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Original Article

## The Economic Challenges Facing Small Scale Sugarcane Farmers in Malava Sub-County, Kakamega County, Kenya

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Ratoon Seeds,  
Sustainability,  
Vinasse.*

This study examined the challenges and their effects on sugarcane farming in the Malava sub-county, Kakamega County. The study objectives were to: assess cane transportation problems and establish challenges related to the marketing of sugarcane farmers in the Malava Sub-County. It was undertaken in Malava Sub-County, where sugarcane is the economic backbone and the region's key cash crop owing to the favourable geographical conditions in Western Kenya. Despite Malava Sub-county's vast experience in sugarcane farming, production has gone down. Furthermore, such a study is yet to be done in Malava. The study purposed to find out the reasons for inefficiency and insufficiency in sugar production. A descriptive research design was used. Purposive and systematic random sampling techniques were used to select sugarcane farmers from the seven wards; Manda/Shivanga, Butali/Chegulo, Chemuche, East Kabras, West Kabras, and South Kabras, Shirugu/Mugai and the sugar factory stakeholders in the two sugar factories; Butali and Kabras in Malava Sub-County. Malava Sub-County has an estimated population of 65,323 sugarcane farmers. From this population, a sample of 384 was used, based on Mugenda and Mugenda's formula (2003):  $n = \frac{z^2 pq}{d^2}$ , for a target population which is greater than 10,000. Primary data was collected by the use of questionnaires, interview schedules, Focus Group Discussions, and observation guides. Secondary data was collected through a literature search in online journals, theses and publications related to the study topic. Analysis was done using descriptive statistics aided by Statistical Package for Social Sciences (SPSS). The presentation of data was done using tables and graphs. A pilot study in Lwandeti and Chevaywa wards in Lugari Subcounty was conducted to test the validity and reliability of the data collection instruments, and Cronbach's alpha of 0.8 was good evidence of reliability. Research findings showed that 70% (269) of the respondents accepted that the transportation charges were high compared to other costs of production, 60% (230) of the cane farmers sampled said that there was a ready market for mature sugarcane, while 40% (154) responded negatively and 100% of the farmers indicated that they never witnessed the weighing of their

cane. Finally, 79.95% (307) of the farmers accepted that the equipment for the operation of cane farming was mainly the locally available ones for instance, Jembes, Pangas, and ox ploughs; and 83% (319) of farmers failed to uproot old cane due to lack of money to hire the tractors and high technology equipment. Small-scale farmers in the Malava sub-county have low productivity due to these factors. This study recommends that sugar millers cover transportation costs, provide licenses on schedule, introduce mobile weighbridges to allow farmers to observe the weighing of their cane, and the government provide loans for small-scale farmers to acquire village tractors.

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## INTRODUCTION

One of the industrial crops in Kenya is sugarcane (*Saccharum Officinarum*), KSB (2014). KSB indicated that the industry had made a substantial contribution to the nation's progress. It concludes that considering the main importance of the sector to the economy, it has tended to perform poorly, resulting in a sustained production deficit.

According to Clowes *et al.* (1998), sugarcane is grass that thrives in high temperatures and minimal precipitation but requires a great deal of water to grow. It takes a lot of manual labour and cannot be done totally by machine if one wants the optimum results from the sugarcane crop. Cushion *et al.* (2010) pointed out that cane farming is a worldwide activity practised in most countries because of the major product it provides; sugar. Cushion and associates also pointed out that sugarcane is a crop which is grown both on a large scale and small

scale; (the small-scale farmers are known as out growers in the Malava sub-county).

The Sugar Research Institute (SRI) 2020 asserts that the private sector dominated Kenya's sugar economy before independence. In 1922, the Miwani Sugar Company and the Ramisi Sugar Company began large-scale sugar production and processing. According to SRI, after Kenya's independence, the government adopted a more significant role in sugar control and regulation.

Jerome *et al.* (2010) list Cuba, the Caribbean, Brazil, Mexico, India, and the Philippines as important sugarcane producers. India, Brazil, the EU, Thailand, and China produce the most sugar, according to Walton (2018). Sugar cane is the main source of revenue for various countries, especially Central and South America and the Caribbean, where it is used to make sugar, syrups, molasses, soft drinks, spirits, and ethanol for fuel. Cushion *et*

al. (2010) argue that despite these gains, the sugar business faces obstacles that lower its productivity. According to FAO (2015), most sub-Saharan African (SSA) nations grow sugarcane, although five nations produce more than half. South Africa (33%), Sudan (including South Sudan, 9%), Kenya (7%), Swaziland (7%), and Mauritius (7%).

Chandiposha (2013) reported that sugarcane and sugar yields vary with climate extremes (drought and tropical cyclones). Zhao and Rui (2015) agreed with Chandiposha that weather and climate are key challenges for sugarcane production worldwide, especially in underdeveloped nations. In Northern

Brazil, high temperatures attributed to climate change have increased evapotranspiration, lowering soil water, making sugarcane planting problematic, and increasing irrigation demand. Drought and floods are catastrophic in tropical Africa and Kenya’s Malava region. Zhao and Rui (2015) stated that climate change affects cane production directly or indirectly. Cane yields vary widely across developed countries. *Table 1* shows years and regions with fluctuating rainfall and temperature due to insufficient adaptability, high natural catastrophe sensitivity, and poor forecast and mitigation efforts.

**Table 1: Trends in World’s Sugar Demand and Supply (2008-2014)**

Period	Production	Consumption	Trade	End Stock
2008-09	113.84	153.46	39.62	30.3
2009-10	120.01	154.08	34.07	28.76
2010-11	129.98	154.79	24.81	29.83
2011-12	133.4	158.15	24.74	35.99
2012-13	139.71	163.67	23.96	43.16
2013-14P	140.23	167.64	27.41	43.38

**Source:** United States Department of Agriculture, (2017)

Brazil has grown steadily over the past 50 years and is the world’s largest producer of sugar cane, ethanol, and ethanol fuel, according to Cushion et al. (2010). Jerome (2010) also argued that Brazil had a substantial advantage in cane output due to decades of study and commercial farming. Jerome noted that there was still an area appropriate for producing sugarcane that was not being used and that the Brazilian government encouraged ethanol production and consumption. Brazil ensured appropriate market conditions. These advantageous aspects of sugar production are likely to be lacking in Kenya and Malava Sub-County.

Girei and Giroh (2012); Singels et al. (2013); Tena et al. (2016) revealed that economic issues, such as transport, market, and capital equipment, were the greatest challenges to sugarcane farmers in other African nations, such as South Africa and Nigeria.

According to Waugh (2009), the cultivation of sugarcane was also hindered by cultural (human) reasons. Waugh notes that inheritance laws and the fragmentation of holdings in several nations have resulted in the land being divided equally among a deceased farmer’s sons (rarely between daughters).

These customs resulted in the subdivision of farms into numerous small, dispersed fields. Fragmentation results in a great deal of wasted time when shifting from one field to another and may generate access issues.

Onyango (2016) and Scoones (2016) noted that sugar shortages in Africa were what they termed an “Old Africa Problem.” Scoones added that Illovo sugar, a South African company, has withdrawn from a 2,6-billion-rand sugar project in Mali due to financial issues and political threats.

According to Biancardi et al. (2012), the sugar beet is yet another plant that produces sugar; it is known as the *Altissima cultivar* category of the common beet in plant breeding (*Beta vulgaris*). Biancardi et al. (2012) suggested that sugar beet is a crop whose roots contain high levels of sugar and are commercially cultivated for sugar production; sugar beet has a flat crown, conical white fleshy root (tap root), and the root and leaf rosette of the plant.

Mwangi (2009) observed that farmers in Nyandarua were experimenting with sugar beet as an alternative. European settlers grew them for human

and animal consumption. Mwangi determined that after independence, indigenous Kenyans kept growing them. Biancardi *et al.* found that cane sugar tastes better. According to Lunn (2008), 80% of sucrose comes from sugarcane and the rest from sugar beet.

According to Wakhisi *et al.* (2015), the cane type used in Brazil matured as early as six months, compared to Kenya's 18 months, and Brazil and Sudan's 15 tons of sugarcane generate 1 ton of processed sugar, whereas Kenya's 35 tons produce 1 ton, which is why Kenya had sugar deficiency. This study tried to assess the cane varieties grown in Malava Sub-County.

Kariuki (2000) researched the Sugar Industry in Nyanza and Western areas. The study identified these challenges: Companies could not promote locally produced sugar against dumped imports due to legislative and marketing concerns. Poor cane husbandry led to low output per hectare and farm-level sugar content. Low factory productivity led to low sugar yields, which hampered cane husbandry. This study will analyze cane farming's transportation challenges to fill the gap left by Kariuki (2000). Kariuki's study spanned Nyanza and Western. This study is being done specifically in Malava, which is a sub-county in Kakamega County, Western region.

The Utafiti Sera Policy (2015) study shows that sugar is still one of Kenya's most important goods, with a projected production of 632,000 metric tons and consumption of 879,000 metric tons in 2015. More than 250,000 small-scale farmers and almost six million Kenyans are directly or indirectly supported by the sugar business, according to the report. The report reveals that despite governmental investments in sugar facilities, sugar self-sufficiency has remained elusive. Also, demand has mostly outstripped domestic output over the last 30 years.

Production and trade evidence indicates that Kenya's self-sufficiency in sugar production is far from being achieved. Monroy *et al.* (2013) made related findings in the *Analysis of Sugar Incentives and Disincentives in Kenya*. The study pointed out that the sugar intake in Kenya has risen steadily over the last three decades, outpacing domestic demand. This may have been a concern in Malava.

A report by the Sugar Farmers Task Force (2019) indicates that Kenyan Sugar production peaked at around 600,000 tons in 2015. In addition, the report notes that consumption was just over 1 million tons, with the difference being made up by imports from COMESA members. The survey also noted that sugar is currently oversupplied on the worldwide market and that this scenario is expected to persist into the foreseeable future.

Waswa *et al.* (2011) in their study about commercial sugarcane farming in the Lake Victoria basin, pointed out that a lot of changes need to take place if the sugar industry is to be revived because it still experienced a deficit in sugar production despite the measures taken by the government and the industry players to improve the sector. The present study therefore has attempted to establish from the small-scale sugarcane farmers and suggested workable recommendations that could help solve the problems and revive the sugar industry in Malava Sub-County and Kenya as a whole.

## LITERATURE REVIEW

### Transportation Problems of Sugarcane

Paitoon *et al.* (2016) found that sugar cane production and sugar mill growth in Northeast Thailand were expanding rapidly. The study identified sugar mills at Udon Thani, Mukdahan, Kalasin, and Khon Kaen. Domestic and foreign demand boosted the economy. The study found that Thailand's primary sugar industries produce and convert sugar cane into raw sugar. The scholar noted that transport delays increased manufacturing costs, which impacted consumer retail prices. Paitoon said transit costs were high compared to other variable costs. According to studies in Thailand, most cane farmers in the northeast are family-run operations. Because they lack access to trucks and operate with only a small or traditional multi-purpose vehicle, they bear the financial burden of transporting their crop to mills such as Kumpawapi, Mid Kalasin, and Ratcha. Farmers of all sizes had the same transport problem: they needed to rent a truck and pay hired help to cut and load sugar cane. Malava cane growers may have the same problem.



The investigation by Chamnalaw *et al.* (2004) in Thailand about truck allocation in the sugar sector revealed that the long wait line for trucks to discharge sugarcane at the sugar miller was one reason for high transportation costs. Each truck waited for 20 to 35 hours before discharging sugar cane; therefore, the carrying cost was high. The study revealed one of the successful systems was deciding the number of 20-ton and 8-ton trucks used to transport cane each year. The researcher emphasized that in the next harvest year, sugar cane trucks must be registered for millers. The sugar plant may then plan and operate all vehicles. Before harvest, farmers could receive the truck schedule and harvesting plan.

Chamnalaw *et al.* (2004) thought all trucks could be planned and controlled to reduce waiting time and costs. Lamsal *et al.* (2016) found a sugarcane harvesting and transport coordination program in Louisiana. By adjusting the distance between successive sugar mill arrivals, they intended to reduce wait times. Arrivals might be coordinated to reduce truck waiting at millers, their research showed. This study examined if the aforesaid concerns exist in Malava Sub-County.

Yang *et al.* (2014) presented a global overview of sugar crop R&D at the International Conference on Sustainable Growth of Sugar and Integrated Industries in Developing Countries. The scholar hoped the conference would allow scientists, technologists, extension officers, businesses, policymakers, and other stakeholders to gather and share their perspectives and experiences for the benefit of global sugar and adjacent industries.

Warner (1923) studied sugarcane transportation in South Africa and concluded that an ideal system handled the cane from the field to the carrier. Warner contended that each handling increased cost and cane waste. The expert said that producers always bear costs, directly or indirectly. Warner thought wagon transport was most cheap within a mile of a sugar plant. The scholar said field loading was easier since the wagon could be brought near to where cane cutters were working, eliminating a long carry. This study examined whether the Malava sub-county used wagon transport.

Mukhwana (2015) found in research about the unsustainable finances of the sugar business in

Kakamega County, Kenya, that farmers had to pay for expensive transport. Farmers bribed transporters to prioritize their fields and supply sugar cane. Mukhwana stated that farmers use this approach to preserve drying cane. Transport costs showed that extra variables might be responsible for high transport costs; for example, most Mumias sugar mill cane processing zones were outside the company's 24-kilometre radius. This increased the shipping cost per ton of cane. The researcher discovered that most roads are murrum-surfaced, making them impassable during the rainy season.

Mukhwana's research showed it might take a week after sugar cane harvesting to get it to the mill, which significantly impacted the farmers' expected net income owing to weight loss. Mukhwana (2015) determined that sugar cane should be sent to millers as soon as feasible after a good harvest to avoid sucrose depletion and cane tonnage reduction due to drying in the field. In his Least Cost Theory of Industrial Location, Weber (1909) advised the industry to be located where raw materials and finished items are easily transported. This aligns with Waugh (2009) who said that fast market transit requires an effective transport network. This study examined whether small-scale sugarcane producers in the Malava sub-county face the same issues.

According to the Daily Nation; Nation media group (2013), a bill requesting cane weighing at farm gates will be debated in the Kakamega county legislature. Malala accused sugar millers of manipulating weighbridges to exploit farmers, stating that is why they insisted on weighing cane at their enterprises. The Bill also required millers to pay for raw material transportation. The Nation Media Group furthermore reported that cane spillage during transportation had made farmers suffer huge losses in the past and that the millers would be able to control that if they weighed cane at the farms. They also pointed out that the deputy speaker vowed to lobby county representatives to pass the Bill into law, arguing that the same requirements were stipulated in the Sugar Act (2001). They added that the reaction of the deputy speaker followed accusations against sugar millers in the county by cane growers, where he argued that the millers must allow farmers to witness cane weighing if they could not afford to set up weighbridges at the farm gate in order to address the growers concern once

and for all. The Malava study also tried to establish if the above problems are faced by small-scale sugarcane farmers.

### Marketing Problems Facing Small Scale Sugarcane Farmers

Button *et al.* (2015) agreed with Waugh (2009) that markets and transportation are related (perishable and bulky goods). Waugh (2009) noted that market size and income affect demand. According to Whittman *et al.* (2010), the world's average annual sugar consumption per capita was 21.6 kg; in India, it was 16.3 kg, compared to 48.8 kg in the U.S.A., 53.6 kg in the U.K., 57.1 kg in Australia, and 78.2 kg in Cuba (Raju, 2015). Whittman and associates believed that poor market demand and sales challenges led to sugar dumping in underdeveloped countries. They determined that dumping destroys small-scale local producers in both origin and sale nations. Sudan's sugar imports to Kenya hurt local family-based sugar production. Dumping happens when items are sold below their manufacturing cost, as per Whittman *et al.* (2010).

The Economist Group (2017) found that African sugar exports make up a minuscule fraction of world supplies. Sugar contributes to export profits, jobs, and economic development in many African countries. Africa could lose significant sugar export markets due to huge economic developments in the EU in 2017 and a supply/demand shift in Europe. Rising demand in the region could provide an alternative to Europe, but delayed progress in eliminating trade obstacles means the chance is likely to be lost.

The research by Chimwai and Chidoko (2011) on economic challenges in the production of cane in the Lowveld of Zimbabwe showed that low prices were charged for the sugar cane harvested; these affected most of the operations of the farmers as they were unable to pay competitive salaries, repair equipment and purchase fuel. The increasing demand for fuel and electricity may be alleviated if the economic issues facing the sugar sector were handled and more sugar was produced. According to Chimwai and Chidoko (2011), this was so because Sugarcane by-products could be used for the production of electricity and also for ethanol that could be mixed into gasoline. This means that, since they would not

import electricity and fuel during the milling season, the nation would save foreign currency. This study tried to find out if such problems are faced by the small-scale sugarcane farmers in the Malava Sub-County.

EPZ (2005) found that agriculture is the most important sector of the Kenyan economy in their study of the effect of sugar factories on the development of sugarcane farmers. Export revenues from agriculture, including tea, coffee, and horticulture, are also cited as the sector's major contributor to foreign exchange. For a large percentage of the population, farming is both an economic and a sustenance necessity. About 75% of the population is said to be dependent on the sector in some way.

Whittman *et al.* (2010) argued that all of these were weakened by organizations such as the World Trade Organization (WTO) and the International Monetary Fund (IMF) by leading political and economic forces such as the United States (US) and the European Union (EU). Instead of securing food for the world, these institutions also presided over a regime that prioritized export-oriented development and increased global hunger for sugar. The present study attempted to find out if these economic challenges are also faced by the small-scale sugarcane farmers Malava Sub-County.

The study by Brenda (2012) on problems facing cane farming in Kenya reported that flooding of markets by cheap imported sugar resulted in unfair competition. This caused a delay in disbursing payments to farmers by sugarcane companies. Kweyu (2013) made a similar observation in his master's degree thesis about factors influencing the withdrawal of farmers from sugarcane farming. Kweyu revealed that the cane farmers in Mumias Sub-County had pulled away from growing sugarcane because of delayed payment for the sugarcane supplied to the factory. Brenda (2012) further viewed that Kenya is among the African Countries that are faced with economic problems contributing to the decline of sugarcane production. Brenda also argued that apart from being faced with problems such as pests, diseases, accidental fires, and the closure of factories such as Ramisi and Miwani sugar, factories in the country are fleecing farmers by charging them highly for services and

inputs extended to them on credit. Could these problems also be facing Malava cane farmers?

Chahale (2017) in a study in Kenya about elected authorities failing the sugar business found that West Kenya Sugar Company and powerful politicians were flooding the country with substandard duty-free sugar. Chahale noted that this violated high court decisions barring the same. Chahale found that the substandard item, whose quality had not been checked by the Kenya Bureau of Standards (KBS), was repacked into containers and rebranded as 'Kabras Sugar'. It also emerged that the company's directors were working with influential politicians who had large financial stakes in the business, making a killing in a country deprived of locally produced sugar owing to production failures.

Chahale (2017) also noted that huge profits from the illicit trade were used to bribe Kenya Revenue Authority (KRA) officials to look the other way as the commodity was imported camouflaged as sand. It was clear that the company's directors were taking advantage of their close business ties with powerful politicians in government not only to be involved in illicit import trade but also to viciously undercut competitors. Substandard sugar imports posed a health concern to millions of unsuspecting customers since their quality was never tested by the Kenya National Bureau of standards as required by law.

Waswa *et al.* (2011) emphasized that the imbalance in sugar supply will only widen as the country's population keeps expanding (by 3.3% per year) and sugar consumption keeps growing (by an estimated 2% per year). Their study found that contract sugarcane farmers in Chemelil, Lurambi, and Koyonzo in Western Kenya kept 34, 32, and 31% of the gross income. Traditional input costs affected net sales differently, but yield appeared to influence total revenue. Farmers had little say over company-driven deductions, which affected net income. Langat (2015) noted that unequal revenue sharing,

where sugar corporations retained at least 60% of gross income, posed sustainability challenges that needed a participatory strategy engaging all important stakeholders. He added that Kenyan sugarcane growers have pledged to uproot the crop. This study examined the challenges affecting Malava cane farmers.

According to the KSB (2014) Report, both small- and large-scale sugar farmers confront life-threatening difficulties. Low sugarcane prices due to cheap imports and cane companies not paying farmers' dues were cited in the report. Malava and similar studies were needed to find methods to develop the sugar sector in Malava Sub-County.

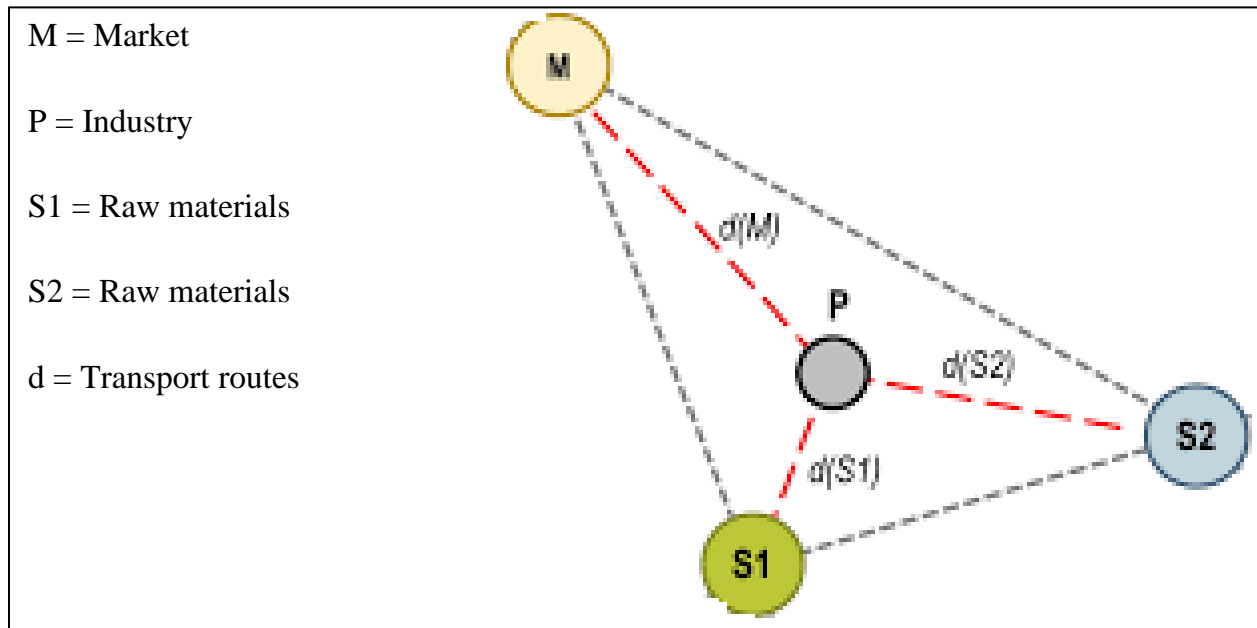
In summary, the results from the studies of the scholars discussed in this section show that there are common challenges faced by cane farmers in various areas of the world. This is because similar views were repeated across all their findings. For instance, higher costs of production/increased costs of input, inadequate extension services to the cane farmers and other credit facilities like herbicides and fertilizer were mentioned as the constraints to sugarcane production by SSGs. Also, the presentation of their results was done by use of tables, charts, and graphs.

### **Theoretical Framework**

This study was guided by Alfred Weber's (1909) Least Cost Theory of industrial location in an attempt to explain the economic challenges facing the small-scale sugarcane farmers in Malava Sub-County. Weber's theory states that industry is situated where raw materials and final product transportation costs are at a minimum. Weber's theory addressed Economic-based variables for example, transport, raw materials, and market.

According to Alfred Weber (1909), the Least Cost Theory accounted for the location of the manufacturing plant to minimize the three categories of costs, as shown in *Figure 1*:

**Figure 1: Weber’s Location Triangle**



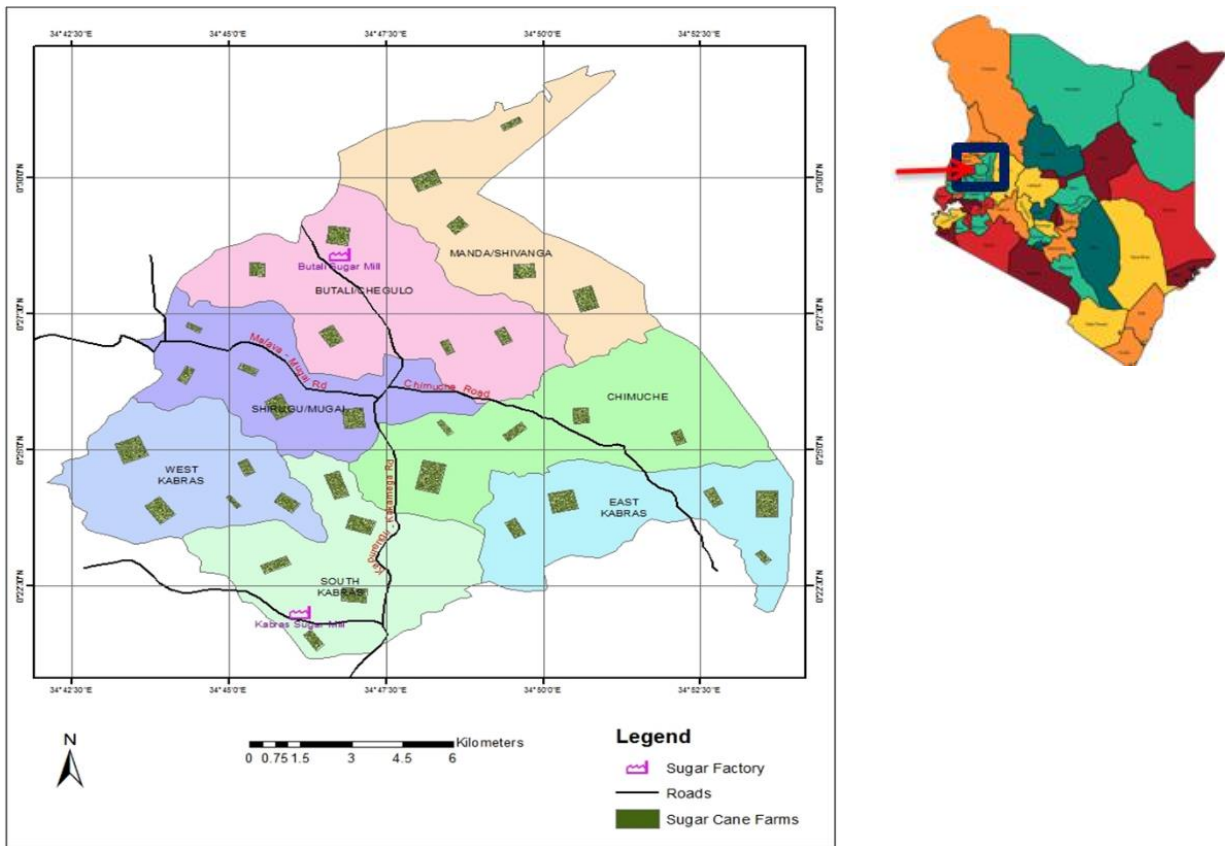
**Source:** Transport Geography organization, 2020.

Weber defined two cases; in one case, the finished product weight was less than the mass of the raw material in the manufacture of the product. It was the case of weight loss; in the other case, the finished product was heavier than the transported raw material. This was typically a case of integrating some ubiquitous (everywhere available) raw material such as water into the piece. This was called the weight-gaining case.

This study therefore attempted to establish to what extent the Least Cost Theory of Industrial Location was applicable in indicating the challenges facing sugarcane farming in Malava Sub-County. Based on this theory, it was hoped that solutions would be suggested. This, according to Weber was simply because Location Theory addresses questions of what economic activities are located where and why? In this case, Butali sugar, Kabras sugar and sugarcane farms; Malava Sub-county Map in *Figure 2* indicates their sites.



**Figure 2: Malava Sub-County Map**



**RESEARCH METHODOLOGY**

It was undertaken in Malava Sub-County, where sugarcane is the economic backbone and the region’s key cash crop owing to the favourable geographical conditions in Western Kenya. Despite Malava Sub-county’s vast experience in sugarcane farming, production has gone down. Furthermore, such a study is yet to be done in Malava. The study purposed to find out the reasons for inefficiency and insufficiency in sugar production. A descriptive research design was used. Purposive and systematic random sampling techniques were used to select sugarcane farmers from the seven wards; Manda/Shivanga, Butali/Chegulo, Chemuche, East Kabras, West Kabras and South Kabras, Shirugu/Mugai and the sugar factory stakeholders in the two sugar factories; Butali and Kabras in Malava Sub-County. Malava Sub-County has an estimated population of 65,323 sugarcane farmers. From this population, a sample of 384 was used, based on

Mugenda and Mugenda’s formula (2003):  $n = \frac{z^2 pq}{d^2}$ , for a target population which is greater than 10,000. Primary data was collected by the use of questionnaires, interview schedules, Focus Group Discussions, and observation guides. Secondary data was collected through a literature search in online journals, theses and publications related to the study topic. Analysis was done using descriptive statistics aided by Statistical Package for Social Sciences (SPSS). The presentation of data was done using tables, graphs, and pie charts. A pilot study in Lwandeti and Chevaywa wards in Lugari Subcounty was conducted to test the validity and reliability of the data collection instruments and Cronbach’s alpha of 0.8 was good evidence of reliability.

**RESULTS AND DISCUSSIONS**

**Transportation Problems Facing Small Scale Sugarcane Farmers**

In this section, the data were analyzed to answer the first research question on the problems related to the transportation of sugarcane that affected the productivity of small-scale sugarcane farmers in Malava Sub-County. The data for this variable was derived from data obtained from the Farmers' Questionnaires, Factory manager's interview schedule and Focus Group Discussion's Interview schedule, as discussed in the following sections:

### *The Distance from Sugarcane Farms to the Sugar Factories*

The farmers' questionnaire data results indicated that sugarcane farms from the wards that were near the sugar mills had a minimum distance of approximately two kilometres from the mills and a maximum distance of approximately ten kilometres from the sugar mills. For instance, Butali/Chegulo ward near Butali Sugar and South Kabras ward near Kabras Sugar Mills. Other wards: Chemuche, West Kabras and Mugai wards which are a bit far from the Sugar mills, showed a minimum distance of approximately eleven kilometres from the millers and a maximum distance of approximately thirty-five kilometres, as indicated in *Table 2*.

**Table 2: Distance of Wards from the Sugar Mills**

S/N	Ward	Approximate distance from the mills (KM)	
		Min	Max
1	Butali/ Chegulo	2	10
2	Mugai/Shilungu	4	35
3	Chemuche	7	20
4	South Kabras	10	20
5	West Kabras	11	15

Source: Researcher's Field Work, 2019

### *Charges for Transportation of Sugarcane after harvesting in Malava Sub-County*

The following *Table 3* illustrates how transportation payment was made in Malava Sub-County:

**Table 3: Transportation Charges of Sugarcane per Ton.**

S/N	Sugarcane Zones	Butali Sugar	Kabras Sugar
1	A → (0-10) Km	455	460
2	B → (11-20) Km	455	460
3	C → (21-30) Km	605	460
4	D → (31 – Above)	605	460

Source: Researcher's Field Work, 2019

The above table indicates that Butali sugar charges Ksh. 455 per tonne in zones A and B, while Ksh. 605 in zones C and D. On the other hand, Kabras sugar indicates the charges being Ksh. 460 in all

zones. When the respondents were asked about the above transportation charges, their response was as shown in *Table 4* below:

**Table 4: Transportation Charges of Sugarcane to the Sugar Millers**

Variable option	Frequency	Per cent
High	269	70
Very High	96	25
Average	19	5

Source: Researcher's Field Work, 2019

The respondents: 70% and 25% who confirmed the charges being high, argued that this was partly because of poor roads where trucks could get stuck, delaying to deliver the cane on time and also lack of or few bridges which made the distance from cane farms to the mills to be long; leading to farmers being charged the rate of far-flung zones, (Ksh. 605 per tonne).

Some FGD discussants were rather unhappy with the transportation charges by the sugar millers. They had the following to say;

*“Exorbitant transport charges per tonne. Sugarcane drops on the way during transportation. I cannot handle this problem; it is beyond my ability.”*

Another discussant said;

*“There is a delay in collection of harvested cane which leads to the cane losing weight and as if that is not enough the transportation is charged per ton.”*

He added that;

*“Because we have no alternative, for now, we are just stuck to cane farming half-heartedly.”*

Therefore, this study revealed that the transport charges of cane to the millers are high because the majority confirmed it (70% and 25%) of the respondents. These results concur with the study findings of Chimwai and Chidoko (2011) in Zimbabwe in the reviewed literature, who found out that cane productivity was declining and discovered that the low productivity was largely due to high transport and haulage charges. Similarly, the findings of Paitoon *et al.* (2016) in Thailand revealed that transportation costs had been found to be very high in proportion to other variable costs.

The discussants’ feelings may be owing to transportation fees deducted from their cane payments. The Kabras sugar mills charged Ksh. 460 per tonne for transport, according to interview schedule data (from the closest to the furthest). Perhaps these charges are inflated, so cane producers find them expensive. 70% (269) of respondents felt that sugar millers should pay for or cut transportation costs, as stated by Waugh (2009) in the evaluated literature.

***Payment of Sugarcane Cutters and Loaders in Malava Sub-County***

The results of the payments of sugarcane cutters and loaders were recorded in *Table 5* below:

**Table 5: Sugarcane Harvesting and Loading Charges in Ksh. Per Truck**

	<b>Harvesting</b>	<b>Loading</b>
Farmer	1200	800
Sugar mills	-	400
Total	1200	1200

**Source:** Researcher’s Field Work, 2019

The findings of this research revealed that the cane farmers cater for the payments of cane cutters and loaders, which is manually done. 100% of the respondents confirmed the use of manual harvesting which they argued was more expensive. Another comment in the form of an example about this, according to one discussant, was:

*“I am a sand harvester; if my customers buy sand, they should ensure that the items reach their destination for use at their own expense. So, it is for the sugar millers, they should not charge the cane farmers harvesting fee but pay*

*for the expenses themselves since they are the buyers”.*

This finding concurred with what Ahmed *et al.* (2015) did in their study on the assessment of mechanical versus manual harvesting in Sudan; they revealed that manual harvesting is more expensive. Sundara (1998) also ranked machine labour second, which meant that manual labour was first.

***Transportation of Harvested Sugarcane Charged per Ton/Truck***

The analysis of this theme was based on the questionnaire data from the farmers, the interview schedule for the factory managers and the FGD information. It was established that the transport services were being charged per ton (Ksh. 455 – 605), as shown in *Table 3*. The farmers’ feelings were that it should be charged per truck in the meantime as the millers prepare to be meeting the transportation expenses themselves.

FGD discussants reported that cane farmers were being exploited by the millers when they did charge them per ton for transport. The findings from the interview schedule of the factory managers also indicated that the transportation charges are done per ton. The feelings of the respondents are that the

transportation charges be removed completely on the side of sugarcane farmers.

***Duration the Cane Trucks Take to Unload Raw Sugarcane at The Mills and Whoever Pays For Any Extra Time***

The farmers were asked what they knew about the duration the cane trucks took for the raw sugarcane to be unloaded. They were also asked whoever pays for any excessive time spent at the sugar mills. From the data displayed in *Table 6*, more than three-quarters of the sample population (86 %) indicated that it took 5-10 hours, while the rest, about (14%) indicated that it was 20-30 hours.

**Table 6: Duration of the cane trucks take to be unloaded, Malava Sub-County**

Variable Option	Frequency	Per cent
5-10 hours	332	86
20-30 hours	52	14
Total	384	100

Source: Researcher’s Field Work, 2019

When they were asked whoever pays for any excessive time spent at the sugar mills waiting to unload the raw sugarcane, 74.22 % indicated that it was the sugar millers. 10.68% said it was the farmer, while 7.29% indicated that it was the farmer and the

miller (shared half each) and 7.81% did not know whether or not the farmer or the miller was responsible for incurring the expenses of excessive time spent. This is illustrated in *Table 7* below:

**Table 7: Payment of excessive time spent at the mills waiting to be unloaded**

Variable option	Frequency	Per cent
Farmer	41	10.68
Miller	285	74.22
Farmer + miller	28	7.29
Not known	30	7.81
Total	384	100

Source: Researcher’s Field Work, 2019

Forty-one respondents indicated that it was the cane farmers who incur the expenses for any excessive time spent at the sugar mills waiting to be unloaded. They assumed that the payment was included in the deductions made by the millers because most cane farmers pointed out the issue of transportation charges being high.

the cane farmer. The same view was repeated across all the wards surveyed. According to another discussant, it was asserted that the farmers meet the charges as they are included in other expenses to be deducted from the farmer. Another discussant stated:

*“Most of the work is done by the farmer, including transport of cane to the miller”.*

There were focus group discussants who held the view that the excessive time spent at the millers waiting to unload the raw sugarcane was paid for by

When the factory managers were asked to elaborate on the issue of delays in transportation and unloading of the raw sugarcane, Butali sugar had the following to say:

*“We have ensured that there is no time wastage at our factory by making sure that sugarcane is weighed once delivered and off-loaded immediately. We have enough trucks.”*

Yet another respondent from the Kabras sugar mills stated:

*“There are more than enough trucks to ferry sugar cane from farms; we also allow farmers to transport their own cane privately to the company. Therefore, offloading is instant”.*

These results concur with the study findings of Chamnahlaw *et al.* (2004) in Thailand, who found out that one of the reasons for high transportation costs was the long waiting line of the trucks to unload sugarcane at the millers, whereby each truck

could wait for about 20-35 hours on average before unloading sugarcane; then the carrying cost was highly charged to compensate that long waiting time. Paitoon *et al.* (2016) of Thailand also revealed in their study that truck drivers might spend up to twenty-four hours for just one transaction, which of course, had an impact on the cost of transportation.

### **Marketing Problems Facing Sugarcane Farming in Malava Sub-County**

This section presents the findings on the second objective, which was to establish the challenges related to prices of sugarcane faced by Malava cane farmers. The findings were discussed as follows:

#### ***Selling of Sugarcane after Maturity***

The study found out that the majority of sugarcane farmers (55%) were contracted to both Kabras sugar and Butali Sugar Mills, (20%) sold their cane to Kabras sugar alone, while 25% sold to Butali sugar alone (*Table 8*).

**Table 8: Selling of harvested sugar cane after maturity**

<b>Variable Option</b>	<b>Frequency</b>	<b>Per cent</b>
Butali and Kabras Sugar	211	55
Butali sugar	96	25
Kabras sugar	77	20
Total	384	100

**Source:** Researcher’s Field Work, 2019

It was assumed that a higher percentage of cane farmers contracted both Kabras sugar and Butali sugar. This is because initially, there was only one sugar factory (Kabras sugar) which started in the year 1981, according to the report of the Task Force on recovery of the sugar industry (2018). Most cane farmers were contracted to Kabras sugar until after the year 2007, when Butali sugar began operations. The same farmers shifted and could register different sugarcane farms with either of the companies. The farmers were partly in Kabras sugar, and Butali sugar may be because they wanted to compare the services rendered by the two sugar companies and find out which one was fair.

#### ***Availability of Ready Market for the Mature Sugarcane.***

When asked about the ready market for mature sugarcane, 60% of the cane farmers sampled said Yes, while 40% responded negatively that there was no ready market for mature sugarcane. The respondents (60%; 230) who said that there was no ready market for mature cane described how it was tedious for one to acquire a permit to harvest the sugarcane after maturity. They argued that this led to cane being harvested after two years instead of eighteen months and therefore delaying the farmers’ plans and operations on their farms.

However, results from (40%; 154) respondents who believed that there was absolutely no ready market for mature sugarcane elaborated on how the sugar mill's management made it difficult for one to acquire a cane harvesting permit. They said the supervisors in charge of issuing the permits were



corrupt. A member from one of the focus group discussions said;

*“You have to keep on visiting the factory many times. You are asked to ‘bribe’ whoever issues the permit. After harvesting, one opts to uproot the cane because it is too expensive. No profit”.*

Yet another asserted,

*“We are forced to bribe the supervisors in order to be given the harvesting permit; at least Ksh. Two*

*thousand per permit or sell to the Jaggaries at a throwaway price of Ksh. 35,000,” as shown in Table 9.*

Agreeing with the above view, a discussant from a different FGD asserted;

*“There is no ready market for a mature cane; I usually apply for a permit to harvest my cane which takes a long period to be issued. I keep on bothering the field officers to the extent of even bribing them. It is complicated!”*

**Table 9: Price of Sugarcane**

Butali Sugar (1 truck approx. 13 tons)	Kabras Sugar (1 truck approx. 13 tons)	Factory/Jaggery Lorry approx. (13 tons)
4050 per ton = 52680	3900 per ton = 50700	35,000 per Lorry

**Source;** Researcher’s Field Work, 2019

Table 9 above indicates that the price of raw sugarcane is Ksh. 4050 per ton in Butali sugar and Ksh. 3900 per ton in Kabras sugar. While the price of sugarcane at the factory per lorry of 13 tons is Ksh. 35,000.

These sentiments agree with the cane farmers’ response that there is no ready market for mature sugarcane. It can be assumed from these findings that if a cane farmer does not have money, their sugarcane will not be harvested in time after maturity. This could be one of the reasons why some of the farmers opt to uproot the sugarcane and go for other crops which have a ready market after their maturity of short periods. For instance, beans and

vegetables as also revealed by Amadala (2014) in the literature review.

***The Duration of Payment after Sugarcane Delivery to the Mills***

Data from the questionnaire’s respondents revealed that the duration taken for a cane farmer to be paid after the delivery of sugarcane to the mills is one week, both in Kabras sugar mills and Butali sugar mills. When the cane farmers were asked whether they were comfortable with that period, the majority (63%) said yes, while (37%) responded negatively (Table 10).

**Table 10: Farmers' Perception Regarding One Week’s Payment After Cane Delivery**

Response	Frequency	Percentage
Yes	242	63
No	142	37
Total	384	100

**Source:** Researcher’s Field Work, 2019

Those who responded negatively (37%:142) argued that seven days is a long period of time and that the sugar millers sell molasses and Bagasse and therefore should have enough cash to pay farmers at least two days after sugarcane delivery.

Focus Group Discussion across the wards in Malava Sub-County confirmed these findings:

One discussant said,

*“The cane cutters and loaders demand payments on the spot; Seven days waiting by farmers is too long. If possible, payments should be immediate”.*

*“Other crops like vegetables, potatoes, beans and projects like brick making and sand harvesting pay faster.*

Yet other discussants asserted,

*“Seven days is long and therefore one cannot use the money to solve an emergency”.*

*“The payments should be done immediately farmers supply their sugar cane”.*

These findings tie up with literature reviewed by Faraz (2013) in India who found out that farmers complain about sugar millers being unable to purchase their yield immediately. Faraz (2013) also pointed out that those who grew sugarcane were underpaid in the market despite them being the real producers of the crop, such that the main beneficiaries of any price increase were always sugar millers or processors.

It is also in agreement with the findings of Brenda (2012) on problems facing cane farmers in Kenya, which reported that there is a delay in disbursing payments to farmers by sugarcane companies. This reduces farmers' morale and their capacity to carry out extensive farming. From the questionnaires' responses and FGD discussants, this study revealed that the Malava farmers' cane yields were also not purchased immediately.

### ***The Price of Sugarcane in Malava Sub-County.***

This study found out from the farmers' questionnaire data that sugarcane price was determined by the sugar mill owners, as indicated in *Table 10*. These payments are based on the weight of sugarcane but not the sucrose content of the cane. Most farmers expressed how they are affected in their operations on the farms when the price of sugarcane is determined by the weights. They argued that sometimes the millers delay transporting the harvested sugarcane; the more the harvested cane stays on the farms, the more it loses weight. Therefore, the farmers end up earning very little.

This study also found out from the respondents that farmers are at times cheated on the net weight of their harvested cane because they are never involved in that process of weighing; they are just

told that it weighed such tons. One of the focus Group Discussant said;

*“Sometimes, it is very difficult to tell if it's true that the allocated tonnage is genuine because the farmer is not present while the weighing machine is operated; anything fishy can be done; tonnage weighing should be done in the presence of the farmer and if possible, at the farm”.*

Yet another asserted,

*“We are many times cheated on the net weight of our sugarcane; We are not sure if the tonnage is true because there are cases of accumulating tons from different farmers and then someone else is paid”.*

However, other sentiments of those who said that they are affected negatively when the price is determined based on the weight of cane and not its sucrose content had the following to comment;

*“Sugarcane which has over matured has less weight. This is caused by the delay to issue harvesting permits. As farmers, we gain nothing but losses”.*

*“Most sugarcane has little weight but high sucrose content; hence as a farmer, I am paid lowly when the pricing is based on the weight of cane; sucrose content should be based on while determining the price”.*

*“Pricing using the weight of cane leads to a farmer earning little. Therefore, discouraging further sugar cane farming, the government should set the price to protect the farmers from being exploited, and they should base on the sucrose content of cane”.*

These findings resemble those revealed in the marketing stages of the cane crop study in India by Faraz (2013), where it was based on the weight of cane instead of sucrose recovery; and it encouraged inefficiency in cane cultivation because farmers put less effort into improving their crop quality for high sucrose content. Also, the delay in transporting the harvested cane led to a loss of moisture from the crop, making it lighter and, therefore less valuable. These results also concur with the study findings of

Chimwai and Chidoko (2011) in Zimbabwe in the reviewed literature, who found out that low prices were paid for the harvested sugarcane and that these had affected most of the farmers' operations as they could not pay competitive wages, repair equipment, and buy fuel. This study, therefore, established that Malava cane farmers are also facing these problems of price determination and delay in purchasing the sugarcane yield.

### ***Evidence of Imported Sugar in Malava Sub-County.***

The questionnaire information and the FGD discussants from all the seven studied wards clearly revealed that there are cases of imported sugar in Kenya and in the Malava Sub-County. This was also confirmed by the interview schedule for the factory manager informants from the two sugar mills in the Sub-County; Kabras sugar and Butali sugar, that there is the importation of sugar whereby they expressed how they are affected by these imports; they asserted;

*“The overflowing of imported sugar on the market leads to unhealthy competition, where our local sugar lack market”.*

Discussants in FGDs also expressed how they are unhappy with the importation of sugar. They had the following to say;

*“The cartels importing sugar are inside the government, thus hard to eradicate them. They import sugar and pack it in Kabras sugar mills packets. The government should minimize importation by stopping the sugar cartels”.*

According to Whittman *et al.* (2010), the government has allowed the importation of sugar because of trade agreements with other countries, but this has turned into the 'dumping' of cheap, unsafe sugar into our country.

Other discussants said,

*“As a farmer, I am discouraged because overflowing of sugar on the market has made the millers not to purchase mature sugarcane on time”.*

These findings are in agreement with those revealed in the literature review by Brenda (2012) that

flooding of markets by cheap imported sugar resulted in unfair competition, causing a delay in disbursing payments to farmers by sugarcane companies. Chahale (2017) also revealed that West Kenya sugar company in collaboration with powerful politicians in government, were flooding the country with imported duty-free sub-standard sugar in total disregard of standing high court orders banning the same and that the directors of the company were colluding with powerful politicians in government who also have huge financial stakes in the business making a killing in a country starved off locally produced sugar due to failure to meet the production capacities. This study established that the sugarcane farmers in the Malava sub-county are also facing these challenges.

When asked about whether sugar conferences were held in Malava Sub-County or not, the respondents confirmed being not aware of any sugar conference in the Sub-County. This was contrary to the findings of Chamnalaw *et al.* (2004) in Thailand, Yang *et al.* (2014) in China and Brown (2012) in Fiji, whose findings indicated evidence of sugar conferences being held there.

## **CONCLUSION**

Productivity in the sugar industry affects the whole nation in terms of foreign currency earnings, production of ethanol, generation of electricity, molasses, and other by-products from sugarcane. The success of the sugarcane industry in Malava Sub-County and Kenya, in general, is built on best practices in transportation, marketing, and capital equipment. On the basis of the research findings in relation to the objectives, it is concluded that:

- The cost of transporting sugarcane from farmers to mills in the Malava sub-county is considerable compared to other variable costs. Loading stations would assist producers, truck drivers, and millers. Small-scale cane farmers that rely on family labour should gain the most. Government and political officials from sugar belts should cease keeping quiet and implement appropriate policies, legislation, and programs to minimize the high cost of cane production in the country.

- Mature sugarcane has a ready market, but small-scale cane producers are upset with the hidden expense of harvesting permits. Payment following cane delivery to mills is slow. Millers determine the producer price of raw sugarcane based on its weight, not its sucrose content. Cane farmers are not involved in the cane weighing procedure at the plants; therefore, they are not confident about the weights.
- Small-scale cane farmers in the Malava sub-county are less productive due to poor agronomic practices: input difficulties, ageing ratoon, and lack of equipment to complete tasks on time. Malava sub-county farmers have considerable sugarcane-producing experience but lack resources. Most farmers withdraw and turn to brick manufacturing and sand gathering to get quick money.

### Recommendations

It is recommended from this study's findings that:

- The millers to meet the transportation costs. The sugar millers introduced mobile weighbridges for harvested sugarcane to be weighed at the farm gate before transportation to the sugar millers. This will promote effectiveness and efficiency in the transport department.
- The producer price for sugarcane should be determined by the government. It should be based on sucrose content to motivate farmers to work hard in order to improve the productivity and quality of cane. This could also promote the efficiency of the sugar millers.
- There should be more involvement of extension workers in rendering expert advice on cane farming operations to ensure high productivity. The government should consider providing loans to small-scale farmers to buy tractors for use within the village, from farm to loading stations and be able to perform other farm operations. The sugar millers should supply fertilizers and other inputs on time and at fair prices to motivate the cane farmers.

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