for commercialization of apiculture.

Table 7. Socio-economic and cultural factors influencing farmer's group participation.

socio-economic and cultural factors	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval	
					Lower	Upper
1. More male involve in group participation in apiculture than female	21.918	161	.000	2.235	2.03	2.44
2. More farmers with small piece of land participate in farmer groups more than those with large piece of land	30.606	161	.000	2.531	2.37	2.69
3. Farmers with large families easily opt for group participation to commercialize honey for more income generation	31.455	161	.000	2.889	2.71	3.07
4. Education level of beekeeping farmers is directly proportional to the rate of group participation among apiculture	31.469	161	.000	2.938	2.75	3.12
5. Majority of farmers are participating in groups based on their social status	30.054	161	.000	2.932	2.74	3.12
6. Marital status has affected participation of farmers in apiculture groups in relation to commitments	31.808	161	.000	3.037	2.85	3.23
7. Farmers group participation promote commercialization of honey thereafter improve their social status in society	41.965	161	.000	3.562	3.39	3.73
8. Young farmers participate actively in apiculture groups than the old farmers	28.286	161	.000	2.895	2.69	3.10

Table 8. Groups are formed where there are funding/financial institutions.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	123	75.9	75.9	75.9
	No	39	24.1	24.1	100.0
	Total	162	100.0	100.0	

From the findings obtained, 75.9% of the respondents agreed that farmer groups are commonly formed in areas where there are cases of existence of funding bodies. This is to facilitate funding by the financial

institutions as farmers are able to act as security for the funds. Farmer groups have been formed to facilitate better access to credit (Adong *et al.*, 2013). A similar investigation was done on the influence of income level of the respondents on the purchasing power of apiculture equipment hence commercialization of apiculture. Table 9 below shows findings obtained on the influence of income level on purchasing power of apiculture equipment as well as group participation for commercialization of apiculture.

Table 9. Income level determine purchasing of apiculture equipment.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	125	77.2	77.2	77.2
	No	37	22.8	22.8	100.0
	Total	162	100.0	100.0	

The results obtained revealed that 77.2% of the respondents agreed that household income level determine purchasing power of apiculture equipment hence encourage group participation. This means that farmers with high income level have high purchasing power for the apiculture equipment hence get motivated to participate in group production. High income level also enables them to make their monthly subscription in the group as expected for group development. According to Bernard and Spielman (2009), non-participation of farmers in cooperative societies in Ethiopia was hindered by poverty or due to high financial contribution required by the organization.

The researcher further investigated the influence of financial institution on commercialization of honey. Table 10 below represents the results obtained on the influence of financial institutions on farmer group participation for commercialization of apiculture.

Table10. Financial institutions play important role in commercialization of honey.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	110	67.9	67.9	67.9
	No	52	32.1	32.1	100.0
	Total	162	100.0	100.0	

From the results obtained, 67.9% of the respondents agreed that financial institutions in the area have played a major role in promoting commercialization of honey through facilitating formation of groups. This is due to the fact that the financial institution majorly works with the group in delivering their services such as funding the farmers on loans or grants, trainings as well as networking the farmers to other supporting institution.

CONCLUSION AND RECOMMENDATIONS

Result unveiled that for every unit increase of socio-economic and cultural factors leads to an increase in commercialization of apiculture among small holder farmers. The study concluded that socio-economic and cultural factors such as household income, farm size, age, family size, education level, social status, marital status and gender statistically influence farmers' group participation for commercialization of apiculture. It is proved that these factors play a major role in enhancing commercialization of apiculture. The factors are also statistically significant in influencing group participation for commercialization of apiculture as discussed in the report in one way or the other. I therefore recommend the government to address the socio-economic and cultural factors and other factors that negatively affect farmer group participation to facilitate commercialization of apiculture. County government should also identify various potential areas that are equipped with adequate conditions that support bees to initiate apiculture through farmer group approach. Group approach has been the approach in commercializing agriculture in various sectors.

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