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Relationship between Change Management and Sugarcane Productivity in Sugar Factory Cane Catchments Areas in Kenya

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Abstract

The study sought to determine the relationship between change management and sugarcane productivity in 13 sugar factory cane catchment areas in Kenya. The philosophical foundation of this study was positivism. Cross-sectional survey design was adopted. A sample of 478 respondents were used where 400 were farmers and 78 were the factory leaders. A simple regression model was used to test the statistical significance. The findings show that when change management is held constant, sugarcane productivity will remain at 0.714. A unit increase in change management will increase sugarcane productivity in sugar factory cane catchments areas in Kenya by the rate of 0.751. The null hypothesis of the study was change management has no significant relationship with sugarcane productivity in sugar factory cane catchments areas in Kenya. Since, the p value was less than the critical value 0.05, the study rejected the null hypotheses and thus change management has a significant relationship with sugarcane productivity in sugar factory cane catchments areas in Kenya. The study concludes that, to achieve varied goals, managers need more than fragmentary ad-hoc change programmes dealing only with present sugarcane productivity challenges. They need change management methods to prepare for upcoming organizational competitive difficulties. The study provides significant information for managers of the sugar companies on the need to implement appropriate change management policies and practice in organizations. The study confirms that change management has a significant effect on productivity of the sugar factory cane catchment areas.

Keywords: *Change Management, Productivity, Sugarcane Factories*

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1.1 Introduction

The world sugar is obtained largely from sugarcane (90%) and sugar beet (10%) at a per capita consumption rate of about 22.6 kg (ISO, 2019).World sugar trade is regulated by World Trade Organization (WTO) of United Nations. The organization regulates world trade through 5 liaison mandates: trade negotiations, managing trade disputes; monitoring national trade policies; giving technical assistance and training for developing countries and cooperating with other international organizations to foster international trade (WTO, 2015). Kenya and other 163 country economic sub-sectors are in the WTO mutuality business union and bound by rules that are designed to discourage trade distortions and enhance creation of competitiveness.

In 2019, the Kenya 13 sugar factories mills could deliver only 500,000 tonnes sugar per year out of potential a potential of 800,000 tonnes. (Agriculture and Food Authority, 2019). The mills also failed to substantially meet the consumption demand of 1,031,055 metric tonnes of sugar 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 of 2005.The requirements allow sugar import reprieves as one the trade conditions for sugar deficit producing members in order to protect their local sugar industry from competition if there are mitigations in place to correct for non-performance. Negative impacts like from COMESA sugar producing countries, where Kenya is a member, are mitigated against this way (Kemigisha, 2016). Beyond COMESA, negative impacts from some other world sugar sub-sectors have been evident due to sugar trade globalization. ACP countries which include Kenya have had serious trade challenges with discontinuation of favoured access to European sugar markets with EU farm subsidies related attractive sugar prices pre-2017.The EU sugar market collapse plus several other negative impacts from globalized trade have led to low sugarcane and sugar productivity in the Kenya sugar sub sector. The existing poor sugarcane supply condition in the agribusiness environment has justified this study on the Kenya sugar-sub-sector raw material production. Sugarcane production model realignment through change management is to be investigated.

Moran and Brighton (2011) define change management as the process of continually renewing an organization's direction, structure and capabilities to serve the ever-changing needs of external and internal customers. Korir, Mukotive, Loice and Kimeli (2012) define change management as the effective management of a business change such that executive leaders, managers and frontline employers work in concert to successfully implement the needed process, technology or organizational changes. According to O'Donovan (2017), change management refers to the discipline that guides people in preparing, equipping and supporting change effectively to drive organizational success and results. Burnes (2004) avers that change is an ever-present feature of organizational life, both at the operational and strategic levels. Due to its importance, change management is becoming imperative, and needs appropriate managerial skills and strategy for restoration of competitive advantage in business environment including Kenya's sugar subsector of 13 mills subject to WTO guidelines of 2005.

A general agricultural process like sugarcane farming delivers amounts of farm produce in a quantifiable amount to a farmer for a sugar factory. The produce may be converted into productivity, which is defined generally as a ratio between the produce output volume and the volume of inputs to generate the produce (FAO, 2017). At farm level in the sugar sub-sector this

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measures how, for example, units of land area, in hectares, labour in man hours and capital in a currency, are able to give level of productivity, say in tonnes sugarcane per hectare. This is partial factor productivity or PFP presented as Tonnes cane per Hectare (TCH) (Fuglie *et al*., 2016). In this study, productivity metrics involve only Partial Factor productivity (PFP) such as Tonnes Cane per Hectare (TCH), at farm level and tonnes sugar per year (Ts/Y) at the factory. Other productivity types are Total Resource Productivity (TRP) important in farming but with environmental impact evaluations (Nadia, 2014).

1.2. Statement of the Problem

The Kenya Sugar sub-sector has been experiencing a dismal performance compared to others in the world and at regional level. The sub-sector has failed to deliver on its sugar business mandates nationally and internationally (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 needed for consumption (Gakunga, 2020). The 13-mill subsector is able to make 500,000 and not the rated 800,000 tonnes sugar per year. Cheap import quotas fill the deficit in the Kenya sugar market e.g. COMESA and other markets average USD 350 per tonne sugar while Kenya has USD 750. Therefore, the country cannot enjoy exports, under the WTO guidelines, to COMESA, EAC, AGOA and EU. The cheap imports have partly and indirectly inhibited cane supply to the sugar mills creating socioeconomic problems including unemployment. Raw material deficits is a key challenge for several operational gaps arising from: lack transparency, poor operational efficiency and low profitability caused by political interference (Mitullah *et al*., 2017). Technically key gaps are reflected in inefficient land use and no serious potential cane development by millers who would rather import cheap sugar than get it from their own grown sugarcane. The cane areas or catchments produce only 4.95 million tonnes per year of sugarcane out of the expected 8.7 million tonnes. Deficits in sugarcane farming “exports” an assortment of jobs to sugar exporting countries and creates other social problems like criminality at sugar factories and cane catchment areas. Agricultural land is not limiting as out more than 350,000 hectares available only 180,000 hectares are today farmed (AFFA 2021).Therefore, this study examined the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya.

1.3 Objective of the Study

To determine the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya

1.4 Research Hypothesis

Ho: There is no significant effect of change management on sugarcane productivity in sugar factory cane catchments areas in Kenya

2.1 Literature Review

2.2 Theoretical Review: Kurt Lewin Change Management Theory

Kurt Lewin established this model in the 1950s. The model holds that the safe zones are mostly preferred by the individuals (Sarayreh, Khudair & Barakat, 2013). The model is considered a three-step model change theory (unfreezing, transition and refreezing) which gives change

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managers ideas on the implementation of reforms. The model avers that an organization needs to keep adjusting to ever-dynamic environment by adopting the complex adaptive characters for it to survive. Organizations need the three-step model in order to break the status quo and to maintain an equilibrium. The managers are encouraged to change and replace the old practice with new ones for the reforms to be implemented effectively (Kariel, 2016). The model gives a momentous stage involved in implementation of a change process hence right policies and initiatives ought to be involved during the transitioning from old to new.

The theory is critiqued for lacking the accountability for the interaction of the individual, organization and the society and for failing to explain the complex involved in the change process as its process is linear. The model was significant to the study as it holds the relevance of farmers empowerment through trainings, strategic leadership and operational changes. In the world of competition, sugar factory cane catchments areas like any commercial entity have to embrace strategic changes and operational changes for its survival.

2.3 Empirical Review

Leaders championing the change management strategically will attain a new sub-sector vision for lifting cane supply for 800,000 tonnes sugar per year from 8.7 million tonnes sugarcane per year at the 13 factories of the sub-sector. This study is seeking a justification for farming model change in the cane catchment areas realigned to some change management practices. Leadership tools and the farmer characteristics could be engaged for good yield response: 8.7 million tonnes and not 4.95 million tonnes sugarcane per year giving only 500,000 tonnes sugar per year instead. (AFA, 2019).

Kurgat (2019) studied the relationship between change management and organizational performance of media companies in Kenya. The study used questionnaires to collect primary data. Interviews were conducted via phone calls. Regression analysis was done using SPSS. Descriptive analysis was used to determine the relationship between change management and organizational performance. The study findings were statistically significant for the relationship between change management and performance of Kenyan media firms. The study failed to introduce the moderating and the mediating variables. This study introduced the farmers' characteristics and situational leadership to establish the relationship between change management and productivity.

Al-Jaradat, Nagresh, Al-Shegran and Jadellah (2013) examined the relationship between change management and performance. The study adopted the case study research design. Random sampling was employed. Data was collected using questionnaires. The collected data was analysed through SPSS. The study results indicate a statistically significant relationship between change management and performance. The study was limited to university libraries in Jordan. The study did not consider the moderating and mediating variables. This study was done in sugar factory cane catchment areas in Kenya. This study will introduce farmer characteristics and situational leadership as an intervening and moderating variable.

Kimhi and Oliel (2019) conducted a study on change management and organizational performance in Manufacturing Companies. The study was anchored on organizational change and Lewin`s Three Step Model. Descriptive survey design was adopted, and primary data was employed. The study found that technological changes have a positive significant effect on organizational performance in manufacturing companies. Change management strategies have a

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positive significant effect on organizational performance in manufacturing companies. Leadership changes have a positive significant influence on organizational performance in manufacturing companies. The study concluded that change management has a positive significant effect on organizational performance in manufacturing companies.

Sung and Kim (2021) conducted a study on the effect of change management on organizational innovation. The study was an empirical study on the impact of change management on organizational innovation through innovative behaviour in the public sector. The independent variables are the four elements of change management (organizational goal, transformational leadership, participation and communication, education and training), the dependent variable is organizational innovation, and the mediating variable is the innovative behavior of members. The results indicated that change management factors have a positive effect on innovative behavior and organizational innovation. In addition, public officials' innovative behavior played a mediating role between change management and organizational innovation. It was confirmed that the innovative behavior of organizational members is essential to achieve organizational innovation. Among the factors of change management, participation and communication had the highest influence on innovative behavior and organizational innovation.

Olajide (2014) carried out a research on change management and its effect on organizational performance of Nigerian telecoms industries using empirical insight from Airtel Nigeria. A total of 300 staff of Airtel were randomly selected from a staff population of 1000. Three hypotheses were advanced to guide the study and data collected for the study were analyzed using One-way Analysis of Variance. The result revealed that changes in technology had a significant effect on performance and that changes in customer taste has a significant effect on customers patronage. The result also shows that changes in management via leadership have significant effect on employee's performance.

2.4 Conceptual Framework

The study's conceptual framework presents the graphical relationship between change management as the independent variable and sugarcane productivity as the dependent variable. The conceptual model is illustrated in Figure 1.

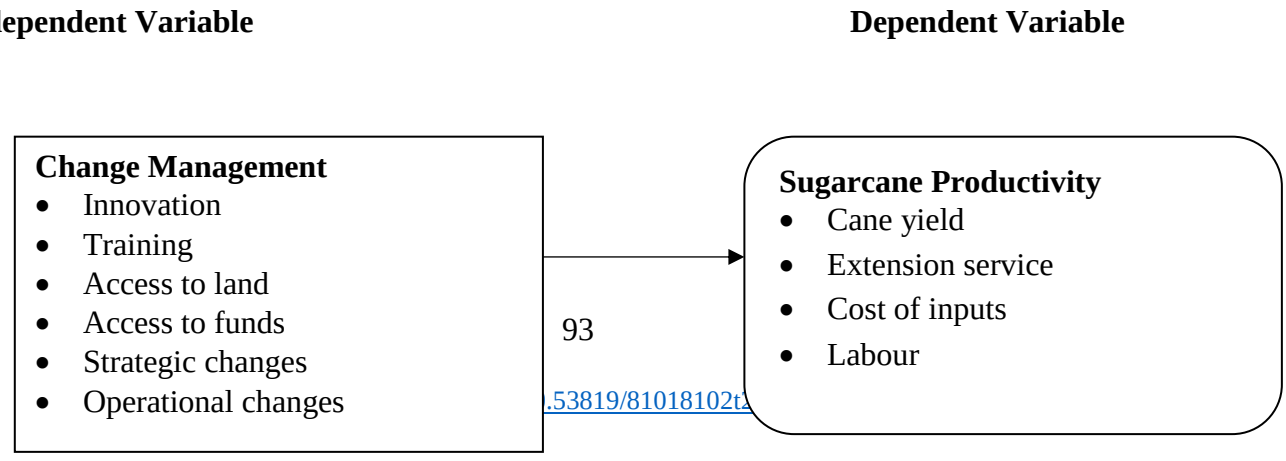

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Figure 1: Conceptual Model

3.1 Research Methodology

The philosophical foundation of this study was positivism, where quantitative data was used. This study adopted the positivist philosophy which is founded on objectivity, precision and scientific rigor to develop knowledge as opposed to the phenomenological approach which focuses 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 188449 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 was obtained. 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 was:

$$P = \beta_0 + \beta_1 CM + \varepsilon$$

Where:

P = Productivity

CM= Change Management

β_0 = Constant

β_1= Beta coefficients

ε = Error term

4.1 Results and Findings

The study realized a success rate of 96% response. 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.

4.2 Correlation Analysis

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Correlation analysis was carried out to determine the association between change management, 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
Sugarcane Productivity	Pearson Correlation	1.000	
	Sig. (2-tailed)		
Change Management	Pearson Correlation	.750**	1.000
	Sig. (2-tailed)	0.000	

The results 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). Since the R-value was above 0.7, this is an indication that change management portrayed a high association with sugarcane productivity in sugar factory cane catchments areas in Kenya.

4.2 Hypothesis Testing

The objective of the study was to determine the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya. A simple regression model was used to test the statistical significance of the independent variable (Change Management) on the dependent variable (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 effect of change management on sugarcane productivity in sugar factory cane catchments areas in Kenya.

The hypothesis was tested by regressing change management and sugarcane productivity guided by the equation $SP= \beta_0 + \beta_1 CM + \varepsilon$

Where SP = Sugarcane Productivity, CM= Change Management.

Table 3: Model Fitness for Change Management

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Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.750a	0.563	0.562	0.77146

As presented in the Table 3, the coefficient of determination R Square is 0.563. The model indicates that change management explains 56.3% of the variation in sugarcane productivity in sugar factory cane catchments areas in Kenya. This implies that there exist a significant relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya.

The Analysis of Variance (ANOVA) results are shown in Table 4. Analysis of Variance consists of calculations that provide information about levels of variability within a regression model and form a basis for tests of significance. This was conducted using SPSS by engaging average mean score of change management and sugarcane productivity.

Table 4: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	355.724	1	355.724	597.699	.000b
Residual	276.152	464	0.595		
Total	631.876	465			

The results indicate that F-Calculated (1, 464) = 597.699 which is greater than F-Critical (1, 464) = 3.84 at 95% confidence level. Therefore, the results confirm that the regression model of change management on sugarcane productivity is significant.

Table 5: Change Management and Sugarcane Productivity

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	0.714	0.100		7.17	0.000
Change Management	0.751	0.031	0.750	24.448	0.000

The fitted model from the result is

SP= 0.714 + 0.751CM

This implies that a unit change in change management will increase sugarcane productivity in sugar factory cane catchments areas in Kenya by the rate of 0.751. H_0 stated that change management has no significant relationship with sugarcane productivity in sugar factory cane catchments areas in Kenya. Since, the p value 0.000<0.05 is less than the critical value 0.05, the study concluded that change management has a significant relationship with sugarcane productivity in sugar factory cane catchments areas in Kenya.

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4.3 Discussion

The objective of the study was to determine the relationship between change management and sugarcane productivity in sugar factory cane catchments areas in Kenya. A simple regression model was used to test the statistical significance of the independent variable (Change Management) on the dependent variable (Sugarcane Productivity) in sugar factory cane catchments areas in Kenya. The hypothesis stated in the null form was:

Ho: There is no significant effect of change management on sugarcane productivity in sugar factory cane catchments areas in Kenya.

The hypothesis was tested by regressing change management and sugarcane productivity. The findings shows that when change management are held constant, sugarcane productivity will remain at 0.714. At the same time, a unit increase in Change Management will increase sugarcane productivity in sugar factory cane catchments areas in Kenya by the rate of 0.751. The null hypothesis of the study was Change Management has no significant relationship with sugarcane productivity in sugar factory cane catchments areas in Kenya. Since, the p value was less than the critical value 0.05, the study rejected the null hypotheses and thus Change Management has a significant relationship with sugarcane productivity in sugar factory cane catchments areas in Kenya. The envisaged conceptual model (Figure 1) of the study could therefore be retained as an optimized one by this null hypothesis finding.

The findings are consistent with what Kurgat (2019) found in a study on the relationship between change management and organizational productivity of media companies in Kenya and findings were statistically significant for the relationship between change management and productivity of Kenyan media firms. The results are also in line with the outcome of Al-Jaradat, Nagresh, Al-Shegran and Jadellah (2013) whose study on the relationship between change management and productivity indicate a statistically significant relationship between change management and productivity.

Kimhi and Oliel (2019) in a study on change management and organizational productivity in Manufacturing Companies found also that changes have a positive significant effect on organizational productivity in manufacturing companies. Change management strategies have a positive significant effect on organizational productivity in manufacturing companies. Leadership changes have a positive significant influence on organizational productivity in manufacturing companies. The findings by Sung and Kim (2021) on the effect of change management on organizational productivity indicated that change management factors have a positive effect on innovative behavior and organizational productivity. In addition, public officials' innovative behavior played a mediating role between change management and organizational productivity. It was confirmed that the innovative behavior of organizational members is essential to achieve organizational productivity. Among the factors of change management, participation and communication had the highest influence on innovative behavior and organizational productivity. The findings by Olajide (2014) on change management and its effect on organizational productivity of Nigerian telecoms industries revealed that changes in technology had a significant effect on productivity and that changes in customer taste has a significant effect on customers patronage. The result also shows that changes in management via leadership has significant effect on employee's productivity.

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Nyasha (2011) had similar results while examining the impact of organizational change and established that change management and employee involvement indicated that the change vision was not communicated, while employee involvement was minimal in all stages of change processes. The findings are in line with those of Ahmed, Rehman, Asad, Hussain and Bilal (2013) who examined the impact of organizational change on the productivity and showed that organizational change had a positive significant impact on productivity in the banking sector. The findings are also consistent with Safo-Adu (2014) conducted a study on the role of change as an organizational improvement and found that the sources of resistance to change were primarily from blind resistance, intellectual (ideological) resistance and political resistance. Further, personnel training was found to be the factor with the highest effect on successful implementation of and acceptance of change.

5.1 Conclusion

The study investigated the relationship between change management and sugarcane productivity in sugar factory cane catchment areas in Kenya. The study showed that change management enhances sugarcane productivity and is supported by existing similar studies. Regression analysis was done to find out if the effects were sufficient or not to support the hypothesis. The results indicated that change management influences sugarcane productivity in sugar factory cane catchments areas in Kenya, therefore, it can be concluded that higher profitability may exist for a sugar company as a result of improved change management. The study concludes that in order to achieve corporate raw material supply goals, managers need more than fragmentary ad-hoc change programs dealing only with present sugarcane productivity challenges for the farm. They need change management methods to prepare for upcoming organizational competitive difficulties in sugarcane production. For this managers must gain knowledge on how to build and manage farmers or human groups that are proficient of foreseeing the new, capable of changing factory vision into technology, products, processes and services, willing and able to agree with the new way of carrying out the required new agricultural processes. All organizations including sugar factories go through change but it may be necessitated differently: some organization's productivity has to change to take advantage of new growth and opportunities while others are forced to quickly change to survive and remain competitive in the agribusiness..

6.1 Recommendations

The study provides significant information for managers and farmers of the sugar factory cane farms on the need to implement appropriate change management policies and practice in their farming system. The study confirms and is supported by earlier research findings that change management has a significant effect on productivity of the sugar companies. These findings inform the need to ensure adoption of change management as an approach to bring positive change in the factory sugarcane farming. The significant information is for managers and their farmers at the sugar factory sugarcane farms has appropriate recommendations for cane yield improvement. This is important when sugar factories like those in this study operate in an overly growing competitive globalized business environment thus calling for quick strategic changes to cope up. Therefore, this change management study will mitigate against sugar factory milling raw material availability challenges now at 4.95 million and not 8.7million sugarcane tonnes per year. The WTO guidelines of 2005 coming together with the sugarcane supply shortages in the sugar sub-sector is worry enough to catapult the factories' leadership and farmers into strategic

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change process solutions as per this study. And therefore the future competitive industry survival may be guaranteed with new sugarcane production solution.

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