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Devolution of Agriculture and its Effects on Mango Marketing by Small-Scale Farmers in Makueni County, Kenya

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*Devolution,
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Makueni
County.*

The study aimed to evaluate the devolution of agriculture and its effects on mango marketing by small-scale mango farmers in Makueni County, Kenya. It utilised a descriptive research design and collected data in narrative and numerical formats from mango farmers in the county. The study used a semi-structured questionnaire and interviews; data was collected using a stratified random sampling technique. Quantitative data was analysed using frequencies, percentages, and correlation analysis in the SPSS (V27) package, while qualitative data from interviews was analysed using thematic analysis. The findings hold significant implications for policymakers, farmers, and researchers. Furthermore, the study informs small-scale farmers about the benefits of adopting good agricultural practices to improve the quality of their mangoes. Key indicators of devolution identified in the study include improved marketing guidelines, farm cooperatives, processing of farm produce, infrastructure development, improved bargaining power, provision of farm inputs, funding/soft loans, and training and capacity building. The benefits of devolution for mango farmers encompass increased decision-making authority, subsidies for farm inputs, and overall improvement in their lives. Some of the challenges faced by mango farmers are limited marketing options, restricted credit availability, and low prices for their produce. Based on the findings, there is a significant positive relationship between agricultural devolution and mango marketing. The correlation analysis indicates a positive relationship between devolution and the marketing of mangoes ($r = 0.572$, $p = 0.000$). The study concluded that although mango marketing cooperatives helped farmers, the Makueni County government lacked sufficient marketing options for mango producers. This resulted in limited market access, restricted credit availability, and low prices for their produce. The study recommends collaboration between the county government and mango farmers to increase demand and marketing approaches for mangoes.

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INTRODUCTION

Efforts to reduce poverty and hunger have prompted economic and political reforms in various countries, including India, Pakistan, Netherlands, France, Canada, Guatemala, and Kenya (Lee-Geiller & Lee, 2019; Kimathi, 2017). Fonseca et al. (2020) argue that prioritising rural economies is crucial for achieving SDGs related to poverty and hunger. However, rural development programs in mango-producing countries like India, Pakistan, and Brazil have not consistently improved livelihoods (Castro-Arce & Vanclay, 2020; Nogueira et al., 2020).

Limited markets also hamper mango farmers in countries such as India, Thailand, Brazil, and Venezuela (Thompson, 2021). Efforts in Egypt and Madagascar highlight integrated rural development programs to enhance mango production (O'Brien et al., 2019). Devolution and technological advancements are critical for African mango-producing countries (Mulesa & Westengen, 2020).

Kenya, a major mango producer, faces challenges in accessing international markets (Odari, 2018), while small-scale farmers in Makueni County lack marketing opportunities (Wangu et al., 2020). Mango farmers in Makueni County have faced significant distress due to post-harvest losses, inadequate coordination with traders, limited government support, and limited market access, leading to an unproductive and unsustainable sector. Studies conducted in the county, such as Muema et al. (2018), Wangu et al. (2020), and Lelgut (2020), highlight these challenges. For example, Wangu et al. (2020) revealed the limitations of inclusive agribusiness in addressing

food and nutrition security, emphasising the hardships faced by mango farmers. Muema et al. (2018) found that farmers lose up to 45% of their produce due to poor post-harvest handling and disease management practices.

The purpose of this study was to capture a range of perspectives and experiences related to mango farming and marketing among different demographic groups in the county. The objective of the study was to evaluate agricultural devolution and its effects on mango marketing by small-scale farmers in Makueni County, Kenya.

LITERATURE REVIEW

A study in the Islamic Republic of Iran highlighted indicators of agricultural devolution, emphasising the importance of extension services, training, funding, public participation, provision of farm inputs, and infrastructural development (Tajbakhsh, 2019). In Ethiopia, devolved functions were found to facilitate new investment opportunities and improve market access through marketing aid, subsidised inputs, processing, and farm cooperatives (Mulesa & Westengen, 2020).

Kenyan studies emphasised the potential of devolution in addressing marketing challenges and promoting sustainable practices for fruit farmers, stressing the need for marketing aid, processing, regulation, and cooperative promotion (Wanjiku, Jonyo & Alwanga, 2020; Ngaruiya, 2019; Wangu et al., 2020). A study conducted in Britain examined devolution and governance, emphasising the positive impact of local-based commissions in addressing structural bottlenecks faced by farmers through enhanced public participation, improved extension services, and

infrastructure development (O'Brien, Pike & Tomaney, 2019).

Another study in Kenya acknowledged the mixed impact of devolution on marketing channels and service delivery to farmers, highlighting limitations such as low capacity and limited finance (Keya et al., 2019). The current study provides a targeted analysis of devolution's effects on mango farmers in Makueni County.

A case study conducted in Huong Thuy Town, Vietnam, highlighted the limited access to lucrative markets and the lack of agricultural marketing interventions for rural communities dependent on agriculture (Pham, Kappas & Faust, 2021). The study emphasised the vulnerability of small-scale farmers who are forced to sell their produce in domestic markets characterised by bad governance, corruption, and unhealthy practices. The context of this study in Vietnam differs from the current study conducted in Makueni County, Kenya, thus warranting an examination of similar dynamics in the mango farming sector.

A review of past studies on small-scale mango farming in African communities revealed challenges related to poor production chain structures, post-harvesting practices, and inefficient marketing systems (Thompson, 2021). These factors have limited the marketability of mangoes from African communities in international markets, leading farmers to rely on local markets with poor pricing and handling practices. While this study provides insights into the challenges faced by mango farmers in African contexts, it differs from the current study conducted in Makueni County, which focuses on the specific context of mango farming in that region.

Agarwal (2018) conducted a study in India comparing the marketing challenges faced by group farms and individual family farms, highlighting issues related to economies of scale and limited access to marketing information in international markets. However, this study did not address the specific challenges faced by mango

farmers in Kenya, particularly in Makueni County.

Stewart (2021) examined the effects of agricultural policies on smallholder farmers in Norway, emphasising the establishment of savings and cooperative societies to enhance cooperation and bargaining power. However, this study's focus differs from the context of mango farmers in Makueni County, Kenya, highlighting the need for research specific to the effects of agricultural policies on mango farmers in the county and the potential of savings and cooperative societies.

THEORETICAL FRAMEWORK

The study was based on the theory of unbalanced growth, proposed by Hirschman in the 1950s. The theory argues for prioritising key economic sectors for targeted investments to achieve overall growth and stability, especially in developing countries. Saliminezhad and Lisaniler (2018) also support this view, emphasising the efficient allocation of public resources through prioritisation in fiscal budgets.

In the study on devolution and mango farming in Makueni County, the theory is relevant as it aligns with the objectives of identifying indicators of devolution, assessing benefits for mango farmers, understanding marketing challenges, and exploring coping strategies.

The Theory of Agricultural Transformation (TAT) proposed by Johnston and Kilby (1975) also highlights the significance of agricultural transformation for economic growth. The study in Makueni County aligns with the TAT principles. The objective of establishing indicators of devolution relates to the TAT's focus on policies and institutions. Assessing the benefits of devolution corresponds to the TAT's emphasis on increased agricultural productivity. Examining marketing challenges aligns with the TAT's focus on effective marketing strategies. Investigating coping strategies corresponds to the TAT's recognition of the importance of farmer cooperatives and extension services (Johnston & Kilby, 1975; Diao et al., 2017).

RESEARCH METHODOLOGY

The study employed a descriptive research design to examine the causal relationship between dependent and independent variables. The study focused on Makueni County. Mango farming is a lifeline economic activity for the majority of small and medium-scale farmers. Marketing of varied crops in Makueni County is an important aspect of the agricultural industry. Small-scale farmers dominate the agricultural sector, and they rely on various crops for their livelihoods. The target population consisted of Mango farmers in Makueni County, farmer group associations, corporations involved in mango marketing and sales, and relevant county departments. The main crops grown in the region include maize, beans, cowpeas, green grams, pigeon peas, sorghum, and millet. Mango farming is also a popular activity in the region, with a majority of small and medium-scale farmers relying on it as a source of income. As the study targeted a finite population of 106,379 farmers, the sample size was computed using Cochran's formula for sample size determination, as shown below;

$$n = \frac{Z^2 pq}{d^2}$$

Thus $n = 1.96^2 (0.5 \times 0.5) / 0.05^2 = 384$, distributed proportionally among all six Sub-Counties (Makueni, Mbooni, Kibwezi East, Kibwezi West, Kaiti and Kilome) in Makueni County to ensure that the study captured the diverse perspectives of mango farmers across the county. Stratified random sampling was therefore used. Each Sub-County has unique characteristics such as climate, soil type, and economic activities, which may influence the production and marketing of mangoes. Therefore, by selecting all Sub-Counties, the study aimed to obtain a representative sample that reflects the diverse perspectives and experiences of mango farmers across the county.

Data collection methods included semi-structured questionnaires, interviews, and focused group discussions. The questionnaire was designed to capture information on the marketing channels that mango farmers are currently using as well as

those accessed before the devolution started. Interviews were used to collect in-depth information on marketing channels from the Key Informant Persons (KIP), who included committee members of local mango cooperatives, local mango traders and exporters, farmers groups and agricultural stakeholders such as the Kenya Agricultural Productivity Project (KAPP), Kenya National Farmers Federation (KENAFF), Mbukinya Digital and Uvuanyo which deal with marketing and sales of mangoes within the county and offer technical support to enhance the mango value chain, as well as the county department of agriculture. To get more detailed information from the farmers and some members of cooperative societies, the researcher also conducted focus group discussions. The focus group discussions were conducted in addition to the individual interviews to obtain more detailed information on the experiences of the farmers and members of cooperative societies in relation to agricultural devolution and the marketing of mangoes. The analysis involved percentages, frequencies, mean averages, and standard deviations for quantitative variables, while qualitative data were analysed for themes and relationships. Inferential statistics, such as correlation analysis, were used to test hypotheses. Data cleaning and entry were performed in SPSS (V27).

RESEARCH RESULTS

Demographic Characteristics of the Respondents

In this study, demographic data of the respondents including gender, age, education level, family size, and farm size were collected to provide insights into the socioeconomic status of small-scale mango farmers in Makueni County, Kenya. The analysis of the demographic data was done using frequencies and percentages to provide a comprehensive picture of the characteristics of the respondents.

The findings indicated that 59% (n=185) of the respondents were male, whereas 41% (n=128) of the respondents were female. The findings of the

study on the age bracket of the respondents show that most of the mango farmers in Makueni County are between the ages of 31 and 40 years, making up 35.5% (n=111) of the total respondents.

Educated farmers are more likely to adopt new farming practices, access credit, and utilise technology in their farming practices (Nogueira et al., 2020; Muema et al., 2018). The findings indicated that the majority of the respondents (45%, n=141) had attained secondary education level.

Ng’asike et al. (2020) suggest that stable family relationships provide a basis for farmers to make long-term investments in farming activities. On

marital status, the findings indicated that most of the respondents (70%, n=219) were married.

The findings indicate that most of the respondents (32.6% n=102) have 3-4 children in their households. These findings align with studies that focus on the livelihoods of farmers in Kenya, such as Ng’asike et al. (2020), who discuss the challenges facing smallholder farmers in the country.

The respondents were asked to indicate the size of their farms. The research findings indicated that 47.9% (n=150) of the respondents had a farm size of 3 hectares. The results are illustrated in *Table 1*.

Table 1: Demographic Characteristics of Participants

Characteristic		Frequency	Percent
Gender	Male	185	59.0
	Female	128	41.0
Age Bracket of Farmers	Up to 30 years	70	22.4
	31-40 years	111	35.5
	41-50 years	102	32.6
	51 years or more	30	9.5
Highest Education Level Attained by Farmers	None	5	1.6
	Primary	27	8.6
	Secondary	141	45.0
	Tertiary	65	20.8
	University	75	24.0
Marital Status of Farmers	Married	219	70.0
	Unmarried	88	28.0
	Widow/Divorced	6	2.0
Family Size of Farmers	1-2 people	96	30.7
	3-4 people	102	32.6
	5-6 people	87	27.8
	7 or more people	28	8.9
Farm Size of Farmers	1 hectare or less	37	11.9
	2 hectares	42	13.4
	3 hectares	150	47.9
	4 hectares	63	20.1
	5 hectares	21	6.7

Indicators of Agricultural Devolution

Promotion of Farm Cooperatives

The study sought to establish the indicators of agricultural devolution in Makueni County. The respondents were first asked to indicate whether there were mango marketing cooperatives within their area. The survey results show that 180 out of

313 respondents (57.5%) reported the existence of mango marketing cooperatives. Out of the 180 respondents who reported the existence of mango marketing cooperatives, 31.3% (98) are members of one of the cooperatives, while 68.7% are not members of any mango marketing cooperative. The results are illustrated in *Table 2*. These

findings support the findings of Maina et al. (2019) that farmers used cooperatives as among the main ways of marketing their mangoes.

Table 2: Existence of Mango Marketing Cooperatives

		Frequency	Percent
Existence of mango marketing cooperatives	Yes	180	57.5
	No	133	42.5
Member in at least one of the mango-selling cooperatives in the county	Yes	98	31.3
	No	215	68.7
	Total	313	100.0

Marketing Aid

According to the results, the majority of the respondents (60%) sold mangoes through agents, followed by those who sold through cooperatives (17%) and market centres (23%). The finding that 60% of the respondents sold mangoes through agents implies that most farmers do not have direct access to the market and are likely to receive lower prices for their produce compared to what they would receive if they sold directly to the consumers. As suggested by Lelgut (2020), there is a need to create more opportunities for direct marketing, such as through the

establishment of farmers' markets, and to provide training and support to farmers to enable them to engage in direct marketing effectively.

Most respondents (69.3%) feel the County Government lacks sufficient marketing options for mango farming, while 30.7% disagree. 78% believe the Government has not invested in improved marketing structures. 41.2% think there are enough marketing options, while 58.8% disagree. 73.2% believe market facilities affect processing efforts for small-scale farmers, compared to 26.8% who do not (Table 3).

Table 3: Mango Marketing Scenario in Makueni County

		Frequency	Percent
County Government has developed enough marketing options	Yes	96	30.7
	No	217	69.3
County Government has invested in better marketing structures	Yes	69	22.0
	No	244	78.0
Enough marketing options for mango produce	Yes	129	41.2
	No	184	58.8
Market facilities affect the efforts of processing mangoes farmed by small-scale farmers	Yes	229	73.2
	No	84	26.8
	Total	313	100.0

The findings indicate that the majority of the respondents (69.3%) believe that the County Government has not developed enough marketing options for mango farming, and many feel that there are not enough marketing options for mango produce, as also postulated by Nogueira et al. (2020) in Brazil.

The study utilised interviews and focus group discussions with committee members of mango cooperatives, traders, exporters, farmers, and agricultural stakeholders, along with the county

Department of Agriculture. Findings from these sources corroborated the farmers' findings, showing County Government involvement in marketing mango produce for farmers, but with room for improvement.

Processing of Produce and Value Addition

Regarding the impact of devolution on the processing of farm produce, 35.1% (n=110) of respondents disagreed, 15.3% (n=48) agreed, and 6.4% (n=20) were unsure (Table 4). This suggests

that challenges in farm produce processing may persist despite devolution. The 15.3% who agreed that processing had improved under devolution, albeit a small percentage, indicate some positive effects. The study highlights that farm produce processing in the County falls short of requirements but is still considered a positive step for mango production. Odari (2018) notes the struggle fruit farmers face in meeting international quality standards, making their produce unattractive to global markets. The County Government established a processing plant to assist farmers, although some respondents felt it was hindered by middlemen. The establishment of fruit fly-free zones and proposed value-addition capacities and certified nurseries, as suggested by Muema et al. (2018), reflect comprehensive efforts by the County Government to enhance the mango industry and local economy.

Inspection and Regulation

The study found that a significant portion of the respondents (66.1%) agreed that the County Government had put in place measures to reduce the impact of brokers and middlemen on mango marketing. Additionally, 40.2% of the respondents agreed that the County Government had developed better marketing guidelines to this effect, and 25.9% strongly agreed. However, there were still 24.3% of the respondents who disagreed with this statement, suggesting that more needed to be done to reduce the negative impact of brokers and middlemen on the mango marketing value chain (Table 4).

The County Department of Agriculture implemented programs to enhance mango production, providing technical assistance and regulating quality. This increased the reputation and demand for Makueni's mangoes, as noted by respondents during key informant interviews. The Department of Agriculture in Makueni County introduced a certification program for mango farmers, guaranteeing quality standards. This positively affected the reputation and increased demand for Makueni's mangoes, according to key informant interview responses.

The Department of Agriculture partnered with regulatory agencies to promote safe pesticide use in mango farming, enhancing quality and protecting health. These collaborations facilitated training and education on the proper handling of pesticides.

The study revealed that 32.9% (n=103) of respondents disagreed on improved farmers' bargaining power due to devolution, while 14.1% (n=44) agreed and 9.9% (n=31) strongly agreed (Table 4). This aligns with Kibet's (2019) and other studies highlighting the detrimental effects on smallholder farmers' bargaining power and profitability. The County Department of Agriculture's initiatives in mango production demonstrate the positive impact of government intervention on smallholder farmers (O'Brien et al., 2019; Omondi, 2019). The partnerships with regulatory agencies align with the importance of agricultural regulation in ensuring safety. (Tajbakhsh, 2019; Ngaruiya, 2019).

Infrastructural Development

The findings on whether devolution had improved the roads and transportation networks for mango farmers show that 43.1% (n=135) of the respondents disagreed, 27.8% (n= 87) of the respondents strongly disagreed, while 16.6% (n=52) of the respondents agreed (Table 4).

The study highlights the need for improved roads and transportation networks to benefit mango farmers economically. The low agreement on road improvements emphasises the necessity for government interventions. Interviews and FGDs revealed that devolution improved resource access, and the County Government worked on infrastructure development. In contradiction to the findings of the study, Maina et al. (2019) illustrate that there had been rural development in terms of better service delivery, including market structures and road development for perishable products in semi-arid lands in Kenya.

Public Participation (Decisions Making)

The study findings on whether there was better marketing as a result of devolution due to public

participation in decision-making, 34.5% (n=108) of the respondents agreed, 26.2% (n=82) of the respondents disagreed, while 24.9% (n=78) of the respondents strongly agreed (*Table 4*). This finding implies that there is a mixed perception among the respondents regarding whether there was better marketing as a result of devolution due to public participation in decision-making.

Therefore, the researcher sought to find out if the same was applicable to FGDs and key informants. As reported by some of the respondents during the key informant's interview and FGDs, devolution has, in some instances, helped with better marketing, as there was improved decision-making. The study findings on better marketing as a result of devolution due to public participation in decision-making are consistent with previous studies (Keya et al., 2019) that have shown that public participation in decision-making can lead to better outcomes for communities. Keya et al. (2019) found that involving local communities in decision-making processes related to natural resource management can lead to more sustainable and equitable outcomes.

Climate Change Policy

The study found that 37.7% (n=118) of the respondents strongly agreed that the climate change policy as a result of devolution ensured that there was more produce by the farmers, 37.7% (n=118) of the respondents strongly disagreed, 33.5% (n=105) disagreed, and finally, 22.4% (n=70) strongly agreed (*Table 4*). The study revealed a lack of consensus among respondents regarding the impact of the climate change policy on agricultural production in Makeni County. 37.7% strongly agreed that the policy increased production, while an equal percentage strongly disagreed. This suggests ongoing debate among farmers regarding the policy's effectiveness.

The information from FGDs and key informant responses shed some light on the issue. One informant noted that while the climate change policy had brought about positive changes in agricultural practices, farmers were still struggling with the effects of climate change.

FGDs responses also noted that while the policy had been well-intentioned, it had not been adequately implemented to achieve the desired results. Another informant highlighted the need for more resources and support from the Government to enable farmers to adapt to climate change and improve their agricultural practices. These two responses illustrate the divergent opinions that exist on the impact of the climate change policy on the mango industry in Makeni County.

Studies such as Kogo et al. (2021) and Muema et al. (2018) have shown that while climate change policies are important in addressing the challenges posed by climate change, their impact on agricultural production may be limited by a number of factors, including inadequate implementation and lack of resources.

Training and Capacity Building

On whether there was more produce due to training and capacity building to the farmers as a result of devolution, 36.7% (n=115) of the respondents agreed, 26.5% (n=83) disagreed, whereas 24% (n=75) of the respondents strongly agreed (*Table 4*). The finding implies that there is some level of agreement among the respondents that training and capacity building for farmers have increased as a result of devolution. The fact that a quarter of the respondents strongly agreed with the statement suggests that there have been some successful training and capacity-building programs initiated at the county level. Findings from Tchewafei et al. (2020) collaborate with the current study findings, which illustrates that there have been devolved departments of agriculture which have consequently backed the enhanced capacity building for small-scale farmers in seeds and seedlings management, post-harvest management, value addition, marketing, and sales of produce.

Provision of Extension Services

The study found that the Makeni County Government, in partnership with other stakeholders such as cooperatives and external marketers, had established strong extension

networks to support farmers in accessing the latest information and technology for managing pests and diseases in mango farming. These extension networks provide training on best practices for mango farming, access to credit and financial services, and assistance with market development and marketing. This highlights the County Government's efforts towards ensuring that farmers are equipped with the necessary skills and resources to succeed in their farming activities, particularly in mango production.

The findings of this study align with existing research, indicating that devolution has had a significant impact on the agriculture sector in Kenya. The FAO highlighted the positive effects of devolution on agricultural productivity, particularly in counties with strong collaboration between the County Government and agriculture stakeholders. The study's findings, including improved access to extension services, training, capacity building, and market support, are consistent with the recommendations of the FAO. Furthermore, the study corroborates the

importance of various components in mango production highlighted by Ajibade et al. (2018), emphasising the role of the County Government in providing extension services to promote and enhance the mango industry in Makueni County.

Funding/Soft Loans and Subsidised Farm Inputs

Regarding the provision of funding/soft loans by the County Government, the study found that only 16.9% of the respondents agreed that it led to more produce, suggesting limitations in funding availability and accessibility. This could be due to insufficient funds allocated for agriculture or inadequate information about funding programs (n=82, n=60, n=53). O'Brien et al. (2019) highlighted successful examples of integrated rural development programs, subsidised inputs, and soft loans in mango farming in countries like Egypt and Madagascar. Similarly, for the provision of farm inputs, only 15% strongly agreed that devolution facilitated it, indicating a gap in availability in Makueni County (n=98, n=94, n=47).

Table 4: Summary Descriptive Statistics on Indicators of Agricultural Devolution (%)

	SD	D	N	A	SA
The County Government has developed better marketing guidelines that have reduced the impact of brokers and middlemen	9.3	24.3	0.3	40.2	25.9
Devolution has created more marketing avenues for mango farmers through the promotion of farm cooperatives	8.3	29.7	2.3	36.7	23.0
The processing of farm produce is now better because of devolution	35.1	6.4	38.4	15.3	4.8
Devolution has improved the roads and transportation networks for mango farmers	27.8	43.1	8.7	16.6	3.8
Farmers have better bargaining power because of devolution	9.6	32.9	33.5	14.1	9.9
Devolution has facilitated the provision of farm inputs	31.3	30.0	15.4	8.3	15.0
There is better marketing as a result of devolution due to public participation in decision making	12.8	26.2	1.6	34.5	24.9
There is more produce due to the provision of funding/soft loans by the County Government	19.2	26.2	26.8	16.9	10.9
There is more produce due to training and capacity building for the farmers as a result of devolution	12.5	26.5	0.3	36.7	24.0
The climate change policy as a result of devolution has ensured that there is more produce by the farmers	37.7	33.5	0.0	6.4	22.4
Composite Mean and Std. Dev					

Benefits of Devolution on Mango Farmers

The study first sought to determine whether the devolution changed the life of Mango farmers in

Makueni. The findings indicated that 66.1% (n=207) of the respondents agreed that devolution changed their life, whereas 33.9% (n=106) of the

respondents disagreed (*Table 5*). The finding that 66.1% of the respondents agreed that devolution changed their life while 33.9% disagreed suggests that devolution has had a significant impact on the lives of the people in Makueni County. Increased public participation and resource allocation support local development, creating new funds and programs in agriculture, education, and health. Some respondents faced challenges due to

limited access to information and resources. Kimathi (2017) found that devolution in Kenya led to improved health services and new health facilities. Chang et al. (2020) reported increased public participation and job opportunities. Few farmers received subsidies, 55.3% disagreed on soft loans, and 64.2% agreed on training facilitation. This is shown in *Table 5*.

Table 5: Devolution Benefits to Farmers

		Frequency	Percent
Devolution has changed the life of Mango farmers	Yes	207	66.1
	No	106	33.9
Subsidy for farm inputs from the County Government or donors	Yes	84	26.8
	No	229	73.2
County Government offers soft loans to the farmers	Yes	140	44.7
	No	173	55.3
Devolution facilitates the training and capacity building of farmers	Yes	201	64.2
	No	112	35.8
County Government offers training services to mango farmers	Yes	277	88.5
	No	36	11.5

Collaborating with development partners, the county can build market-driven agriculture, improving profitability and boosting the local economy. A positive step for the mango value chain in Makueni County. Devolution facilitated collaboration between the County Government, farmers, and stakeholders (Njeru, 2017). The study found that 36.7% agreed on increased mango production, 39.3% disagreed on income facilities, and 33.2% agreed on improved farming standards (*Table 6*). Devolution had a positive impact on mango production and income but had less effect on farming standards.

The research findings indicated that the overall production/mango yields per hectare have been increasing since devolution was introduced, where 47.9% (n=150) of the respondents strongly agreed, 39.9% (n=125) agreed, and 9.6% (n=30) of the respondents disagreed. On whether there was an increased volume of mango marketing since devolution was introduced, 58.8% (n=184) of the respondents strongly agreed, 19.8% (n=62) disagreed, and 18.5% (n=58) of the respondents agreed. On whether there was an increase in income levels of farmers since devolution was introduced, 30% (n=94) of the respondents agreed, 30% (n=94) strongly agreed, whereas 16.4% (n=51) of the respondents disagreed. The results are shown in *Table 6*.

Marketing of Mangoes

Table 6: Descriptive Statistics on Marketing of Mangoes

		SD	D	N	A	SA
The overall production/mango yields per hectare have been increasing since devolution was introduced	f	0	30	8	125	150
	%	0.0%	9.6%	2.6%	39.9%	47.9%
There has been an increased volume of mango marketing since devolution was introduced	f	0	62	9	58	184
	%	0.0%	19.8%	2.9%	18.5%	58.8%
There has been an increase in the income levels of farmers since devolution was introduced	f	12	51	62	94	94
	%	3.8%	16.4%	19.8%	30.0%	30.0%

Devolution positively impacted mango farming: increased production, yields, marketing volume, and farmer income.

Challenges Faced by Mango Farmers

The study found that 67.1% (n=210) of the respondents disagreed with the establishment of better markets by the County Government, while

32.9% (n=103) agreed. Regarding the transportation of produce, 66.5% (n=208) reported bad roads, and 33.5% (n=105) indicated good roads. Additionally, 76.4% (n=239) agreed on the presence of middlemen in produce sales, while 23.6% (n=74) disagreed. The findings are presented in *Table 7*.

Table7: Challenges in Mango Farming

		Frequency	Percent
Better markets established by the County Government	Yes	103	32.9
	No	210	67.1
Status of roads used for transportation of your produce	Good	105	33.5
	Bad	208	66.5
Presence of middlemen in the sale of the respondent’s produce	Yes	239	76.4
	No	74	23.6

Based on the findings in *Table 7*, key informants and FGDs supported that there were challenges in mango farming, such as a lack of the technical expertise to effectively implement devolved functions, which has led to poor service delivery, among others. Studies by O’Brien et al. (2019) have found that devolution has led to improvements in service delivery and infrastructure development in some counties. However, other studies have found that the implementation of devolution has been slow and ineffective in some areas, leading to limited improvements in the lives of residents (Omondi, 2019). Overall, the findings suggest that there is a need for continued efforts to improve the implementation of devolution and to invest in infrastructure development to improve the lives of rural residents in Kenya. Extreme weather conditions like drought reduce mango yields and quality. Pests and diseases further impact crop yields, leading to lower income. High input costs

and expensive pest control methods reduce profit margins for mango farmers.

Coping Strategies on Challenges Faced by Mango Framers

First, the respondents were asked whether the challenges facing mango farmers in Makueni County could be solved. From the findings, 81.5% (n=255) of the respondents agreed, whereas 18.5% (n=58) of the respondents disagreed. The findings indicated that 47.3% (n=148) disagreed that farm sales helped them, whereas 52.7% (n=165) of the respondents agreed. From the findings, 60.1% (n=188) of the respondents agreed that dependence on local markets helped avoid logistical problems experienced in the county, whereas 39.9% (n=125) of the respondents disagreed. The findings are shown in *Table 8*.

Table 8: Coping Strategies for Farmers

		Frequency	Percent
Challenges facing mango farmers in Makueni County can be solved	Yes	255	81.5
	No	58	18.5
Farm sales help the farmer	Yes	148	47.3
	No	165	52.7
Dependence on local markets helps avoid logistical problems	Yes	188	60.1
	No	125	39.9

Respondents recommended investing in infrastructure (irrigation systems), weather monitoring, and disaster risk reduction programs to mitigate the impact of bad weather on mango farming (Farmers, cooperatives, traders, county department of agriculture). Mitigating the impact of high production costs can involve promoting integrated pest management, providing subsidies for inputs, and developing market linkages for fair prices.

The results of the correlation showed that agricultural devolution had a significant positive relationship with the marketing of mangoes, with a correlation coefficient of 0.572 and a p-value of 0.000. The study reveals a strong positive relationship between agricultural devolution and mango marketing, indicating that devolution policies in Makueni County positively impacted the marketing of mangoes by small-scale farmers. The findings are shown in *Table 9*.

Table 9: Hypothesis Testing

		Marketing of Mangoes	Agricultural Devolution
Marketing of Mangoes	Pearson Correlation	1	.572**
	Sig. (2-tailed)		.000
	N	313	313
Agricultural Devolution	Pearson Correlation	.572**	1
	Sig. (2-tailed)	.000	
	N	313	313

***. Correlation is significant at the 0.01 level (2-tailed).*

CONCLUSION

The study concludes that there were indicators of agricultural devolution which included better marketing guidelines (40.2%), promotion of farm cooperatives (36.7%), processing of farm produce (15.3%), better infrastructure (16.6%), and increased engagement of the private sector among others.

The Makueni County Government supports the mango industry through aggregation centres, a processing plant, and orchards, alongside extension services, loans, and subsidies. However, overproduction remains a challenge, causing a market glut and lower mango prices.

The study concluded that there were other challenges, such as inadequate infrastructure, limited market information, pests and diseases, and insufficient government support hindering the mango industry’s growth. In conclusion, the study highlights the various coping strategies employed by mango farmers to overcome the challenges they face. Farmers utilise on-farm sales, local market participation, capacity building, and crop diversification to mitigate transportation and market constraints, ensuring livelihoods and business sustainability.

Recommendations

The study recommends that the County Government and other stakeholders should invest in extension services and research programs that help farmers to identify and control pests and diseases effectively and sustainably. The study recommends the development of a comprehensive monitoring and evaluation framework that tracks the progress of devolution in the mango industry in Makueni County. Also, the County Government should give the mango farmers loans to buy mangoes as a way of supporting the mango industry in the County.

Farmers can work with the County Government and relevant organisations to identify and address the root causes of challenges they face, such as limited access to markets and poor transportation infrastructure. Also, the County Government and mango farmers need to work together to find ways to increase the demand for mangoes. The study recommends that the County Government should educate the mango farmers on the best strategies to use so as to reduce the overproduction of mangoes which leads to a glut in the market. Also, identification of the most effective coping strategies being used by mango farmers in

Makueni County and encourage their replication among other farmers in the region.

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