

MARKETING SKILLS AS A FACTOR INFLUENCING ADOPTION OF INNOVATIONS ALONG THE MANGO SUPPLY CHAIN IN MERU COUNTY, KENYA

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Abstract

The study adopted descriptive survey design. The population of the study consisted of Mango Growers in Meru County and the mango traders and exporters. Meru County was chosen due to the good climatic condition that has made it suitable for mangoes production. This study adopted a probability sampling method to select the respondents for the study. Out of 13,442 farmers, traders and exporters, 447 farmers, 12 traders and 2 exporters were randomly selected for interview. Secondary data used in the study was collected from the Ministry of Agriculture Offices while primary data was collected from the respondents using a structured questionnaire with both open and close ended questions. Both qualitative and quantitative data were used in the analysis. Quantitative data obtained from the field was analyzed using descriptive and inferential techniques. The descriptive techniques adopted were means and frequencies while the inferential technique used were regression and correlation to establish relationship between variables in the study and inferences made. Frequency tables and charts were used to present the findings.

The study found out that majority of the traders/exporters were trained on marketing. They had price knowledge, product knowledge and promotion knowledge and majority adopted innovations unlike the growers who had low marketing skills; this would explain why 39% of the produce goes to waste. On traders/ exporters, a significant chi-square relationship was established with innovation given a chi-square value of 9.620 at $p=0.047$.

The study concludes that marketing skills influence buying and selling; and if value chain members had excellent marketing skills, nothing could be going to waste as they would adopt relevant technologies and add value to the produce and meet the customers' needs.

The study recommends that there is need for intense training on market skills on value chain members and stakeholders, either through NGOs and private sector. There is also need for business incubation programs and need to revise training curriculum to cater for marketing skills.

Keywords: Value chain, Marketing skills, agriculture, Mango, adoption, innovation

Introduction

The agricultural sector in Kenya continues to face major challenges affecting the value chain despite the government proposed a strategy for revitalizing agriculture, 2004 –2014; mainly due to poor productivity, poor land use, lack of markets and value addition. The challenges are exacerbated by the unfavorable institutional framework currently governing the sector (Moturi et al., 2010).

To streamline the challenges in the sector, the Government through its policy document “Vision 2030” aims to promote an innovative, commercially-oriented, and modern agricultural sector through adding value to farm and livestock products before they reach the local and international markets. This will be accomplished through transforming key

institutions in the sector to promote growth, increase productivity, introduce land use policies for better utilization of high and medium potential lands, developing more irrigative areas in arid and semi-arid lands for both crops and livestock, and improving market access for small holders through better supply chain management (Rok, 2008). These interventions should contribute to the adoption of innovations along the mango value chain driven by producers, agents, transporters, processors and traders as key actors in the chain.

The improved processes at all stages of the value chain, from the farm to the consumer, will make significant contributions to an efficient and effective enterprise, with increased profitability at the small-scale production level and at the same time avail quality and safe mangoes and mango products to the Kenyan consumers at affordable prices. According to the ROK (2009), value chain analysis can strengthen the innovation process by determining the contribution of each actor with a view to maximizing synergies and complementarities between actors.

According to Diederer, et al, 2002, agriculture progresses technologically as farmers adopt innovations. The extent to which farmers adopt available innovations and the speed by which they do so determines the impact of innovations in terms of productivity growth. It is a common phenomenon that farmers, like any other kind of entrepreneurs, do not adopt innovations simultaneously as they appear on the market.

Despite them being successful, the agricultural revolution is still dynamic and calls for new innovation systems on a constant basis (World Bank, 2006). Rapid adoption of innovations in developing countries is constrained by lack of credit, limited access to information, aversion to risks, inadequate incentives associated with land tenure arrangements, insufficient human capital, absence of equipment to relieve labor shortages (thus preventing timeliness of operations), chaotic supply of complementary inputs (such as seeds, chemicals and water) and inappropriate transportation infrastructure (Zilberman et al, 1985). Msabeni,et al; (2010) also found out that stakeholders/actors along the mango value chain including producers, agents/buyers, service providers, input suppliers, processors, wholesalers, exporters lacked information on markets and prices.

Problem Statement

For the last forty years during mangoes harvesting season, the researcher has observed that a lot (39%) of mangoes in Meru County go to waste. This is also emphasized by DANIDA report (2010). However, technologies (innovations) exist to arrest this situation but farmers are yet to adopt these innovations.

According to World Bank report (2007), change in market demands affects the production cycle in different ways. It determines the acceptable levels of inputs into production and value addition up to the delivery of the product to the consumer. Firms are effectively making use of their marketing skills (price, product, place and promotion). This has made firms to start competing less on price but on their ability to adapt and produce products that meet the market standards. This in turn has generated innovation globally as high standards continue being adopted.

A study by Msabeni et al; (2010) found out that, out of the total production, 51% of the mangoes from Meru County go both to local and international market. The home consumption is 10% while 39% of the mangoes go to waste, however, technologies (innovations) exist to arrest this situation- raising question, why has the mango growers and traders not adopted the already established technologies? Do marketing knowledge/ skills influence the adoption of innovations along the mango value chain in Meru County? This study sought to fill this gap by investigating whether existence of marketing knowledge/ skills on value chain members would influence the adoption of relevant technologies along the mango value chain in Meru County.

The purpose of this study was to:

Investigate whether market skills influence the adoption of innovations along the mango value chain in Meru County.

Research Hypothesis

H₀: Marketing skill is not associated with innovation, and

H₁: Marketing skills is associated with innovation.

Review of Related Literature

Market power has been argued to both encourage and discourage the diffusion process. As Nancy Dorfman suggested in 1987, four major arguments support the positive role of market share in determining the level of innovative activity and these same arguments apply also to the choice to use new innovations, because many of the factors and underlying issues are quite similar at both stages.

Authors such as Feder and Slade 1984; Rees et al., 2000 argue that provided a technology is profitable, increased information induces its adoption. However in the case where experience within the general population about a specific technology is limited, more information induces negative attitudes towards its adoption, probably because more information exposes an even bigger information vacuum hence increasing the risk associated with it. A good example is the adoption of recombinant bovine Somatotropin Technology (rbST) in dairy production (McGuirk, Preston and Jones, 1992; Klotz, Saha and Butler, 1995). Feder and Slade (1984) assert that the right mix of information properties for a particular technology is needed for effectiveness in its impact on adoption.

Rogers (2005) after reviewing 156 studies had generalized that “Earlier adopters have more change agent contact than later adopters”, since 87% of all the studies he reviewed supported such a generalization. Other studies as well have found a significant positive relationship between extension contact and adoption of innovations. Examples of these studies were Mussei et al. (2001), Getahun et al. (2000), Baidu-Forson (1999), Madhukar and Ram (1996), and Abd El-Razek (2002). However some studies found no relationship between the two variables. Examples of these studies were, Bulale (2000), Salama (2001), Getahun et al. (2000), Mussei et al. (2001), and Adesina and Baidu-Forson (2005).

In an analysis of the organizational linkages along the mango value chain, Mbeere District Eastern Province, Kenya, Msabeni,et al; (2010) found out that while there were various stakeholders/actors along the mango value chain including producers, agents/buyers, service providers, input suppliers, processors, wholesalers, exporters and consumers (end users), their linkages were weak since they operated in isolation and lacked information at various levels along the chain. For example, the producers lacked information on markets, producer prices and appropriate agro-chemicals.

According to Msabeni,et al; (2010), lack of market information and prices is a loophole the agents are strongly exploiting, while lack of information on the appropriate agro-chemicals has resulted in the use of sub-standard chemicals thus affecting the quality and quantity of yields. The extension service providers also lack information on changing market needs and are not able to advise the producers appropriately. Bringing various stakeholders together through different forums would strengthen the linkages and improve information flow along the chain (HCDA, 2008).

Research Methodology

This research was guided by the methodology used by Nchinda and Mendi (2008) in the study of yoghurt technology adoption in the western highlands of Cameroon.

Research Design

This study assumed participatory action research to develop innovative technologies and products associated with mangoes. Baseline survey was done.

The study districts included the former Meru Central and Meru North Districts currently known as Meru County. The County lies to the east of Mt. Kenya whose peak cuts through the southwest border of the County. To the North East it borders Laikipia County; to the West it borders Nyeri and Kirinyaga counties, Tharaka Nithi County in the south and Isiolo County to the north.

Participant (Subject) Characteristics

The study was concentrated on seven divisions, which are highly productive in mangoes as shown in Table 3.1.

Table: 1.1 Study Areas (Survey figures, 2010)

Meru County	Study divisions	Area under mango per ha.	Production in Mt (2010)	Number of farmers
	Imenti North	275	2,586.97	910
	Meru Central	1289	14,553.97	4,347
	Imenti South	73	1,011.11	516
	Igembe South	278	3,120.14	4,023
	Igembe North	71	637.37	2,176
	Tigania West	106	783.06	1,074
	Tigania East	31	170.34	396
Total		2,123	22,862.96	13,442

Source MOA, 2010

The study area was limited to the lower part of the County whose climatic condition favors the production of mangoes. The population of the study included individual mango farmers, traders and exporters in Meru County. The mango farmers are approximately to be 13,442, traders are 120, while exporters were 12 (MOA Survey, 2000). Therefore, the target population for the study was 13,574 traders, farmers and exporters.

Sampling Technique

The Population of Mango farmers in the county was estimated at 13,454. Since the population is large (above 10,000), the following formula was adopted to calculate the sample size of farmers.

$$n = \frac{N}{[1 + Ne^2]}$$

A sample size of 447 mango farmers/ growers was established.

A stratified random sampling technique was used to get a sample size of traders and exporters since the target population was not homogeneous. The researcher therefore subdivided it into groups or strata in order to obtain a representative sample. From the above population of thirteen thousand five hundred and seventy four, 10% from both traders and exporters, giving each item in the population an equal probability of being selected. This generated a sample size of 461 respondents from whom the study sought information. Table 1.2 below gives summary of the sample size.

Table 1.2 Sample Size (MOA, 2010)

Sections	Population (Frequency) (N)	Sample Ratio	Sample (n)
Traders	120	0.1	12
Exporter	12	0.1	2
Farmers	13,442		447
Total			461

The questionnaires were then distributed through the ministry's division headquarters. Out of the target population, 447 questionnaires were administered to 447 farmers, 12 traders

and 2 exporters. Out of the 461 questionnaires distributed, 296 questionnaires were returned with 283 coming from farmers, 12 from traders and one from an exporter.

Measures and Covariates

Primary data (mainly information on factors influencing adoption) were collected from the respondents through questionnaires. Structured questionnaire with both open and close ended questions were the key instruments used in collecting primary data from the respondents. The questionnaire was pre-tested before being administered to the respondents.

Quantitative data obtained from the field was coded using the SPSS and analyzed using descriptive and inferential techniques. Descriptive techniques were adopted using frequencies to show the tendency of occurrence between study variables. Inferential techniques like regressions were used so as to establish the relationship between variables in the study and inferences made.

A logit analysis was used to determine whether adoption of innovation is influenced by entrepreneurial, financial, marketing and training skills. Logit regression is used to determine the probability of occurrence of an event with the presence of its determinants by fitting the data on a probability curve. A Logit model was found suitable by Nchinda and Mendi, (2008) who used the same approach to investigate the factors influencing adoption of milk technology in Cameroon.

The Logit model was conducted by transforming ‘innovation adoption’ variable into binary (1 = adopted innovation, 0 = has not adopted innovation). Logit regression was preferred as it is not affected by other factors such as serial autocorrelations and would, thus, have a better presentation of the prediction. Innovation (I) was the dependent variable while marketing skills, respectively were the independent variables. These variables were measured based on the respondents’ agreement or disagreement with the variable indicators whereby agreement was accorded value 1 and disagreement value 0. The analysis was done on four independent variables as shown below:

$$P(Y = 1 | X_1, \dots, X_p) = \frac{e^{\alpha + \sum_{j=1}^p \beta_j X_j}}{1 + e^{\alpha + \sum_{j=1}^p \beta_j X_j}}$$

Marketing skills (X₁): (0=lack marketing skills, 1= have marketing skills);
 I and X variables were converted into standard scores: Z_y, Z₁,Z₂,.....Z_n.

Results

The study found out that majority 63.3% of growers indicated that they were trained on marketing, 36.7% indicated that they were not trained. Out of the trained growers, 49% adopted innovations and 51% did not adopt. Out of the growers who were not trained, 6.7% adopted innovations and 93.3% did not adopt. The study also found out that 84.6% of traders/exporters were trained on marketing skills while 15.4% were untrained. Out of the trained traders/exporters, 73% adopted marketing innovations

Growers had low (8%) marketing adoption rate for the trained and 1% for the untrained. Further, it was established that 21% of the growers had price knowledge, while 79% didn’t. Out of those who had price knowledge, 17% adopted innovations. It is clear that growers had low (21%) knowledge on price and therefore low (17%) innovation adoption for those with price knowledge and 2.2% adoption for those with no price knowledge. On the issue of promotion, only 5.6% of the growers had promotion knowledge. This shows that growers had low (5.6%) knowledge on promotion and therefore low adoption rate. On the other hand, the number of growers without place knowledge but adopted innovation was

8.9%. Finally with regard to negotiation as an indicator of marketing skill, 24% of growers had negotiation knowledge. This clearly shows that growers had low (24.8%) knowledge on negotiation and thus low (39%) adoption.

On the other hand, the study established that 92.3% of traders/exporters had price knowledge in the market and 80% of them had adopted innovations. This shows that traders/exporters had high interest on price and thus high knowledge on price and high adoption rate of price innovation. This can be compared to growers whose price knowledge was 20.8% and the adoption rate of 17% for those who had perfect knowledge.

The study also found out that 84.6% of traders/exporters had product knowledge while 15.4% didn't. The results further reveal that 63.6% of traders/exporters with product knowledge had adopted innovation. The analysis shows traders/exporters had high knowledge of the product and thus high adoption rate of (63.6%). As compared to growers who had an equivalent high (83.7%) knowledge, and high product adoption rate of 65% for those who had perfect knowledge and 2.2% for those had no knowledge.

The study also examined promotion as an indicator of marketing skills as far as traders/exporters are concerned. It was established that the percent of traders/exporters with promotion knowledge was 69.2% and the number without promotion knowledge was 30.8%. The percent of traders/exporter with promotion knowledge and adopted innovations was 66.7%, while the percent of traders/exporters with promotion knowledge but did not adopt the innovation was 33.3%. Similarly, the percent of traders/exporters without promotion knowledge but adopted innovation was 25%.

Logit Regression Results

Table 1.3: Logit Model Coefficients

		B	S.E.	Wald	Df	Sig.	Exp(B)
Model 1: Growers	Marketing Skills	-.335	.662	.255	1	.613	.716
	Constant	-1.148	.776	2.187	1	.139	.317
Model 2: Traders/ Exporters	Marketing Skills	-41.875	45720	0	1	0.999	0
	Constant	42.365	57340	0	1	0.999	2.51E+18

a. Variable(s) entered on step1: Marketing Skills

That study shows that marketing skills would negate adoption of innovation as it has a coefficient of -0.335. The Logit model shows that, when other factors are held constant, marketing skills would decrease adoption of innovation by 41.875.

Chi-Square Results

Chi-square test was used to determine whether an association (or relationship) between independent and dependent variables in the sample is likely to reflect a real association between these variables in the population. The null and alternative hypotheses for the chi-square test were:

Hypothesis One

H₀: Marketing skill is not associated with innovation, and

H₁: Marketing skills is associated with innovation.

Table 1.4 Chi-Square – Innovation and Independent Variables

			Value	Degrees of Freedom (df)	Asymp. Sig. (2-sided)
Model 1	Marketing Skills	Pearson Chi-Square	9.418c	10	.493
		Likelihood Ratio	10.469	10	.400
		Linear-by-Linear Association	.238	1	.626
Model	Marketing	Pearson Chi-Square	9.620g	4	.047

2	Skills	Likelihood Ratio	12.860	4	.012
		Linear-by-Linear Association	3.017	1	.082

Chi square results on growers shows that neither linear association nor a significant chi-square distribution was established between marketing skills and adoption of innovations as the p-values established were 0.626 and 0.493 respectively. The null hypothesis is thus not rejected and the study fails to accept the alternative hypothesis. On traders/ exporters, a significant chi-square relationship was established with innovation given a chi-square value of 9.620 at $p=0.047$. However, insignificant linear relationship was established as the p-value established was 0.082 ($P>0.05$). These show that, on overall, along the traders-buyers inter-linkage along the mango value chain, innovation is only influenced by marketing skills and training level of the actors.

Discussion

The study sought to compare the indicators of marketing skills for traders/exporters with growers. It was observed that the number of traders/exporters with price knowledge was 92.3% and those without price knowledge was 23.1% out of the 13 traders/exporters. The number of traders/exporter with price knowledge and had adopted innovations was 80%. While the number of traders/exporters with price knowledge and had not adopted innovation was 20%. Similarly, the number of traders/exporters without price knowledge but had adopted innovation was 66.7%, while the number of traders/exporters without price knowledge and had not adopted innovations was 33.3%. This shows that traders/exporters had high interest on price and thus high (92.3%) knowledge on price and high adoption rate of price innovation. This can be compared to growers whose price knowledge was 20.8% and the adoption rate of 17% for those who had perfect knowledge and 2.2% for those who had no knowledge. Traders/exporter price knowledge was 92.3% and price adoption rate was 80% for those who had perfect knowledge and 66.7% who had no knowledge.

With regards to product, when examining traders/exporters, (84.6%) had product knowledge and the number without product knowledge was 15.4% out of the 13 traders/exporters. The results further reveal that the number of traders/exporters with product knowledge and had adopted innovation was 63.6%, while the number of traders/exporters with product knowledge and had not adopted innovation was 36.4%. Similarly, the number of traders/exporters without product knowledge but had adopted innovation was 50%, while the number of traders/exporters without product knowledge and had not adopted innovation was 50%. The analysis, therefore, shows traders/exporters had high 84.6% knowledge of the product and thus high adoption rate of 63.6% for those who had perfect knowledge and 50% adoption rate for those who did not have knowledge. As compared to growers who had an equivalent high 83.7% knowledge, and high product adoption rate of 65% for those who had perfect knowledge and 2.2% for those had no knowledge.

The study also examined promotion as an indicator of marketing skills as far as traders/exporters are concerned. It was established that the number of traders/exporters with promotion knowledge was 69.2% and the number without promotion knowledge was 30.8% of the 13 respondents. The number of traders/exporter with promotion knowledge and adopted innovations was 66.7%, while the number of traders/exporters with promotion knowledge but did not adopt the innovation was 33.3%. Similarly, the number of traders/exporters without promotion knowledge but adopted innovation was 25%. While the number of traders/exporters without promotion knowledge and had not adopted innovation was 75%. The analysis, thus shows that traders/exporters had high (69.2%) knowledge on promotion and high adoption rate of 66.7% for those who had perfect knowledge and 25% adoption for those who had no knowledge, as compared to growers whose promotion knowledge was 5.6% and adoption rate 25% for those who had perfect knowledge and 1.5% for those who had no knowledge.

Regarding place as an indicator of marketing skills, the number of traders/exporters with place knowledge was 84.6% and the number without place knowledge was 15.4%. Out of the number of traders/exporters with place knowledge 82% adopted innovation. While those with place knowledge but had not adopted innovation was 18%. Similarly, the number of traders/exporters without place knowledge but had adopted innovation was 50%, while those without place knowledge and did not adopt innovation was 50%. Thus, majority (84.6%) of traders/exporters had place knowledge and their adoption rate was as high as (82%) for those who had perfect knowledge and 50% for those who did not have knowledge, as compared to the growers whose place knowledge was as low as (20.5%) and low adoption rate of (8.6%) for those who had perfect knowledge and 8.9% for those who had no knowledge.

Finally, the study examined negotiation as an indicator of marketing skills and noted that the number of traders/exporter with negotiation knowledge were 77% and those without negotiation knowledge were 33%. The traders/exporters with negotiation knowledge but did not adopt innovation were 80%, while those with negotiation knowledge but did not adopt innovations were 20%. Similarly, those traders/exporters without negotiation knowledge but did adopt innovation were 33.3%. While those traders/exporters without negotiation knowledge but did not adopt innovation were 66.7%. Majority, therefore, (77%) of traders/exporters had high negotiation knowledge of 80% for those who had perfect knowledge and 33.3% who did not have knowledge. On the other hand, growers had low (24.8%) knowledge on negotiation and low (36.8%) adoption rate for those who had perfect knowledge and 2.8% for those who had no knowledge. The above analysis shows growers had less knowledge on marketing skills and, thus, less adoption than traders/exporters. According to Dorfman (1987), there is a positive role of market skills in determining the level of innovative activity and these same arguments apply also to the choice to use new innovations. This could therefore be the reason why traders/exporters reported a high rate of adoption of innovations than the growers.

Conclusion

The study concludes that growers had less knowledge on marketing skills and thus less adoption than traders/exporter. This shows that value chain members have imperfect marketing skills. Traders/exporters are more knowledgeable than growers on marketing skills. Marketing skills influence buying and selling. That is why 39% of the produce goes to waste. If value chain members had excellent marketing skills, nothing could be going to waste. So, marketing skills influence innovation adoption.

The study recommends intensification of training on market skills on value chain members and stakeholders, either through NGOs and private sector on the areas of price, place, promotion and negotiation so that growers could be better equipped in marketing skills.

There is also need for business incubation programs (KTDA model) and; revise training curriculum to cater for marketing and processing.

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