

Devolved Farmer's Trainings and Households' Food Security in Makueni County, Kenya

Kalvin Musyoki, Prof. Anne Sande

Chuka University

DOI: <https://dx.doi.org/10.47772/IJRISS.2024.8100168>

Received: 10 October 2024; Accepted: 24 October 2024; Published: 13 November 2024

ABSTRACT

Devolution of agriculture and extension services in Kenya has been implemented for over five years, yet food insecurity has persisted in some counties. Makueni County is one of the food insecure Counties with prevalence above 78%. The gap in knowledge on the role of devolved farmer's trainings on household food security prompted the initiative to undertake the study. The study adopted a descriptive survey research design. The study population was 150,697 households. The target population was household heads and ward agricultural extension administrators. A sample size of 389 respondents was selected. Simple random and purposive sampling methods were used and data was collected through Key Informant Interviews (KII) and questionnaires. Quantitative data was analyzed using descriptive statistics (percentages and mean) and inferential statistics (correlation, regression models and chi-square), while qualitative data were analyzed using content analysis. The results of the study indicated a positive association between farmers training and household food security ($R=0.252$; $P=0.05$). About 58% of the farmers had ability to access agricultural training and about 54% had been trained. It was therefore, concluded that devolved agricultural extension services had positive contribution to household food security. However, the study recommended involvement of all stakeholders in the development and implementation of training program to increase household food security in the study area.

Key Words: Devolution, Agricultural, Training, Household, Food security, Extension, Subsidized

BACKGROUND INFORMATION

Food security dimensions vary from global, regional, national, household and down to an individual level (FAO, 2013). Food availability comprises the physical presence of food due to domestic production, purchase and food aid. The production, distribution and exchange of food can be affected by ownership and utilization of land (Kaynakçı & Boz, 2019). The availability of food at the household is influenced by unsustainable farming practices, poor harvesting and storage technology as well as processing, transportation, and packaging of produce (Shahbaz & Ata, 2014). The ability to access food is influenced by income, land, education, gender, and age of household's members and especially the head who determines food purchase. A household accessibility to food is assured if it's done in a sustainable and socially acceptable manner (Agunga, 2013).

An agricultural education program is a collection of formal and informal, short- or long-term educative activities prepared for a person or institution of farmers to achieve specified agricultural goals (Cai et al., 2019). More precisely, agricultural education interventions aim at promoting knowledge or skill transfers on specific agricultural issues that are thought to benefit farmers (Oduro-ofori et al., 2015). According to Agriculture Intelligent pour le Climate (AIC) (2015), Agricultural training initiatives cover a wide range of areas from; education of drought tolerant crop varieties, crop insurance, climate-smart agriculture, farming inputs support with a major focus on household food security. Although, agriculture training is aimed at improving farmer's farm produce, Grote et al., (2021) argue that the effect of agricultural training on African small scale farmers is not sufficient to guarantee food security.

Since the launch of devolution in Kenya, County Governments have initiated different programs and strategies to improve agricultural food production depending on their specific needs and strengths (Alliance for Green Revolution in Africa, 2018). Counties like Murang'a have improved dairy farming through the establishment of milk processing plants, providing cooling facilities, improving fodder quality for animals and value addition for milk and meat thus increasing household food security and production (Kiambi et al., 2018; Odero-

Waitituh, 2017). To enhance household food security, Wajir County initiated irrigation for crop farming, boreholes, and adoption of solar and wind- powered water pumps for irrigation, recruitment of agricultural extensions officers, establishment of agricultural mechanization services center, the supply of seeds to farmers, revolving fund for farming groups, the value chain for fruits, construction of grain stores, construction of livestock market yards and establishment of revolving fund for livestock pasture and marketing groups (Kiprono & Ibanez Llario, 2020).

Kenya was ranked 87th out of 113 countries as food insecure by the Global Household food security Index established on affordability, accessibility, and value of food products (Claire , Kayitakire, Saisana, 2017; Izraelov & Silber, 2019). In Makueni County, various agricultural and extension efforts have been made to enhance household food security. These include the establishment of six value chains; grain ,fruit, crop, horticulture, dairy, meat, and poultry value chains as well as dispensation plants in order to increase household income (Makhanu, 2019). Despite these efforts Ambale, Kiptui,&Saina,(2018), indicate that in the year 2018 only 21.8% of households were food secure in Makueni County. This justified the need to conduct this study in bid to generate results that could guide policy makers as well as future studies on the influence of devolved agricultural extension services on household food security. The County Government of Makueni also trained farmers on post-harvest management to equip farmers with adequate skills to appropriately handle produce as well as on the construction of food storage structures (Ministry of Agriculture, Livestock and Fisheries, 2017). Despite the efforts, the study area was documented as food insecure, leaving a knowledge gap on the role played by the devolved services on household's food security in the study area.

METHODOLOGY

The study was carried out in Makueni County is located in the former Eastern province. The area was suitable for the study because it had continually remained food insecure despite the efforts made by the County government in respect to devolution of agricultural extension services to enhance household food security. The study assumed a descriptive survey research design. The study population was 150,697 people from five sub-Counties namely Katonzweni, Kibwezi, Makindu, Makueni and Mukaa. The target population was; farmers and agricultural officers. Sampling was done using simple random and purposive sampling techniques. The sample size was 388 people. Questionnaires and interviews were used for primary data collection. Descriptive statistics was used to generate means, standard deviation, percentages and frequencies. The inferential statistics used was spearman correlation and regression analysis. Qualitative data was analyzed using narrative analysis.

RESULTS AND DISCUSSION

The Role of devolved Farmers Training on Household's Food Security

Farmers training promotes transfer of new knowledge and skills to farmers Cai et al., (2019). E.H. & Makhanu (2019), Farmers may not be aware of new developments in agricultural sector in terms of improved farming methods, availability of more productive and improved seeds as well as new pesticides and fertilizers. Therefore, examining the role of farmers training becomes critical in understanding the dynamics of agricultural training and its contribution to household food security.

Ability to Access Training Services on Agricultural Farming

The study explored on the percentage of respondents who had access to training services and the outcome of their descriptive statistics represented in Figure 3.

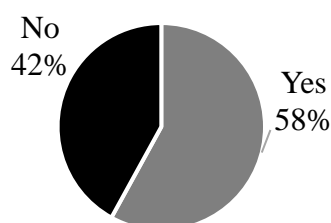


Figure 1: Ability to Access to Training Services on Agricultural Farming

The study outcome revealed that (58%) of study participants had access to advisory services offered by the county government on agriculture while (42%) had no access to agriculture services. The results of the study also portrayed that, though about 89% of the respondents had the desire to be trained on agricultural practices, only 58% had accessed to training opportunities. This prompts the urge to further investigate the causes of the mis-match between desire and accessibility of training services. A report by Mbo'o-Tchouawou, (2014) pointed out that accessibility to agricultural services was the biggest challenge to adoption of knowledge and skills by farmers.

Participation in Agricultural Training

The study investigated the percentage of respondents who were trained on agriculture. A summary of descriptive statistics was presented in Figure 4.

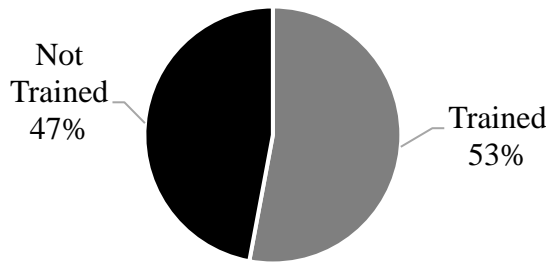


Figure 2: Agricultural Training of Respondents

The findings indicated that 54% participants had attended agricultural training from the county government while 46% of respondents had not received any agricultural training. Although Makhanu (2019) upholds that agricultural training provides farmers with skills and knowledge to help increase food security, Tedson & Olala, (2018) ascertain that the manner in which training of farmer's influences food stability is still a challenge. This is because farmers still experience food insecurity due to other socio-economic challenges. It is important to examine the designs of farmer training Programme that could enhance sustainable food security. security.

The Need for Agricultural Training

The study examined respondents need for training and a descriptive summary of their views represented in Figure 5.

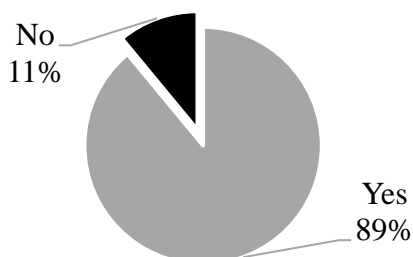


Figure 3: The need for Agricultural Training

The study outcome indicated that 89% of respondents needed agricultural training while 11% of deed no show need for agricultural training. According to Agunga, (2013), most farmers usually have a higher desire to be equipped with new skills and technologies. As indicated earlier only 54% of the farmers accessed the agricultural trainings. This created curiosity in understanding the factors that prohibit farmers from accessing the training Programme.

Benefits of Training on Agricultural Farming

The study investigated respondents rating on the benefit of Agricultural Training and a descriptive summary of their responses represented in Figure 6

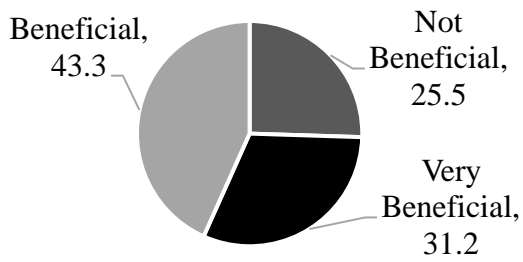


Figure 4: Benefits of Training on Agricultural Farming

From the study outcome majority (74.5%) of the respondents in the study felt that training on agricultural farming by the County Government was beneficial. The results were in agreement with observation by FAO, (2019) where, agricultural training was deemed beneficial in helping farmers adopt new methods of farming to increase food security. Minority (25.5%) respondents expressed the view that training on agricultural farming by the County Government was not beneficial in boosting household food security. The views were supported by results of a study by Tedson & Olala, (2018) which narrated that due to different socio-economic challenges farmers trainings could not solve household food insecurity. The divergence in opinions of different farmers on the benefit of agricultural training initiatives pause need to examine appropriate strategies that could enhance common positive attitude towards the same.

Tests on Different Components of Agricultural Training

The study tested farmer’s opinion on different agricultural training components and results showed in Table 11 below.

Table 1: Agricultural Training on Different Components

Statement	1%	2%	3%	4%	5%	Likert Mean
The county has trained farmers on appropriate management techniques for their farms	8	67	4	17	20	3.79
There have been training services that used a collaborative approach with the community addressed food insecurity	6	2	60	34	19	3.98
Most farmers in my region have been trained on the construction of food storage structures	3	8	72	12	7	4.09
Agricultural training and development services have led to improved food productions	7	12	51	21	15	3.73
Training by the county government has done adequately on drought tolerant crop varieties, crop insurance, climate-smart agriculture, farming inputs support with a major focus on household food security	4	18	66	23	3	3.93

Results in Table 11 shows that(72%)of study participants ascertains that they have been trained on the construction of food storage structures, (66%) of respondents agreed that training by the county government has been done adequately on drought tolerant crop varieties, crop insurance, climate-smart agriculture, farming inputs support with a major focus on household food security and 60% of respondents agreed that there have been training services that used a collaborative approach with the community addressed food insecurity. Further, 67% of the respondents agreed that the county has trained farmers on appropriate management techniques for their farms, and 51% agreed that agricultural training and development services have led to improved food production in Makeni County. The mean response tally (3.90), suggested that majority of study participants believed that training was done substantively on specified components of agriculture.

The study outcome indicates that productive efforts have been made to enhance agricultural productivity in the

study area. This outcome is in agreement with USAID, (2011), that proposes that training on farm management, seed selection and storage facilities increases farmers’ knowledge in enhancing agricultural productivity which in return promotes household food security. So indeed the training program could be assumed as playing a role in enhancement food security in the study area. However, irrespective of training on different components of agriculture, the study area is referred to as household food insecure. There is need to investigate the factors that hamper effectiveness of the agricultural training program in the study area.

Inferential Statistical Analysis

This section presents results of correlation and regression analysis in relation to the role of agricultural training program on household food security. Analysis, presentation, and interpretation are provided for different components of devolved agricultural training. Table 12 displays descriptive statistical findings for means, standard deviations, and valid data items related farmers training.

The impact of Farmers Training on Household Food Security

The means and standard deviations of farmers training was determined and summary of inferential statistics represented in Table 12.

Table 2: Farmers Training and Household Food Security

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic Std.	Error	Statistic Std.	Error
Training	364	3.78	.41	-.63	.11	1.87	.26
Food security	364	3.91	.37	-.56	.11	1.91	.26

Key: 5 strongly disagree, 4 Disagree 3 moderately agree, 2 Agree; 1 strongly agree

The study identified the mean and standard deviation for farmers training as (M=3.78; SD=.41). The fact that farmers’ training in Makueni County was generally acknowledged. The following methods were used to achieve training: participation in seminars, participation in conferences, and education programs. The household food security mean and standard deviation are also included in Table 12 (M=3.91; SD=.37). Most people from the study area stated that Makueni County had better household food security, which enhanced food supply, accessibility, use, and stability.

Table 12 also provided skewness and kurtosis tests to determine if the farmers training and household food security study variables’ error distributions are normally distributed. Thakur, (2021) state that a variable’s distribution is regarded as normal if its kurtosis and skewness values fall within the range of -2.0 and +2.0. Table 4.14 demonstrates that the values of skewness and kurtosis for the variables training and household food security were within the advised range. Therefore, the normality test was successful.

Results on table 12 demonstrated that in Makueni County farmers were trained and that household food security was improved, but the level of association between farmers and household could not be established. Hence, there is considerable disagreement as to whether there was a correlation between them because the mean for household food security was greater than that of farmers training. Therefore, a straightforward linear regression analysis was needed. As employed model 4.1. Below

$$y = \beta_0 + \beta_1x_1 + \varepsilon \tag{4.1}$$

The explanatory variable was farmers training, while the response variable *y* was household food security. The term ε “residual” or “error” denoted the variance between actual household food security numbers and those predicted by the model. Initial evaluations of model 4.1 were successful. Therefore, the impact of farmers training in ensuring household food security was investigated. The contribution was examined at a 5% level of significance. Table 13 presents the results.

Table 3: Regression Analysis for Farmers Training and Household Food Security

Model	Unstandardized coefficient		Standardized coefficient	t	Sig
	B	Std. Error	Beta		
(Constant)	3.436	.172		20.004	.000
Training Best line of fit	.210	.041	.262	5.074	.000
R=.252 ^a					
R ² =.068					
Adjusted R ² =.066					
F _{ratio} = 32.744					
P<.05 ^b					
<p>a. Dependent Variable: Food Security</p> <p>b. Predictors: (Constant), Training</p>					

Table 13 demonstrates a marginally positive association between farmers training and household food security (R=.252; p.05). A portion of household food security was measured with an R-square of.068, which was explained by farmers training. It revealed that variations in farmers training were responsible for around 6.8% of the disparity in household food security. The replica's generalizability was indicated by the adjusted R-square. If not identical, it should to be near to R-square as practicable.

The study's deviation from the last model was minimal. i.e.003, or.3%. This suggested that the model might have accounted for about .3% less variance in findings if it had been resulting from the larger population (F ratio = 32.744; p .05). The linear regression model was statistically significant. According to standardized beta coefficients, household food security increased by about .262 units for every standard deviation increase in farmers training and development services. The ideal simple linear regression calculation between farmers training and household food security is also provided by Table 13 and Model 4.1.

$$y = 3.436 + .210x \tag{4.2}$$

There is a statistically significant link between household food security and farmers training, according to linear regression model 4.2 (R =.252; p .05). The variance in training explained 6.8% of the model. According to the linear regression model 4.2, the level of household food security was around 3.436 units lower without training and increased by .210 units for every unit of training. Hainzer et al., (2021) supports the outcome of this study by ascertain training farmers equips them with new knowledge that support them in increasing farm produce hence improved food security.

Mobeen and Varghese (2016) , also agrees with the study results that training small scale farmers on different farming techniques food security is ensured at household level. However, despite the fact that the current study found a link between farmers training and household food security, earlier investigations by (Ali & Farah, 2019) did not. Furthermore, Lameck & Hulst,(2021) were not concerned about the models of analysis, despite the fact that the current study demonstrated the usage of regression models. Also, even though the FAO, (2013) report did not ascertain connection between training and food security, the current study enhanced knowledge by making this connection between training and household food security. Therefore, the study rejects the null hypothesis that Farmers training has no impact on household food security in Makueni County, Kenya.

Thematic Analysis of Qualitative Findings on Farmers Training in Makueni County, Kenya

The researcher interviewed agriculture officers on the impact of agricultural training on household food security. Majority of the interviewees agreed that farmers training influenced household food security. Agriculture officer, P1, observed;

Teaching farmers new skills using extension services models with the goal of supporting and facilitating people to engage in agricultural production for household food security management, farmers training

In Makueni County through participation in seminars, participation in conferencing, continued professional development, coaching programs, mentoring programs, and programs has improved farmers knowledge on farming hence improved household food security? (P1, Male, 2022).

The same thoughts were supported by another agriculture officer by acknowledging farmers training have improved household food security. On further probing, agriculture officer, P2, noted;

Household food security in Makueni since devolution has improved although not in a very substantive percentage due to other uncontrollable factors such a limited rain amounts and extensive drought. However, the County has established food security systems that aim in long run to enable people at all time to have physical and economic access to sufficient, safe, nutritious food that fits their dietary needs and food preferences for an active life. (P2, Male, 2022).

Therefore, farmers training positively impacted the state of food in families in Makueni County, Kenya. Agriculture officer 3 explained the county government efforts on implementing agriculture training program a as follows;

That farmers training on household food security has promoted partnership among farmers, accessing resources from other farm institutes, maintaining contact with other agricultural institutes, and interaction among farmers themselves. She noted that availability of county government support even though not consistent has helped in training farmers on different components especially during uncertain circumstances such as locust outbreak and this has reduced extreme negative impact on crops hence increasing food production, although majority of residents are still experiencing food insecurity (P3, Female, 2022).

CONCLUSION

In the study area 54% of farmers had received training on different components of farming, 62% of them had benefited from different subsidized farm inputs, while 58% had received different advisory services. There was a positive association between farmers training and household food security. There was a statistically significant weak positive association between training and household food security. The variation in household food security could be related to farmers' training. Despite efforts made on training there was minimal impact on households' food security in Makueni County.

RECOMMENDATIONS

The study recommended :

- i. Engagement of all stakeholders in development and implementation of agricultural training program in order to capture farmers interests and meet their specific farm needs and requirements.
- ii. Combine science and indigenous knowledge in implementation of subsidy services. To enable farmers to utilize local knowledge and improve it through modern farming technology to use farm friendly inputs such as manure.

REFERENCES

1. Agunga, R. (2013). Communication for Development as a Strategy to Enhance Agricultural Extension Performance in Turkey. *Journal of Extension*, Vol. 17(2).

2. Ali, H., & Farah, S. (2019). Understanding the Influence and Effects of Devolution on Agricultural Development: A Case Study of Garissa County, Kenya. *International Journal of Contemporary Research and Review*, 10, 110–114.
3. Ambale, B., Kiptui, M., & Saina, C. (2018). Perception on Food Insecurity and Coping Strategies Among Fishing Communities Living in Homa Bay County, Kenya.
4. Ambale, B., Kiptui, M., & Saina, C. (2018). Perception on Food Insecurity and Coping Strategies Among Fishing Communities Living in Homa Bay County, Kenya.
5. Cai, T., Steinfield, C., Chiwasa, H., & Ganunga, T. (2019). Understanding Malawian farmers' slow adoption of composting: Stories about composting using a participatory video approach. *Land Degradation & Development*, 30.
6. Claire, T., D'Hombres, B., Claire, C., Kayitakire, F., & Saisana, M. (2017). The use of the Global Food Security Index to inform the situation in food insecure countries.
7. Grote, U., Fasse, A., Nguyen, T., & Erenstein, O. (2021). Food Security and the Dynamics of Wheat and Maize Value Chains in Africa and Asia. *Frontiers in Sustainable Food Systems*, 4.
8. Hainzer, K., O'Mullan, C., Bugajim, C., & Brown, P. (2021). Farmer to farmer education: Learnings from an international study tour. *Development in Practice*, 31, 1–11.
9. Izraelov, M., & Silber, J. (2019). An assessment of the global food security index. *Food Security*, 11. <https://doi.org/10.1007/s12571-019-00941-y>
10. Kaynakçı, C., & Boz, I. (2019). Roles, Responsibilities, and Competencies Needed by Extension Agents in Extension System.
11. Kiambi, S., Alarcon, P., Rushton, J., Murungi, M., Muinde, P., Akoko, J., Aboge, G., Gikonyo, S., Momanyi, K., Kang'ethe, E., & Fèvre, E. (2018). Mapping Nairobi's dairy food system: An essential analysis for policy, industry and research. *Agricultural Systems*, 167, 47–60.
12. Kiprono, A., & Ibanez Llarío, A. (2020). Solar Pumping for Water Supply. <https://doi.org/10.3362/9781780447810>
13. Lameck, W., & Hulst, R. (2021). Upward and downward accountability in local government: The decentralisation of agricultural extension services in Tanzania. *Commonwealth Journal of Local Governance*, 20–39. <https://doi.org/10.5130/cjlg.vi25.6472>
14. Mobeen, N., & Varghese, J. (2016). The Impact of Agriculture Extension Training Programs on the Extension Services in Kenya. *Asian Journal of Agricultural Extension, Economics & Sociology*, 12, 1–12.
15. Odero-Waitituh, J. (2017). Smallholder dairy production in Kenya; A review. *Livestock Research for Rural Development*, 29.
16. Oduro-ofori, E., Anokye, P. A., Naa, A., & Elfreda, A. (2015). Effects of Education on the Agricultural Productivity of Farmers in the Offinso Municipality.
17. Shahbaz, B., & Ata, S. (2014). Agricultural Extension Services in Pakistan: Challenges, Constraints and Ways forward.