

International Journal of Agriculture Extension and Social Development

Volume 9; Issue 1; January 2026; Page No. 668-675

Received: 12-11-2025
Accepted: 17-12-2025

Indexed Journal
Peer Reviewed Journal

Enhancing African leafy vegetable farmers marketing skills: Lessons from Lewin's change model

¹E Minyattah, ¹J Ombati and ²M Mutuku

¹Department of Agriculture Education and Extension, Egerton University, P. O. Box Njoro, Kenya, East Africa

²Department of Applied Community Development Studies, Egerton University, Kenya, East Africa

DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i1i.3001>

Corresponding Author: E Minyattah

Abstract

Achieving proper integration of smallholder farmers into markets is a viable strategy towards achieving improved livelihoods. Farmers need to shift from just production to agribusiness. African Leafy Vegetables farming has the potential of increasing household income due to their numerous benefits. However, smallholder farmers have not benefited from it due to their low market participation due limited marketing skills. This study sought to use Lewin's change model to improve farmers' marketing skills in Vihiga County, Kenya. The study concludes that incorporating Lewin's change model into agricultural programs would improve farmers participation in the markets hence improve their livelihoods.

Keywords: Change, income, marketing, ALV, agribusiness

1. Introduction

The significance of smallholder agriculture in guaranteeing global food and nutrition security, fostering a sustainable economy in rural regions, augmenting income generation, enhancing household nutrition, and safeguarding biodiversity is profound and should not be overlooked [7]. The efficacy of agricultural marketing is pivotal in achieving food security, alleviating poverty, promoting sustainable agricultural practices, and enhancing livelihoods [28, 26]. Therefore, transformation of agriculture, particularly with an emphasis on marketing, significantly contributes to the achievement of the global Sustainable Development Goals (SDGs). In Kenya, a significant 7.5 million smallholder farmers contribute to 80% of the nation's overall agricultural production [8]. This underscores the essential contribution of smallholder farmers to the agricultural sector and highlights the necessity of enhancing their productivity and market access. Furthermore, scholars propose that access to markets significantly contributes to diminishing vulnerability and enhancing the empowerment of impoverished households [27], while also fostering economic growth among smallholder farmers. The engagement of smallholder farmers in the market therefore presents a significant opportunity to enhance their incomes and create employment prospects. This is particularly true when farmers focus on the cultivation and commercialization of indigenous crops, such as African leafy vegetables (ALV).

African leafy vegetables, also known as indigenous leafy vegetables or traditional leafy vegetables [21], represent a significant category of crops cultivated predominantly by smallholder farmers. There has been a notable increase in

interest surrounding traditional leafy vegetables, primarily due to the substantial evidence supporting their nutritional benefits [11, 4]. In Kenya, there is a notable rise in the production and consumption of indigenous crops. The crucial contribution of ALVs to food, nutrition, and income security for millions of individuals in both rural and urban contexts has garnered acknowledgment from numerous scholars [10, 17] underscores the significant contribution of ALVs in sustaining approximately 60% of rural households by providing both nourishment and a source of income. Additionally, African leafy vegetables serve as significant avenues for employment for individuals in peri-urban regions who are not engaged in the formal sector, owing to their minimal investment requirements (characterized by early maturity, less labour, and inputs) coupled with substantial yields [14, 25]. The brief duration of maturity presents a valuable opportunity to mitigate food insecurity among households and can facilitate rapid income generation.

The engagement of smallholder farmers in markets, both domestically and regionally, has persistently been limited by a range of challenges. The obstacles faced by smallholder farmers encompass significant production risks, inadequate market connections, diminished bargaining power, elevated transaction costs, insufficient technical expertise, a scarcity of dependable market information and potential trading partners, along with a deficiency in human and social capital [24, 26]. The absence of effective coordination among smallholder farmers restricts their capacity to negotiate for better prices and precludes them from capitalizing on economies of scale by consolidating their modest volumes [32]. Research findings indicate that approximately 35% of

smallholder farmers cultivating ALVs in Kenya engage in production for commercial purposes; however, only 30% of these ALVs are actually marketed ^[5]. This serves as a definitive signal of diminished market engagement among ALVs farmers. This can be ascribed to limited marketing skills. Strengthening farmers' marketing skills is therefore an in agriculture development.

Organizing capacity building interventions requires an effective change management framework. Lewin's ^[1947] three-stage change model (*unfreeze, change, refreeze*) provides a useful lens that can move farmers from their mundane production status to a sustainable new marketing related behaviour. Lewin's ^[1947] model proposes that behavioural change occurs in three sequential phases. *Unfreezing* involves building motivation to abandon existing practices; *change* refers to introducing and experimenting with new behaviors; and *refreezing* focuses on institutionalizing those behaviours to persist. Agricultural extension scholars note that the model aligns well with farmer learning processes, where entrenched routines, risk perceptions, and cultural norms strongly influence decision-making ^[35]. Change interventions in rural contexts need to provide opportunities for practice, and ensure long-term reinforcement ^[34]. These insights make Lewin's model particularly relevant for marketing skill development among ALV farmers, whose marketing practices are shaped by long-standing norms around subsistence production, gender roles, and informal trade. This study therefore sought to use Lewin's change model to improve ALVs farmers marketing skills in Vihiga County, Kenya

2. Methodology

2.1 Study Location

The research was conducted in Sabatia and Emuhaya Sub counties within Vihiga County. Vihiga County, situated in western Kenya, is positioned between longitudes 34°2' and 34°38' east, as well as latitudes 00°16' and 00°31' north. The Vihiga County Integrated Development Plan indicates that Vihiga County is situated in the western part of Kenya, within the Lake Victoria Basin. The county encompasses a total area of 563.8 square kilometers. The elevation varies from 1,300 meters to 1,800 meters above sea level. The county was chosen for the study due to the significant cultivation and consumption of ALVs in this area. Furthermore, numerous research and development organizations have actively promoted ALVs production in Vihiga County ^[22].

2.2 Study design

This investigation employed the principles of Lewin's change model alongside a Randomized Controlled Trial (RCT) experimental framework. Lewin's Change Model, conceived by Kurt Lewin in 1958. His theory emphasizes on the transformations that take place within a system as a result of the interactions among its components and actors, ultimately leading to the attainment of desired outcomes. Lewin's change model illustrates the "Unfreeze-Change-Refreeze" concept emphasizes the alteration of human behaviour. He posits that change is a systematic process involving the establishment of a recognition that change is necessary, followed by a transition towards the desired behavioural state, and ultimately, the reinforcement of that

new behaviour as the standard practice. The model comprises three distinct phases: unfreezing, changing, and refreezing. The unfreeze stage cultivates an understanding among individuals regarding the existing state of affairs and elucidates how it obstructs advancement towards a more favourable outcome. The change stage represents the implementation of the desired outcome, while the refreezing stage serves to solidify this change, ensuring that individuals do not revert to their previous habits.

The model was found to be well-suited for this study, as marketing represents a multi-dimensional approach that involves interactions among various stakeholders across multiple tiers. Therefore, it was essential to strategically encourage smallholder farmers, who currently exhibit minimal engagement in the ALVs market, to transition from this passive position to becoming active contributors within the ALVs market. Lewin's change model was therefore employed in this study to assist farmers in recognizing the challenges and opportunities associated with ALVs marketing, facilitating efforts to mitigate the challenges and leverage the available opportunities.

The RCT experimental design systematically allocates participants to various treatment conditions, assessing the efficacy of the intervention by comparing the outcomes of those who received the treatment with those in a control group, who either underwent an alternative treatment or received no intervention at all. A methodically crafted RCT enhances the dependable discernment of intervention effects amidst intricate and multifaceted causal pathways ^[7]. This investigation utilized a randomized controlled trial design, comprising two distinct treatment cohorts: one receiving the intervention and the other serving as the control group. (Table 1).

Table 1: Illustration of the randomized controlled trial experimental design

	Interventions	
	Treatment group	Control group
Activities	Baseline survey	Baseline survey
	Capacity building sessions	No activities
	End line survey	End line survey

2.3 Sampling Procedure and Sample Size

The study purposively sampled two sub-counties from the five sub-counties in Vihiga County. One sub-county served as the treatment group, whereas the other functioned as the control group. Through random allocation of samples Sabatia Sub County was designated as the treatment group, whereas Emuhaya served as the control group. The sample size was determined through a simple random sampling where the farmers to be interviewed were chosen from the list of the 570 ALV farmers in the sub counties. The sample size was established in accordance with the theorem proposed by Yamane ^[1967], given that the population was already known (570 ALV farmers). The sample size was 150 ALVs farmers.

2.4 Implementation of research activities

Lewin's change model was employed. This research delineated the intervention into three distinct phases (Figure 3). The initial phase focused on "unfreezing" where it involved identification and analysis of challenges, interests,

and opportunities within ALVs value chain. The subsequent phase expanded upon this foundation by collaboratively exploring ways of leveraging on the available ALV market

opportunities and minimizing the challenges. The third phase encompassed the execution of the operations that had been mutually established and firming them up.

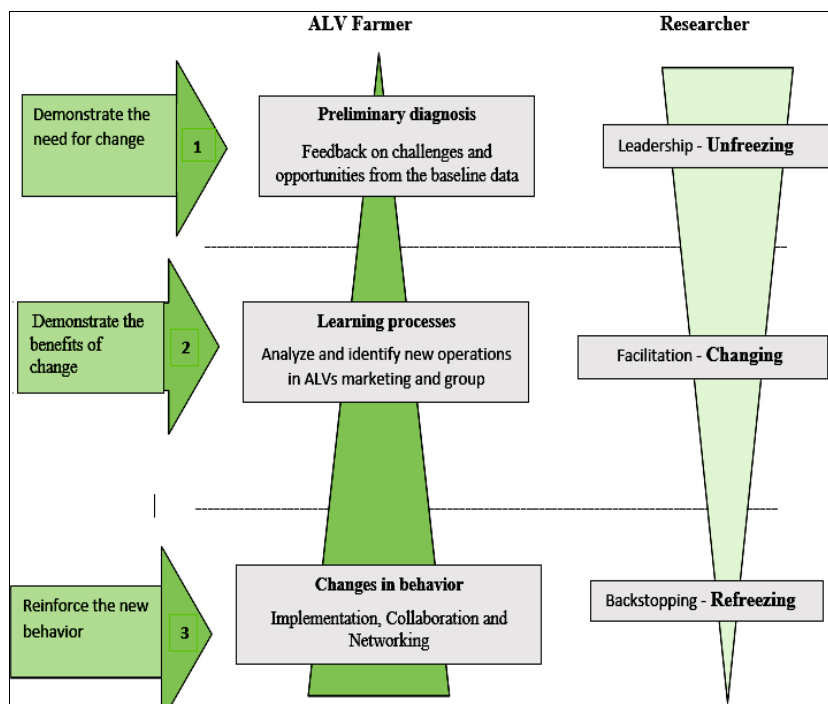


Fig 3: Modified Lewin's Change Model for improving market participation by small scale farmers

3. Results and discussion

3.1 Distribution of respondents in the baseline and end line study

The results are categorized into the two study groups (treatment and control). The groups were; Sabatia sub-County which served as the treatment group, and Emuhaya sub-County as the control group. Baseline and end line data

were collected at the beginning and at the end of the study. During the baseline study, a comprehensive interview was conducted with a total of 167 ALVs farmers with fifty-one percent being farmers from control group and forty-nine percent were from the treatment group. While in the end line study, 57% of the respondents were from the control and 43% were from the treatment group.

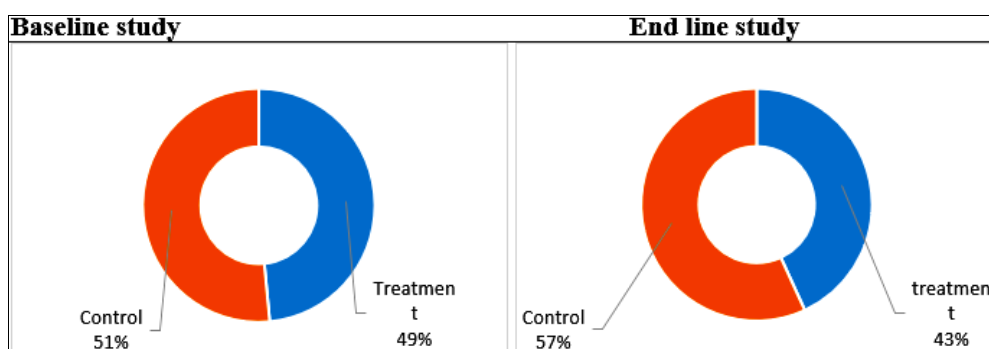


Fig 1: Percentage distribution of respondents in the baseline and end line study

3.2 Relationship among ALV Farmer Group Members

Belonging to a farmer group allows individual farmers to act more collectively, and in doing so, they form a synergy effect where the combined effort put in by the group can help members reach their goals more effectively than if they were working individually. However, the relationship within the group will determine the success or failure of the group. During the intervention phase of the study, the treatment group was trained on the importance of building their social capital through having a cohesive group and how they can use this strength to market their vegetables. Results in table

1, show that there was a significant difference ($p < .003$) in the strength of the relationship between the treatment and the control group. The percentage of farmers reporting the relationship in their group was strong was higher (55.5%) in the treatment group compared to the control group (30%). Conversely, those who reported the relationship in their group was weak were more in the control group (30%) compared to the treatment group (2.2%). This is an indication that the training on the importance of building having a cohesive group had changed the status of the treatment group when compared to the control group.

Table 2: Respondents perception on relationship in the farmer groups they belong

Relationship rating	Experimental group						Test statistics χ^2
	Control-Emuhaya		Treatment-Sabatia		Total		
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Very strong	2	6.7	6	13.3	8	10.7	.003*
Strong	9	30.0	25	55.6	34	45.3	
Average	10	33.3	13	28.9	23	30.7	
Weak	9	30.0	1	2.2	10	13.3	
Total	30	100.0	45	100.0	75	100.0	

A similar study by ^[13] illustrate the complex interplay between relationships, social capital, and market access by smallholder farmers. The study, underscored the critical role strong relationships in bridging gaps that hinder market access for smallholder farmers. In a similar study, ^[30] reveals that connections can facilitate better economic outcomes for farmers by providing informal lending and market information. Results of this in relation to other similar study therefore unravels the importance of quality social relationships in enhancing the economic conditions of farmers, in accessing markets.

3.3 Mode of Marketing African Leafy Vegetables

Marketplace choice is a key part of strategic marketing programs that could help farmers improve their income. ^[16]. This study sort to find the common mode of selling ALVs after the farmers had been trained on marketing and choice of market place.

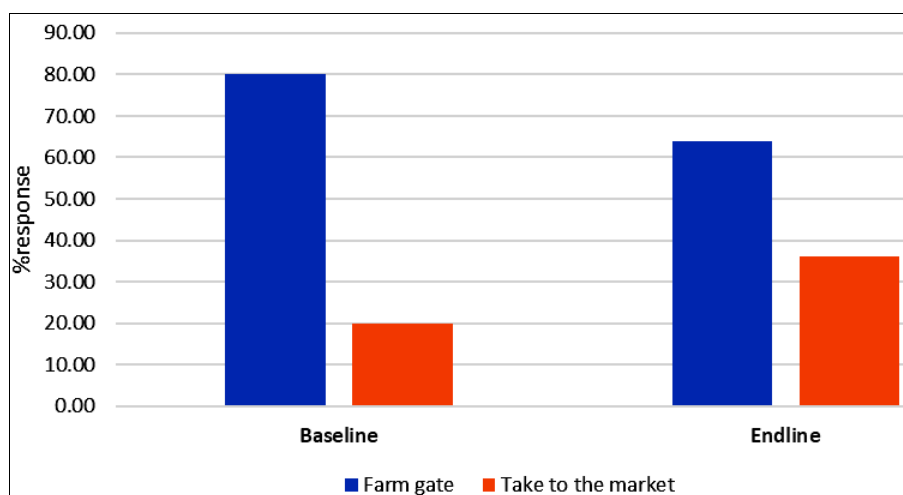
Results in Table 2 show that though in both the control and the treatment group majority of the farmers (63.8%) sold their produce at farm gate, there was a significant difference ($p < 0.03$) between the two groups. The farmers who sold their ALVs at farm gate were more in the control group (70.7%) compared to the treatment group (58.5%).

Table 3: Mode of marketing ALV

Market type	Sub-County						Test statistics χ^2
	Control-Emuhaya		Treatment-Sabatia		Total		
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Farm gate	29	70.7	31	58.5	60	63.8	.029*
Take to the market	12	29.3	22	41.5	34	36.2	
Total	41	100.0	53	100.0	94	100.0	

However, looking at the trend of the mode of sale of ALVs in Figure 3, the sale of ALVs at farm gate had reduced from 80% during baseline study to 64% during end line study. These could be associated with the intervention on capacity building on marketing and creating good market network. It is important to note that the sales through market place was below 50% in both groups of study. This could be associated by the fact that ALVs is majorly done by women hence they may prefer farm gate sales since they have other roles to accomplish at the homestead. The farm gate option

therefore becomes more convenient for them. ^[33] notes that, households run by women are more likely to engage in farm gate sales, since they can often rely on support from family members when there is competition for their time. There is need to educate smallholder farmers on the need of having a strong bargaining power so that they are not exploited. Results by ^[6] concurs that the further the distance from other markets, the more the involvement of vegetable growers in open markets in the nearest centres.

**Fig 3:** Trend in farmers' mode of selling ALV

Strengthening agricultural infrastructure such as physical infrastructure like transportation, storage, processing facilities, financial services and market information systems

is crucial for promoting the marketing of farm produce in developing economies ^[12, 18].

3.4 Farmers' Perception of their Ability to Keep Farm Records

The ability of smallholder farmers to maintain effective production and marketing records is a critical aspect of enhancing agricultural efficiency and profitability. This study's results shows that in terms of record keeping there was no significant difference ($P>.40$) between the control and treatment group. However, the percentage of farmers who kept their ALVs records was higher in the treatment group (53.7%) as opposed to the control group (45%) (Table 3). The results outcome could be associated with the practical sessions on record keeping sessions the treatment group received during the intervention phase.

Table 4: Farmers' Perception on their ability to keep farm records

Rating	Sub-County (%)			Test statistics χ^2
	Control group - Emuhaya	Treatment group-Sabatia	Total	
No	55.0 ^[22]	46.3 ^[25]	50.0 ^[47]	.404
Yes	45.0 ^[18]	53.7 ^[20]	50.0 ^[47]	
Total	100.0 ^[40]	100.0 ^[54]	100.0 ^[94]	

*Figures in parenthesis are frequencies

3.5 Type of Record Kept

Further analysis showed that majority of the farmers both in the treatment and control group kept sales record while the transaction cost record was the least kept record (Figure 4). These results tally with results by^[31] who noted that majority of the respondents did not keep comprehensive farm records^[20] expanded on the theme of record keeping by examining its implications for evidence-based decision-making and traceability in livestock farming. They noted that many small-scale farmers struggle with inadequate record-keeping practices, often resulting in fragmented or

missing data.

The variation in the type of records kept could be associated with the farmers' interest in the particular records kept. However, it is important for farmers to keep all their farm records because it is beneficial to their farm enterprises. Accurate record-keeping plays a vital role in the broader agricultural development and marketing.

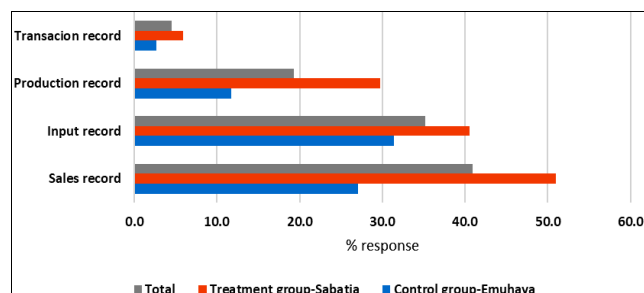


Fig 4: Type of record kept by the farmers

3.6 Relationship between the farmers' socioeconomic characteristics and their ability to keep record

The study sought to find out the relationship between farmers' ability to keep records and their socio economic characteristics. Results in table 5 show that age of the farmer and education level significantly ($P>0.5$) affected farmers' ability to keep record. The farmers who had primary education achieved above average rank in record keeping compared the other levels of education. This could be associated by the fact that those who had secondary and post-secondary education could be engaged in other income generating activities hence may not have time and the commitment to keep farm records. Gender of the respondent did not influence ability to keep record.

Table 5: Socio economic characteristics that influence record keeping ability

	Above average		Below average		Total		Test statistics χ^2
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Education level							
None	0	0.0	9	22.0	9	11.3	.000*
Post-Secondary	9	23.1	1	2.4	10	12.5	
Primary	6	15.4	28	68.3	34	42.5	
Secondary	24	61.5	3	7.3	27	33.8	
Total	39	100.0	41	100.0	80	100.0	
Gender of the farmer							
Female	26	66.7	29	70.7	55	68.8	0.695
Male	13	33.3	12	29.3	25	31.3	
Total	39	100.0	41	100.0	80	100.0	
Age of the farmer							
18-35	5	12.8	4	9.8	9	11.3	.000*
36-45	16	41.0	7	17.1	23	28.8	
46-55	11	28.2	3	7.3	14	17.5	
Above 55	7	17.9	27	65.9	34	42.5	
Total	39	100.0	41	100.0	80	100.0	

A farmer who maintains an adequate set of records can handle problems better than the one who does not, however, farmers often consider it as a difficult task (Poggio, 2006). The farmers could be finding it difficult due to their level of education and age.

3.7 Farmers' ability to meet the demand for ALVs

The ability of smallholder farmers to meet the growing

demand for local vegetables is an issue that has garnered increasing attention by the development agencies.^[32] argued that in order to effectively reduce poverty, policymakers and researchers should consider the potential of traditional markets, which may offer more accessible and profitable opportunities for small-scale farmers. This study sought to find out the ability of the farmers to meet demand for the ALVs they plant. The study results in table 6, shows

that there was no significant difference in the ability to meet the demand in the treatment and control groups. However, the percentage of farmers who had the ability to meet

demand for the vegetables were higher (21.2%) in the treatment group compared to those in the control group (12.2%).

Table 6: Farmers' ability to meet the demand for ALVs

Rating	Control group - Emuhaya		Treatment group - Sabatia		Total		Test statistics χ^2
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Always meet the demand	5	12.2	11	21.2	16	17.2	.276
Don't meet demand	11	26.8	7	13.5	18	19.4	
rarely meet the demand	9	22.0	9	17.3	18	19.4	
Sometimes meet the demand	16	39.0	25	48.1	41	44.1	
Total	41	100.0	52	100.0	93	100.0	

This results are associated with the capacity building session done to the treatment group during the intervention stage of the project. The components taught include profitability of ALVs using the gross margin analysis, SWOT analysis of ALVs and marketing strategies. This could have motivated the farmers to produce more hence were able to get enough surplus to sale to their clients. It is important to acknowledge that smallholders are a diverse and dynamic group, navigating complex environments where multiple factors intersect ^[2]. Therefore, there is need for research and development to aid the farmers especially in navigating through the highly competitive market.

3.8 Farmer groups commitment towards group marketing

In the context of smallholder farmer groups, collective marketing mechanisms can be an asset to improved

marketing of their product, however, this is effective to a market-oriented farmer group. Benefits of group marketing was one of the key aspects taught during the capacity building sessions to the treatment group. The study therefore sought to find out perception of farmers on group marketing after one ALVs cropping session. Results in Table 2 show that there was a significant difference ($P < .005$) between the treatment group and control group in their perception on their groups commitment on group marketing. Though majority of the farmers (35.7%) in the control group felt the relationship was strong, a larger portion (28.6%) felt the commitment was weak. On the other hand, the proportion of farmers who felt the groups commitment to group marketing was very strong was higher (15.7%) in the treatment group than the control group (7.1%). This could be associated by the capacity building sessions conducted in the control group on benefits of group marketing.

Table 2: Groups commitment towards group marketing

Rating	Treatment groups			Test statistics χ^2
	Control group - Emuhaya	Treatment group-Sabatia	Total	
	Percentage	Percentage	Percentage	
Average	28.6 ^[8]	51.1 ^[23]	42.5 ^[31]	.005*
Strong	35.7 ^[10]	31.1 ^[14]	32.9 ^[24]	
Very strong	7.1 ^[2]	15.6 ^[7]	12.3 ^[9]	
Weak	28.6 ^[8]	2.2 ^[1]	12.3 ^[9]	
Total	100.0 ^[28]	100.0 ^[14]	100.0 ^[73]	

Figures in parenthesis are frequencies

3.9 African Leafy Vegetable Market Network

Market networks are valuable not just for large corporations but also for those at the bottom of the pyramid ^[19]. Small-scale farmers, for example, face logistical challenges in selling the surplus agricultural produce. Although empirical studies ^[23, 1] show the importance of social networks in the diffusion and adoption of agricultural technologies, researchers and policymakers have not fully explored the use of social networks to enhance smallholder ability to access and participate in markets.

This study sought to find out the ALVs market network in the study sites using the social network theory. Figure 5 shows these network structure in the study sites. This structure is composed of nodes which represent actors in the market value chain who are either individuals or groups. The interaction was found to be limited within the region.

For instance, only one single clique containing the players from Sabatia (Treatment group) crossed regions and was connected to one of the major sub-group of the network in Emuhaya (control group). The biggest sub-group of 21 players was found in Emuhaya. However, a number of subgroups of 5-10 players were found in Sabatia (5 subgroups). Equivalent nodes which are connected to a similar set of actors, are more likely to obtain similar information or social influence. Majority of the nodes has a linear network link with less than 4 connections. Linear links are not beneficial to the farmer since their source of information on marketing are limited. Farmers with wider networks have better access to critical information, while those with less ties experience more challenges since social network affects the flow of information and access to it.

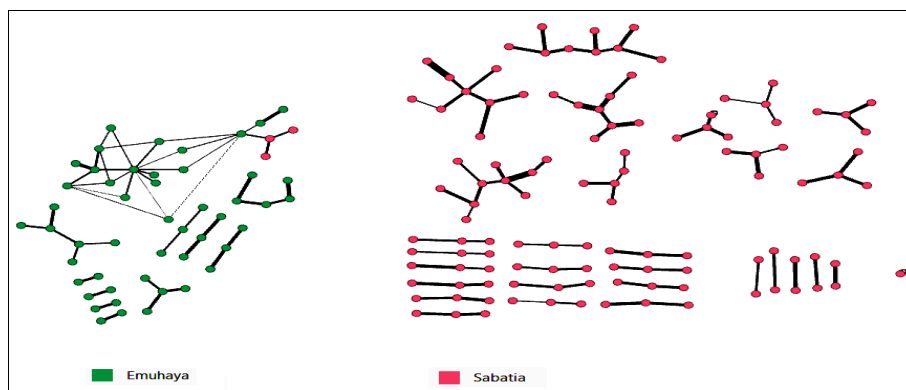


Fig 5: ALVs market network by study sites

According to ^[15] in their study they note that the success of farmers markets is tied to the social positioning and cognitive anchoring of market actors. The communication and shared experiences fostered by these networks create a foundation for confidence among exchange partners, thereby promoting effective market interaction. According to ^[29] an individual's position in a network is presumed to be determined by social and economic attributes and these can be leveraged to efficiently and effectively disseminate information within a network. ALVs farmers therefore need to form stronger networks for them to benefit from the networks.

3.10 Strength of Relationship of ALVs Market Players

Various studies have shown that the strength of networks significantly influences the marketing capabilities and economic outcomes for smallholder farmers ^[9]. In this study, results show that most farmers were connected to smallholder consumers both in the treatment and control groups. The strength of the relationship was depicted by the thickness of the connecting line. The thicker the line the stronger the relationship. The strength of relationship was found to be stronger for many connections in Sabatia (treatment group) than Emuhaya (Control groups) as seen in subgroup labeled E,F,M in Figure 6. This could be associated by the ALVs marketing strengthening initiative undertaken in the treatment group, which enabled the farmers to strengthen their ties within their networks.

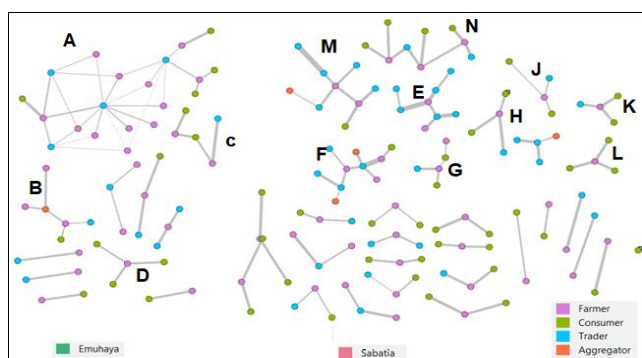


Fig 6: Type of ALVs market players

Farmers with stronger, wider networks have better access to critical information, while those with weaker ties experience more challenges since social network affects the flow of information and access to it.

4. Conclusion and Recommendation

The results show that change model was successful enhancing in farmers marketing skills. There was a positive trend in various aspects of marketing. For instance, farmers reporting the relationship between them and their ALVs customers had grown stronger was higher in the treatment group compared to the control group. The farmers who attempted to sale their ALVs at the market as opposed to farm gate had also increased in the treatment group. In addition, farmers in the treatment group, improved their record keeping skills as compared to the control group. The study recommends Lewins change model in agriculture extension studies.

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