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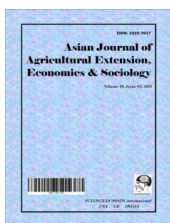
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The Impact of Agriculture Extension Training Programs on the Extension Services in Kenya

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Authors' contributions

This work was carried out in collaboration between both authors. Author NM designed the study and wrote the protocol. Author JV carried out all laboratories work, performed the statistical analysis and edited the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Many studies have shown challenges and in some cases major failures toward the training programs sponsored by extension services. Extension services in Kenya are supposed to help local farming communities' increase their productivity towards the survival of the agriculture industry in Kenya. Farming is the main source of income and survival for many Kenyans therefore; this research looked in to the perceptions of the farmers toward the extension services in Kisumu district, Kenya. Another part of this research was to discover the preference of the farmers toward different extension approaches to create motivation for the farmers, to participate in the extension training programs. The research showed a significant motivation factor presents in the farming community of Kenya, to learn new techniques to improve their farming practices and to become more profitable. However, due to lack of organization and planning by the extension services, farmers got discouraged to attend any training or workshop in their farming community. Another factor is the non-supportive government incentives toward extension services. Many extension agents could not be found in the farming communities to provide farmers timely information and guidance toward their problems. Lastly, the extension workstations were without proper technology

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and resources due to lack of funding by the government, which created a dilemma for the Kenyans farming community.

Keywords: Extension; rural development; training programs; Kenya.

1. INTRODUCTION

1.1 Background of the Study

Almost all countries in the world deliver some type of extension service to help rural people advance their agricultural productivity and improve their living standard [1]. Extension is responsible for serving about 900 million-community scale farmers in the world [2]. Therefore, improvement of agricultural sciences and technology has brought about dramatic changes in the agricultural sector [3]. This has led to the increased need and opportunity for investigating the effectiveness of agricultural extension services in various parts of the world. Also, this situation stimulates the need for new approaches to promote the transition of new innovations into concrete benefits to poor farmers in developing countries [4]. East Africa is among the places with the largest extension system in Africa [5], and studies have indicated that the agriculture sector in this part of Africa has not shown significant improvement in production and bettering peoples' lives in rural areas [6].

In Kenya, there are still no substantial improvements in agricultural and livestock production among small-scale farmers despite extension decentralization efforts made to ensure that extension services are available to many farmers [7]. Kenya suffers from low agricultural productivity due to a number of factors including an inadequate extension system leading to ineffective dissemination of technologies, poor market linkages; weak links between research and extension, and inadequate government support [8].

Other issues affecting efficiency of the extension system include poor organizational structure, poor administrative and institutional structure, lack of small business contribution in the future development, and untimely provision of extension services [9,10]. Research has been conducted to address these issues by [11,12,9,13-15] but there is insufficient research toward the role of the clients based (farmers) in the effectiveness from the perspective of extension services. In his study, [16] pointed out

that the "Farmer Advisory Committees (FACs) have been successfully used to ensure full stakeholder involvement in program planning and to increase farmers' accountability".

Kenya's economy depends on the agriculture sector, which contributes the half of the GDP and Kenya's workers about 80% of the workforce [17]. There is a need to strengthen the extension services by incorporating ideas of small-scale farmers who dominate this sector in Kenya [18]. [11] pointed out that weak perception of technology, low education of farmers, disorganization, and lack of knowledge among extension agents are some of the factors that affect the success of extension trainings. Because extension deals with people [19], there is a need to understand these people's perceptions about what extension programs deliver to them. As stated by [19], "clients must desire the activities which an extension agent promotes" (p. 117). Therefore, there is a need to know the extent to which farmers want the agricultural educational activities in their areas. [20] further pointed out that the levels at which farmers adopt agent recommendations are very low. The role of extension is to empower farmers and enable them to identify and analyze their agricultural problems so they are able to make correct decisions [21]. This justifies the importance of understanding the perceptions of the clients served so that the clients can be effectively involved in extension program planning and promote their ability to adopt the technologies delivered.

As stated by [22], "the satisfaction of human beings in their social associations depends on the expectations they bring to them as well as on the actual benefit they receive in them" (p. 89). Thus, the current study aimed to identify farmers' level of satisfaction in extension education programs to help in the modification of the extension programs to satisfy farmers' preferences. [23] pointed out, "Much is said about the importance of involving farmers in extension education programs, but such involvement is often a token gesture". Therefore, there is a need to understand farmers' perceptions in order to find better means of helping them effectively participate in the

extension education programs by developing programs and use of methods that meet their requirements.

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Agricultural extension

Agricultural extension is a component of agricultural education mostly known for serving rural farmers. Many scholars have conducted studies on various aspects related to agricultural extension. It is estimated that crop and livestock production started about 10,000 years ago. Throughout this period, farmers have adopted various technologies, tested them, and shared them with other members in the community. The communication process has taken the form of verbal explanation and practical demonstrations.

2.1.2 Agricultural extension in Kenya

In Kenya, agricultural extension services provided mainly through the Ministry of Agriculture Livestock & Fisheries [24]. The ministry also provides room for private sectors to participate in improving the delivery of agricultural related services to farming community. On the same time, the public sector puts more emphasis on policy formulation, financial provision, and regulation of those deliveries of agriculture related services [24]. The extension services can be strengthen provided by the ministry is to bring about stakeholder concept for the farmers into the extension services to hold extension agents accountable for their actions. This will be achieved if, and only if, farmers have a positive perception and appreciate the significance of the extension services. The ministry is restructured to create opportunities for the small farm owners, which will easily adopt the change and implement any changes toward the problems and needs [15].

2.2 Empirical Literature Review

Farmers' participant has been a concern of many projects. [15] mentioned the main aims of Kenya's National Extension Program (KNEP) is to initiate farmers' participation in agricultural extension. This (KNEP) was funded by the World Bank to improve the extension related services to the smallholder farmers. To create a "demand driven" national agriculture extension system,

farmer involvement through a formal process and the informal consultations in policy preparation through a periodic review has to be done [25]. In this regard, farmers with a clear understanding of agriculture extension that can bring about the successful use of extension system, which will effectively address farmers' need. As pointed out by [13], an effective extension system should identify farmer needs and problems and determine the best solutions. According to the KNEP, Kenya is suffering from low agricultural productivity due to a number of factors including an inadequate extension system, poor communication linkage between higher education to help extension with up to date research, and climatic changes.

Alonge [26] studied the perceptions of extension personnel. He identified factors that affected the extension services in many developing countries as being staffed with ill trained and ill-equipped village extension workers and working in unfavorable environments. Poor resource farmers have access to only the village extension worker. The current study tried to connect the farmers' perceptions to what extension agents deliver to them. [27] pointed out that most agricultural extension training activities are based on voluntary participation. Therefore, in order to have farmers voluntarily participate in extension training, their needs and preferences have to be addressed. Different groups of farmers have varying needs for extension training. For instance, the study by [27] revealed that farmers' need for extension services differ based on age, number of cattle owned, and educational level. Furthermore, a study by [20] revealed that "some farmers indicated that they do not want any extension advice and some do not want the current service to continue".

2.2.1 Role of extension in developing counties

Mattee [13] pointed out that "it is truism to state that the effective transmission of research findings to farmers is essential if research efforts are to contribute to agricultural progress". He added that this requires an effective agricultural extension system that links effectively with research and works very closely with farmers. Maunder (1972, as cited in [28]) mentioned that the factors that push the advancement of agricultural extension in developing countries were: (a) threat of famine, which forces governments to take measures to improve food production; (b) social unrest among rural people

has made it politically imperative to give assistance in bettering their levels of living; (c) newly independent countries have found that agricultural modernization is a first step toward economic development and freedom from economic dependence on more powerful and advanced nations; and (d) a recognition that people in rural areas, who make up the majority of the population in most countries, have a right to equity for an advanced and better life. These factors provide the necessity to understand the needs of the farmers and develop means that will facilitate their participation and adoption of new and approved practices. A study by [29] revealed that non-adopters are more likely to be constrained by less contact with extension employees.

2.2.2 Delivery method preference for extension services

There are various means used by extension agents for delivering information to farmers. Extension is the process of getting farmers to do what they would otherwise disregard [19]. In this regard, prior preparation and proper selection of the delivery methods must be done so as to achieve this aim of extension. As stated by [25], there is no one extension approach suitable for all situations, objectives, or clientele. Most of the extension programs focus on adult farmers. Characteristics of adult learners, as outlined by [30] include: (a) they are mature, independent, and self-directed; (b) they have a reservoir of experience that can be resourceful for learning; (c) readiness toward the task related social development in their communities; and (d) preference to learn things that will be applied immediately in their daily life. In delivering extension training, these traits have to be taken into account so as to encourage active participation among learners (farmers) and improve the adoption rate. Research has shown that, for effective adult training, providers (extension agents) have to ensure that farmers get something to take home with them [31]. The commonly used extension approaches in Kenya include the training at their farm site, contract farming, community farmer extension, farmer field schools, farming systems approaches, and participatory extension [24].

2.2.3 Farmers' access to agricultural information

The public extension service is the main source of information about agricultural activities [20]. [32] mentioned radio, village meetings, and

extension meetings as sources from which farmers obtain information about market issues, agricultural technologies, and climate forecasts. Furthermore, [20] stated that hearing agricultural information on the radio helps encourage farmers to look for more detailed information that will convince them to pay for some agricultural extension services. "Communication and sharing of knowledge from farmer to farmer has remained to be the main methods despite of the inadequate reliability of information and experience shared among them" [32]. Also, some farmers use cellphones to share their indigenous knowledge of agricultural production with others [32,33]. [32] argued that the implementation of cellphones in rural areas in Kenya has helped spite of the limited recourse of income among farmers; this is facilitated mainly in the decrease in prices for mobile services and increased network coverage.

2.2.4 Factors affecting extension education programs in developing countries

The extension education system for training farmers is provided in many African countries, but it has had little impact in the home villages of the farmers [34]. [19] pointed out that a lower salary level and fewer resources for field extension agents as compared to those at the "headquarters" represent the major factors that lower the effectiveness and efficiency of extension systems in most developing countries. The other problem mentioned by [19] in the ministry-operated extension service is the financing needed for working facilities, such as vehicles and inputs needed for effective extension operations. [35] also criticized the ministry-based extension system in that it is too bureaucratic and extension agents have no authority to change the definition of their duties. This is also a common problem in Kenya as a large part of extension services are conducted through the Ministry of Agriculture Livestock & Fisheries.

Another factor affecting extension in Kenya is the bureaucratic system; as explained earlier, the extension agents are civil servants in that "their allegiance is more to the government as the employer rather than to the farmers" [13]. As a result, extension agents pay more attention to the employers' demand compared to the immediate needs of farmers. In the meantime, farmers have no power to direct the tasks of extension agents or to express their desires and concerns; instead, they are offered what the extension agent is willing to present [13]. One

additional factor is that farmers have limited accessibility to extension agents; "because of the dispersed nature of the field staff, few farmers have direct contact with these agents as and when necessary" [13]. On average in Kenya, one extension agent is responsible for serving 1,000 farming households; in reality, it is hard for the extension agent to serve them all [13]. The number of extension agents in Kenya does not correlate with the need [24]. Furthermore, [24] pointed out that the lack of prioritizing crops in specific areas leads to extension agents providing services regarding many crops, which reduces their efficiency.

3. METHODOLOGY

3.1 Nature and Sources of Data

The purpose of this research is to assess the general perceptions of Kisumu district farmers regarding extension-training programs; the following are the objectives:

1. Identify farmers' general perceptions about agricultural extension training programs,
2. Identify the extent, to which farmers participate in agricultural extension education training programs,
3. Identify preferred methods for delivering agricultural extension training programs,
4. Identify factors that influence farmer participation in agricultural extension education training programs, and
5. Identify selected demographic data and analyze the comparisons among variables.

This study looked into the target group perceived the extension services. Knowing this, extension service providers can be aware of what best can be done to meet target group needs and foster advancement of the agricultural sector by encouraging more farmers to participate in extension training and adopt the given technologies. It will help in planning extension programs by incorporating ideas that will foster positive perceptions of extension among farmers regarding recommendations that are given. As stated by [36], "farmers' receptivity to training largely depends on the use of several educational methods by extension agents to reach farmers". Therefore, this study helped to identify farmers' most preferred methods so as to improve their receptivity of extension education programs and, hence, their success and eventual improvement of agricultural production.

3.2 Nature and Sources of Data

The agricultural extension is not effective unless the activities are based on substantially to the attributes of farming community receiving and using the information [37]. From this study, knowing farmers' perceptions of extension training will help greatly in modifying the information that extension offers in order to fit farmers' needs. The results of this study can help to make the information delivered more meaningful and more accepted by farmers. [38] indicated "Little information exists about perceptions of farmers on extension courses and instructors". This comment shows why this study is significant toward the developing counties in the particular agricultural sector in Kenya.

The findings of this study will help in improving the competence profiles of extension agents based on farmers' attitudes and expectations. [38] pointed out that understanding the characteristics of a target group (farmers) has a lot to do with improving competency profiles for extension agents as professionals. This is because extension workers need to be equipped with specific techniques to help specific groups of people based on their characteristics and identified needs.

4. PRESENTATION OF RESULTS AND ANALYSIS

The findings identify farmer perceptions about extension education programs provided in the country and how it affects participation and, hence, the effectiveness of extension training programs. The study also identified the motivational factors that influence farmer participation in extension education programs as mainly to gain new ways of farming for enhancing farmers' economic well-being through improved agricultural production.

4.1 Demographic Characteristics

The gender distribution of the research participants is sixty percent ($n = 72$) of the participants were male. Of the farmers interviewed, most of them 79.2% ($n = 95$) were married. Only 5.0% ($n = 6$) were single, whereas 1.7% ($n = 2$) were divorced and 14.2% ($n = 17$) had partners who had died. A majority of the participants interviewed 84.2% ($n = 101$) were native to their respective village, leaving only 15.8% ($n = 19$) who had migrated to their

respective villages. The most prevalent age range, represented by 40.8% (n = 49) of the farmers interviewed was 46 to 50 years of age. Only 3.3% of the participants were between 18 and 25 years of age, and 5.0% were 56–60 years of age. The active group of the participants (36–45 years of age) comprised 23.3% (n = 28) of the farmers interviewed. Almost half of the farmers (48.3%, n = 58) owned about two to five acres on which different crops were being grown. Just over one third of the participants (34.2%, n = 41) owned more than 10 acres, but most of them indicated that they did not cultivate all of it. Instead they leased some of it to other farmers in need. In addition, 17.5% (n = 21) of the participants had farms with less than 2 acres. Most of the farms were not located at one site. Farmer level of education is indicated in 4. A majority of the farmers interviewed (66.7%, n = 80) had completed standard seven, and 25.8% (n = 31) had completed standard four. Only 4.2% (n = 5) had completed form four level of education, and 3.3% (n = 4) had never been to school. Cows and pigs were the most common livestock kept by most participants, and very few farmers (8.3%, n = 10) did not keep any animals. Other animals raised included goats and chickens. Maize and tomatoes were the major crops grown in the district.

4.2 Understanding and Awareness of Extension Services

As indicated by the participants 50.8% (n = 61) of the participants interviewed had no idea about the meaning of extension, whereas 22.5% (n = 27) had some understanding of the meaning of extension and the remaining participants (26.7%, n = 32) claimed to understand the meaning of the term extension. Farmers who claimed to understand this term were asked to explain it. Most of them were correct in their description. Those who had no idea about the meaning of this term were told the meaning during interview session. Of the farmers interviewed, 85.0% (n = 102) indicated that they knew the extension agent for their respective area, and the remaining 15% (n = 18) stated that they didn't know the extension agent in their respective area. Just over half (51.7%, n = 62) had ever attended extension training programs in their respective area, but not all of them had attended training programs provided by the local government extension agent. Of the households visited, 16.7% (n = 20) of the participants mentioned a woman as the one who attended the training program, whereas 13.3% (n = 16) of the families

mentioned a man as the main attendant at the training program. In addition, 19.2% (n = 23) of the families reported that both parents attended agricultural training program, and only 0.8% (n = 1) reported that all family members attended training programs when available.

4.3 Extension Agents Performance from the Farmers' Perceptions

The mean scores based on Likert-type measurements based on the farmers' perceptions about the quality of the extension agent working in their respective areas are displayed in Table 1. The mean score of farmers' perceptions and views about the performance of the extension agent in providing useful ideas to help farmers improve production was 3.5, whereas the mean score of their perception of the availability of the extension agent in helping farmers when they are in need was 3.3. Furthermore, the mean scores of the farmer's perceptions of the extension agents' preparedness for the training programs was also rated 3.5; extension agents having all training facilities was rated 3.1; extension agents being friendly and easily approachable was rated 3.6; and extension agents providing continuous support to help farmers implement technologies was rated 3.8 As shown in Table 2, 47.5% (n = 48) of the farmers interviewed disagreed with the statement that extension agents play a great role in helping farmers improve production, whereas 40.3% (n = 45) agreed with the statement and the remaining 41.2% (n = 42) responded that they didn't know. Most of those who disagreed with the statement explained that extension agents did not visit them and most of the time the advice given was not useful.

4.4 Ministry Support toward the Extension Services through Farmers' Perceptions

Farmers' perceptions of how the government supports extension services in their respective areas are displayed in Table 3. The majority of the farmers interviewed (76.5%, n = 104) disagreed with the statement that the ministry plays a critical role in uplifting farmers through the extension service. The mean score of the responses for the statement that Ministry plays a critical role in helping farmers through the extension service (M = 5.0; rated on a Likert-type scale of: 1 = *strongly agree*, 2 = *agree*, 3 = *I don't know*, 4 = *disagree*, and 5 = *strongly disagree*) indicates that most farmers disagreed with this

Table 1. Participants' perceptions of extension agents' efficiency in training and helping farmers (N =135)

Perception	N	Minimum	Maximum	M	SD
Extension agent provides good ideas that help improving my production	135	2	4	3.5568	0.99921
availability of extension agent to help farmers	135	2	5	2.9217	0.75561
Extension agent well prepared during training session	135	1	5	3.3091	0.54559
Extension agent has all training facilities	135	1	4	3.5511	0.44522
The efficiency of the extension agent in helping farmers	135	2	4	3.1111	0.89902
Extension agents are friendly and easily approachable for advice	135	2	5	3.5215	0.92223
Extension agent provides continuous support to help the application and implementation of the information taught	135	1	4	3.7581	0.65439

Note. Perception statements were rated on a Likert-type scale on which 1 = strongly agree, 2 = agree, 3 = I don't know, 4 = disagree, and 5 = strongly disagree

statement. Farmers gave various reasons for this perception such as lack of transportation for extension agents, lack of inputs to take care of the demonstration plots where they exist, and the fact that most extension agents do not have quality houses built for them in their assigned villages. This situation forced most of them to live outside of the village and, as a result, it narrowed their accessibility to farmers. In addition, in some villages farmers complained that the government offered them subsidized fertilizers that are not suitable to their area that they "don't know" whether this statement was true or not.

Table 2. Participants' perceptions of extension agents' roles in helping to improve production (N=135)

Do you believe that extension agents play a role in helping farmers to improve production?	n	%
Yes	45	40.3
No	48	47.5
I don't know	42	41.2

4.5 Extension Technologies, Method and Knowledge Preference

Most of the farmers interview (62.5%, n=89) reported that they did not know whether training programs were provided for them in such a timely way to be able to apply the knowledge in the field. This information indicated that many farmers were not keen about what was being

taught and or did not attend most of the training programs. On the issue of applicability of training lessons and technologies, only 32.2% (n = 38) of the interviewed participants declared that the training program given could be easily applied. However, the majority of the participants (66.7%, n =91) reported that they did not know if the lessons provided through the extension services could be easily implemented or not.

The distribution of responses based on the participants' views about the most preferable extension teaching methods, preferable extension approaches, and their preferred way of getting information related to their agricultural production (crops and livestock). Most of the farmers interviewed (85.0%, n = 110) indicated that they prefer learning-by-doing through demonstrations with hands-on activities. Most of the remaining participants (18.2%, n = 22) preferred learning through group discussions and activities. The most preferred extension approach was the training and visit approach (50%, n = 68), which means, according to most of the respondents that the extension agent is required to visit each farmer and give them enough opportunity to explain their problems and get the appropriate advice from the extension agent. The percentages of farmers interviewed who preferred the farmer field school and farmer-to-farmer approaches were 29.2% (n = 39) and 30.0% (n = 32), respectively, whereas contract farming, preferred by only 0.8% (n = 3), was the least preferred, as many farmers in the study area seemed to not be very familiar with the approach. Furthermore, many farmers

Table 3. Participants' perceptions of ministry support for extension (N=135)

Government plays a good role in helping farmers through extension services	n	%	M	SD
Agree	9	6.8		
I don't know	22	16.7		
Disagree	50	38.2		
Strongly disagree	54	38.3		
Overall	35	100.0	5.0000	0.92223

Perception statement was rated on a Likert-type scale of: 1 = strongly agree, 2 = agree, 3 = I don't know, 4 = disagree, and 5 = strongly disagree

interviewed (39.2%, n = 48) commented that they preferred to get agricultural information from their friends who they believed were more experienced than they were. In addition, friends were easily available in their living environment as compared to other alternatives mentioned. Other participants identified local village meetings (35.8%, n = 43) as the best place for participants to get agricultural information. The participants interviewed, 14.2% (n = 18) said that they preferred to get agricultural information through media and another 9.2% (n = 11) received information through cellphones, by which they could easily get market information about various crops via a special system set up by network companies and the MAFC through various crop boards. Only 1.7% (n = 4) of the participants mentioned village notice boards as the best place for them to get agricultural information.

4.6 Kenya's Farmers' Perceptions toward Extension Services Based on Demographic Characteristics

The *t*-test was used to compare the attitude of the participants (farmers) based on their demographic characteristics. The *t*-test helped identify differences in the attitude of the gender among farmers based on their level of education. As shown in Table 4, more men attended extension-training programs as compared to women. However, on the issue of farmers' attendance at extension training in relation to gender, there was no statistical significance difference between males and females at the .05 significance level ($p=.58$).

The results of the analysis of variance shows that there were no statistically significant difference among the levels of education and the farmers' attitude of extension services in the study area (Table 5).

Descriptive statistics indicated that participants at all educational levels had negative perceptions of

extension services and the way programs were offered (Table 6).

Table 4. Participants' attendance at extension training by gender

Have you ever attended extension training program?	Gender	
	Male	Female
Yes	48	24
No	32	31
Mean difference	-1.7886	-1.7886
t	-1.895	-1.895
Sig. (2-tailed)	0.051	-0.052

5. DISCUSSION OF RESULTS

The overall goal of this research is to assess the overall understanding of farming community toward the agricultural extension training programs in Kisumu district, Kenya. This research was to assess the general perceptions of farmers regarding agricultural extension training programs in Kisumu district, Kenya. This research aimed to identify the extent to which farmers participate in extension training programs in their areas, their preference for extension delivery methods, as well as factors that influence their participation in extension trainings in their localities. Furthermore, the study also identified differences in demographic characteristics.

The most of participants were small-scale farmers from the 81 villages of Kisumu district. Of the participants interviewed, 60% were male and 40% were female. This finding is consistent with the study by [39] in which the number of women taking part in extension education training as well, as in this study, the number of men who had ever attended extension training outweighed that of women. The findings regarding the distribution of participants based on age in this study seemed to be consistent with the study by the [40]. Also, in their study, [41]

Table 5. One-way analysis of variance for farmers' perception of extension services by participants' level of education

Farmers perception of extension services	df	M	Sig
Usefulness of extension education programs ever attended	134	3.355	0.051
Extension agent provides good ideas that help improving my production.	134	2.945	0.326
The efficiency of extension agent in helping farmers	134	1.182	0.8
Government plays good role in helping farmers through extension services.	134	2.332	0.362
Do you think the extension service offers what you really need.	134	0.871	0.399
Participation in extension education programs helps to improve my production.	134	2.243	0.479

Table 6. Means of farmers perceptions of extension by education level

Perceptions statements	Never been to school (n = 6)	Standard Four (n = 37)	Standard Seven (n = 84)	Form Four (n = 8)
Usefulness of extension education programs.	4.01	4.13	3.07	2.33
Usefulness of extension agent ideas	4.44	3.33	3.71	3.78
Efficiency of extension agent.	0.11	4.15	4.31	4.10
Government plays a good role in helping farmers through the extension.	5.01	4.01	3.91	4.00
Extension service offers what you really need.	2.90	4.12	4.68	2.90
Participation in extension education programs helps to improve my production.	2.89	3.11	2.99	3.01

Note. Perceptions rated as: 1–2 = positive perception, 3 = neutral, 4–5 = negative perception

concluded that the farming population in most developing countries is aging, thus hindering the agricultural sector in such places to advance to a more commercial basis as the adoption rate among older farmers is lower. The majority of the farmers interviewed were married. This finding is also in line with the study by [40]. The education level of most of the participants in this study was the lowest education level. This is attributed mainly to the fact that most youth, after finishing school, migrate to urban areas looking for a better life. Hence, elders 46–50 years of age, who for one reason or another, have had no access to moving to the urban areas; dominate the agricultural sector in rural areas. In their study, [42] reported that the aim of most youth who get a chance to go to school is to migrate to urban areas and look for opportunities for nonagricultural employment. This shows the negative attitude many youth have about agricultural activities. Moreover, studies have

shown that youth have poor perceptions of the socioeconomic and cultural conditions of their local places [42]. A low education level of farmers also leads to farmers' poor ability to grasp the technologies presented to them [11] which in turn leads to poor farmer attendance at extension service programs as they find it difficult to conceptualize the concepts presented. [41], in their study of subsistence farmers in Botswana, found that the majority of the farmers had only a primary level education and some had never gone to school. This implies that there is a great need for extension agents to be very keen and give special treatment to such groups of farmers so that they can grasp the innovations being introduced to them [41]. The findings of a study by [43] indicated that, of the 237 rural households that were involved in the study in other districts of Kenya, 48.1% of the households were severely food insecure.

6. SUMMARY AND RECOMMENDATION

6.1 Summary

The study also determined that most farmers preferred learning by doing through hands-on activities. Due to the negative perceptions that many farmers had, it was difficult for them to communicate with an extension agent. The study also indicated that there is poor participation in extension training programs among farmers. This is because there is a lack of the use of participatory methods as well as a lack of small farmer groups. Additionally; almost half of the participants did not attend any extension training program every year. The reason given by most of them was lack of information about the training programs conducted in their areas. Furthermore, from the study it can be concluded that farmers are not satisfied with the support that government has to extension services in Kenya. Also the study concluded that, there are no known schedules for providing extension training programs among farmers in Kenya. And farmers are rarely receiving extension-training programs regarding crops they produce. It can also be concluded that there is a weak evaluation system of the extension services offered to farmers in the villages. Generally, the farmers understand the usefulness of agriculture related training programs to increase the output, therefore there is a great need to improve the way services are offered as well as the dissemination of information about training to capture the attention of many farmers regarding the training to be conducted.

6.2 Recommendations

1. In most cases farmers claim that they fail to consult extension agents because extension agents are not experienced enough to help them. This decreases the trust among farmers toward extension agents and, hence, increases the negative perception of extension service in general and poor attendance. Based on farmers' advice, the ministry should provide frequent in-service training and orientation of newly employed extension agents based on the types of crops being produced in their assigned workstations.
2. Where extension agents are livestock professionals, there is a great need to employ other extension agents with expertise in crops. In the areas of crop and livestock areas needed to be emphasis through evaluation to ensure

that, they offer equal opportunities to both livestock and crop producers. The extension system should provide a livestock and/or a crop specialist in areas where they are needed.

3. As indicated by this study's findings, in most cases there is no known schedule for training. The recommendation put forward is that extension agents should have a known schedule for training to help farmers allocate time for such training. This will help to alert farmers of the trainings coming up, instead of bringing it to them as an urgent situation. The extension system should provide and distribute a list of events or training programs well in advance to assist farmers in participating in training programs.
4. Effective collaboration is recommended between public extension services and the private/NGO-based extension system. As cited in this study, most private-based extension services are more advanced, but they cannot cover large areas due to funding problems. To overcome some weaknesses that are evidenced in public based extension, working in collaboration with the NGO-based system might be the solution. Therefore, it is recommended that public- and private-based extension service entities should organize and deliver programs through collaborative efforts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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