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Influence of Product, Price, Promotion and Place on Banana Market Trend in Kilimanjaro-Tanzania

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Abstract

The study focuses on the Product, Price, Promotion and Place On Banana Market Trend In Kilimanjaro, it provides the market strategy to enhance the competitiveness of banana companies in the current market dynamics. Through quantitative research, this paper revealed the effectiveness of (4P) in the Banana marketing strategy and the significant links between place, price, products, promotion and the impact in increasing the market opportunity in the banana sector. Specifically, the study evaluates the performance of marketing strategy practices across various dimensions. Marketing mix strategy were explored in terms of Product, Price, Promotion and Place. In addition, the data was collected from 575 banana growers throughout 52 wards. This study employed a cross-sectional survey approach to examine the commercial viability of the banana value chain, and the corresponding questionnaires were successfully collected. The results show (99.3%) of banana growers have a great challenge with access to the market and poor price information. Moreover, the producers (62.8%) rely on the middlemen rather than delivering bananas to the Private Banana Company. Based on these findings; for the farmers and private sector to generate

growth and excellence, Private Banana Company need to decentralize their business model and develop a marketing strategy by implementing its marketing mix in a way that will acquire and then sustain its competitive edge in the market. These will enhance the competitiveness of banana companies and lay a solid foundation for their sustainable success in the banana business.

Keywords: Banana, Marketing, Farmers, Kilimanjaro, Market

Introduction

Bananas are an important starchy food and cash crop in Tanzania and the Great Lakes region of East Africa countries largely including Tanzania, Uganda, Kenya, Rwanda and Burundi Nyombi., (2013). Banana-based farming, most specifically intercropped with other cash and domestic crops such as coffee, common bean and smallholder dairy cattle system, has played a significant role in sustaining smallholder farmers' livelihoods in the highland, Southern and like zone of Tanzania Meya et al. (2023); Tumaini et al (2024). The widespread reports of declining Banana profits in some countries in East Africa including Tanzanian since the 1930s and the low yields today do raise serious food security concerns Tumaini et al, (2024). The banana private business investors known as Micro small and medium-sized enterprises (MSMEs) investing in banana business do contribute to achieving the 2030 Agenda for Sustainable Development Goals (SDGs) United Nations., (2024). Moreover, Private sector by investing in the Banana business MSMEs help reduce levels of poverty through job creation and economic growth, MSMEs are the key drivers of employment, decent jobs and entrepreneurship for women, youth and groups in vulnerable smallholder farmers' locality areas in United Nations., (2024).

But also, farmers small holders' farmers are the majority of the world's food producers and play critical roles in feeding the global population closing the gender gap as they ensure women are fully and effectively participating in the production at different levels in the value chain United Nations (2024). Despite Bananas having significant contributions to food security in countries like the Philippines, Tanzania, Uganda, Kenya, India, China, Indonesia and Brazil and another 150 countries contributing to global banana production Filipenco, (2023. Farmers are challenged with the domestic banana market which consists of several marketing channels). Such complex characteristics of marketing channels negatively affect the growth of banana sectors in developing countries including Tanzania Lodovice, & Lee, (2024). Previous studies showed that the price dispersion and response depend on varieties of bananas and market levels from farmgate, wholesale and retail Lodovice, & Lee, (2024). It is

suggested that banana market stakeholders need to develop different strategies to improve the efficiency of the domestic banana market. To improve the complex distribution structure, the government needs to design medium- and long-term projects Lodovice, & Lee, (2024).

On the other hand, the value chain is going through different challenges that threaten the sustainability of banana production and consumption in Tanzania George, (2024). These include pests and diseases such as Fusarium wilt (Panama disease) and Banana Xanthomonas Wilt (BXW), which can devastate banana plantations and reduce yields George, (2024). Moreover, inadequate infrastructure, post-harvest losses, and Banana growers have been challenged by the unreliable banana market and price and some important basic economic concepts like the relationship with buyers and as well as middlemen growth have increased rapidly Mangarin, (2023. This research applies 4Ps as the assessment and measuring tool to see how the marketing mix model is currently running, namely by applying the 4Ps elements contained in the marketing mix model, Place, Price, Promotion and Product this marketing mix model can quickly describe how this business runs and offer the recommendation for investors and government in general (Mangarin, 2023)

Empirical and Theoretical Literature Review

Changes in the marketing environment have generated a need to reconsider the managerial perspectives on marketing in the business Elhajjar, (2024). Managers around the globe are recognising the increasing necessity for their companies and organisations to develop the skills, aptitudes and knowledge to compete effectively in international markets Roffik, et al (2024); Quester, (1999). The need for managers to develop the skills to respond to these pressures affects companies of all sizes. In the following sections, we will define international marketing and examine if it is important or necessary to become more centralised or decentralised to maintain an effective international marketing strategy. To generate growth and excellence, companies need to develop and then implement their marketing mix models in a way that will acquire and then sustain their competitive edge in the market (Ravikant, 2007). Marketing Mix Theory became popularized after Neil H. Borden published his 1964 article, The Concept of the Marketing Mix These 4P's are the parameters that the marketing manager can control, subject to the internal and external constraints of the marketing environment. The goal is to make decisions that centres the four P's on the customers in the target market in order to create perceived value and generate a positive response Langat, (2016). The four 4Ps of marketing: product, price, placement, and promotion are all affected as a company moves internationally. New product and service launches are

one of the most challenging for marketers because they require the target audience to go through every stage of the purchase decision sequence: from awareness and interest, to understanding, trial and, ultimately, brand preference. The challenge is even greater for new products because it requires a greater emphasis on educating not only end users, but also internal audiences and the sales force, those in the channel of distribution, and influencers (Johnson, 2002).

The Product is the central point on which marketing energy must focus the appearance of the product in line with the requirements of the market and the function of the product and products must address the needs of potential customers as identified through market survey (Marshal,2007). A global company can create a single product and only have to twist elements for different markets. For example, beverage company Coca Cola applied two formulas (one with sugar, and one with corn syrup) for all markets. The product packaging in every country incorporates the contour bottle design and the dynamic ribbon in some way, shape or form However, the bottle can also include the country's native language and is the same size as other beverage bottles or cans in that country (Coca-Cola, 2010).

The Price will always vary from market to market. Price is affected by many variables: cost of product development (produced locally or imported), cost of ingredients cost of delivery transportation and tariffs. Getting the price right involves examining customers' perceptions and rival products as well as manufacturing costs. Promotion involves engaging in a range of activities in promotion for example a competition, or product tasting Safitri, et al (2024). Placement (place) refers to how the product is distributed by producers in the case of the current study we mean banana farmers, on how the produce, is packed and transported from farm to market or any intended buyers. It can be ward to-ward, district to district or country-by-country decision influenced by how the competition is being offered to the target market. Using Coca-Cola as an example again, not all cultures use vending machines. Placement decisions must also consider the product's position in the marketplace place involves using the best possible channels of delivering the service such as leading supermarket chains (Svend, 2007).

Another aspect of the marketing mix is Promotion: The global corporation seeks to reduce costs by minimizing redundancies in personnel and working to maximise the speed of implementation and speak with one voice. If the goal of a global company is to communicate the message worldwide, then delivering that message in a relevant, engaging, and cost-effective way is the challenge. The use of social media not only focuses on promotion but also on increasing interaction with prospective the key is testing advertising ideas using a marketing research system proven to provide results that can be compared across countries Putra, (2024).

Therefore, the question that bothers the sector's players is how to build brand loyalty to create understanding and a level of confidence that will promote sustainable growth and profitability for all actors in the chain (Quayson et al., 2024).

The arguments however for standardisation suggest that if you go through the process of adapting the product to local markets it does little but add to the overall cost of producing the product and weakens the brand on the global scale (Beise, 2001). Today's global world, in which consumers travel more, watch satellite television, communicate and shop internationally over the internet, is now becoming smaller. Moreover, there is little need to adapt products to local markets. Brands such as Coca-Cola, MTV, Nike and Levis are all successful global brands with a standardised approach to their marketing mix; all these products are targeted at similar groups globally (Beise, 2001).

For the company to act locally the benefit is gained based on targeting the volume, value-for-money segment, supported by aggressive localisation to get costs down Li et al., 2002. It involves operating similarly to the way the successful local competitors are operating. For example in the PC business, Dell stands out as the one foreign maker of PCs that seems to be holding its own in China by following this strategy IIS & WEB,(2003) & Elder,2004). Hewlett-Packard seems to be heading in this direction. In mobile phone handsets, US producer UT Starcom which has aggressively targeted the market for PHS handsets China being the world's largest market also seems to have built a sustainable competitive position by focusing on China's local, low-end consumer demand. There is a need for the company to act locally this will enable it to bring the product costs down by about half, which then puts them in a much stronger position to compete with the rapidly growing local producers. It also found restaurant satisfaction with wholesale distributors is an important purchasing factor in local food purchasing decisions Roy, (2024). In the light of empirical findings, theoretical and practical implications are discussed. As suggested by Li, (2002) the key elements of localisations-based cost reduction are as follows: By assembling imported parts locally, tariff costs can be reduced by about 20%, the cost saving can be achieved by sourcing raw materials locally, A higher level of savings can be achieved by developing truly local supplier Simon, (2001).To improve the welfare of smallholder farmers, multiple countries (e.g., Ethiopia and India) have launched online agri-platforms to transform traditional markets.

However, there is still mixed evidence regarding the impact of these platforms and, more generally, how they can be leveraged to enable more efficient agricultural supply chains and markets Levi et al., (2024). Agribusiness facilitating market access for farmers is a key strategy for

driving rural industrial rejuvenation in China Li, & Xu, (2024). Moreover, in the manufacturing & Service Operations Management. Local designers with knowledge of the domestic market are more capable of adapting an existing product to suit local tastes and budgets by designing out unnecessary features which involve added cost. In addition, local engineers have a greater working knowledge of domestic industry capabilities, allowing product designs to better utilise locally sourced components Shimbun, (2003). Employing local management, rather than experts, may lead to some further cost reduction Hewitt associate, (2002). It is these bundles of information which provide evidence to convince the agribusiness sector in Tanzania to plan to shift and invest near the producers to reduce unnecessary costs which affect farmers' produce price, quality and income.

The role of marketing is to manage the process and be responsible for identifying, anticipating and satisfying customer requirements profitably and innovative marketing strategies in the agribusiness sector can be effective in increasing consumer understanding about product quality, added value and sustainable agricultural practices Waluyo, (2024). Thus, marketing involves: focusing on the needs and wants of customers, identifying the best method of satisfying those needs and wants, orienting the company towards the process of providing that satisfaction, and meeting organisational objectives Peter, (2007). Private partners pose less of a problem since objectives are generally more well-matched. There is more of a tendency to allow one partner to control the operation at the same time to prevent internal competition at one extreme, a Private Banana company are opting to centralise production to reduce costs. At the other extreme, a company may have products, such as soft drinks, where transportation costs are too high to justify taking advantage of the scale of economy in production. In between these two extremes are products for which multiple production locations are necessary, but for which there is product transaction potential when costs move differently among the countries, due to such factors as inflation rates or an exchange rate re-alignment.

There is also the potential for price competition among these subsidiaries when there is excess capacity. Several companies have instituted regional control to prevent sales shifts which could be disruptive to their production facilities (Williams, 1967). Furthermore, Smallholder banana farmers grapple with declining farm productivity and low market prices in a fragmented, broker-dominated market (Murigi, & Ogada, 2024). That company is moving more toward centralising its operation so that to adjust the profit margins which will compensate for the cost changes among countries. Selecting the best marketing communication channel for a medium-sized agricultural company is an important area to consider. The current research will fill the gap offered by Nedeljković, et al (2024). The

recent article titled, the Selection of Marketing Communication Channels in Agribusiness article offers theoretical and practical recommendations to improve the marketing mix targeting the banana farmers in Kilimanjaro.

Methods

Targeting a sample of 575 banana growers throughout 52 wards. This study employed a cross-sectional survey approach to examine the Influence of Four (4P) in the banana value chain Kilimanjaro. A one-day training session and a three-day pilot study were carried out before the main survey to help improve the questionnaire and guarantee that enumerators were adequately ready. Fifteen trained enumerators using the KOBO tool collected data; their 100% completion rate resulted from the survey's relevance and community awareness. With changes made depending on pilot comments, such as concentrating sales data on the high/peak season and removing uneven seedling costs, the questionnaire concentrated on farming techniques, market access, and economic considerations. Important obstacles noted include inappropriate storage, post-harvest handling problems, and insufficient infrastructure, all of which help to cause major economic losses. Descriptive statistics and chi-square tests were used in data analysis; results were presented in tables to underline important conclusions and recommendations.

For Kilimanjaro's food security and economy, the banana value chain is vital. With an eye on the demographic and household of banana growers, transportation issues, and value chain challenges, this study seeks to analyze the commercial viability of the banana value chain. The knowledge acquired from this study should guide policies and other stakeholder to improve the viability and profitability of banana growing in the area.

Residential and Demographic Distribution

The study exposes a varied demographic scene among Kilimanjaro's banana growers. Rombo is the main area producing bananas; 59.5% of responses were from Rombo District, 29.7% from Moshi, and 10.8% from Moshi DC. Reflecting an experienced workforce, the age distribution shows that 58.1% of farmers are between 36 and 60 years old; 36.9% are 61 years or older, suggesting a substantial number of elderly, maybe less physically active people involved in farming. The fact that all respondents cooperate on the same land and the male dominance (64.9%) point to a gendered division of work and a strong feeling of community inside farming operations. The great ownership of land (99.1%) emphasises the stability and dedication of the farming households.

The banana value chain is seriously challenged by transportation choices and logistics. Only 37.2% transport to larger commercial buyers.

Relatively speaking, a considerable number of producers (62.8%) rely on middlemen rather than delivering bananas to the main commercial client. The main means of mobility bicycles (61.4%) and walking (18.3%) show a dependence on less effective strategies, therefore aggravating post-harvest losses and lowering market access efficiency. The great frequency of journeys needed 55.1% making one to four trips adds to these problems. The low use of small trucks (4.7%) points to a main obstacle being an insufficient transportation system. Using better access to motorised vehicles and enhancement of road networks, among other transportation choices, one can greatly minimise spoilage and increase market efficiency.

With 56% of farmers depending on middlemen and 26.3% on brokers for marketing their produce, intermediaries become rather important in the banana value chain. Since these middlemen take a large portion of the income, farmers' profit margins are often lowered from this great reliance on them. Using cooperative structures and direct marketing channels, farmers could be able to avoid middlemen, therefore preserving a larger portion of their income and maybe improving their profitability.

The results show that 99.3% of banana growers have a great degree of unawareness regarding Private Banana Company market implying that many of them are losing out on maybe profitable market prospects. This unawareness reduces farmers' access to better prices and market contacts. Given just 0.7% of respondents had past encounters with Private Banana Company, marketing mix promotion, company positioning and educational initiatives are needed. Improving farmers' understanding of market possibilities and organisations like Private Banana Company would enable effectively negotiate the market, increase their economic performance, and assist the expansion of the banana industry in the region.

Maintaining banana quality and lowering losses depend on post-harvest handling methods. The survey found several important problems including rotting, physical damage, and poor handling techniques brought on by bad sanitation, temperature control, and packing. The perishable character of green bananas and inadequate infrastructure for managing them aggravate these issues. The effects on farmers' livelihoods are that bad handling methods cause market value to drop and economic losses. Minimising losses and raising banana quality depend on using improved post-harvest management strategies, increased sanitation standards, and efficient farmer handling and packaging techniques training **(Table 4.1).**

Table 1: Demographic and household distribution and Banana activity (n=575)

Variable	Category	n	%
District	Rombo	342	59.5
	Moshi	171	29.7
	Moshi DC	62	10.8
Age	18-35	29	5.0
	36-60	334	58.1
	61-100	212	36.9
Gender	Male	373	64.9
	Female	202	35.1
People live in households (including children)	1-4	315	54.8
	≥5	260	45.2
People engaged in banana farming	1-3	502	87.3
	≥4	73	12.7
All work together to produce bananas on the same piece of land	Yes	575	100.0
Rent or own the land on which produce bananas	Rent	5	0.9
	Own	570	99.1
Transport process of bananas			
Transport bananas from the farm to the point-of-sale largest commercial buyer	Yes	214	37.2
	No	361	62.8
Means of transportation used to transport bananas during the peak season to the point of sale of the largest commercial buyer	Walk	105	18.3
	Cycle	353	61.4
	Small van	90	15.7
	Small truck	27	4.7
Trips needed to make on average to transport bananas from the farm to the point of sale of the largest commercial buyer	1-4	317	55.1
	5-8	153	26.6
	≥9	105	18.3
Responsible for transporting/procuring bananas from the farm	Middlemen	322	56.0
	Brokers	151	26.3
	Buyers/Own	102	17.7
Pay or share costs for transportation	Yes	5	0.9
	No	570	99.1
Reason for not selling bananas to Private Banana Company	Unaware of Private Banana Company	571	99.3
	Sold to Private Banana Company before but discontinued.	4	0.7

Demographic and household distribution by District

The age distribution reported considerable variations between districts (χ^2= 14.188, p = 0.007). In Moshi, 51.7% are between 18 and 35 years old, in Rombo most of the farmers are older 67.5% are between 61 and 100 years. Though Moshi DC indicates a concentration of younger farmers,

her distribution is rather balanced. This implies that farming methods and problems might be influenced by age demographics. Although Rombo's older farmers may have more experience, they can also have physical restrictions unlike those of younger farmers in Moshi. By customising support programs to meet age-specific needs such as agricultural methods for younger generations or physical aid for elderly farmers, one improves general output.

Gender distribution among the districts indicates a non-significant chi-square value (χ^2= 3.872, p = 0.144), thereby no appreciable gender-based variations in banana cultivation activity. Rombo (62.2%) shows a higher proportion of male farmers than Moshi (28.4%) and Moshi DC (9.4%), nonetheless. The distribution points to the possible influence of gender roles on farming dynamics even if the statistical test shows no change. Investigating gender-specific issues and possibilities to assist in correcting any underlying inequalities and provide fair support for farmers, male and female alike.

Rombo has a higher share of households with 1–4 individuals (62.2%), while Moshi municipal and Moshi DC have a less balanced distribution according to household size data (χ^2 = 4.107, p = 0.128). The non-significant chi-square value suggests that district household size does not change appreciably. Rombo's bigger households, however, affect the labour availability for banana growing. Programs aimed at meeting labour demands or supporting bigger homes could assist in maximising farming activities and output.

Across districts, the number of persons involved in banana growing shows variance (χ^2 = 17.562, p < 0.001). Whereas Moshi has a higher percentage of farmers with 4 or more individuals active, Rombo, 62.7% of farmers have 1-3 people involved. This implies that Moshi might feature bigger, more labour-intensive operations while Rombo's banana growing is more likely to be a small-scale business. With tactics for both small-scale and larger-scale farms, customising support depending on the degree of farming activities could enhance efficiency and productivity.

Data on land tenure (χ^2 = 3.272, p = 0.195) shows no appreciable variation in district ownership or rental of land. Of the farmers, most own the land they work on (59.8% in Rombo, 29.5% in Moshi, and 10.7% in Moshi DC). The data indicates that Rombo has the most land ownership, even if the statistical relevance is not significant. Rombo's more stable land ownership could help to create a safer farming environment than in Moshi and Moshi DC, where rental agreements are more frequent. Providing support for people renting land and guaranteeing safe land ownership will help to enhance farming activities and banana industry investment.

Table 2: Demographic and household distribution by District

Demographic and household	Rombo n(%)	Moshi n(%)	Moshi DC n(%)	X^2(p-value)
Age (Years)				14.188(0.007) *
18-35	12(41.4)	15(51.7)	2(6.9)	
36-60	187(56.0)	107(32.0)	40(12.0)	
61-100	143(67.5)	49(23.1)	20(9.4)	
Gender				3.872(0.144)
Male	232(62.2)	106(28.4)	35(9.4)	
Female	110(54.5)	65(32.2)	27(13.4)	
People live in households (including children)				4.107(0.128)
1-4	196(62.2)	92(29.2)	27(8.6)	
≥5	146(56.2)	79(30.4)	35(13.5)	
People engaged in banana farming				17.562(<0.001) **
1-3	315(62.7)	137(27.3)	50(10.0)	
≥4	27(37.0)	34(46.6)	12(16.4)	
Rent or own the land on which produce bananas				3.272(0.195)
Rent	1(20.0)	3(60.0)	1(20.0)	
Own	341(59.8)	168(29.5)	61(10.7)	

*Significant; ** Very significant

Banana activity processes by District

Analysis of banana transportation to the biggest commercial buyer exposes geographical differences. Compared to 20.6% in Moshi municipal and 11.7% in Moshi DC ($\chi^2 = 13.839$, $p = 0.001$), 67.8% of Rombo's farmers straightforwardly get their bananas to the point of sale. Rombo farmers have more direct access to markets, which could be the result of more effective local market systems or improved infrastructure. Farmers in Moshi municipal and Moshi DC, on the other hand, have more difficulties and most likely pay more for transportation and suffer less profitability. The chi-square value implies that by lowering reliance on middlemen and thereby cutting transportation costs, enhancing market access in Moshi municipal and Moshi DC could increase the commercial feasibility of banana production.

Furthermore, the difference among districts is the means of transportation utilised to carry bananas. While in Moshi just 25.5% of farmers use bicycles, in Rombo 65.7% of farmers use bicycles; in Moshi DC the proportion reduces to 8.8% ($\chi^2 = 20.151$, $p = 0.003$). Walking is more common in Moshi municipal (38.1%), and Moshi DC (12.4%), than in Rombo (49.5%), and small vans and trucks are less used in Rombo (53.3% and 37.0%, respectively). These variances imply Rombo gains from improved transportation choices, which could cut the time and expenses involved in delivering products to market. In Moshi and Moshi DC, where reliance on less effective approaches is greater, improving transport

infrastructure could help to reduce spoilage and increase market competitiveness.

Different districts demand different frequencies of trips needed to move bananas. Whereas in Moshi only 29.7% of farmers make 1-4 excursions, in Rombo 61.2% of farmers make these journeys ($\chi^2 = 14.544$, $p = 0.006$). In Moshi DC just 9.1% of farmers do. This suggests Rombo farmers might have closer proximity to markets or higher logistical efficiency, therefore lowering the requirement for several visits. Farmers in Moshi and Moshi DC, on the other hand, frequently deal with more logistical challenges that could result in lower profitability and maybe higher transportation expenses. Simplifying transportation logistics would help to solve these issues, therefore banana cultivation would become more feasible in Moshi and Moshi DC.

Rombo has 58.4% of farmers depending on bananas, compared to 31.1% in Moshi and 10.6% in Moshi DC ($\chi^2 = 2.139$, $p = 0.710$), therefore middlemen have the most responsibility for transporting bananas. Though the difference is not statistically significant, the way that transport expenses are distributed indicates clear variance. While 80% of Moshi farmers and 20% of Moshi DC farmers pay or share transportation costs, just 0% of Rombo farmers do ($\chi^2 = 7.682$, $p = 0.021$). This implies that Rombo farmers will gain from reduced transit expenses when compared to those in Moshi, where farmers incur a major financial load. Dealing with the differences in cost-sharing policies can help Moshi's farmers have better financial results.
With 59.9% of Rombo farmers, 29.4% of Moshi farmers, and 10.7% of Moshi DC farmers reporting they are unfamiliar of Private Banana Company ($\chi^2 = 5.926$, $p = 0.052$), awareness of Private Banana Company differs greatly within districts. Rombo farmers' lack of knowledge can restrict their market prospects and thereby influence their profitability. More market possibilities and maybe higher pricing for farmers could come from raising awareness and enabling better access to Private Banana Company, especially in Rombo where present involvement is low. All things considered, the results emphasise geographical variations in banana market access and transportation. Targeted upgrades in transport infrastructure, cost-sharing policies, and market awareness could increase the profitability and efficiency of banana cultivation in Kilimanjaro, so addressing the issues experienced by farmers in various districts (Table 3).

Table 3: Banana activity processes by District

Banana activity processes	Rombo n(%)	Moshi municipal n(%)	Moshi DC n(%)	X^2(p-value)
Transport bananas from the farm to the point-of-sale largest commercial buyer				13.839(0.001) *
Yes	145(67.8)	44(20.6)	25(11.7)	
No	197(54.6)	127(35.2)	37(10.2)	
Means of transportation used to transport bananas during the peak season to the point of sale of the largest commercial buyer				20.151(0.003) *
Walk	52(49.5)	40(38.1)	13(12.4)	
Cycle	232(65.7)	90(25.5)	31(8.8)	
Small van	48(53.3)	31(34.4)	11(12.2)	
Small truck	10(37.0)	10(37.0)	7(25.9)	
Trips needed to make on average to transport bananas from the farm to the point of sale of the largest commercial buyer				14.544(0.006) *
1-4	194(61.2)	94(29.7)	29(9.1)	
5-8	101(66.0)	34(22.2)	18(11.8)	
≥9	47(44.8)	43(41.0)	15(14.3)	
Responsible for transporting/procuring bananas from the farm				2.139(0.710)
Middlemen	188(58.4)	100(31.1)	34(10.6)	
Brokers	96(63.6)	38(25.2)	17(11.3)	
Buyers/Own	58(56.9)	33(32.4)	11(10.8)	
Pay or share costs for transportation				7.682(0.021) *
Yes	0(0.0)	4(80.0)	1(20.0)	
No	342(60.0)	167(29.3)	61(10.7)	
Reason for not selling bananas to Private Banana Company				5.926(0.052) *
Unaware of Private Banana Company	342(59.9)	168(29.4)	61(10.7)	
Receive better prices by selling to other off takers	0(0.0)	0(0.0)	0(0.0)	
Sold to Private Banana Company before but discontinued.	0(0.0)	3(75.0)	1(25.0)	

*Significant; ** Very significant

Banana volume sales and market distribution in Rombo

With an average home size of 4.27 individuals (median 4, IQR 3-6), Rombo suggests that banana cultivation is a group effort involving several house members. Banana cultivation averages 2.02 (median 2, IQR 1-2), suggesting a degree of family participation in farming operations. Although farmers vary greatly in the average land size used for banana growing

median of 0.75 acres, IQR 0.5–1 this indicates a range of modest to large-scale farming operations. Reflecting the different ranges of banana output, the average number of banana trees grown is 207.84 (median 150, IQR 100-250). These demographic elements together draw attention to how household size and land area shape Rombo's banana growing methods and output levels.

Seasonal variations in the volume of bananas grown and sold are evident. The average amount sold between January and April, the high season, is 14.62 kg (median 2 kg, IQR 1-3), indicating a production peak. During the low season, from May to October, the average amount sold is 8.77 kg (median 1 kg, IQR 1-2), suggesting lower production. With similar low production levels, the median season (November to December) average volume sold is 8.22 kg (median 1 kg, IQR 1-2). With higher output during peak seasons and reduced during off-seasons, this seasonal fluctuation reflects the effect of climatic and market elements on banana sales.

With an average need of 9759.94 kg (median 600 kg, IQR 2725-12000) and prices per unit of 819.39 TZS (median 50 TZS), fertiliser costs constitute a significant part of banana production expenses. While harvesting expenses average 30520.11 TZS (median 25000 TZS, IQR 25000-60000), labour costs for applying fertilisers and pesticides average 46672.71 TZS. Average maintenance labour expenditures are 35776.22 TZS (median 30000 TZS, IQR 20000–50000). These numbers show the large financial outlay needed for labour and supplies, which greatly affects general sustainability and profitability in banana growing.

Sales to various market segments expose different economic dynamics. Prices average 333.23 TZS per kg (median 200 TZS, IQR 42.5-200), whereas the average quantity of bananas sold to neighbours during the high season is 150.72 kg (median 65 kg, IQR 42.5-200). At 397.28 TZS per kg (median 250 TZS, IQR 200–300), sales to intermediaries average 3508.04 kg (median 800 kg, IQR 450–3200). Prices average 1429.81 TZS per kg (median 250 TZS, IQR 200-300); sales to local markets average 2192.37 kg (median 600 kg, IQR 300-2940). Variations in prices and volume sold across several market channels point to distinct market possibilities and financial constraints farmers must face.

With an average of 89.11 kg (median 50 kg, IQR 30-80) of bananas impacted by diseases or theft, post-harvest losses are a serious problem. At the farm gate, an average of 162.7 kg (median 45 kg, IQR 30-120) is spoilt; 127.82 kg (median 50 kg, IQR 40-120) stay unsold on the market. During the high season average, the estimated total banana sales come to 233345.17 TZS (median 80000 TZS, IQR 80-300000). Per journey, the cost of transportation averages 3517.29 TZS (median 4000 TZS, IQR 2000–5000.). These numbers show losses at the market and manufacturing stages, which

emphasises the need for better post-harvest management and effective transportation methods to increase profitability.

Table 4: Banana volume sales and market distribution in Rombo

Rombo-Banana volume sales and market distribution	Rombo		
	Mean (SD)	Median (IQR)	Min-Max
People live in households (including children)	4.27(1.87)	4(3 - 6)	(1 - 10)
People engaged in banana farming	2.02(0.99)	2(1 - 2)	(1 - 6)
The land size used to farm bananas(acres)	0.94(0.89)	0.75(0.5 - 1)	(- 13)
The number of banana trees that have been planted on the land	207.84(229.89)	150(100 - 250)	(1 - 3000)
High season (January to April)	14.62(45.23)	2(1 - 3)	(- 600)
Low season (May to October)	8.77(25.63)	1(1 - 2)	(1 - 300)
Medium season (November to December)	8.22(17.3)	1(1 - 2)	(1 - 120)
Number of fertilizers required (in KGS)	9759.94(12237.79)	6000(2725 - 12000)	(25 - 85000)
Cost per unit of fertilizer (in TZS)	819.39(4673.46)	50(50 - 500)	(20 - 50000)
Labour costs for applying fertilizers and pesticides (in TZS)	46672.71(32929.35)	40000(25000 - 60000)	(60 - 210000)
Labour costs for harvesting (in TZS)	30520.11(24892.27)	25000(15000 - 41250)	(500 - 200000)
Labour costs for maintenance activities ie weeding (in TZS)	35776.22(21188.35)	30000(20000 - 50000)	(7000 - 150000)
Water supply (if not rain-fed) (in TZS)	14000()	14000(14000 - 14000)	(14000 - 14000)
The total produce harvested in the last high season consumed within the household (in KGS)	249.71(466.39)	150(80 - 300)	(16 - 7000)
Kgs sell to neighbours in the High season	150.72(225.08)	65(42.5 - 200)	(1 - 2000)
The Price in TZs per kg - when selling to neighbours	333.23(858.15)	200(200 - 250)	(25 - 10000)
Kgs sell to middlemen in the High season	3508.04(21416.43)	800(450 - 3200)	(3 - 320000)
The Price in TZs per kg - when selling to middlemen	397.28(1210.78)	250(200 - 300)	(15 - 15000)
Kgs sell to primary markets (local markets) in the high season	2192.37(3502.99)	600(300 - 2940)	(6 - 21200)
The Price in TZs per kg - When selling to local markets	1429.81(13135.19)	250(200 - 300)	(11 - 171000)
Kgs stolen or affected by diseases in the high season	89.11(171.26)	50(30 - 80)	(2 - 1600)
An approximate proportion of bananas that are spoilt at the farm gate (in kgs)	162.7(271.61)	45(30 - 120)	(8 - 1600)
An approximate proportion of bananas that remain unsold in the market (in kgs)	127.82(156.35)	50(40 - 150)	(8 - 500)
An estimate of total banana sales in the last high season.	233345.17(389677.28)	80000(80 - 300000)	(5 - 2480000)
The cost of transportation per trip (in TZS)	3517.29(2526.09)	4000(2000 - 5000)	(100 - 25000)
Amount paid per trip during the peak season (in TZS)			

Banana volume sales and market distribution in Moshi municipal

The statistics on banana volume sales and market distribution in Moshi municipal point out important features of the local banana agricultural industry. With an average household size of 4.46 (median 4, IQR 3 - 6), Rombo's household is like others but with more variance. This demographic element is very important since it affects household support for activities related to banana growing as well as labour availability. With an average of 2.54 (median 2, IQR 2 - 3), the number of persons involved in banana farming shows a modest degree of labour involvement, which affects the scale of production and efficiency in managing banana farming activities.

Moshi' municipal average 1.15 acres (median 1, IQR 0.5 - 1.5) for banana farming is rather more than Rombo's. This suggests that Moshi municipal farmers could have more acreage available for banana farming, thus enabling a larger scale of output. Reflecting a marked investment in banana farming, the average number of banana trees planted is 262.92 (median 200, IQR 120 - 350). This is important since the possible income from banana farming depends on the number of trees directly. Regarding seasonal production, the high season (January to April) generates an average of 38.18 kg (median 2, IQR 1 - 32), the low season (May to October) produces 19.56 kg (median 1, IQR 1 - 32), and the medium season (November to December) produces 24.78 kg (median 1, IQR 1 – 40). The significant variation in production across seasons emphasises the fluctuation in banana availability and implies that growers must deal with rather different income swings all year long. The high season reveals a peak that might be used to balance revenue over the year using improved market techniques.

Reflecting the investment needed for optimal output, economic factors include the average 7212.67 kg, median 3600, IQR 1500 - 9000) and related costs (cost per unit of fertiliser is 10342.17 TZS) show. Further taxing the economic sustainability of banana cultivation are the high labour costs including applying fertilisers (average 62971.83 TZS, median 30000, IQR 15000 - 60000) and harvesting (average 83316.67 TZS, median 25000, IQR 15000 - 55000). These large expenses could affect the general profitability and draw attention to the requirement for good cost control techniques.

At last, the average quantity of bananas sold to several markets exposes interesting variations. Farmers market 6337.77 kg to intermediaries (median 1140, IQR 400 - 4000) and 236.9 kg to neighbours (median 70, IQR 30 - 325). Comparatively, to neighbours, the higher average sales to intermediaries imply that middlemen are quite important in the distribution network, maybe providing better market access or prices despite certain difficulties. With an average of 434.51 TZS/kg when selling to neighbours (median 250, IQR 200 - 500) and 308.14 TZS/kg when selling to

intermediaries (median 250, IQR 200 - 500), the prices obtained vary greatly between markets and indicate the need of better price negotiating and market strategy optimisation.

Table 5: Banana volume sales and market distribution in Moshi

Moshi -Banana volume sales and market distribution	Moshi		
	Mean (SD)	Median (IQR)	Min-Max
People live in households (including children)	4.46(1.95)	4(3 - 6)	(1 - 10)
People engaged in banana farming	2.54(1.24)	2(2 - 3)	(1 - 8)
The land size used to farm bananas(acres)	1.15(0.69)	1(0.5 - 1.5)	(0.25 - 4)
The number of banana trees that have been planted on the land	262.92(222.32)	200(120 - 350)	(30 - 1500)
High season (January to April)	38.18(71.17)	2(1 - 32)	(1 - 400)
Low season (May to October)	19.56(41.71)	1(1 - 24)	(1 - 360)
Medium season (November to December)	24.78(35.27)	1(1 - 40)	(1 - 150)
Number of fertilizers required (in KGS)	7212.67(9714.7)	3600(1500 - 9000)	(3 - 63000)
Cost per unit of fertilizer (in TZS)	10342.17(74075.2)	500(500 - 1000)	(10 - 800000)
Labour costs for applying fertilizers and pesticides (in TZS)	62971.83(113116.75)	30000(15000 - 60000)	(4000 - 800000)
Labour costs for harvesting (in TZS)	83316.67(167966.87)	25000(15000 - 55000)	(500 - 800000)
Labour costs for maintenance activities ie weeding (in TZS)	57397.44(64846.94)	45000(30000 - 60000)	(5000 - 360000)
Water supply (if not rain-fed) (in TZS)	50000(10000)	50000(40000 -)	(40000 - 60000)
The total produce harvested in the last high season consumed within the household (in KGS)	264.82(282.81)	192(90 - 320)	(4 - 1800)
Kgs sell to neighbours in the High season	236.9(316.25)	70(30 - 325)	(1 - 1200)
The Price in TZs per kg - when selling to neighbours	434.51(696.32)	250(200 - 500)	(30 - 5000)
Kgs sell to middlemen in the High season	6337.77(24857.57)	1140(400 - 4000)	(45 - 240000)
The Price in TZs per kg - when selling to middlemen	308.14(392.63)	250(200 - 300)	(100 - 4000)
Kgs sell to primary markets (local markets) in the high season	2911.71(4004.65)	1240(337.5 - 3915)	(90 - 21150)
The Price in TZs per kg - When selling to local markets	369.79(463.72)	300(250 - 300)	(50 - 4000)
Kgs stolen or affected by diseases in the high season	301.45(460.83)	120(40 - 400)	(3 - 2500)
An approximate proportion of bananas that are spoilt at the farm gate (in kgs)	383.82(322.35)	350(100 - 560)	(2 - 1240)
An approximate proportion of bananas that remain unsold in the market (in kgs)	162.5(165.4)	105(45 - 337.5)	(40 - 400)
An estimate of total banana sales in the last high season.	275632.95(667695.5)	70000(181.25 - 300000)	(23 - 7200000)
The cost of transportation per trip (in TZS)	2317.14(2300.57)	2000(1000 - 2000)	(200 - 10000)

Amount paid per trip during the peak season (in TZS)	2375(1796.99)	1750(1125 - 4250)	(1000 - 5000)

Banana volume sales and market distribution in Moshi MC

Banana volume sales and market dispersion across two separate administrative areas are compared using data from Moshi municipal (MC) and Moshi district council (DC). Comparatively to Moshi DC, the average household size in Moshi MC is 4.84 (median 5, IQR 4 – 6). This suggests that Moshi MC homes would have greater resources for agricultural operations, therefore influencing labour availability and family support for banana output. With Moshi MC at 2.5 (median 2, IQR 2 - 3) and Moshi DC at 2.02 (median 2, IQR 1 - 2), both regions indicate a comparable degree of labour engagement in banana farming.Regarding acreage used for banana cultivation, Moshi MC's mean of 1.17 acres (median 1, IQR 0.5 - 1.5) like Moshi DC's mean of 1.15 acres (median 1, IQR 0.5 – 1.5). This implies that both areas have equivalent territory accessible for banana farming, which enables identical production sizes. Moshi MC has a greater average number of banana trees planted (378.55, median 265, IQR 150 - 442.5) than Moshi DC (262.92, median 200, IQR 120 - 350), thereby suggesting a perhaps bigger investment in banana farming in Moshi MC.

Additionally, the difference between the two regions is seasonal output. High season production averaged 15.48 kg (median 2, IQR 1 - 2) in Moshi MC, below the 38.18 kg (median 2, IQR 1 - 2) in Moshi DC. This captures a variation in banana availability during the high season. While in Moshi DC, it is 24.78 kg (median 1, IQR 1 - 40), the low season production in Moshi MC is 12 kg (median 1, IQR 1 - 2). Media season production in Moshi MC averages 3.05 kg. This suggests that compared to Moshi MC, Moshi DC produces more consistently throughout seasons.Furthermore, considerable variations are found in economic aspects. Reflecting greater fertiliser use in Moshi MC, the average number of fertilisers needed in Moshi MC averages 8607.58 kg (median 4500, IQR 500 - 9300) compared to 7212.67 kg in Moshi DC. With Moshi MC at 3850.47 TZS (median 1000, IQR 500 - 1500) the cost per unit of fertiliser is much greater than in Moshi DC's 10342.17 TZS (median 500, IQR 500 - 1500). This disparity draws attention to the higher financial expenses indicator Moshi MC farmers bear on fertiliser expenses.

Concerning market dynamics, Moshi MC reveals 6386.14 kg to middlemen (median 1200, IQR 450 - 3700) and an average of 155.15 kg sold to neighbours (median 65, IQR 30 - 210). By contrast, Moshi DC averages 3508.04 kg to middlemen (median 800, IQR 450 - 3200) and 150.72 kg sold to neighbours (median 65, IQR 42.5 - 200). Higher average sales to middlemen in Moshi MC point to a more dominating middleman's role in

this context than in Moshi DC. Furthermore, demonstrating superior pricing or market circumstances in Moshi MC (435.54 TZS, median 250, IQR 200 - 300) is the average price per kg when selling to local markets compared to Moshi DC (1429.81 TZS, median 250, IQR 200 -300).With variances in household size, land use, and economic costs, the data shows Moshi MC sees higher banana output and market activity than Moshi DC. The seasonal fluctuations and market dynamics imply that Moshi MC might have a more complicated and maybe more profitable banana-growing environment, but also suffers greater expenses, particularly about fertilisers.

Table 6: Banana volume sales and market distribution in Moshi MC

Moshi MC-Banana volume sales and market distribution	Moshi DC		
	Mean (SD)	Median (IQR)	Min-Max
People live in households (including children)	4.84(1.74)	5(4 - 6)	(1 - 10)
People engaged in banana farming	2.5(1.35)	2(2 - 3)	(1 - 7)
The land size used to farm bananas(acres)	1.17(0.7)	1(0.5 - 1.5)	(0.25 - 3)
The number of banana trees that have been planted on the land	378.55(304.15)	265(150 - 442.5)	(75 - 1300)
High season (January to April)	15.48(52.33)	2(1 - 2)	(1 - 300)
Low season (May to October)	12(31.33)	1(1 - 2)	(1 - 150)
Medium season (November to December)	3.05(7.02)	1(1 - 1)	(1 - 32)
Number of fertilizers required (in KGS)	8607.58(12520.43)	4500(500 - 9300)	(50 - 52500)
Cost per unit of fertilizer (in TZS)	3850.47(14523.53)	1000(500 - 1500)	(20 - 73500)
Labour costs for applying fertilizers and pesticides (in TZS)	33526.32(25827.64)	30000(19500 - 42500)	(2000 - 150000)
Labour costs for harvesting (in TZS)	56727.27(49395.57)	50000(23750 - 60000)	(15000 - 200000)
Labour costs for maintenance activities ie weeding (in TZS)	49195.12(37287.54)	35000(30000 - 60000)	(10000 - 200000)
Water supply (if not rain-fed) (in TZS)	27750(7794.23)	30000(30000 - 30000)	(3000 - 30000)
The total produce harvested in the last high season consumed within the household (in KGS)	10118.62(66185.7)	165(60 - 327.5)	(20 - 500000)
Kgs sell to neighbours in the High season	155.15(188.93)	65(30 - 210)	(15 - 800)
The Price in TZs per kg - when selling to neighbours	268.75(121.42)	225(200 - 300)	(100 - 500)
Kgs sell to middlemen in the High season	6386.14(27569.47)	1200(450 - 3700)	(8 - 180000)
The Price in TZs per kg - when selling to middlemen	414.78(700.6)	250(150 - 400)	(15 - 4000)
Kgs sell to primary markets (local markets) in the high season	3336.11(6267.58)	800(200 - 2500)	(75 - 22800)
The Price in TZs per kg - When selling to local markets	435.54(865.31)	250(200 - 300)	(50 - 4800)
Kgs stolen or affected by diseases in the high season	451.96(441.81)	300(200 - 500)	(30 - 1600)
An approximate proportion of bananas that are spoilt at the farm gate (in kgs)	684.29(1027.4)	400(200 - 720)	(50 - 5500)
An approximate proportion of bananas that	90(14.14)	90(80 -)	(80 - 100)

remain unsold in the market (in kgs)			
An estimate of total banana sales in the last high season.	246196.32(421779.19)	60000(1700 - 280000)	(64 - 2400000)
The cost of transportation per trip (in TZS)	4955.56(5602.02)	3000(1375 - 6000)	(200 - 15000)
Amount paid per trip during the peak season (in TZS)	15000()	15000(15000 - 15000)	(15000 - 15000)

Discussion

The study offers an investigation of banana market and the 4p practices in different districts, therefore underlining the differences in farming circumstances, market dynamics, and the influence of agricultural inputs. This study offers important new perspectives on the possibilities and difficulties banana growers experience by looking at important factors such as transportation, input prices, and market access. The results provide a knowledge of how several elements of the 4p impact the banana market system and the study offers the recommendations for possible market developments in the banana sector.Rombo (59.5%) is the most often used district for banana growing, well above Moshi (29.7%) and Moshi DC (10.8%). This concentration in Rombo emphasises its significance as a major centre of banana production and implies that to maximise output, resources and actions should be concentrated. Furthermore, farmers 58.1% fall between the ages of 36 and 60, suggesting a seasoned workforce that might gain from programs meant to involve younger farmers to guarantee future sustainability. The great percentage of elderly farmers highlights the need for knowledge transfer and young participation to sustain sector development.

According to the results, each household member grows bananas (100%), and most of them live in homes ranging from one to four persons (54.8%). This group participation points to a substantial dependence on family labour, which is necessary for operational effectiveness. This reliance, however, might restrict production scale. Although long-term planning benefits from stability in land tenure indicated by the high land ownership rate (99.1%), this emphasises the need for better mechanisation to maximise land usage.

With insufficient percentage using compact vans for transporting banana bunches (15.7%) and trucks (4.7%), transport choices depend on less efficient modes: walking (18.3%) and cycling (61.4%). This implies that the main obstacle to effective market access is probably an insufficient transportation system. Distribution efficiency is further complicated by the fact that 62.8% of farmers depend on middlemen and do not personally handle bananas. Direct market access support and improved transport infrastructure help to greatly increase operational efficiency and lower expenses.Since most farmers (99.1%) do not pay for transportation directly,

middlemen usually cover these expenses. This configuration possibly affects farmers' market access and profit margins. Unawareness of Private Banana Company (99.3%) and low interaction with other sales channels suggest lost market prospects. Direct sales and improved market understanding could give farmers easier access to markets and maybe larger profits. Improving the economic feasibility and sustainability of banana cultivation in the area depends on filling in these voids.

The household depicts regional differences highlighting fundamental differences in banana cultivation methods. Rombo has a far greater number of senior farmers (61–100 years) at 67.5%, compared to Moshi (23.1%) and Moshi DC (9.4%), according to the age distribution, which shows a clear variation throughout districts. This implies Rombo mostly depends on a senior workforce, which could affect the acceptance of new technologies and agricultural methods. Moshi (51.7%) clearly shows the younger age group (18–35 years) more than Rombo (41.4%) and Moshi DC (6.9%), thereby indicating a possible area for focused training and capacity-building activities in Rombo to guarantee sustainability and modernising of practices.

The study found clear geographical differences in banana farming methods and how they affect profitability and output over Rombo, Moshi, and Moshi DC. The noted variations in land area and banana tree density point to more general structural variations in farming methods among these areas. Rombo struggles to scale up output given his lowest mean land size (0.94 acres) and fewest banana trees (207.84 trees). Often, this limitation results in lower economies of scale and more per-unit production costs. On the other hand, Moshi and Moshi DC gain from more extensive farming activities that usually improve productivity and operational efficiency since their average land sizes and greater tree densities call for more Rombo's smaller scale of operations points to a need for targeted interventions to expand the area under use or raise tree planting density to raise general production capacity and competitiveness.

Determining the profitability of banana growing mostly relies on market access and transportation. Rombo averages 3,509.29 TZS, while Moshi (2,317.14 TZS) and Moshi DC (4,955.56 TZS) have different travel expenses, which highlights the logistical difficulties farmers experience. Rombo's greater transportation expenses could result from less effective transportation infrastructure or more expensive fuels, therefore compromising the economic feasibility of banana growing. Rombo's transport system's high expenses and possible inefficiencies could help to explain less market competitiveness and profitability. On the other hand, especially in Rombo, the noted high degrees of spoiling and unsold goods could point to errors in market access or post-harvest management techniques, therefore affecting farmers' revenue.Different market conditions

and price realisations are also reflected in the variances in banana sales and pricing throughout districts. Rombo's mean sales income (233,345.17 TZS) is lower than Moshi's (275,632.95 TZS) and Moshi DC's (246,196.32 TZS), therefore underlining differences in market access and income generating. Rombo's decreased sales income along with more spoilage and unsold produce point to possible difficulties for farmers trying to reach profitable markets and get better pricing for their goods. Overall, the results imply that to increase the sustainability and financial viability of banana growing in these areas, a strategy including improved infrastructure, better resource management, and targeted support for farmers is needed.

Summary

Examining methods of banana production in Rombo, Moshi, and Moshi DC reveals geographical variations in land utilisation, output, and financial results. Rombo struggles to properly scale production and control labour and input costs given smaller land areas and fewer banana trees. Conversely, Moshi and Moshi DC gain from more efficient production using bigger land areas and higher banana tree densities. However, market access problems and transportation expenses influence profitability in every area; Rombo has more expenses than Moshi and Moshi DC, therefore reducing sales income. These results mirror more general difficulties in agricultural viability and efficiency within the banana-growing industries in these areas.

Conclusion

The differences in banana farming methods seen in Rombo, Moshi, and Moshi DC highlight the need for focused interventions. Rombo's smaller production size and more transportation expenses draw attention to the necessity of greater infrastructure and availability of agricultural inputs and reliable market. Moshi and Moshi DC still deal with labour expenses and market access even if they perform better in terms of sales and productivity. The results show generally that the economic viability of banana growing in these areas depends critically on bettering agricultural methods, maximising input utilisation, and boosting market access.

Strengths of research

This study presents an insightful analysis of regional differences in banana cultivation methods. The strong dataset provides knowledge on land usage, productivity, input costs, and market dynamics, therefore enabling a sophisticated knowledge of the elements influencing banana cultivation. Using statistical studies including chi-square tests and descriptive statistics, the results gain credibility and underline variations among districts. Furthermore, the study's emphasis on pragmatic farming issues including

market access and transportation provides useful information for enhancing the banana industry economic results and practices.

Study limitation

The analysis ignores outside elements like policy changes or climate change that could affect banana output and methods of cultivation. Furthermore, restricting the generalisability of the results to other areas with various agricultural settings is the concentration on just three districts.

Policy implication in agriculture

The results have a major impact on policies and agricultural methods. Through the identification of the difficulties experienced by banana growers in various districts, stakeholders can customise treatments to properly meet regional needs. For Rombo, for instance, better transportation facilities and support for scaled-down manufacturing increase general market access and production. This is because reducing logistics expenses, lowering post-harvest losses, and finally increasing the profitability of banana production.

Recommendation for Further Research

Future studies should consider a mixed-methods approach combining quantitative data with qualitative insights from farmer interviews and focus groups, therefore strengthening the present work. This strategy would provide a closer knowledge of the possibilities and difficulties in banana production. Furthermore, investigating how digital platforms and precision agriculture two technology developments improve market access and production could provide farmers with some suggestions. Dealing with the issues and enhancing the general sustainability of banana growing methods would depend on involving local agricultural extension services and legislators to carry out and assess focused actions.

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