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### An Investigation of Coping Strategies Adopted by Small-Scale Sugarcane Growers in Bungoma County, Kenya

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**Keywords:**

*Coping Strategy,  
Small-Scale,  
Sugarcane Growers,  
Adoption,  
Declining Farmers'  
Participation,  
Bungoma County.*

This paper reports on one of the findings of a study undertaken to investigate the coping strategies used by small-scale sugarcane growers in Bungoma County, Kenya. A descriptive survey design was used. A multi-stage sampling procedure was employed in the selection of the divisions, villages, key respondents, and sugarcane farmers to be interviewed. Primary data were collected using questionnaires from 100 small-scale sugarcane growers' household heads from Bumula Sub-County. Data were collected during the month of December 2016. Qualitative data collected were analysed thematically. Quantitative data was analysed using regression in SPSS version 23 and Microsoft Excel. Results from small-scale sugarcane farmers in Bumula Sub-County revealed a declining farmers' participation in sugarcane farming activities in the area. Coping strategies identified included off-farm income-generating activities, sale of sugarcane by-products and non-contracted cane farming. Significance test qualification was based on a percentage of adjusted R<sup>2</sup> and within 0.3 to 0.7 ranges for Beta weight value. The correlation coefficient (R-value) for the model was 0.362, indicating a moderately positive relationship between variables. The coefficient of determination (R<sup>2</sup>) was found to be 0.284 (28.4%). Adopted coping strategies accounted for 28.4% variability in the declining farmers' participation in sugarcane farming. This result suggests the existence of other factors that explain the remaining 71.6% of the variation in the declining farmers' participation. Farmers should enhance both on-farm and off-farm income-generating activities, sugarcane by-products value addition, and non-contracted cane farming in order

to reverse the outcome and result in an enhanced farmers' participation in sugarcane farming activities by 36.2%

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## INTRODUCTION

According to Zulu *et al.* (2019), sugarcane farming "is an industry with a high socio-economic developmental focus in rural areas by organising resources, creating job opportunities, providing a source of income and developing transport and communication networks." Despite sugarcane being a major economic pillar for Kenya's economy, its production has continued to decline. This has affected small-scale sugarcane growers' income. As a result, the majority of them are not able to provide the basic needs for their families like paying for school and medical fees. This has made farmers seek alternative sources of income. Hence, the question, what are the coping strategies adopted by small-scale sugarcane growers to caution themselves against declining farmers' participation in sugarcane farming?

Previous researches have addressed several aspects of coping strategies adopted by farmers to caution themselves against unexpected crop failure or yield losses. The most important

coping strategies applied by farmers included selling livestock, accessing relief aid, obtaining credits, and migration to towns and more productive areas (Adimassu & Kessler, 2016). In response to declining farm yields, households find new ways of raising incomes. One way of raising income that this study looks at is through income diversification. This is where farmers allocate resources among different income-generating activities to maintain a household's livelihood. The current research focuses on the following household income diversifications, on-farm and off-farm income-generating activities, and diversification of cane by-products.

Many studies in Kenya have been conducted on determinants of sugarcane productivity, but none investigated the declining farmers' participation in small-scale sugarcane farming and their coping strategies. For example, the study by Muli (2010) conducted in Kwale only determined the challenges facing smallholder sugarcane farmers. The same was done by Kokeyo (2013) in Migori County. Moreover, the study by Kweyu (2013) aimed at assessing

the factors influencing the withdrawal of small-scale sugarcane farming in Mumias Sub-County. However, these studies did not look at declining farmers' participation and how they were coping through income diversification of sugarcane by-products. The current research is intended to fill this knowledge gap.

This paper addresses the need to fulfil the above gaps in order to make the sugarcane industry continue being productive and beneficial to farmers. The knowledge on the income diversification of sugarcane by-products as a coping strategy is important in helping farmers to make better decisions, enhance their participation in sugarcane farming and also raise alternative sources of income to improve their standards of living. The sugarcane farmers of Bungoma County will also benefit from gaining insight and an understanding of Kurt Lewin's theory of the psychological field applied within the context of this paper (Kurt, 1943).

## LITERATURE REVIEW

According to Adimassu and Kessler (2016), coping strategies are 'short-term and unplanned in response to unexpected crop failure and yield losses and just for survival. Whereas, Korir (2011) defines coping as the methods used by households to survive when confronted with unanticipated livelihood failure. Individual households find new ways of raising incomes when faced with unanticipated livelihood failures. One way of raising income is through income diversification. According to Korir (2011), 'people diversify their assets, activities and income because of several reasons; to manage risk, to handle seasonality in farming activities, credit market failures and to iron out problems in labour markets.'

Among the income diversifications that farmers use to caution them against crop failure are crop diversification, intensification, livestock keeping and off-farm income-generating

activities. According to Nguyen (2017) and Makate *et al.* (2017), the crop diversification agricultural system is ecologically sound, less costly and an effective way of reducing uncertainties among small-scale farmers. It provides a variety of food diet and increases the purchasing power of the household. The system expands the variety of crops to the market and increases the stability of produce, thus improving the household's income.

A number of studies have shown that the agricultural practices that conserve organic matter in the soils lead to increased agricultural production. For instance, Magarey *et al.* (2010) found that small-scale sugarcane farmers in Australia break monoculture practices with legumes (soya beans and peanuts). Legumes fix nitrogen and reduce the need for more fertiliser use (BFAP, 2014; Makate *et al.*, 2017). Legumes are environmentally friendly, increases food to the household and are sold to raise additional household income. However, these studies did not cover other coping strategies used by sugarcane farmers. This study goes further to investigate both on-farm and off-farm income-generating activities adopted by farmers to caution themselves against declining farmers' participation in sugarcane farming. In addition, it looks at the income diversification of sugarcane by-products.

The other strategy that farmers engage in to cope with the agricultural yield loss is agroforestry. Agroforestry has enabled the communities in Ethiopia to improve their income and compensate for the loss in sugarcane (Kassie, 2017). According to Kassie (2017), 'agroforestry products buffer up farmers' income during the loss of crop yields.' Ogbonna (2015) study in Nigeria found that small-scale sugarcane farmers rear livestock as an alternative source of income. They find livestock as a reliable store of wealth as it can be easily turned into cash. However, these studies did not look at coping strategies used by

sugarcane farmers to declining sugarcane production. The current study intends to fill this gap in knowledge.

Farming has failed to provide sufficient household income in many developing countries because of declining agricultural production, shrinking farm income and widespread poverty (Babatune & Qaim, 2016). Micro-business has become the preferred coping strategy to compete for income risks from crop failure including sugarcane. Rural households engage in micro-businesses to supplement their household income during the off-farming season periods (Babatunde & Qaim, 2016). However, the study only addressed off-farm activities, while the present study addresses both off-farm and on-farm income-generating activities that caution farmers during sugarcane yield loss.

Socio-economic factors encourage or discourage the farmer from adopting a particular coping strategy (CS) to use. The use of a given coping strategy is dictated by the farmer's social characteristics like gender, age or level of education (Kragt et al., 2013). For instance, a study in Bangladesh revealed that farmers who were older and not educated could not use new methods of farming (Uddin et al., 2014). Besides that, the farmers' choice of the CS can be influenced by the farm size he/she owns and household income (Ike and Ezeafulukwe, 2015). Other studies have shown that large families do not have labour problems on their sugarcane farms, as much of the labour can be supplied by the family members (Aina et al., 2015). Studies by Ellis (2000), Togolay

(2010) and Chanzi (2016) observed that the majority of women were engaged in market gardening; however, they observed that women supplied much of the family farm labour.

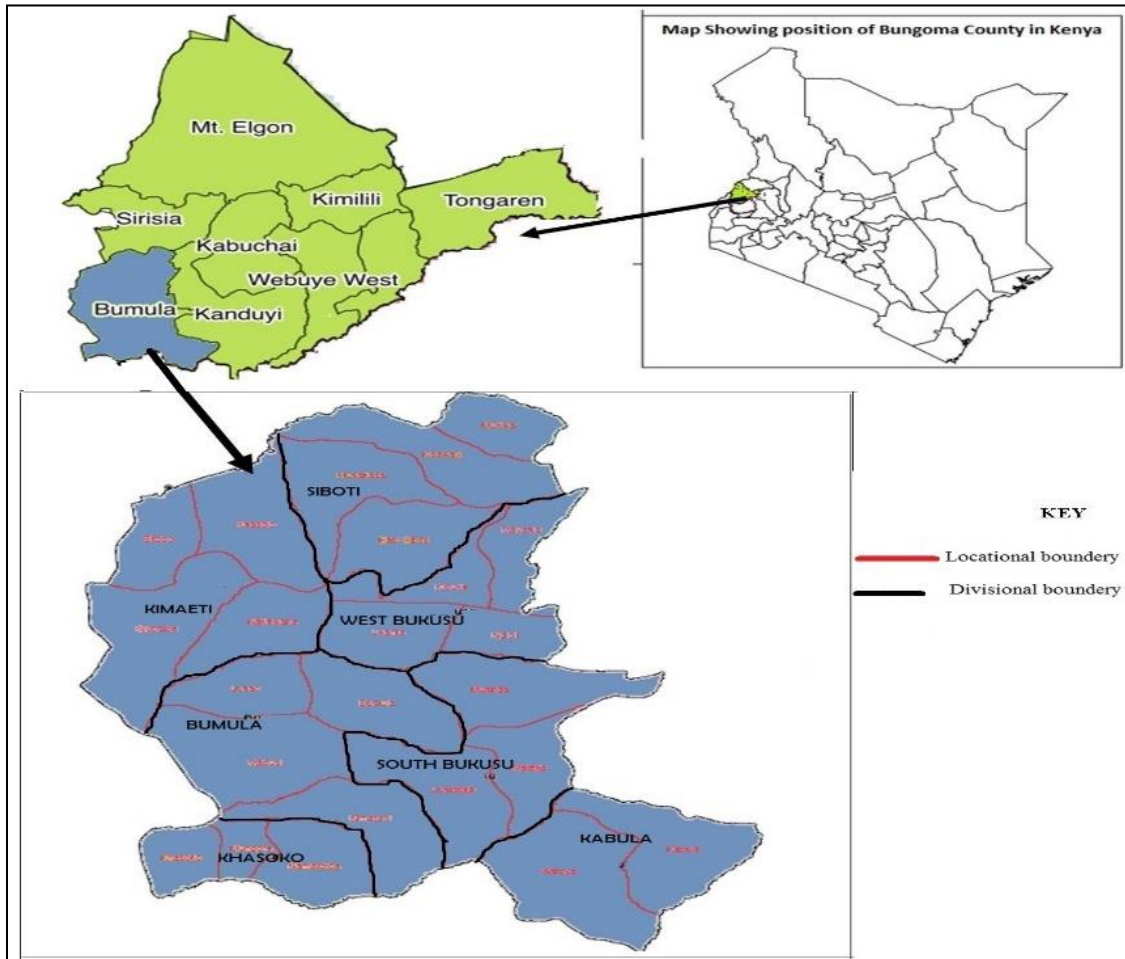
The economic challenges may also arise when the coping strategy becomes expensive to use. For instance, Nguthi (2007) observed that sugarcane farmers in Africa have limited finance, markets and technical skills for value addition. This makes them sell their produce at low prices with marginal profit. Tena et al. (2014) add that poor road systems are a serious problem for small-scale sugarcane growers in Ethiopia. It increases the cost of production against the low sugarcane prices leading to losses by the farmer. Many of the studies reviewed focus on the determinants of sugarcane production; for example, Muli (2010), Kokeyo (2013), Kweyu (2013) and Oyugi (2016). The present study focuses on declining farmers' participation in sugarcane production and how they were coping.

## METHODOLOGY

### Study Area

The study was carried out in Bumula Sub-County of Bungoma County. The County has 10 Sub-counties, namely, Mt. Elgon, Sirisia, Kimilili, Tongaren, Bungoma North, Bungoma Central, Webuye West, Webuye East, Kanduyi and Bumula. Bumula Sub-County lies between latitude 0° 30.2' North and longitude 34° 30' East. The Sub-County covers a total land area of 347.8 Km<sup>2</sup> (*Figure 1*).

**Figure 1: Map of Bungoma County showing Study Sites**



Source: Bungoma County Intergraded Development Plan, 2013

The land slopes from altitude 1800 meters to 1200 meters above sea level (Mkomwa et al., 2011). The Sub-county has hills such as Siboti, Malakisi, and Nakuti. It has dark acrisols and ferrosols soil types. These soils are suitable for a range of crops. However, they have lost nutrients like Nitrogen and Phosphorous due to sugarcane mono-cropping practices (Mkomwa et al., 2011). The Sub-County enjoys a well-distributed annual rainfall with two rain seasons (March/ May and August/ October). It receives rainfall ranging from 1250 mm to 1800 mm per year (Bungoma County Government, 2013). The area has a temperature range of 21 °C to 25°C all year round (Mkomwa et al., 2011).

### Sampling Procedure

The target population for the survey was 5838 small-scale sugarcane growers in Bumula Sub-County (MSC, 2016). The targeted farmers were those who had practised sugarcane farming in the area for the last five years and had less than five acres of sugarcane farms. The sample size was determined using the formula of Glenn (1992), which gave a total of 100 small-scale sugarcane farmers.

The sampling procedures used were purposive, stratified and random sampling. The purposive sampling procedure involves the hand-picking of 7 key respondents (5 extension officers and

2 area chiefs). These were respondents that had worked for over 5 years in the area and therefore had knowledge in sugarcane matters. It was also used in the picking of Bumula as an area of study among the Sub-Counties that grow sugarcane within Bungoma County. This is because it has been experiencing the lowest yields with some fields registering as low as 17 tonnes per hectare as compared to other Sub-Counties (MSC, 2016). Out of 7 divisions in the

Sub-County, four divisions were purposively selected on the ground that they were major sugarcane growing areas (BCIDP, 2013; MSC, 2016). These were Kabula, Khasoko, Bumula and South Bukusu divisions. A proportionate sample of farmers in each division was reached by the total number of small-scale sugarcane growers in the Sub-County, as shown in *Table 1*.

**Table 1: Sampled Farmers in Each Division**

Number of Farmers in each Division	Target population	Sample size
Kabula	1, 436	24
Khasoko	996	17
Bumula	1, 568	29
South Bukusu	1, 836	30
<b>Total</b>	<b>5, 338</b>	<b>100</b>

Every village following a minor road leading to the rural residence was considered to be a random way of selecting the sample. For that matter, every 2<sup>nd</sup> farming homestead, to either the left or the right of that very road was chosen for the interview.

### Methods of Data Collection and Analysis

Primary data included adopted coping strategies, family sizes, education levels, gender, land tenure, farming experiences and farmers' participation in sugarcane farming activities. This was collected using questionnaires administered to household heads who constituted the respondents. Interview schedules from key informants were used to gain information from agricultural officers and area chiefs who had worked in the area for 5

years. Two focal group discussions (FGD) were used to collect extra data and validate the data that was collected from secondary sources. Direct field observations were carried out with the help of the observation checklist. The coping strategies identified by the participants and the researcher were documented through photographs. This was used to validate the data gathered through the questionnaires, focus group discussions and interview schedule.

Internal consistency of questionnaire items was established through the computation of the Cronbach Alpha coefficient. Cronbach alpha coefficient test on questionnaire items revealed an internal consistency of 0.877 for the questionnaire, which was considered highly reliable and therefore acceptable.

**Table 2: Summary of Reliability Study**

Category	No. of items	Items removed	Cronbach alpha
1 Farmers' characteristics	10	0.0	0.7891
2 Coping strategies	5	0.0	0.910
3 Effectiveness of coping strategies	3	0.0	0.830

The data collected was analysed by using a statistical package for social sciences (SPSS – Version 23) and Microsoft Excel. Both descriptive and inferential (Regression analysis) were used. Descriptive statistics were employed to have a summary description of the data collected using percentages. Qualitative data was analysed thematically according to the nature of the responses. A triangulation approach was used where data gathered through a questionnaire, interview schedules, observation checklists, and secondary sources supplemented each other during data evaluation. The data confirmed as true was transcribed, with emerging themes used to corroborate and augment the quantitative findings of the study.

Hypothesis testing was done through regression analysis at a 95% level of significance. This statistical technique is appropriate for the study because it includes analysing several variables when the focus is on the relationship between a dependent variable and one or more independent variables. This study postulated that declining farmers' participation = f (farmers' socio-economic characteristics and adopted coping strategies). Therefore, a regression model was used to determine the relationship between the factors ( $X_1$ ,  $X_2$ ) and Declining farmers participation ( $Y$ ),  $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \varepsilon$  (Where  $Y$  = Declining Farmers' participation in sugarcane farming;  $\beta_1, \dots, \beta_2$  = Coefficients of determination;  $X_1$  = Farmers' socio-economic characteristics;  $X_2$  = Adopted coping strategies;  $\varepsilon$  = Error term).

Regression analysis was further done to make a stronger statistical inference of the magnitude based on the observed relationship in order to predict and reveal the strength of the relationship between the variables tested in the

hypothesis. In the regression analysis, the value of *adj. R<sup>2</sup>* together with the Beta weight value, was used. The significance tests were pegged on Beta weight values, where the decision criterion was on Beta range 0.30 to 0.70 (Nabiswa, 2018). This range suggested a moderate relationship between the variables tested. The significance test qualification was nearness to + 1 or – 1 of Beta weight value

Approval of the research proposal was sought from the School of Social Sciences, Kenyatta University. Thereafter, a research permit was sought from the National Commission for Science and Technology (NACOST). Since the study yielded a variety of ethical issues both in relation to farmers' personal characteristics and socio-economic data, consent was sought at all stages. This is an acceptable practice in social sciences research (Saunders et al., 2007). Interviews were conducted in privacy.

## RESULTS AND DISCUSSION

### Demographic Characteristics of the Respondents

The response rate achieved was 100%. The high response rate was realised because of the researcher's own initiative to administer questionnaires personally and encourage the respondents to participate in the study. This response rate was acceptable and was in line with Mugenda and Mugenda (2004), who advises that the response rate of 90% and above is excellent.

The demographic characteristics of the respondents included gender, marital status, age, level of education and household size, as shown in *Table 3*.

**Table 3: Demographic Characteristics of the respondents**

<b>Social Variables</b>	<b>Category</b>	<b>Percentage</b>
Gender	Female	30.0
	Male	70.0
Marital Status	Married	93.0
	Single	7.0
<b>Social Variables</b>	<b>Category</b>	<b>Percentage</b>
Age	below 35 years	4.0
	35 – 50 years	39.0
	50+ years	57.0
Level of Education	No schooling	7.0
	Primary	53.0
	Secondary	28.0
	Post-secondary	12.0
Household Size	1-5 persons	34.0
	5 – 10 persons	37.0
	10+ persons	29.0

As shown in *Table 3*, the gender of the respondents was 70% males and 30% females. The majority of the small-scale sugarcane growers in the study area were male. Togolay (2010) had observed the same situation in small-scale rice cultivation in Tanzania. The Study by Chanzi (2016) had also revealed that most of the sugarcane farming activities were done by men. They noted that traditionally, most women do not own land for farming. Women's access to land in most African communities was based on status within the family and involved right of use, not ownership. This finding contrasts with Ellis (2000), who asserted that women are more involved in farming activities than their male counterparts.

The study respondents were asked to state their age brackets. It was found that they ranged between 25-75 years. 57% of those interviewed were above 50 years of age, 39% were between 35 and 50 years, as only 4% of them were below 35 years. Agricultural production, especially sugarcane farming is labour intensive requiring physical energy. This has had a negative implication on sugarcane production in the area, as it was being handled by the elderly

farmers aged 50 years and above who were the majority. The elderly people lack the physical energy required on sugarcane farms. The results further revealed that the elderly farmers had not impressed alternative sources of income. This explains why there was a declining farmers' participation in sugarcane production in the area.

The study respondents were asked to state their marital status (*Table 3*). The findings reveal that 93% of the respondents were married and only 7% of them were single. This implies that small-scale sugarcane production is dominated by married adults. These people have family responsibilities that require more money to meet their needs. They also have family labour which encourages them to participate in sugarcane farming. This finding is similar to (Chanzi, 2016). However, this finding contrasts with the findings of Nguthi (2007) which showed that, regardless of the marital status of the individual farmer, the decision to adopt a given strategy depended on the availability of capital and security of land tenure.



The study sought to establish the educational level of the farmers. It was found that a majority (60%) of the farmers had a primary level of education and below. The educational level determines one's ability to seek and apply knowledge. The study further revealed that those with post-primary education had diversified their sources of income. The lack of proper education hinders one from applying modern agricultural skills in agriculture. Moreover, the level of education can also be a barrier to agricultural production. This is because as the education level of a person increases, the opportunity for employment outside farm activities increases too. This has had a negative effect on sugarcane farming in

the areas, as the educated people went to urban areas to look for white-collar jobs. The less educated are left at home to till the land and are resistant to adopt new strategies to cope with declining crop production. This explains why there is a decline in farmers' participation in small-scale sugarcane farming.

### **Coping Strategies to Declining Farmers' Participation in Sugarcane Farming**

Farmers were asked to indicate the coping strategies they adopted to caution them against declining farmers' participation in sugarcane farming. The results in Table 4 show the results.

**Table 4: Adopted Coping Strategies**

Category	Percentage		
	Yes	No	Missing
<b>Cane By-Products</b>			
Cane trash	87.0	10.0	3.0
Sugarcane juice	72.0	17.0	11.0
Cane stalk	39.0	11.0	50.0
<b>Non-contracted cane farming</b>	39.0	6.0	55.0
<b>Off-farm income-generating activities</b>			
Petty trade	34.0	64.0	2.0
Wood fuel	29.0	67.0	4.0
Sand harvesting	39.0	11.0	50.0
Brick making	23.0	75.0	2.0
Casual labour	31.0	61.0	8.0

The results on sugarcane by-products show that a majority of 87% of the respondents used cane trash as animal feeds. Some farmers fed it to the animals directly as green trash, while others made hay and fed it to the livestock or for sale. 72% of those interviewed said they extracted the juice for making jaggery and soft drinks. The jaggery was sold as animal feeds and in the making of the local brews. In collaborating results from the FGDs, members said they would wish to have value addition on cane juice to make soft drinks and sweets given capital.

More than half of the farmers (55%) had contracted their sugarcane with Mumias Sugar Company, while the rest had cultivated non-contract (private) cane. The farmers preferred to cultivate private (non-contract) cane in order to avoid company deductions. Non-contracted cane gave them the freedom to sell to any willing buyers without restrictions. Nonetheless, selling sugarcane privately had very low returns. Kokeyo (2010) had affirmed that 'the wealth of contract farmers was found to be significantly higher than that of non-contract farmers.

The study results show that the majority (64 %) of the farmers were not involved in Off-farm income-generating activities (petty trade). The majority of the farmers lacked the capital to start some businesses. This implies that the area has a low business environment as the population has low purchasing power. This study confirms the study by Kokeyo (2010) that the majority of sugarcane farmers in Kenya relied on income from the farms, which was, in most cases, not adequate.

**Effectiveness of coping strategies adopted by farmers**

There was a need to establish whether the coping strategies used by the farmers were effective in cautioning against declining farmers’ participation in sugarcane farming. The results indicate that a majority, 65% of the farmers, did not have effective coping strategies that could caution them against declining participation in sugarcane farming. The farmers lacked income diversification

skills to adopt strategies that could caution them against low income. Farmers require mentorship programs to create awareness of the best on-farm and off-farm income-generating activities. This will result in efficient and enhanced farmers’ participation in sugarcane farming.

**Inferential Results and Hypothesis Testing**

*H<sub>01</sub>: There is no significant relationship between the adopted coping strategies and declining farmers’ participation in small-scale sugarcane farming.*

An alpha value of  $\alpha < .05$  was used in the regression statistical inferential tests. Significance test qualification was nearness to 0.000 for regression test. In the regression analysis, the value of adj. R<sup>2</sup> together with its beta weight, were used. Significance test qualification was based on a percentage of adj. R<sup>2</sup> and within 0.3 to 0.7 ranges for Beta weight value (Nabiswa, 2018).

**Table 5: Model Summary**

R	R Square	Adjusted Square	R Std. error of the Estimate	Change Statistics				
				R Change	Square Change	F Change	df	Sig.
.362 <sup>a</sup>	.487	.394	.70926	.287		27.83	3	.000

The regression results (Table 5) show that taking all factors into account the adopted coping strategies used by sugarcane growers constant at zero, declining farmers’ participation in small-scale sugarcane farming was 0.362. These findings indicate that the correlation coefficient (R-value) for the model was 0.362. R-value is used to show the strength and direction of the relationship between the variables. In this case, the R-value of 0.362 indicates a moderately positive relationship between variables (Nabiswa, 2018).

The coefficient of determination (R<sup>2</sup>) was found to be 0.394 (39.4%). This implies that the

adopted coping strategies studied accounted for 39.4% variability in the declining farmers’ participation in sugarcane farming activities at a 95% confidence interval. This result suggests the existence of other factors that explain the remaining 60.6% of the variation in the declining farmers’ participation in small-scale sugarcane farming.

The Sig. column is important for the interpretation and it shows that the p-value is less than 0.05, which means that our model is statistically significant to explain the influence of our independent variables (adopted coping strategies used) on declining farmers’

participation in small-scale sugarcane farming in Bungoma County. *Table 6* shows the regression of declining farmers' participation

against the adopted coping strategies used in the study.

**Table 6: Regression of declining farmers' participation against the adopted coping strategies**

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error			
(Constant)	1.764	.347		5.877	.000
Off-farm income	.233	.157	.341	1.734	.105
Sugarcane By-products	-.124	.179	-.437	-.671	.411
Non- contracted sugarcane farming	.314	.099	-.578	2.826	.011

Applying the regression formula:  $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \epsilon$ .

The established model for the study was;  $Y = 1.764 + 0.341X_1 + -0.437X_2 + -0.578X_3 + \epsilon$ .

Regression of declining farmers' participation against off-farm income-generating activities, Sugarcane By-Products and Non- contracted sugarcane farming. The regression equation above established that taking all factors into account off-farm income-generating activities, sugarcane By-products and non-contracted sugarcane farming constant at zero declining farmers' participation in small-scale sugarcane farming were 1.764. However, a unit increase in off-farm income-generating activities would result in a 0.341 or 34.1% increase in declining farmers' participation in sugarcane farming. This is a moderate relationship as the beta weight is within the decision criterion of the coefficient range 0.3 to 0.7. This value ( $\beta_1 = 0.341$ ) implies that the variance in off-farm income-generating activities significantly accounted (by 34.1%) for the declining farmers' participation in small-scale sugarcane farming.

A unit increase in the sugarcane by-products would lead to a -0.437 (43.7%) increase in the declining farmers' participation in small-scale sugarcane farming activities. This is also a moderately significant relationship as the beta

weight is within the decision criterion of coefficient range -0.3 to -0.7. This is an inverse relationship between adopted coping strategies and declining farmers' participation in small-scale farming activities. This value ( $\beta_2 = -0.437$ ) implies that a unit increases in sugarcane By-products will increase farmers' participation in sugarcane farming activities. The negative relationship could be that the sugarcane By-products caution farmers against declining income from the sale of cane to sugar firms, which kept them engaged in sugarcane farming. These results would also mean that if farmers were sensitised to various by-products and other business opportunities in the sugarcane value chain, they could still realise high profits than the current situation where their main focus is to supply to the millers. This study confirms the study by Kokeyo (2010) that the majority of sugarcane farmers in Kenya relied on income from the royalties received after supplying their sugarcane to the companies, which was in most cases not adequate.

A unit increase in the non-contracted sugarcane farming would lead to -0.578 ( $\beta_3 = -0.578$ ), an increase in the declining farmers' participation in small-scale sugarcane farming. The negative relationship could be that the non-contracted sugarcane farming sold to other middlemen cautioned farmers against low and delayed

payment by the sugar firms sugarcane, and this kept farmers engaged in sugarcane farming. The  $\beta_3 = -0.578$  is a moderate relationship as it is within the decision criterion of the coefficient range 0.3 to 0.7 (Nabiswa, 2018). Non-contracted sugarcane farming was the highest predictor of the declining farmers' participation in sugarcane farming activities as it accounted for 57.8% of the variability in the dependent variable. This implies that addressing the negative effect of non-contracted sugarcane farming in terms of cost of input, market access and price has the potential to significantly increase farmers' participation in sugarcane farming.

## CONCLUSION AND RECOMMENDATION

There is a decline in farmers' participation in sugarcane farming. Small-scale farmers were engaged in various coping strategies such as the sale of sugarcane by-products, non-contract cane farming and off-farm income-generating activities. However, these strategies could not substitute the income farmers got from selling sugarcane to Sugar factories. The adopted coping strategies were insufficient in cautioning farmers against declining farmers' participation in sugarcane production. The adopted strategies cannot measure up to the economic power the farmers had while delivering their cane to MSC. Enhancing the identified coping strategies, particularly sugarcane by-products value addition, would reverse the outcome and result in an increase in farmers' participation in sugarcane farming activities by 36.2 %.

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