African Journal of Emerging Issues
Peer reviewed | Double blind | Interdisciplinary

African Journal of Emerging Issues (AJOEI)
Online ISSN: 2663 - 9335
Available at: https://ajoeijournals.org

MANAGEMENT & LEADERSHIP

THE MEDIATING EFFECT OF FARMER CHARACTERISTICS ON THE RELATIONSHIP BETWEEN CHANGE MANAGEMENT AND SUGARCANE PRODUCTIVITY IN SUGAR FACTORY CANE CATCHMENT AREAS IN KENYA

[1*]Wanjala, Aggrey Waliaula, [2]Prof. Emmanuel Awuor & [3]Dr. Michael Ngala

[1]Post Graduate Student, Management University of Africa

[2]Lecturer, School of Management and Leadership, Management University of Africa

[3]Lecturer, School of Management and Leadership, Management University of Africa

***Email of the corresponding author: wanjalaa@gmail.com**

Publication Date: October 2021

ABSTRACT

Purpose of the Study: This study sought to determine the mediating effect of farmer characteristics on sugarcane productivity in sugar factory cane catchment areas in Kenya.

Statement of the Problem: Compared to other parts of Africa and the world, the Kenyan sugar sector has not performed as well as is expected. Locally Kenya sugar subsector cannot satisfy the citizenry consumption sugar needs at 1,031,055 metric tonnes per year in the period 2014-2018 due to low sugarcane productivity.

Methodology: A cross-sectional design study based on positivist philosophy was used to collect data on the study variables: change management, farmer characteristics and sugarcane productivity. The mediating effect of farmer characteristics was assessed and results explained using coefficient of determination (R-Square), Analysis of Variance (ANOVA) and the regression coefficients.

Result: Step 1, 2 and 3 were met as the P-value were below 0.05. However, in step 4, the P-value for corporate governance was below 0.05. Therefore, this indicate that there is a partial mediation effect on the mediating role of farmer characteristics on the relationship between change management and sugarcane productivity.

Conclusion: The study concluded that there is a partial mediation effect on the mediating role of farmer characteristics on the relationship between change management and sugarcane productivity.

Recommendation: The study recommends that the management should ensure that their organizations have strong control environment, which will inform their strategies. The strategies should incorporate the farmers need as the generation changes.

Keywords: *Farmer Characteristics, Productivity, Sugarcane Factories*

INTRODUCTION

Liberalized sugar trade policies after 2017 in EU have hit subsidies on import quotas into Europe. Benefitting ACP countries including Kenya have had to experience decline in income and employment in their countries. New sugar trade Policy development has been required to allow recapture of lost revenues and employment opportunities. Attempts to remodel sugar trade in ACP countries may not to be easy (Rakotoarisoa & Chang 2017). This has been proven the case for Kenya (Wachiye, 2012; Gakunga, 2020). At continental level, Africa has several sub-sector challenges that need addressing before policy development: land use restrictions in war zones in Nigeria, Sudan, Eritrea and Somalia limit access to land for development sugarcane farms and factory products marketing (Kergna *et.al.* 2014). Irrigation water deficits and poor soils for sugarcane production in the continent's savannas hamper business for example in Sudan (Mahgoub, 2014). Perhaps critical is having presence of few good policy developers and practitioners that cannot eliminate large-scale corruption and interference with sugar subsector operational infrastructures.

Today's Kenya 13 mills some of which emerged from State Owned Sugar Enterprises (SOSE) can deliver only 500,000 tonnes sugar per year out of potential a potential of 800,000 tonnes of sugar per year. The mills fail to meet the consumption demand of 1,031,055 metric tonnes per year for a population 47 million citizens. Gakunga (2020) indicates a widened sugar deficit of 58% relative to sugar consumption needs. Kenya therefore is a net importer of sugar under WTO sugar trade requirements. The country seeks WTO reprieves from the guidelines to protect her industry from COMESA (Kemigisha, 2016, Wachiye 2012). The negative impacts on some sugar sub-sectors particularly for the ACP countries including Kenya have been evident (Rakotoarisoa & Chang 2017). The trade globalization negative and a few other local impacts have justified this study for Kenya where low sugarcane and sugar productivity are prevalent and not allowing expected good agribusiness from the sugar-subsector. Hence, this study sought to establish the effect of change management, situational leadership and farmer characteristics on sugarcane productivity in sugar factory cane catchment areas in Kenya.

Farmer characteristics are derived from the demographic of a group of people doing some farming business. Demographic are a set of variables like: Age, level of education, farming experience in years, size of cultivable land, land ownership and finance access (Nkari & Kibera, 2016; Mitullah,

Kamau & Kivuva, 2016). Sugar sub-sector studies have previously been done in Kenya and involved general and common sugar industry characteristics (Mitullah *et al*., 2016). According to Arsenault (2004), farmer age gaps is described by architype classification for farmer characteristics and these include Veterans, Baby boomers, Exers and Nexters. Crop yield benefits are known to accrue from knowledge availability in good management practice (GMP) and sharing in best practice crop farming among demographic elements (Wanyonyi, 2016).

STATEMENT OF THE PROBLEM

Compared to other parts of Africa and the world, the Kenyan sugar sector has not performed as well as is expected (AFA, 2019). Locally Kenya sugar subsector cannot satisfy the citizenry consumption sugar needs at 1,031,055 metric tonnes per year in the period 2014-2018 (AFA, 2019). In 2020, the subsector was at 58% sugar availability on the 1,038,717 metric tonnes sugar per year (Gakunga, 2020). The 13-mill subsector is able to make less than 500,000 and not the rated 800,000 tonnes sugar per year. COMESA and other WTO free trade areas sugar import quotas fill the deficit in the Kenya sugar market demand from USD 350 per tonne sugar. The country cannot enjoy exports under WTO guidelines because its sugar, available at USD 750 per tonne, is not internationally price competitive. This is despite sugar market being available in COMESA, EAC, AGOA and EU. Large Sugarcane supply deficits from farmers is a key challenge for several operational gaps in crop productivity at an average 4.95 million instead of a designated farm produce demand of 8.7 tonnes sugarcane per year at the sugar mills. Deficits in raw material supply originate from poor farm production strategies associated with: lack of operational transparency and inefficiency on-farm and in mill operations. Presence of political interference in the agribusiness makes business goals attainment even more difficult (Mitullah *et al*., 2016). Evidently, therefore, crop productivity gaps are reflected in inefficient available suitable cane catchment land use (fallow) and millers have no coherent potential cane development and supply plans for efficient use of mill crushing capacity at 8.7million tonnes per year. The productivities gaps at the mills together with highly priced sugar attract cheap imports causing socio-economic discomfort including job losses in the sugar sub-sector. This study on sugarcane productivity in the mill raw material catchments is therefore justified.

The existing studies fail to provide a general analysis of determinants of sugarcane productivity in sugar factory cane catchments areas in Kenya. Further, the evidence in literature on linkage

between farmer characteristic and sugarcane productivity are not conclusive on the nature of the influence and strength of the relationship and there is, therefore the need for further investigation. In addition, most of studies done are based on different contexts other than sugar mills in Kenya. These previous studies exhibited a conceptual gap in that; there are no studies that had reviewed the mediation effect of farmer characteristics. Due to the gaps identified in previous research and lack of consensus in findings from previous studies, the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya is therefore open to further scrutiny as to how they relate with the mediation effect of farmer characteristics.

RESEARCH OBJECTIVE

The objective was to determine the mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya.

RESEARCH HYPOTHESIS

Ho: There is no significant mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya.

THEORETICAL REVIEW

General Systems Theory (GST)

General Systems Theory (GST) was modeled by Ludwig (1950). General systems theory adds a reversal causal effect of firm performance. GST is inculcated in developing broad and general applicable concepts and principles as specific concepts as opposed to one specific concept. Employee skills and abilities are inputs while employee attitudes and behaviors are cellular mechanisms while firm performance is the output, which in turn generates inputs required to maintain the system. The theory argues that performance outputs generate inputs or feedback to the organizational performance linkage (Shin & Konrad, 2017).

EMPIRICAL REVIEW

Nkari and Kibera (2016) looked at the relationship between farmer characteristics and performance. The study findings revealed significant relationship between farmer characteristics and performance. However, the study used farmer characteristics as an independent variable rather

than a mediating variable. The study also failed to introduce the moderating and mediating variable. The current study introduced the moderating and mediating variable to assess the relationship between change management and productivity. Guo, Wen and Zhu (2015) assessed the impact of aging agricultural labor population on farmland output: from the perspective of farmer characteristics. The results showed that, in this context of aging, changes in the working-age households have a significant impact on agricultural output. This indicates that the adverse effects of changes in the agricultural population age result more from the agricultural output of older farmers who intend to give up farming. This intention adversely affected other elements and reduced investment. Therefore, various forms of training should increase efforts to cultivate modern professional farmers and policies should be simultaneously developed to increase agricultural production levels.

Kassem and Sarhan (2013) studied the effect of job characteristics on satisfaction and Productivity. The study tested core dimensions of the job characteristics model (JCM) among extension agents in Egyptian agricultural extension system. Regression analysis revealed that performance was not related to the core job dimensions while satisfaction was. The study posited that the managers of Egyptian agricultural extension system should put job characteristics into consideration for job redesign to enhance satisfaction and performance of extension agents. Senen, Masharyono and Edisa (2020) examined the effect of job characteristics to employee's productivity. The study used descriptive analysis technique and a cross-sectional design. The study used 75 respondents who have been selected by using non-probability sampling. A questionnaire was used as a research instrument to collect the data from respondents. The analytical technique used is a simple linear analysis technique. Based on the results of the study using a simple linear regression analysis, there was a positive influence between job characteristics on employee performance. The study provides a basis for understanding the issues of job characteristics on employee performance.

Bremner and Carrière (2017) studied the effects of workers' characteristics; skill variety, autonomy, task significance and task identity on job-related work stress at the medical facility and the mediating effect of the importance of work. The study established that skill variety was the most significant of all other job characteristics. The direct relationship between skill variety and cynicism suggests that having the opportunity to conduct complex and challenging work is

engaging for those that work in the healthcare field. The four job characteristics examined in the study only helped to explain about twenty-four percent of the variance in meaningful work.

CONCEPTUAL FRAMEWORK

The study's conceptual framework indicates a relationship between change management as the independent variable and sugarcane productivity as the dependent variable. Farmer characteristics was the mediating factor. The conceptual model is illustrated in Figure 1.

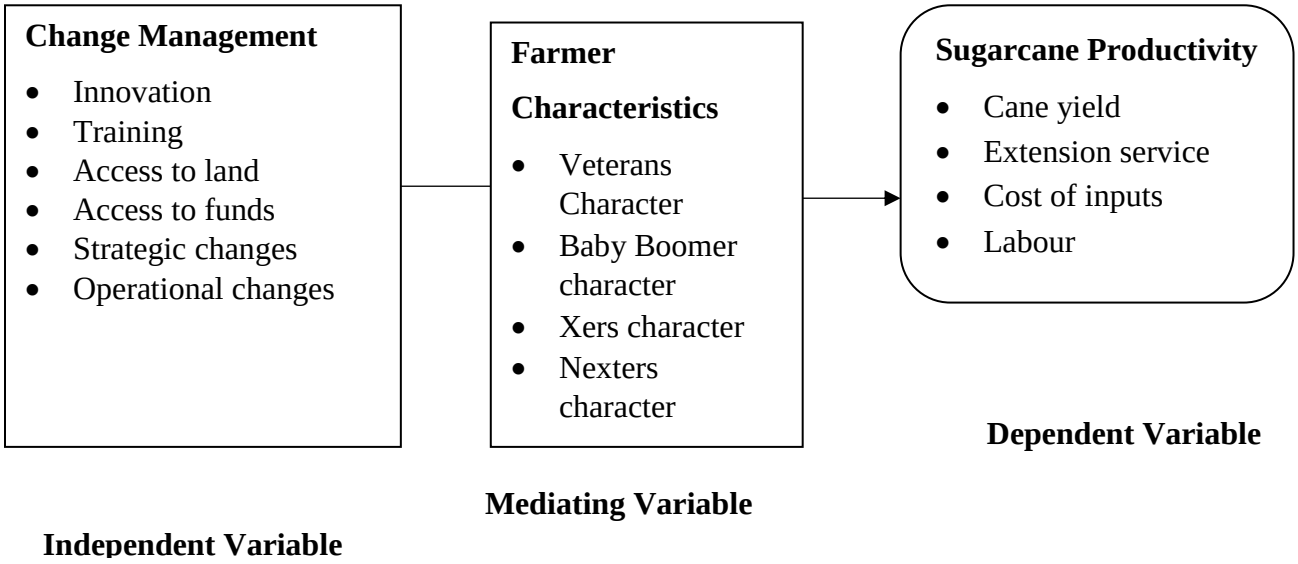

Figure 1: Conceptual Model

RESEARCH METHODOLOGY

The philosophical foundation of this study was positivism, where quantitative data was used. This study thus adopts the positivist philosophy which is founded on objectivity, precision and scientific rigor to develop knowledge as opposed to the phenomenological approach which focusses on personal knowledge and subjectivity (Van Manen, 1997). The cross-sectional survey design was adopted for this study in order to provide relevant information of the extent to which change management influences sugarcane productivity in sugar factory cane catchment areas.

The sugar sub-sector sugarcane production population of 394,321 individuals make a target population of 392,282 farmers and 2,039 extension service staff or leaders. This population works on a gross surface of 188,449 hectares as catchments at 13 sugar mills of the sugar sub-sector. Slovin (1960) formula may be used in deriving a sample size, n, from a target population where

478 respondents were arrived at. In addition, Cane catchment sugarcane farming 78 situational Leaders or extension staff pre-qualify for a domain of special skills (they each independently possess by their jobs descriptions at all the 13 mills; Managing Director, Head of Agriculture Operations, Cane Development Manager, Extension Services Manager, Agronomist. The researcher used structured questionnaires for data collection.

An empirical model was used to test the statistical significance of the independent variable on the dependent variable. The model for the study:

Four Step Mediation Methodology (Baron & Kenny, 1986) was used to establish the mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya.

Step 1: a regression analysis of CM Predicting SP

$$SP = \alpha + \beta_1 CM + \varepsilon \quad (3)$$

Step 2: a regression analysis of CM Predicting FC

$$FC = \alpha + \beta_1 CM + \varepsilon \quad (6)$$

Step 3: a regression analysis of FC Predicting SP:

$$SP = \alpha + \beta_2 FC + \varepsilon \quad (7)$$

If the relationship is significant then proceed to:

Step 4: a regression analysis of CM and FC Predicting SP.

$$SP = \alpha + \beta_1 CM + \beta_3 FC + \varepsilon \quad (8)$$

SP= Sugarcane Productivity;

CM = Change Management,

FC = Farmer Characteristics

β = Coefficient parameters to be determined

ε = Constant error

Steps 1-3 was used to establish that zero-order relationship exist among the variables. Situations where one or more of the relations is non-significant depicts no possibility of mediation (Baron & Kenny, 1986). If there are significant relationships from Step 1 to Step 3, then one proceeds to Step 4 where the mediation is supported if the effect of FC remains significant after controlling for

CM. If CM is not significant when FC is controlled, then there is full mediation, and if both CM and FC significantly predict P, there is partial mediation.

RESULTS AND DISCUSSIONS

The study realized a success rate of 96%. According to Mugenda and Mugenda (2003) and Kothari (2004), a response rate of above 50% is adequate for a descriptive study. Babbie (2004) also asserted that return rates of above 50% are acceptable to analyze and publish, 60% is good and 70% is very good. Thus 96% was considered very good for the study.

Correlation Analysis

Correlation analysis was carried out to determine the association between change management, farmers' characteristics and sugarcane productivity. The mean score for each of the independent variables was calculated and the Pearson's correlation obtained using SPSS. The correlations were done at 0.05 significance level with one asterisk (*) or a 0.01 significance level with two asterisks. To determine whether the correlation between variables is significant, one needs to compare the p-value to the significance level used. A significance level (denoted as α or alpha) of 0.05 works well. An alpha of 0.05 indicates that the risk of concluding that a correlation exists when, actually, no correlation exists is 5%. The p-value indicate whether the correlation coefficient is significantly different from 0 or not. When the p-value is less than or equal to 0.05 the correlation is statistically significant. However, if the p-value is greater than 0.05 or the significant level then correlation is not statistically significant (Statistics Solution, 2018). The correlation results are presented in Table 2.

Table 2: Correlation Matrix

Variables		Sugarcane Productivity	Change Management	Farmer Characteristics
Sugarcane Productivity	Pearson Correlation	1.000		
	Sig. (2-tailed)			
Change Management	Pearson Correlation	.750**	1.000	
	Sig. (2-tailed)	0.000		
Farmer Characteristics	Pearson Correlation	.761**	.645**	1.000
	Sig. (2-tailed)	0.000	0.000	

The results in Table 2 indicate that change management is positively and significantly associated with sugarcane productivity in sugar factory cane catchments areas in Kenya (r= 0.750, p=0.00<0.05). Farmer characteristics is positively and significantly associated with Sugarcane Productivity in sugar factory cane catchments areas in Kenya (r=0.761, p=0.00<0.05). Since the R-values were above 0.7, this is an indication that change management and farmer characteristics portrayed a high association with Sugarcane Productivity in sugar factory cane catchments areas in Kenya.

Hypothesis Testing

The objective of the study was to determine the mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchment areas in Kenya. Baron and Kenny (1986) moderation was used. The hypothesis stated in the null form is as follows:

Ho: There is no significant mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya

The mediating effect of farmer characteristics was assessed and results explained using coefficient of determination (R-Square), Analysis of Variance (ANOVA) and the regression coefficients. The mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya was further analyzed in 4 steps.

Table 3: R^2 for Change Management, Farmer Characteristics and sugarcane productivity

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.750a	0.563	0.562	0.77146
2	.745a	0.555	0.554	0.77311
3	.761a	0.578	0.578	0.75766
4	.809a	0.654	0.653	0.68688

The results in Table 3 show that the Rsquare for the mediating effect had varying values. The first step for regressing change management against sugarcane productivity had 56.3% while the second step of regressing change management against farmer characteristics had 55.5%. The third step which regressed farmer characteristics against sugarcane productivity had 57.8% and lastly the step that regressed change management, farmer characteristics against sugarcane productivity

had 65.4%. The Rsquares for all the steps were above 50% and thus indicate a high level of variation between the variables.

Table 4 shows ANOVA for change management, farmer characteristics and sugarcane productivity.

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	355.724	1	355.724	597.699	.000b
	Residual	276.152	464	0.595		
	Total	631.876	465			
2	Regression	345.921	1	345.921	578.751	.000b
	Residual	277.334	464	0.598		
	Total	623.254	465			
3	Regression	365.515	1	365.515	636.729	.000b
	Residual	266.36	464	0.574		
	Total	631.876	465			
4	Regression	413.429	2	206.715	438.134	.000b
	Residual	218.446	463	0.472		
	Total	631.876	465			

The ANOVA results indicate that all the four models were significant at 0.000<0.05. The F-Calculated for model one was (1, 464) = 597.699 which is greater than F-Critical (1, 464) = 3.84 at 95% confidence level. The F-Calculated for model two was (1, 464) = 578.751 which is greater than F-Critical (1, 464) = 3.84 at 95% confidence level. The F-Calculated for model three was (1, 464) = 636.729 which is greater than F-Critical (1, 464) = 3.84 at 95% confidence level. The F-Calculated for model four was (2, 463) = 438.134 which is greater than F-Critical (2, 463) = 2.997 at 95% confidence level. Therefore, the results confirm that the regression model one, two, three and four are significant. The regression coefficients for change management, farmer characteristics and sugarcane productivity are as shown in Table 5.

Table 5: Regression coefficients for Mediating Effect

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.714	0.100		7.17	0.000
	Change Management	0.751	0.031	0.750	24.448	0.001
2	(Constant)	0.678	0.1		6.794	0.000
	Change Management	0.741	0.031	0.745	24.057	0.000
3	(Constant)	0.751	0.095		7.883	0.000
	Farmer Characteristics	0.766	0.03	0.761	25.233	0.000
4	(Constant)	0.405	0.093		4.353	0.000
	Change Management	0.413	0.041	0.413	10.077	0.000
	Farmer Characteristics	0.456	0.041	0.453	11.059	0.000

The regression of coefficients results shows that in step one, the regression model of change management on sugarcane productivity was significant with $\beta=0.751$ $p=0.000<0.05$. In step two, the results show that the regression model of Change Management on Farmer Characteristics was significant with $\beta=0.741$, $p=0.001<0.05$. In step three, the results show that the regression model of Farmer Characteristics on sugarcane productivity was significant with $\beta=0.766$, $p=0.000$. In step four, the results show that the regression model of Change Management and Farmer Characteristics on sugarcane productivity was significant with $\beta_1=0.413$, $p=0.000<0.05$: $\beta_2=0.456$, $p=0.000<0.05$.

The fitted modes were:

Model 1: SP= 0.714 + 0.751CM

Model 2: FC= 0.678 + 0.741CM

Model 3: SP= 0.751+ 0.766FC

Model 4 SP= 0.405 + 0.413CM + 0.456FC

Where;

SP= Sugarcane Productivity

CM= Change Management

FC= Farmer Characteristics

Steps 1-3 were used to establish that zero-order relationship existed among the variables. Situations where one or more of the relations is non – significant depicts no possibility of mediation (Baron & Kenny, 1986). If they are significant relationships from step 1 through 3, one proceeds to step 4 where mediation is supported if the effect of change management remains significant after controlling farmer characteristics. If change management is not significant when farmer characteristics is controlled, there is full mediation, and if both change management and farmer characteristics significantly predict Sugarcane Productivity, there is partial mediation. Thus, step 1, 2 and 3 were met as the P-value were below 0.05. However, in step 4 the p value for corporate governance was below 0.05. Therefore, this indicate that there exists a partial mediation effect on the mediating role of farmer characteristics on the relationship between change management and sugarcane productivity.

Discussion

The objective of the study was to determine the mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya. The hypothesis stated in the null form is as follows:

Ho: There is no significant mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya.

The mediating effect of farmer characteristics was assessed and results explained using coefficient of determination (R-Square), Analysis of Variance (ANOVA) and the regression coefficients. The mediating effect of farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya was further analysed in 4 steps. The regression of coefficients results shows that in step one, the regression model of change management on sugarcane productivity was significant. In step two, the results show that the regression model of change management on farmer characteristics was significant. In step three, the results show that the regression model of farmer characteristics on sugarcane productivity was significant. In step four, the results show that the regression model of change management and farmer characteristics on sugarcane productivity was significant.

Steps 1-3 were used to establish that zero-order relationship existed among the variables. Situations where one or more of the relations is non – significant depicts no possibility of mediation (Baron & Kenny, 1986). If they are significant relationships from step 1 through 3, one proceeds

to step 4 where mediation is supported if the effect of change management remains significant after controlling farmer characteristics. If change management is not significant when farmer characteristics is controlled, there is full mediation, and if both change management and farmer characteristics significantly predict sugarcane productivity, there is partial mediation. Thus, step 1, 2 and 3 were met as the P-value were below 0.05. However, in step 4, the P-value for corporate governance was below 0.05. Therefore, this indicate that there exists a partial mediation effect on the mediating role of farmer characteristics on the relationship between change management and sugarcane productivity.

The results agree with Nkari and Kibera (2016) who looked at the relationship between farmer characteristics and productivity and the study findings revealed significant relationship between farmer characteristics and productivity. The findings by Guo, Wen and Zhu (2015) on the impact of aging agricultural labour population on farmland output: from the perspective of farmer characteristics showed that changes in the working-age households have a significant impact on agricultural output. The study also found that elderly farmers who do not intend to abandon farming had higher agricultural output compared to other farmers. This indicates that the adverse effects of changes in the agricultural population age result more from the agricultural output of older farmers who intend to give up farming. This intention adversely affected other elements and reduced investment. Therefore, various forms of training should increase efforts to cultivate modern professional farmers and policies should be simultaneously developed to increase agricultural production levels.

The findings are consistent with Kassem and Sarhan (2013) who studied the effect of job characteristics on satisfaction and productivity and the results revealed that productivity was not related to the core job dimensions while satisfaction was. The study posited that the managers' agricultural extension system needed put job characteristics into consideration for job redesign to enhance satisfaction and productivity of extension agents. The findings by Senen, Masharyono and Edisa (2020) study on the effect of job characteristics to employee's productivity also found a positive influence between job characteristics on employee productivity.

CONCLUSIONS

The study concludes that there exists a mediation effect of sugarcane farmer characteristics on the relationship between change management and sugarcane productivity in sugar factory cane catchment areas in Kenya. Older farmers were more traditional and less inclined to change, whereas younger farmers tended to be more progressive, and willing to try new cane productivity ideas. The farmers, unlike their older counterparts readily enroll in cane farming extension programs and enhance productivity. Unlike the vibrant young farmers, the older ones may have loss of mental and physical human energy with advanced age and the departure of children from households may negatively alter motivation urge for improved change in sugarcane farming. Age differences also favor the better-educated and younger producers who may have fewer years of experience but have more family members available for work on the farm. Negative farm performances from potential better-educated farmers many times have other sources of income such as salaried jobs, creating time conflicts and isolation from possible support systems. This conflict may lead to poor cane productivity. Such young farmers may perform worse than the experienced and seasoned older type farming the same crop in a catchment.

RECOMMENDATIONS

The study recommends that the sugar factory management should ensure that their organizations have strong business control environment, which will inform their sugarcane crop productivity strategies. The strategies should incorporate the sugarcane farmers' needs as they generate desired changes. The needs of sugarcane farmer types: Veterans Character, Baby Boomer character, Xers character, and Nexters character must be understood well, although they may keep changing, for affective productivity operations. The monitoring and evaluation must be mainstreamed in farming operations and outcomes, along the character types.

The partial mediation effect of farmer characteristics on the relationship between change management and sugarcane productivity contributes to literature on the role of farmers' characteristics. These findings are very critical to management to ensure they develop and implement policies that support all character category of sugarcane farmers and their diverse needs. It is helpful for sugar cane farm managers not only identify their own work style but also the style of farmers they manage for sugarcane productivity synergies. In this way, raw supply deficits will not be as adverse as they are now.

REFERENCES

Agriculture and Food Authority, [AFA] (2019). Kenya Sugar Industry Year Book of Statistics

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.

Bremner, N., & Carrière, J. (2011). The effects of skill variety, task significance, task identity and autonomy on occupational burnout in a hospital setting and the mediating effect of work meaningfulness. *Telfer School of Management*, *11*.

Gakunga., M. (2020). COMESA Sugar Safeguard on Kenya is Paying-Off.

Guo, G., Wen, Q., & Zhu, J. (2015). The impact of aging agricultural labor population on farmland output: from the perspective of farmer preferences. *Mathematical problems in Engineering*, *2015*.

Kassem, H. S., & Sarhan, A. M. (2013). Effect of job characteristics on satisfaction and Productivity: A test in Egyptian agricultural extension system. *African Journal of Agricultural Research*, *8*(48), 6126-6130.

Kemigisha, R. (2016). Safeguards & Trade Remedies in COMESA and the Tripartite Free Trade Area Agreement. COMESA Secretariat. Retrieved in September 2021 from https://www.tralac.org/news/article/12001-customized-trade-remedies-in-africa-the-case-of-the-comesa-eac-sadc-tripartite-free-trade-area.html.

Mahgoub, F. (2014). Status of agriculture and future challenges in Sudan

Mitullah, W., Kamau, P. & Kivuva, J.M. (2016). Employment creation in agriculture and agro-processing sector in Kenya in the context of inclusive growth: political economy and settlement analysis. *Institute of Development Studies*, University of Nairobi, Kenya.

Mugenda, O. M., & Mugenda, A. G. (2003). Research methods. *Quantitative and qualitative approaches*. Nairobi: ACTS Press.

Nkari, D. I. M., & Kibera, P. F. N. (2016). The influence of farmer characteristics on productivity of commercial farmers in Kiambu County, Kenya. *European Journal of Business and Social Sciences*, *5*(03), 63-78.

Rakotoarisoa M.A. & Chang K, (2017). The Sugar Sub-sector in Africa-Caribean-Pacific Countries in the Post -2017 era: Impacts of European Union production quota elimination and ACP-EU reciprocal preferential access on ACP sugar market and trade

Senen, S. H., Masharyono, M., & Edisa, N. (2020). The Effect of Job Characteristics to Employee's Productivity: A Case Study on Employees at Interior Industry. In *3rd Global Conference on Business, Management, and Entrepreneurship (GCBME 2018)* (pp. 227-232). Atlantis Press.

Shin, D., & Konrad, A. M. (2017). Causality between high-productivity work systems and organizational productivity. *Journal of management*, *43*(4), 973-997.

Slovin, E. (1960). Slovin's formula for sampling technique.

Wachiye, R. M. (2012). *Strategic responses by companies in the sugar industry in Kenya to the implementation of the COMESA free trade agreement*. University of Nairobi.

Wanyonyi, J. P. (2016). *Influence of Sugar Factories on Improvement of Cane Farmers Livelihood in Kenya. A Case of Bungoma East Sub County.* University of Nairobi.

WTO (2015). World Trade Organization (WTO).