

Influence of Supplier Training on Performance of Sugarcane Enterprises in Kenya

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Abstract

Manufacturing firms are increasingly using supplier development to address gaps in their supply base aimed at improving their performance. There has been a decline in sugarcane yield in Kenya yet, the demand for sugar has been increasing steadily over time. Drawing on the supplier training aspect of supplier development strategy, the study objective was to establish how supplier training impacts on performance improvement of sugarcane enterprises in Kenya.

Index terms— supplier development, supplier training, supply base, material flow,

1 Introduction

Manufacturing firms try to achieve uninterrupted flows of material resources required for their conversion process into the organizations through the adoption of sourcing strategies that place their suppliers at the center of their operations. One of these sourcing strategies is supplier development, which is a strategy adopted to empower suppliers through the process of direct investment of resources in the supplier to augment and upgrade their operational abilities to enhance performance objectives. Joshi et al., (2017) opined that the buyer's supply base needs to be self-sufficient and could be realized through supplier development initiatives. Indeed the central role the strategy plays is supported by the available modeling and evaluation analysis that goes into assessing the effects of supplier development on performance improvement of both the buyer and supplier (Dou et al., 2014). Usually, there exist some shortcomings in the supplier's ability to meet buyer expectations concerning material flow (Busse et al., 2016).

The stream of supplier development research has provided empirical support and assertions that supplier development improves performance metrics such as delivery time, quality, cost reduction, quantity, and profit (Blome et al., 2014; Dalve & Kant, 2015; Dalve & Kant, 2018). Glock et al., (2017) are of the view that supplier development is one way of the manufacturer getting involved in shaping and influencing the supply base with a view of propelling the focal company to gaining competitive advantage.

There has been a shift from the stand-alone strategies arising from the competitive pressure and production requirements, to more supplier collaborative and supportive strategies to access the needed resources by the manufacturing organizations (Bai & Sarkis, 2014). These collaborative and supportive strategies include supplier development which is described as a way of deriving financial and material resources to support the manufacturer's present and future operational needs. The adoption of supplier development strategy is informed by the prevailing uncertainties in the supply market dominated by various forms of supply risks and the attendant supply chains that result in material shortages (Scur & Kolososki, 2019). Besides, the realization that most buyers do not have the required raw material in the house and the M influence that suppliers exert on buyer performance have been a major driving force behind the adoption of supplier development.

The complex nature of organizational supply chains owing to the number of participants, stage in the development of each participant, and networks make it mandatory for a buyer to engage in a close working relationship with suppliers to secure sustainable flow material from outside sources (Trapp & Sarkis, 2016).

1 INTRODUCTION

45 Supplier development is defined as the "long-term investment relationship between the buying firm and the
46 supply base intended to improve their capacity to meet the buying firms' resource needs sustainably (Routroy
47 & Pradhan, 2014). The strategy is about ensuring that the buyer has access to the required resources that are
48 domiciled outside its boundaries and are necessary for the manufacturer's operations and routines in meeting
49 its marketing and customer objectives (Wang & Gunasekaran, 2017). The dependence by buyers on suppliers
50 for raw material supplies reflects the relative importance both parties attach to the relationship and the value
51 created by their actions in supplier development. Notably, the ability to achieve the intended goals is determined
52 by the strategic importance each part attaches to the supplier development initiative. Roloff et al., (2015) opined
53 that it is important to consider the interests and views of both the buyer and supplier before the implementation
54 of supplier development programs.

55 In practice, supplier development may take the form of direct or indirect programs. The direct programs
56 required a lot of capital input by the buyer whilst indirect programs require less capital input and involvement.
57 Proch et al., 2017 and Lawson et al., 2015 emphasized that the direct supplier development paradigm requires
58 substantial human, financial, and material deployment by the buyer to achieve desired results. Specifically, an
59 initiative such as supplier training that is supported by the buyer to empower the supplier with the required
60 skills and capabilities can go a long way in improving the performance of both the buyer and supplier (Lawson
61 et al., 2015; Mohanty et al., 2014). Competition in the market has shifted the traditional areas based on cost
62 leadership to supply chains, where the buyer is in the driving seat to influence the flow of material resources
63 into the organization to support its manufacturing activities in tandem with the customer satisfaction needs
64 (Glavee-Geo, 2019). In most cases tradeoffs are required to balance the needs of the company and the customer,
65 resulting in customer focus paradigm supported by reliable supply chains.

66 The direct supplier development aspect of training and education is an important factor in the transfer of skills
67 and capabilities to a supplier at the cost of the buyer. Yawar & Seuring (2020) found that training and education
68 of suppliers has a positive impact on the performance improvement of both the buyer and the supplier. The
69 supplier dependency scenario and the need of the buyer to maintain its market share by striving to meet customer
70 needs exceedingly may drive the buyer to invest in supplier training and education. Training and education of
71 supplier firm employees have been a game-changer in the effort by manufacturing companies by viewing social
72 and economic dimensions as the basis of competition derived from the market needs of their customers. This
73 assertion is in line with that of Guo-Ciang (2017) that emphasized training and education aspects of suppliers in
74 matters of socially responsible supplier development to improve the sustainable performance of small and medium
75 enterprises. According to Marti et al., (2015) where suppliers are trained in sustainable development issues relating
76 to products and services, it results in economic, social, and environmental performance improvement, with benefits
77 accruing to the supplier, buyer, and society.

78 Globally, supply chains have shaped and changed the dynamics of competition based on their value creation
79 abilities among the market players. Tanskanen (2015) argued that since buyers depend on the supply chains
80 of their suppliers to compete, they have no other option but to invest in the training of their suppliers to
81 leverage their resources. Critical requirements to support value creation operation of the buyers usually reside
82 with suppliers, hence buyers must go to great length to build collaborative relationships with suppliers that are
83 aligned and support their overall corporate and functional strategies.

84 Reliable suppliers for sugarcane in the Kenyan sugar industry are rare to come by, necessitating sugar millers
85 to identify and train sugarcane farmers in modern farming methods to argument sugarcane products to meet
86 the demands of the millers. Training as a dualaction involving farmers and millers results in concurrence of
87 farmers' and millers' strategic priorities in line with the overall view of the sugar industry policy anchored on
88 the Government of Kenya vision 2030 strategy. An extensive literature review reveals that supplier training
89 is an essential component of supply chain performance, particularly in regards to performance improvement of
90 suppliers and buyers (Busse et al., 2016). Informed by the desire to improve sugarcane yield in Kenya to ensure
91 a steady flow of raw material to support value addition activities of sugar millers, it is expected that training of
92 suppliers (farmers) has a turnaround effect on sugarcane shortage in Kenya. Accordingly, informed by empirical
93 evidence that training as a direct supplier development is essential for the smooth functioning of supply chain
94 networks; it is considered a worth feature to explore concerning the performance of sugarcane enterprises in
95 Kenya, drawing on the sugarcane farmers paradigm.

96 The Kenyan sugar industry has evolved from a single factory at inception to over ten factories to date.

97 The Government considers the sector as a reliable source of income arising from the sale of sugarcane and
98 employment; and significantly impacts the national economy (Mwanga et al., 2017). Sugar manufacturers wholly
99 depend on private farmers for the supply of cane for crushing as their nucleus farms produce less than 16% of
100 the total cane crushed in Kenya (Mati & Thomas, 2019). The sugar industry suffers from many challenges that
101 include dilapidated machinery, ineffective policy, lack of financial support, lack of spare parts for maintenance,
102 completion from importers who hardly pay requisite taxes, and under capacity utilization (Mati & Thomas,
103 2019). Under -capacity utilization is a result of an acute shortage of sugarcane occasioned by lack of a clear
104 policy by the millers to support sustainable sugarcane development programs (AFA, 2015; USDA, 2017). The
105 sugarcane shortage has limited miller from exploring other viable but untapped revenue streams like cogeneration
106 and ethanol production.

107 Cumulatively, under-capacity utilization leads to a shortage of sugar as demand outstrips supply. According to

108 USDA (2018), importations to meet the shortage usually operate to distort the market in favour of the importers.
109 Meeting the requirements of customers remains a critical factor that dictates the value addition process in pursuit
110 of competitive advantage. The reliability of the raw material supply base determines the success and improved
111 performance of a company in the market. The desire to have a reliable source of sugarcane supply provides a
112 considered justification for millers to confer sugarcane farmers with requisite innovative skills in modern farming
113 through training and education as a direct supplier development strategy.

114 The traditional performance paradigm in business is usually evaluated based on profit attained, market share,
115 and improved shareholder value. Mishra et al., (2018) indicated that performance measurement lays out variables
116 that help to quantify the effects of actions already taken to justify the outcomes. Supply chain performance is
117 about how well the supply base supports operations of the focal buyer based on specific attributes. Similarly,
118 Mishra et al., (2018) assert that the supply chain supports the achieving efficiency, effectiveness, and goals of
119 an organization. These actions are motivated by the urgency to grow the organization towards meeting their
120 customer expectations measured in terms of economic dimensions of quality, delivery time, quantity, and cost
121 (Jagan et al., 2019).

122 According to Busse et al., (2016) rise in globalization and an informed global consumer has led to the inclusion
123 of non-economic attributes of products like the use of reusable materials, waste disposal, pollution, and recycling
124 performance evaluation of supply chain actions. Sugarcane farming performance measures are in terms of yield
125 per and the quality of the cane evaluated based on sucrose content that determines the amount of sugar produced
126 per ton (AFA, 2015). Training of farmers in modern farming methods viewed from the supplier development
127 perspective of the integrated supply chain improves sugarcane yields resulting in the availability of raw material
128 to support millers' ability to produce sugar to meet the demand of the country.

129 **2 II.**

130 **3 Statement of the Problem**

131 Production of sugar has not kept pace with the demand. This is attributable to the idle capacity experienced by
132 sugar millers due to shortage of sugarcane for crushing (Mati & Thomas, 2019). The average production yield
133 per acre has declined leading to unscheduled production stoppages arising from sugarcane shortage (AFA, 2015).
134 The shortage of sugarcane is attributable to poor cane husbandry, composition of plant population on the farms
135 being predominantly of ratoon 2 and 3 crops, cost of inputs and unhealthy completion leading to harvesting of
136 immature cane (AFA, 2015; Mati & Thomas, 2019). Mwanga, Ongala and Orwa (2017) developed a sugarcane
137 yield prediction model that revealed a decline in sugarcane production from a high of 60 tons per hectare in 2016
138 to a low of 51.48 tons in 2018.

139 Demand for sugar has been on a steady rise due to increase in population and industrial activities (USDA
140 2018). However, the increased demand is not supported by corresponding increase in production in a drive for
141 the country to attain self-sufficiency. Shortage of cane has been linked with changes in regulations governing
142 the growing and sale of cane. Liberalization of the cane market has resulted in withdrawal and/or scaling down
143 of services such as farmer training and extension outreach previously offered by the millers. Consequently, this
144 resulted in under capacity utilization which creates a shortage in the market leading to importation of sugar to
145 bridge the gap (AFA, 2015; USDA 2018). According to Dubb (2014) decline in sugarcane production by small
146 scale farmers in KwaZulu-Natal province, South Africa was as a result of regulatory changes that limited sugar
147 millers' support for farmers.

148 In Kenya, sugar millers supply less than 17% of sugarcane from their own nucleus estates, while 93% is supplied
149 by farmers, thus sugarcane farmers are major stakeholders in the sugarcane supply chain (Mati & Thomas, 2019).
150 The dependency of sugarcane millers on farmers as the source of raw materials provides a justification for millers
151 to invest in farmers through provision

152 **4 a) Objective of the study**

153 The objective of the study was to establish how direct supplier aspect of supplier training impacts on performance
154 improvement of sugarcane enterprises in Kenya. Specifically, the study endeavoured to determine whether supplier
155 training enhances the performance of sugarcane enterprises in Kenya.

156 **5 III.**

157 **6 Literature Review a) Conceptual framework**

158 The conceptual framework depicted in Figure 1 shows how the variables Supplier training and performance of
159 sugarcane enterprises in Kenya were hypothesized and operationalized. The study tested the research hypothesis
160 stated as-Ha1: There is a significant positive relationship between supplier training and performance of sugarcane
161 enterprises in Kenya. The construct supplier training was examined based on inputs, planting, and weeding
162 settings, complemented and supported by miller's field agricultural extension staff. Training of farmers on the
163 correct use of the type, amount, and time of fertilizer application is crucial in the quantity and quality of cane
164 yield. Training of farmers on the aspects of planting the right seed cane with proper spacing and prior land

165 preparation enhances sugarcane yield per acre. Similarly, training of farmers on manual weeding and pest control
166 using herbicide and pesticides are critical in enhancing sugarcane yield. When sugar millers use their agricultural
167 extension staff to undertake farm visits, farmers open field days, and miller-owned demonstration plots, it helps
168 to impart practical knowledge in modern farming techniques. Cumulatively, the training of farmers cultivates a
169 positive relationship with the millers resulting in enhanced sugarcane production.

170 7 i. Human Capital Theory

171 Human Capital Theory has predominantly been used in the labour aspects of employees, especially in the drive for
172 production improvement. The theory was formally introduced by Schultz in 1961. The theory has gained use by
173 supply chain scholars to explain the phenomenon of supply chain resource requirements. Human capital is made
174 up of assets of intangible resources owned by people as a result of training; education and work experience (Cooper
175 et al., 2016). Consequently, the bundles of these acquired resources confer to the employer and the employees
176 the leverage to use them in the enhancement of improved production that benefits both parties. According to
177 Hohenstein et al., (2014) firms engage in many different activities that extend beyond their boundaries in search
178 of resources that support their operations to ensure their competitiveness in the market. These activities are
179 many and include supplier (farmer) training which would confer the necessary capabilities to enable the farmer
180 to increase sugarcane production.

181 The resource-based view theory supports the human capital theory in that training of suppliers by the firms
182 enables them to acquire skills that accrue for the benefit of competitive advantage (Huo et al., 2015). The
183 complexity and dynamism in the supply chain emanating from the unstable environment makes it prudent for
184 manufacturing firms to invest in training their suppliers who in turn guarantee consistent inflow of materials
185 resources to support their material need.

186 8 c) Supplier Training

187 Training and education of suppliers seek to upgrade the capabilities of suppliers that have gaps in their operations.
188 Supplier development reinforces the reality that a reliable supplier is a foundation upon which firms compete;
189 training provides the platform and conditions necessary to access to resources of the supplier (Vos et al., 2016).
190 Still, buyers allocate their resources to the training of suppliers to transfer the skills and capabilities to the
191 employees of the supplier to gain preferred customer status based on the reciprocity principle (Pulles et al., 2016).
192 Supply chain scholars assert that buyers consider suppliers as enablers in achieving competitive advantage; they
193 are the source of critical resources that support their operation, and buyers are willing to invest resources to
194 build a longlasting relationship with suppliers through supplier development.

195 Training of suppliers is a valuable proactive and deliberate strategy of building long term business relationship
196 that is beneficial to all the parties involved in the transactions. Accordingly, buyers implement supplier
197 development strategies as part of supply chain management efforts of seeking and influencing their supply base as
198 an avenue of accessing resources owned by the supplier but are critical in the operations of the buyer (Ellegaard
199 et al., 2017). Moreover, putting efforts in training of suppliers is consistent with the social exchange theory
200 based on the notion that training of suppliers is an investment by the buyer expecting the supplier to exchange
201 resources with the buyer in a business transaction that results in mutual attraction and long-lasting business
202 relationships (Bemelmans et al., 2015).

203 Training and education of suppliers may also be viewed as the process through which the buyer initiates
204 actions that would provide resources for use by the buyer and supplier to improve in performance. Consistent
205 with supplier development strategy as a building block to the buyer-supplier exchange relationship, each party
206 must strive to convince the other party to invest in the relationship (Tanskanen & Aminoff, 2015). To this end,
207 therefore, the quality of the expected relationship outcomes consisting of economic and noneconomic must be
208 capable of meeting the parties' present and future requirements. Consequently, the training of suppliers creates
209 relational resources that provide a means through which there is a balanced exchange between the buyers and
210 the sellers that results in mutual benefits and improved performance.

211 9 d) Empirical Review

212 The sourcing strategy adopted by a firm depends on the importance attached to the material. A critical material
213 to support the operation of the buying firm and the spend on the material involved dictates that more attention
214 is put in securing the source of supply. Training suppliers is a strategic avenue through which critical material
215 required to support the operations of the buyer is controlled and managed. Glavee-Geo (2019) conducted a study
216 on supplier development as a means to establish customer satisfaction and sustenance of the relationships. The
217 study was undertaken in the Ghana cocoa production area. A sample size of 444 small scale cocoa growers was
218 used as key informants. Six constructs were developed to evaluate the phenomenon. The supplier development
219 construct had six-item sub-constructs that included training and education. Structured questions were used
220 in face to face interview to collect data from the informants. All items under all the constructs had factor
221 loadings of 0.7 and above. Structural model estimates and post-havoc analysis was used to analyze data and
222 draw conclusions. The study established that supplier development activities had a significant and positive effect

223 on supplier performance. Therefore it was concluded that establishing a reliable source of supply is critical to
224 improving the performance of the buyer, hence investing in supplier training is justified.

225 Supply chain management is faced with many challenges both locally and globally. These challenges are risks
226 to lead to interruptions of material flows. Supply chain practitioners implement different strategies aimed at
227 minimizing the effects of such risks. Busse et al., (2016) undertook a case study on supplier development with
228 the underlying issues of sustainability in the global supply chain barriers. Sustainability in supplies has become
229 the focus of many scholars because of the immense benefits that accrue when the economic and noneconomic
230 goals of the exchange partners are achieved. The design was an exploratory case study with a focus on WBF
231 (Europe) that has a strong foothold in the packaging, dairy, and aluminum industries in China. WBF has been
232 hailed as a company that works closely with its customers and suppliers. Specifically, the company is known to
233 offer training to farmers and education to consumers of their products. Items under this study included technical
234 training and education of suppliers, communication, and knowledge transfer.

235 A sample size of 10 executives from WBF and 31 from six Chinese suppliers was drawn. Data were collected
236 through interview and in some triangulation method was adopted. Data were analyzed by applying qualitative
237 content analysis. The study findings indicated that in the context of global supply chain barriers, the A study by
238 Subramaniam et al., (2019) set out to establish the impact of global manufacturers from the socially responsible
239 supplier development perspective. The purpose of the study was to test the impact of supplier development
240 programs on the social outcomes of suppliers. Multinationals distribute their products beyond their operation
241 domains and as such are likely to influence the adoption of suppliers' sustainable practices. Furthermore,
242 multinationals because of their geographical reach are in a strong position to influence the formulation of policies
243 and regulations by governments in developing countries that often suffer from a weak regulatory environment as
244 opposed to developed countries (Akamp & Müller, 2013).

245 A sample size of 141 multinational operating in Malaysia was chosen. Nine constructs were developed; among
246 them was the supplier development. This construct was measured by four items that included training and
247 education of suppliers. The study used a questionnaire survey to gather data from 141 informants and data was
248 analyzed by the use of partial least squares structural equation modeling method. The findings indicated that
249 supplier development had a significant positive influence on suppliers' social performance. This is a demonstration
250 that multinationals supplier support enhances the ability of suppliers to improve their social performance.

251 Manufacturing firms always strive to upgrade the skills, competencies, capacities, and capabilities of their
252 supply base networks. This is achieved through structured training programs that facilitate relationship building.
253 Similarly, relationship development is built along with the improvement of the operational performance of
254 the parties involved. Shahzad et al., (2016) provided empirical evidence that firms that implement supplier
255 development improve operationally, quality, and delivery performances. The assertion was in contrast to the
256 findings of Chae et al., (2017) that buyers use power to gain commitment and compliance with the suppliers.

257 10 IV.

258 11 Research Methodology

259 A descriptive research design was adopted for this study supported by the cross-sectional survey. The design
260 was considered suitable due to the geographical scope of the study area, the resources required, methods of
261 data collection, and analysis involved in to generate useful information (Cooper & Schindler, (2012). The design
262 offered a suitable avenue to collect data from several farmers in specific milling zones. It aided the study to
263 empirically test direct supplier development as conceptualized through supplier training and performance of
264 sugarcane enterprises in Kenya. This type of design has previously been used by Imbambi et al., (2017).

265 The population of 250,000 contracted and private small scale farmers spread across all public and private millers
266 in Kenya was used for this study. A representative sample was selected considering ease of data collection, cost,
267 geographical reach, sufficient statistical power, estimated measurement variability, significance criterion, and the
268 level of precision (Singh & Masuku, 2014). Stratified sampling and simple random sampling techniques were used
269 in the selection of informants since the population under consideration constituted different groups affiliated to
270 different millers. The informants were stratified and distributed to each miller in proportion to acreage under
271 sugarcane cultivation by the miller. The Yamane (1967) formula was applied to determine the sample size, where
272 95% confidence level and P-values 0.05 were assumed. This method was also used to calculate a sample size from
273 a large population by Lusuli et al., (2017). $n = N \cdot 1 + N \cdot (e)^2$

274 ???? (Yamane, 1967).

275 Where: n = sample size N = population size e = level of precision (0.05) Therefore $n = 250,000 \cdot 1 +$
276 $250,000(0.05)^2 = 400$.

277 The study established a representative sample of 400 farmers, distributed proportionally to each miller as
278 shown in the table 1. A questionnaire developed after a review of available literature was used as a tool to collect
279 primary data and report the responses. It was considered cost-effective and easy to administer (Neuman, 2013).
280 The questionnaire consisted of both closed and open-ended questions. To enhance the validity and reliability of
281 the data collection tool, a 10% pre-test was undertaken involving randomly selected informants that would not
282 constitute the main study. The study used a drop and pick strategy to distribute questionnaires. This approach
283 was well suited for this study as it helped in improving the response rate. Secondary data was extracted from

284 a five-year published company's records of farmers' payment statements. Data were cleaned, coded, processed,
285 and analyzed using Statistical Package for Social Science (SPSS version 23). Inferential statistics viz. correlation
286 and regression analysis were applied to determine how supplier training impacted the performance of sugarcane
287 enterprises in Kenya.

288 V.

289 12 Results

290 13 a) Demographic Supplier training

291 The respondents in the study consisted of both male and female farmers that supply all the established sugar
292 factories in Kenya. The results in Table 2 show that sugarcane farming is dominated by male (63.5%) and women
293 at (36.5%). The findings validate those of Dubb (2014) who established that sugarcane farming is labour intensive,
294 thus male account for majority of farmers in South African Umfolozi region.

295 14 b) Descriptive Statistics

296 The study sought to establish the extent to which millers provide supplier training among the sugarcane farmers.
297 Table 3 shows that most of the respondents (42.8%) indicated that training on fertilizer application was to a
298 less extent, 30.7% of the respondents showed that training on fertilizer application was to a moderate extent and
299 14.5% to a no extent at all. This implied sugarcane millers never attached any significant importance to fertilizer
300 application on sugarcane, yet fertilizer has a substantial bearing on sugarcane productivity. On the other hand,
301 farmers prioritized fertilizer application in the right quantities as having a positive impact on farm sugarcane
302 production. The finding is in line with that of Zulu et al., (2019) in the study of factors affecting small-scale
303 growers in Ndwende in South Africa found that the correct amount of fertilizer application had a significant
304 increase on sugarcane production.

305 The capacity of the trainers to deliver the required knowledge to farmers on sugarcane farming was rated less
306 extent, moderate extent, and large extent by 37.1%, 29.2%, and 17.2% of the respondents. Requisite technical
307 know-how in sugarcane crop husbandry can have a positive impact on sugarcane production. The extent of
308 training to farmers on land preparation was rated as to a moderate extent, to a less extent, and a large by 36.9%,
309 28.6%, and 16.9 % of the respondents. Training on cane planting was rated by 30% Of the respondents as to
310 a moderate extent an indication of the importance of prior preparation cane planting commences. Sugarcane
311 production requires technical knowledge by the grower due to the many operations involved. The findings agree
312 with the report of the South African Cane Growers Association (2011) that indicated the grower's labour must
313 be resourced in technical know-how to produce a quality crop.

314 Training on weed and pest control was rated by (41.1%) of the respondents as to less extent. Weed and pest
315 control can have a significant impact on crop yield. The use of either manual or chemical application should follow
316 a planned schedule to ensure that weeds and pests do not affect crop production. The findings agree with those of
317 (Owino et al., 2018; Hussain and Khattak, 2008) established that weed and pest control is a substantial overhead
318 cost of sugarcane productivity in Kenya and South Africa. The results on training on intercropping also show
319 that (32.9%) of the respondents indicated that the training was done to a moderate extent, while on the overall
320 assessment of the extent to which farmers had received training on sugarcane farming, 29.4% of the respondents
321 indicated that it was to a less extent and 28.7% indicated that it was to a moderate extent. The results imply that
322 training on various aspects such as fertilizer application, land preparation, cane planting, weed, and pest control,
323 and methods of cropping was not very effective. The findings are supported by Cockburn et al., (2014) that
324 concluded the high cost of inputs and weed control are the major constraints of sugarcane production. Training
325 through revamped extension services is considered an important input through which smallholder farmers could
326 be motivated to improve cane yield and profitability.

327 15 i. Hypothesis Testing using Correlation

328 The objective of the study was to assess the impact of supplier training on the performance of sugarcane enterprises
329 in Kenya. The research hypothesis to test the objective was stated in the alternative as Ha1: There is a significant
330 positive relationship between supplier training and performance of sugarcane enterprises in Kenya. The Pearson
331 correlation coefficient tested the strength of the relationship between the independent variable and the dependent
332 variable. The results in Table 4 show a positive correlation of $r=0.347$, $p=0.000$, which was significant at a 95%
333 level of confidence. This result demonstrates that there is a positive association between supplier (farmer) training
334 on all aspects of crop husbandry and the performance of sugarcane enterprises. It implies that as the level of
335 farmer training increases, the level of performance of sugarcane enterprises also increases, resulting in improved
336 farm sugarcane yield. The improved sugarcane yield supports the miller's operations and increases profitability
337 for both the farmer and the miller. Table 6 shows the ANOVA results. The results show an F statistic of (1,285)
338 $=39.096$, ($p<0.05$). The result demonstrates that the independent variable in the model had a significant effect
339 on the dependent variable. Statistically, the results imply that the independent variable was a good predictor of
340 the performance of sugarcane enterprise. The result returned an F value of 39.096 and $p=0.000$, which was less
341 than 0.05. The results demonstrate that the training of farmers was statistically significant in the improvement

342 of sugarcane production. The more the millers supported farmers through the more the increased sugarcane
343 yields, and the opposite is also true. The coefficient test results in table 7 show that a change in supplier training
344 by one unit increased the performance of sugarcane enterprises by 0.203units. The change was positive implying
345 that an increase in the training positively contributed towards the improvement in the performance of sugarcane
346 enterprises. The constant was significant ($p < 0.05$) and t-values were found to be positive and higher than the
347 stated 1.96, and calculated as 27.822 and 6.253 respectively, thus indicating that when all other variables were
348 controlled in the model, the level of sugarcane production would be 2.415 units. The findings are consistent with
349 those of Joshi et al., (2017) which found that supplier training and Education resulted in improved performance
350 of suppliers and buyers

351 16 Discussion of the Findings

352 The objective of the study was to determine whether supplier training enhances the performance of sugarcane
353 enterprises in Kenya. The study found to support that there was a significant positive correlation between
354 supplier training and performance of sugarcane enterprises in Kenya; hence, the hypothesis found support. The
355 result demonstrates that when training of farmers in modern sugarcane farming is enhanced, it would result in
356 improved sugarcane yield which would minimize the perennial shortage of raw material often experienced in the
357 industry. The findings are supported by that of Njoroge & Mwangangi (2018) who concluded that supplier training
358 in aspects like quality, production and management was responsible for improved procurement performance in
359 Kenyan public universities.

360 Training of farmers should be well structured with specific consideration of the target group and the interests
361 of the miller. The action is informed by the understanding that developing a supplier in an industry where
362 buyers are competing for the same supplier that produces the same product is difficult to achieve with certainty.
363 Important issues like the level of education, age, the capacity of trainers, the content of the subject, and the
364 method of delivery should be considered. The miller should put more effort into the selection of farmers to be
365 developed and consider signing a contract with the farmer. This is intended to avoid the possibilities of a miller
366 spending so much on training the farmer and later the farmer ends up selling the crop to another miller, resulting
367 in the sugarcane poaching scenario currently being experienced in Kenya. Lawson et al., (2015) opined that
368 buyer supported training programs that are well planned and extended to suppliers help suppliers in attaining
369 capabilities that can increase the performance of suppliers and improve overall firm performance. The Pearson
370 correlation test R=0.347 found a significant positive relationship between the training and performance of sugarcane
371 enterprises. The level of the relationship though positive, was not very strong. The result attests to the fact that
372 if the training were increased, the corresponding performance of cane farming would be significant. However,
373 there has been a decline in sugarcane yield per acre. However, there has been a decline in sugarcane yield per
374 acre over the years. This aspect can be explained based on contextual and structural issues in sugarcane farming,
375 drawing on the concept of technical efficiencies and the law of diminishing returns.

376 The analysis of the response rate shows that majority of the farmers, 64.4% are private; 48.1% have been
377 farmers for a period of between 5-10years and 30.7% have been farmers for more than 10years. This is an
378 indication that 78.8% of the farmers have been in the trade for a long time and must have received some
379 training on sugarcane farming during that period. Obviously; some farmers may have developed apathy towards
380 training as they feel that they have been growing cane for a longer period and therefore they do not need further
381 training. The training content, and delivery methods and the prevailing conditions in the sugarcane subsector
382 may have contributed to the results (Mati & Thomas, 2018). Training is a long term investment, and therefore,
383 the results of training may not be felt in the short term. Sugarcane farming requires a lot of farm inputs and
384 considering that the majority of the farmers are private; they may not afford to invest adequately in inputs to
385 support sugarcane production. The use of the correct fertilizer input combination and cost has a significant
386 influence on sugarcane production (Owino et al., (2018).

387 Land tenure policy in Kenya allows subdivision of land into smaller parcels that are uneconomical to carry out
388 meaningful farming. The continued subdivision of land into smaller plots results in many diseconomies that affect
389 technical efficiencies. The continued use of ammonia and urea-based fertilizers has made the land to be acidic.
390 Without adequate liming, the soils remain acidic and unproductive; the periodic application of agricultural lime
391 becomes necessary. Amolo et al., (2017) established that soils in the western Kenya sugar belt were acidic and
392 was one of the major factors responsible for the decline in sugarcane yield in the area. Similarly, it is not clear
393 if the correct type of fertilizer, in the specified quantity, is applied at the scheduled time during the correct crop
394 period. The majority of seed cane planted consists of varieties that are of reduced yield since there has been a
395 slow adoption of new seed cane varieties that possess improved yield attributes (Thujo et al., 2019).

396 Sugarcane has two types of crop period, the plant crop is the first crop; after the first harvest, and the next
397 crop is the ratoon crop. Owing to the high prices of seed cane, most farmers opt to continue to cultivate the
398 ratoon crop. In most cases, the ratoon crop has an inverse relationship with crop yields, and the prevailing
399 on-farm stock of sugarcane in the country consists of ratoon crops (AFA, 2015). In aggregate, it can be inferred
400 that these factors result in allocative inefficiency in sugarcane and other agricultural production that affect overall
401 farm yield as opined by (Mulwa & Emrouznejad, 2013).

402 VII.

17 Conclusion

403

404 The study accessed the effect of supplier training on the performance of sugarcane enterprises in Kenya. The
405 research hypothesis was supported based on the linear regression results that showed that supplier training
406 had a positive influence on the performance of sugarcane enterprises in Kenya. The result confirms the view
407 that buyer investment through the direct supplier development aspect of supplier training improves supplier
408 capabilities that translates to improved performance of the buyer and supplier. The study, therefore, concluded
409 that supplier training significantly contributes positively to improved performance of sugarcane enterprises in
410 Kenya. Consequently, sugarcane millers should strive to train farmers in modern innovative methods to improve
411 sugarcane yield and help to stem the recurring shortage in the country. This study validates similar results in
412 other areas of the manufacturing sector in Kenya, specifically those concerned with the processing of agricultural-
413 based raw materials that require a long gestation period as opposed to manufactured raw material. The study
414 also provided the much-needed reference resource for similar future research spanning the less unexplored area
415 of agricultural raw materials in Kenya.

416 Previous studies have mostly approached supplier development as a strategic sourcing strategy particularly
417 concerned with the seamless inflow of manufactured raw material resources to support buyer operational needs.
418 Few studies if any have been devoted to exploring agricultural raw materials aspects of supplier development, yet
419 this is key to supporting the sugarcane manufacturing sector and the economy as a whole. This study contributes
420 to the supply chain research stream of a supplier development initiative in the form of supplier training. This
421 is an investment by the buyer but is also considered one aspect of resource seeking by the buyer to support its
422 uninterrupted manufacturing process. Supplier training is a direct supplier development initiative that seeks to
423 empower the supplier through the efforts of the buyer forming the wider resource exchange between the buyer
424 and the supplier and is premised on the human capital theory. The found support for the hypothesis as there was
425 a significant positive correlation between supplier training and sugarcane enterprises in Kenya. This provides
426 development that training of farmers imparts knowledge, skills, and capabilities in the trainee. The study found
427 that supplier training improves the performance of sugarcane enterprise performance in Kenya. The finding is
428 supported by Overstree et al., (2019) who opined that supplier training can enable the buying firm to gain a
429 competitive advantage.

430 To improve the training of sugarcane farmers on the practical aspects of cane farming the study recommends
431 that each miller establish a demonstration plot to enhance the ability and capacity to deliver on training.
432 The study also recommends that millers should develop a comprehensive policy to govern their engagement
433 with the farmers. Such a policy should have a provision of entering into a contract with farmers to facilitate
434 seamless engagement and minimize cane poaching. The study further recommends that millers together with
435 other stakeholders should strive to address the issues of technical inefficiencies in sugarcane production both
436 in the short and long term. This is likely to provide insights into the underlying dynamics affecting sugarcane
437 production in Kenya. Further studies are recommended to explore areas where sugarcane is grown under the
438 contract regime as compared to sugarcane grown under the liberalized settings to provide empirical evidence
439 on the constraints arising from the technical allocative inefficiencies that embed full exploitation of supplier
440 development strategy in sugarcane farming in Kenya.

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appropriate skills and techniques to improve sugarcane production, which in turn will eliminate chronic sugarcane shortages being experienced in Kenya. The human capital in sugarcane sector consisting of farmers can help improve the availability of raw material which would minimize the possibility of production stoppages, thus enabling the industry to gain a competitive advantage (Gonzalez-Loureiro et al., 2014).

Year 2020

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Supplier Training ? Input ? Planting
? Weeding

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Figure 1:

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Company	Acreage	Population	Proportion	Sample size
Chemelil	14730	2008	8.0 %	32
Muhoroni	16538	22464	9.0%	36
Kibos	4394	5968	2.4%	10
Butali	18538	25180	10.1%	40
West Kenya	24871	33783	13.5%	54
Nzoia	25124	34127	13.7%	55

Figure 2: Table 1 :

2

	Frequency	Percent	Cumulative Percent
Male	186	63.5	63.5
Female	107	36.5	100.0
Total	293	100.0	

Figure 3: Table 2 :

3

Supplier Training Indicators	Not at all	Less extent	Moderate	Large extent	Very large	extreme	Mean	Median	Standard Deviation
Extent to which training on fertilizer application has been done to farmers	14.5%	42.8%	30.7%	9.5%	2.5%		2.4	2	0.5
Extent to which trainers had capacity to deliver the required knowledge on sugar cane farming	13.4%	37.1%	29.2%	17.2%	3.1%		2.6	2	0.3
Extent to which farmers have been trained on land preparation	13.8%	28.6%	36.9%	16.9%	3.8%		2.7	3	0.1
Extent to which the farmers have received training on cane planting	16.2%	26.6%	30.0%	17.9%	9.3%		2.8	3	0.2
Extent to which farmers have received training on weeding and pest control	23.0%	41.1%	18.8%	13.1%	3.9%		2.3	2	0.6
Extent to which farmers have received training on intercropping in their cane farms	23.6%	31.8%	32.9%	10.4%	1.4%		2.3	2	0.3
Extent to which farmers receive trainings	21.5%	29.4%	28.7%	17.9%	2.5%		2.5	2	0.2

c) Inferential Statistics

Figure 4: Table 3 :

4

Variables	Supplier Training	Performance
Supplier Training	1.00	
Performance	0.347 *	1.00

* p<0.01, * p<0.05

d) Simple Linear regression Tests

Figure 5: Table 4 :

5

Indicator

Figure 6: Table 5 :

6

	Sum of squares	df	Mean squares	F	Sig
Regression	8.412	1	8.412	39.096	.000
Residual	61.319	285	.215		
Total	69.731	286			

Figure 7: Table 6 :

7

	Unstandardized Coefficient	Standardized Coefficient	t	Sig
	B	Beta	Er-	
			ror	
(Constant)	2.415		.087	27.822 .000
Supplier Training	.203	.347	.033	6.253 .000

VI.

Figure 8: Table 7 :

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