

**VALUE CHAIN MANAGEMENT AND THE
PERFORMANCE OF AVOCADO FRUIT SMALL SCALE
FARMERS IN KANDARA SUBCOUNTY, MURANG'A
COUNTY, KENYA**

Maina Karuiru*

Abstract

The purpose of this study was to investigate the influence of financing on the performance of avocado small scale farmers in Kandara Sub County, Murang'a County, Kenya. The study applied a retrospective survey design to examine the avocado small scale farmers and their experience in value chain management. The study used both qualitative and quantitative methods for data collection and analysis. The target population for this study was 100 small-scale farmers. The study used retrospective research design to select the sample size and mixed methods of data collection. It was concluded that, in as much as the small-scale farmers are willing to plant more avocados this is hindered by the fact that they do not have enough land and finances to do so and opt rather to farming other food crops. The study therefore recommended that the government to invest in research in order to seek avocado varieties which take less space in the farm and cohabit with other main food crops. Another way of addressing this problem is for the government to provide the land to those farmers who are motivated and committed for avocado farming.

Key terms: Value chain, management, performance, small scale farming

* Student Master of Arts Degree in project planning and management,The Catholic University of Eastern Africa,

Introduction

A value chain is a set of linked activities that work to add value to a product; it consists of actors and actions that improve a product while linking commodity producers to processors and markets. Among the small scale farmers, this process may include information dissemination, infrastructure, agricultural planning strategies, agricultural financing, and marketing among others.

Agriculture in developing countries often is characterized by dual value chains operating in parallel for the same product: one informal or traditional and the other formal or modern. Small holders are frequently involved in informal chains that deliver products to local middlemen and then to small local stores. Formal value chains can deliver the same product, usually in better or more uniform quality, from larger farms or more organized groups of small farmers to more commercial wholesalers and from there to supermarkets or exporters. This duality has been accentuated by the explosive growth of supermarkets in developing countries. It can limit many small producers to markets characterized by low-quality products, and low prices and low returns for them — hence a frequent concern is to find ways to integrate small producers into more modern value chains, both domestic and export-oriented.

As Lumpkin et al. (2005) pointed out worldwide production of fruit and vegetable crops has grown faster than that of cereal crops. Between 1960 and 2000, the area under horticultural crops worldwide has doubled. Among the main reasons attributable to the growth, high return from horticulture as compared to cereals was the prime one. Per capita farm income from horticulture has been reported up to five times higher. Promotion of the production of, and trade in, fruit and vegetables has recently become one of the key objectives of developing countries. IFAD's regional strategy for sub-Saharan Africa focuses on enhancing the income of small holders within the context of trade liberalization. Smallholder production and the marketing of fruits and vegetables is a key focus (IFAD, 2003). Most fruits are perennial trees and can live more than fifty years (e.g. mangos). Apart from their economic importance, they are forest and environmentally friendly to fight against drought, use as shade, fire wood, food security, agro industry, export, etc.

According to worldatlas.com, Mexico is the top avocado producing country in the world. The total avocado production area is around 415,520 acres, which produces 1.52 million metric tons every year. The majority of the avocados in Mexico, 86%, are grown in the following states: Puebla, Morelos, Michoacán, Nayarit, and Mexico. Unfortunately, drug cartels control much of the state of Michoacán, where they charge avocado producers a protection fee to avoid damage to the crops. Not only does this country produce more avocados than any other country in the world, but it produces more per acre as well (worldatlas.com, 2017). The Mexican avocado sector annually generates a harvested product value of more than USD 700 million, while providing 42 000 permanent and 31 000 temporal jobs (Ramos, 2007)

In the United States of America, Gereffi, Lee, and Christian(2009) confirms that, two industries, chicken and tomatoes, play prominent roles in US food and agricultural competitiveness. Both industries have become more concentrated over time, with powerful “lead firms” driving geographical, technological, and marketing changes. Overall, a processed food revolution has taken place in agricultural products that transforms the types of food and dietary options available to consumers. The nature of contemporary food and agricultural value chains affects the strategies and policies that can be effectively employed to address major health goals such as improved nutrition, food safety, and food security.

In Nigeria, the agricultural sector provides employment for about 60 percent of the labour force and raw materials for industrial development. Its provision of food for the growing population and income for millions of smallholders is remarkable for the maintenance of peace in the country. Nonetheless, the performance of the sector over the years is far below expectation because development efforts have failed to place it as the foundation for economic growth and development; thus it has not witnessed the desired transformation and the available resourceendowment has been grossly underutilized (Olomola, 2007).

A report done in Zanzibar – the United republic of Tanzania by the European Union (2015) on Value Chain Analysis of the Fruit and Vegetable Market for Smallholder Farmers in Zanzibar confirmed that, farmers did not know how to use the market information they have to maximize their profit, lacked access to reliable supply of water, farmers did not understand all the costs

associated with running the farm, farmers faced considerable uncertainty about the price they will receive before beginning their farming season, they faced marketing challenges and they did not receive payment for their produce on time.

In Kenya, according to Kenya Network for Dissemination of Agricultural Technologies (KENDAT) (2015), smallholder farmers contribute 95% of the high value agricultural produce that is marketed in high-end outlets nationally and internationally. As the dominant national economic activity, agriculture is the main source of rural employment, export earnings, a source of food security, and a stimulus to the generation of off-farm employment. In addition, it is a major source of raw materials for the manufacturing sector, providing 33% of the input.

Although smallholders in Kenya have dominated the horticultural sector and the fruit tree sub sector in particular, they have steadily lost market share during the past decade because of a number of factors. For instance, Snodgrass and Sestad (2005) found that participation by smallholder farmers in the fruit tree value chain is constrained by lack of information and knowledge of the markets, limited access to inputs, limited access to resources and/or weak incentives for upgrading, weak vertical and horizontal linkages within the value chain, and lack of trust among producers, brokers, and exporters. The smallholder farmers' situation has been exacerbated by the introduction of stringent new rules and market standards following increasing consumer concern about food safety, as well as social and environmental aspects of the food supply chain (USAID, 2008). Yet, most small scale producers of the avocado fruit lack the requisite skills and knowledge to undertake control measures against diseases and insect pests' attacks.

Currently and especially in Kandara Sub-county, Avocado processors have the potential to manufacture and export various processed avocado including the following: crude avocado oil, refined oil, extra virgin oil, dried avocado, and avocado pulp. Currently, avocado processors in Kenya produce mostly crude avocado oil not because of inadequate supply of avocado but because of insufficient capital for advanced machinery. There is a huge demand for other avocado products by importers, hence the untapped opportunity. Some of the drawbacks to effective involvement in value added chain includes avocado financing, infrastructure, planning,

and marketing. This study will therefore discuss the problem surrounding value chain management and the performance of avocado small scale farmers in Kandara Sub-county, Murang'a County, Kenya.

Statement of the problem

Small-holder farmers in the developing world have traditionally been locked out of high value markets due to the familiar challenges of poor quality, small volumes, and inconsistent supply. The spot-market broker has typically serviced this sector, however with low prices and an unreliable buyer, farmers have been left with little incentive to assume risk and upgrade production. Farmers and especially in Kandara Sub-County have been faced with value-chain management related challenges which have fueled their endless cycle of poverty. It is in this regard that this research is proposed to ascertain the extent to which financial status affect small scale avocado farmers in Kandara Sub-County. The broad objective of this study therefore was to determine the influence of financing on the performance of avocado small scale farming in Kandara Sub-County.

Justification of the study

This study is justified with the reason that, not many studies have exposed value chain management challenges that affect the performance of avocado small scale farmers and especially in Kandara Sub County, a constituency one of the leading producer of avocado fruits in Kenya. It's also rationalized because of the devolved political functions and the researcher would like to confirm some of the information from the media about avocado small scale farming support from the county government.

Theoretical framework

Theory of value chain analysis by Michael Porter (1985) guided this study. The framework divides activities that generate value into two categories – primary activities and support activities. Primary activities comprise a set of activities that contribute to the creation of value in a direct manner. Support activities consist of functions and tasks that are intended to support primary activities. In this case of VCM among avocado small scale farming, financing, marketing and planning strategy are believed to affect value chain directly. Rural infrastructure is

affecting indirectly. This theory however may not fully explain impact on the performance of small scale farmers without the concepts of participation, evaluation and specific methodology for planning. Theory of change proposed by Kubish (1997) will complement the theory of value chain management. Theory of Change explains the process of change by outlining causal linkages in an initiative. The identified changes are mapped – as the “outcomes pathway” – showing each outcome in logical relationship to all the others, as well as chronological flow.

LITERATURE REVIEW

Influence of financing on the performance of Avocado farming

A study conducted in Mexico on the avocado industry based on transaction costs and supply chain management practices confirmed that the adoption of three practices, product standardization, supplier partnership, and information exchange, was a solution when challenges such as enhancing quality, obtaining reliable supply, and coordinating supply and demand conditions, were faced in the supply chain (Coronado, Bijman, Omta and Lansink, 2015). This study was however done among large scale farmers of Mexico. This particular study shall be carried out in Kandara Sub-County, where majority of farmers do it on small scale, and the involvement of the government is minimal. The above supply chain factors apply here in Kenya except supplier partnership. This study shall take a keen consideration look at what extend does product standardization, and information exchange affect avocado small scale farming in the study area.

From an interventional point of view, ICCO (2014) confirmed that Swisscontact enabled cocoa smallholder farmers and entrepreneurs to grasp and take advantage of market and business opportunities in order to increase their income and generate employment. The Value Chain Analysis Approach focuses exclusively on certain sectors or sub-sectors with a particular growth potential. It analyses the different links in a production process – from the extraction or processing of raw materials, to the fabrication of end products and their delivery to end consumers. It identifies and addresses bottlenecks based on a thorough understanding of the goals and potential of the various parties involved.

In recent years, a renewed focus on agriculture has been evident in Africa's development agenda. However, there is a dearth of knowledge on the inter-linkages between production, agro-industry and markets, as well as the potential and capacities for developing these (Kormawa et al., 2012). Some 450 million smallholder farmers around the world face poor marketing linkages. Additionally, farming practices are characterized by low productivity due to dependence on family labour, lack of access to resources and inputs such as seeds, fertilizers, irrigation equipment and machinery. Smallholders remain dispersed and non-aggregated (DGDA, 2012). To feed 9.3 billion people by the middle of this century, the world will need to raise global food production by around 70 per cent. Ironically, majority of people currently suffering chronic hunger are the rural poor who work in agriculture, livestock rearing or fishing. A food-secure world requires that African farmers are enabled to produce agricultural surpluses, which will allow them to sell the excess for income. The income will enable them to invest in better agricultural practices and to insure against the bad seasons that will inevitably come, from time to time.

In South Africa, The gross avocado production value for 1993/94 season was R 73, 2 million in The value for exports for the 1994/95 season amounted to R 120 million (South African Avocado Growers' Association Yearbook 1995- (SAAGA)).This data explains an increase on the gross income inrelation to Avocado farming in South Africa.

In Nigeria, according to Olomola, (2007), the transformation of cassava into various products resulted in considerable increase in value along the chain. From the farm production stage to the assembly stage value increased by 553 percent while the increase from assembly to processing is 10 percent. From processing to the stage of final trading, the Shipment value increased by 61 percent in respect of cassava chips, 73 percent in respect of cassava pellets and 66 percent in respect of starch. The transformation of cassava from farm production into cassava starch, cassava chips and cassava pellets at the final trading stage was associated with an increase in shipment value from US\$43.79 at the cassava production stage to US\$506.63 for cassava chips, US\$544.39 for pellets and US\$522.61 for starch. This represents an increase in shipment values of about 1053 percent, 1139 percent and 1087 percent in respect of cassava chips, pellets and starch respectively. Cassava production of Large Commercial Farms yielded a value added

(US\$41.85) representing 96% of the shipment value. Domestic Value Added (DVA) also represents a high proportion of the shipment value of the cassava products. The proportion varies from 83% in the case of cassava chips, to 85% for starch and 84% for pellets. In each case over 80% of the DVA is made up of domestic costs and mark-ups. The final Shipment values for cassava chips, pellets and starch are US\$506.63, US\$544.39 and US\$522.61 respectively. Compared with the export parity price (US\$-3.00) at the final commodity stage, none of these products was competitive at the international market. In addition to high domestic costs, the very low level of international prices of these products made them unprofitable and uncompetitive.

According to the Government of Rwanda (2012), projections for the year 2013 were that, packaged avocados were to be exported, via Mombasa or Dar es Salam, to the EU where the channel pricefor avocado is \$1.75 per kilogram, providing an estimated 32% margin primarily direct sales to 2-3 key EU wholesalers and distributors. Production costs were driven by the costs of raw materials, labor, packaging, transport, and generalprocessing. The cost of procuring avocados and the cost of packaging were adjudged to have the highestuncertainty and both adjusted upwards by 15% to increase to ensure projections areconservative.The annual revenue forecast for 2017 was \$8 million, requiring an initial investment of \$2.9 million. The investment was expected to deliver an IRR of 38% without leverage, and returns will improve with theaddition of leverage (62% IRR at 50% debt).

In Kenya, currently avocados represent about 17% of the total horticultural exports from this country. Nearly 20 000 tonnes, valued at Ksh 892 million have been exported in 2003 (as compared to 12 890 tonnes valued at Ksh 682 million in 2002), according to the Horticultural Crop Development Authority (HCDA). At this level of export it represents approximately 39% of total avocados annual production of 70 000 tonnes. The major part of production is recorded from March to September and smaller volumes are available from October to February. The main export cultivars are Fuerte (80%) and Hass (20%). Kenya's main competitors on the European market are South Africa, Israel and Spain. These countries have a long-standing tradition and immense experience regarding avocado cultivation.

While farmer groups focusing on avocado are not common in Kisii, the existence of groups that focus on other enterprises such as maize or table banking can be used as a platform to organize farmers into avocado marketing groups. Nevertheless, clarity in the terms of engaging the farmer groups, which entails revealing the engaging terms of the contract to the farmers, is paramount in dealing with the groups. Likewise, reducing the number of partners involved in negotiating the terms of the contract is likely to reduce information asymmetry and enhance group cohesiveness. To the extent that access to support services such as application of manure and fertilizers, spraying, picking and grading, which are crucial for the production of high quality avocado appears to be limited, particularly for the small-scale farmers in Kandara, the existing groups can tap into this opportunity by pooling the resources to hire such services. Alternatively, the contracting companies can consider providing interlinked services, which can be deducted from the farmers' proceeds. However, constraints such as unclear terms of engagement and delayed payments have to be alleviated to reduce cases of side-selling by the farmers.

RESEARCH DESIGN AND METHODOLOGY

Study design

This study adopted a retrospective survey design to examine the avocado small scale farmers and their experience in value chain management.

Sample and Sampling Techniques

This proposed study targets 5000 farmers from Kandara Sub-County. This research will employ a retrospective research design and mixed methods of data collection. Small scale farmers will be the major target for the study. Key informants will also be interviewed on the role of value chain management in avocado small scale farming in Kandara Sub-County. Other Key informants were interviewed until data got to saturation.

Nassiumas (2000) formula is shown below:-

$$S = \frac{N(Cv)^2}{(Cv)^2 + (N-1)e^2}$$

Where S = the sample size

N = the population size

Cv = the Coefficient of Variation

e = standard error

Therefore, the sample size was:

$$S = \frac{5000(0.21^2)}{0.21^2 + (5000-1)0.02^2} = 220.5 \approx 100 \text{ small scale farmers}$$

Methods and Instruments of Data Collection

Quantitative and qualitative approaches (mixed methods) were used to guide data collection procedures in this study. Tools including questionnaires to collect information from the farmers (100), and interview guides to gather information from key informants/players on the sector. Six research assistants were trained to collect data from the six words including Ng'araria, Ruchu, Muruka, Kangundu-ini, Gaichanjiru and Ithiru. Quantitative data was analyzed by the use of SPSS in accordance with the main objectives of the study and presented in form of frequency tables, bar graphs and pie charts.

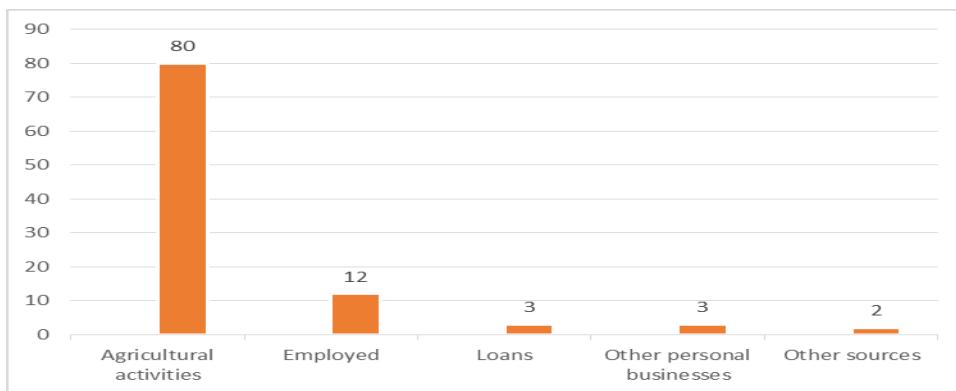
DISCUSSION OF FINDINGS

Influence of financing on the performance of avocado small scale farming in Kandara Sub-County

The purpose of this study was to investigate the factors influencing finance on the performance of avocado on small scale farming in Kandara Sub County. The study sought to find out the source of capital that the farmers used. The findings are presented below.

Source of Capital/ Finance for your farm

From the findings below, 80 (80%) of small scale farmers indicated they were able to get money from agricultural activities, at 12 (12%) got money from employment, 3 (3%) accessed money from loans and other personal businesses respectively while at 2 (2%) obtained money from other sources. According to research finding majority of the small scale farmers from Kandara Sub County relied heavily on agriculture as their main source of finance to sustain their livelihoods hence this could explain the findings.

**Figure 1: Source of capital/finance for your farm****Source: Researcher 2018**

Average capital spent on the farm per season

According to the findings, 70 (70%) of the respondents spent less than Ksh. 10,000 on their farm, 14 (14%) spent between Ksh. 10,000 – 15,000, at 6 (6%) spent on their farm between Ksh. 16,000 – 21,000, at 5 (5%) spent between Ksh. 22,000 – 26, 000 while at 5 (5%) spent on their farms between Ksh. 27,000 – 31,000. Farmers spending are characterized by low productivity due to dependence on family labor, lack of access to resources and inputs such as seeds, fertilizers, irrigation equipment and machinery. Smallholders remain dispersed and non-aggregated (DGDA, 2012).

From the findings it seems urgent that the national government and county governments should provide necessary technical and financial support, leadership and direction in order to avoid the poorly organized value chain. This implies that efforts should be made to make sure that all activities along the chain are well-coordinated and ways should be examined as to how all actors in the chain are brought together in order to ensure an efficient communication and sharing of information in the chain.

Effect of finance on avocado farming effort

From the figure below, at 90 (90%) majority of the small scale farmers had major effect on avocado farming, at 8 (8%) postulated that avocado farming had moderate effect while at 2 (2%) had minor effect. From the findings it was evidently clear that the small-scale farmers of Kandara Sub County had constraints hindering the development of avocados in all stages of the value chain. At the farmlevel, lack of clean disease-free seedlings and grafted seedlings has

compelled small-scale farmers to use inferior and low yielding varieties. Storage facilities are scarce all along the chain and absence of collective bargaining power has forced individual farmers to accept unfavorable deals. Low value adding activities of avocado take place at the farmer, broker or wholesaler level in the value chains and the products are sold unprocessed. Moreover, Avocado fruit crop has significant importance with a potential for domestic and export markets and industrial processing. However, the production, marketing and consumption of avocado fruits are restricted due to improper post-harvest handling. Absence of organized institution and system group marketing has made traders in a better position to dominate pricing.

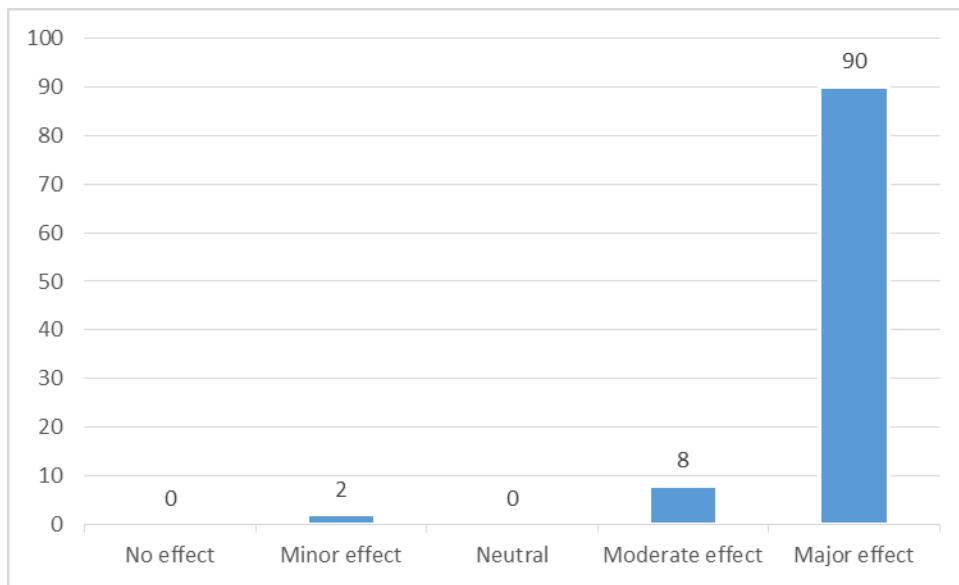


Figure Two: Effect of finance on avocado farming effort

Source: Research 2018

On the influencing of finance on the performance of avocado on small scale farming in Kandara Sub County. The researcher sought to establish acres of land that was owned by the small scale farmers of Kandara Sub County. At 60% owned between 0.6 to 3 acres of land represented by 20% owned less than 0.5 acres owned the most. On the number of trees planted (95%) of the small scale farmers had planted less than 100 trees in their farms and (3%) had planted between 101 and 500 trees representing most of the trees planted.

On Income per season spent from avocado farming in Kenyan shillings majority at(79.0%) of the respondents, had income of less than Ksh. 50,000 while at (10%) had income of between 51,000

and 65,000 which represented the highest. On the effect of finance on avocado farming effort (90%) majority of the small scale farmers said avocado farming had major effect while (8%) postulated that avocado farming had moderate effect.

Conclusions and Recommendations

The small-scale farmers expressed the feeling that they were not able to facilitate the transportations of their consignment on time, 60% of the small-scale farmers were of the view that the quality of road network to their farm was poor as compared to 15% who agreed on road network to be fair. According to the research findings this was attributed by the fact that transport is conducted along national roads using high capacity vehicles. Traffic congestion and poor roads are some of the challenges involved. Further, KENDAT, IFRTD and TCP International (ND) asserts that, because of the low individual volumes transported and the poor condition of the road infrastructure, the First Mile is the most inefficient in terms of travel speeds and transport costs.

Constraints hindering the development of avocados are found in all stages of the value chain. At the farm level, lack of clean disease-free seedlings and grafted seedlings has compelled farmers to use inferior and low yielding varieties. Storage facilities are scarce all along the chain and absence of collective bargaining power has forced individual farmers to accept unfavorable deals. Low value adding activities of avocado take place at the farmer, broker or wholesaler level in the value chains and the products are sold unprocessed. Moreover, Avocado fruit crop has significant importance with a potential for domestic and export markets and industrial processing. However, the production, marketing and consumption of avocado fruits are restricted due to improper post-harvest handling. Absence of organized institution and system group marketing has made traders in a better position to dominate pricing. Therefore, intervention strategy needs to be undertaken in order to promote the development of avocado value chain. This particularly includes, capacity building, post-harvest technology, improved extension, organized plant protection and plant breeding activities. Infrastructural development is also a key to support the sub-sector.

Majority of the small scale farmers at 70% said they preferred to sell their avocado to the middle men or the brokers as compared to 20% of small – scale farmers who sold to the cooperative society and or the farmers group. The research showed that smallholder farmers have been forced to adopt several food safety requirements of the international community for market access. Over 60% of the Kenyan avocado cannot be marketed because their low quality emanating from poor production procedures(Chege etal., 2006).Constraints in marketing of avocado in Kenya include no coordination of fruit exports, limited funds for research on production, preand postharvest and product development. Smallholderfarmers are not organized association(s)that could cater for their needs. Because of this it is difficult to disseminate new technologies or standards that would make them more competitive in the domestic andworld markets.Since the local market for avocado is not streamlined, overproduction, results to low prices and wastage during peak harvesting period. This low pricing could be attributed to the inability to access quality and relevant information and limited interactions between the avocado farmers and relevant bodies as far as their training is concerned on avocado farming in Kandara sub county, Murang'a County.

In as much as the small-scale farmers are willing to plant more avocados this is hindered by the fact that they do not have enough land to do so and opt rather to farming other food crops. This is exacerbated by the fact that avocados are not cohabiting with other crops such as the maize and banana while also taking much space in the farm. One way of resolving this issue is for the government to invest in research in order to seek avocado varieties which take less space in the farm and cohabit with other main food crops. Another way of addressing this problem is for the government to provide the land to those farmers who are motivated and committed for avocado farming. Given the fact that the available land may not be enough the ideal may be to allocate the land to the associations of small-scale farmers. Although this may not pose any problem as the associational culture already exists in this area, it requires, nevertheless, an efficient regulatory legal framework.

Recommendations

The study has revealed that more men were involved on small scale avocado farming than women. The county government of Murang'a, Kandara Sub County should invest on training

initiatives that emphasizes on gender equality which will give voice to both men and women and empower them to make decisions on matters that affect their lives. The County government should ensure that all the county staff are aware of gender mainstreaming as a strategy of eliminating gender bias.

In the short run, it seems urgent that the national government and county governments should provide necessary technical and financial support, leadership and direction in order to avoid the poorly organized value chain. This implies that efforts should be made to make sure that all activities along the chain are well-coordinated and ways should be examined as to how all actors in the chain are brought together in order to ensure an efficient communication and sharing of information in the chain.

The government should also provide necessary support to the small-scale farmers who want to increase the avocado production on their farms. Such support may be in the forms of small credits, fertilizer, grafted seedlings and other technical assistance that small-scale farmers may need especially for treating various diseases which may affect their avocado trees. It is therefore recommended that further studies be conducted to establish the influence of value chain management on the performance of avocado small scale farmers in other sub counties in Murang'a County, Kenya. Taking limitations and delimitations of the study, the following were suggestions for further research:

- I. What are the challenges faced by small scale farmers in harvesting of avocado fruit
- II. A study on the influence of small scale avocado farmers' attitude on planning, implementation and monitoring and evaluation of avocado farming.

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Pennsylvania Avenue, NW 1300 Pennsylvania Avenue, NW Washington, DC 20523