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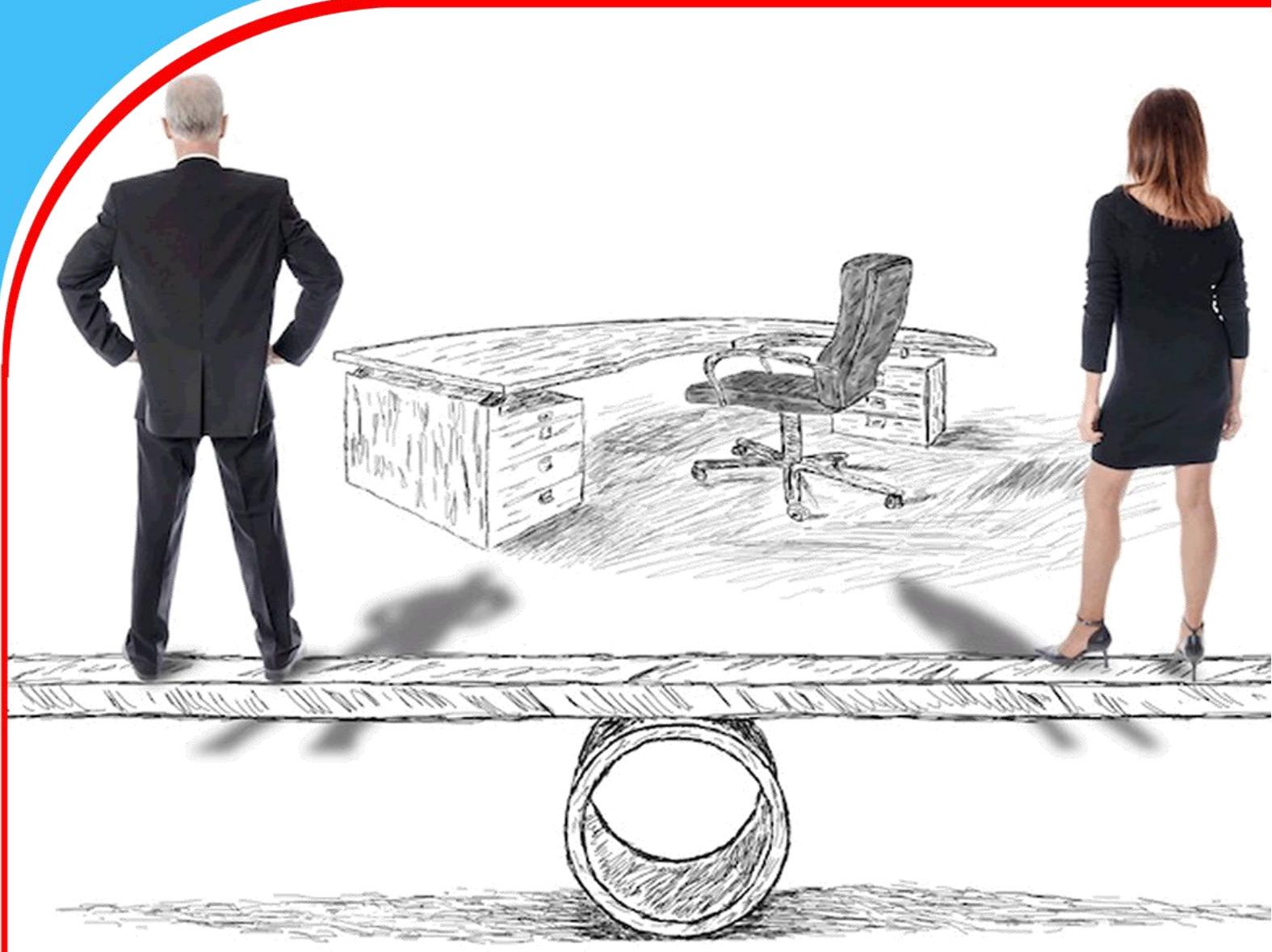

CONTRIBUTION OF RURAL WOMEN EDUCATION LEVELS TO FOOD SECURITY IN LIKUYANI SUB COUNTY, KAKAMEGA COUNTY, KENYA

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ABSTRACT

Purpose: Rural women play an essential role in the four pillars related to food security: availability, accessibility, utilization and stability. However, there is a gender gap in access to resources such as: land, energy, technology, credit, pesticides and fertilizers. The overall objective of this study was to evaluate the contribution of rural women education levels to food security in Likuyani sub county, Kakamega County, Kenya.

Methodology: This study was carried out in Kakamega County, Likuyani sub-county. This study used cross-cultural research design. The study population consisted of 30,685 respondents. The study sampled 395 using simple respondents using random sampling. Data was collected using structured questionnaires and focused group discussion guides. Content validity was tested by experts while reliability was tested at 0.7. Data was analysed using both descriptive and inferential statistics using SPSS version 24 and presented using APA tables.

Findings: The research hypothesis posited H_1: the level of education of rural women has no significant influence on food security in Likuyani sub-county was rejected using both r and R^2. From the results, the level of education of rural women had significant positive effect on food security. Therefore, the hypothesis was rejected. In general, it was revealed that educational empowerment of rural women had largest unique significant contribution to the model.

Recommendations: The researcher recommends that Government and other stakeholders should endeavor to put in place deliberate measures to empower women and girls especially on agriculture as a livelihood to foster food security through Women empowerment projects like women fund. Health organizations should sensitize women on the importance of family planning since larger families put a strain on the available resources. Women should be empowered to have access and control and even ownership of factors of production in partnership with men to enhance their efforts towards household food production and security.

Key words*: Rural Women Education, Household Food Security.*

1.1. Introduction

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. World Food Summit (WFS 1996). Food security consists of four essential pillars**: 1) Food availability.** The amount of food that is present in a country or area through all forms of domestic production, imports, food stocks and food aid" (WFP, 2009). **2) Food access.** Food access is defined as an individual or community's ability to have affordable, healthy, and culturally relevant food readily available in their community. The World Food Summit defines access as having "physical, economic and social access". A household's ability to acquire adequate amount of food regularly through a combination of purchases, barter, borrowings, food assistance or gifts". (WFP, 2009)

3) Food utilization. The World Food Summit's definition of utilization is "safe and nutritious food which meets their dietary needs" Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security. **4) Stability.** The World Food Summit says that stability must be present "at all times" in terms of availability, access and utilization for food security to exist. The literature distinguishes between chronic food insecurity where food needs cannot be met over a protracted period of time and transitory food insecurity, where the time period is more temporary (Maxwell & Frankenberger,1992).

Women who live in rural areas represent 25% of the world's population and constitute an average of 43% of the workforce in developing countries (World Bank, 2019). This percentage oscillates between 20% in South America and 50% in South-East Asia and sub-Saharan Africa. And it is precisely in such rural areas where the differences and difficulties suffered by women and girls are most acute World Bank 2019.

Women play a critical role in food security in this region by fulfilling their role as food providers. There are 3 basic variants of household food production systems in Sub-Saharan Africa: 1) Women are responsible for production of all or most food crops. In this variant, food plots are considered women's plot. 2) Men and women jointly cultivate staple food crops in fields controlled by male household heads. In this type, male household head controls the output. 3) Men are responsible for food production, while women specialize in food processing. This variant is mainly encountered where Islamic practices of female seclusion prevent women from engaging in fieldwork (Koopman, 1992)

In many countries in Africa, there is a rigid division of labor by gender in agriculture. This division may be based on types of activities performed on the farm or type of crops grown by

men and women (Doss, 1999). The division of labor is based on patriarchal norms that typically require women to care for the needs of the members of the households while men are involved in bringing cash income to the household. Women are also expected to help fathers, husbands in their fields, which increase women's workload. Sometimes men will help women in clearing their plots to prepare the land (Mehra & Rojas, 2018). Women's role is not limited to food production, they are also required to process and prepare the food they grow, perform care work in the household and also help men in their cash crop production.

In Kenya about 86% of farmers are women, 44% of women work in their own right and 42% who represent their husbands in their absence (World Bank 2015). In western Kenya 69% of people are food insecure (Ajani & Chianu, 2008). The sugarcane production has depleted soils through continuous production (Nambiro, 2008). In this study compared the level of education in relation to food production. In rural communities in Kakamega County Likuyani, women are often bestowed with the responsibility of providing food in the home. They often farm small subsistence plots of land to provide food for their families. Women are also responsible for at least half the tasks involved in the local storing of food and raising of animals in isolated rural communities. A part from food production, women increase their contribution to household food security by earning income to purchase food. They also try to do both to fulfill basic family needs. For these reasons, women are the foundation of food security in the community International Fund for Agricultural Development (IFAD, 1998).Despite the significant contribution of women towards food security, development interventions aiming to improve access to food often bypass women. The purpose of this study was to evaluate the contribution of rural women education levels to food security in Likuyani sub county, Kakamega County, Kenya.

1.2. Statement of the problem

The rural woman plays an essential role in the four pillars related to food security: availability, accessibility, utilization and stability. However, women in rural areas of developing countries are at a disadvantage due to the fact that they do not have access to the same opportunities or resources as men owing to stereotype issues based on gender (UN General Assembly 2017). There is a gender gap as regards access to certain resources such as: land, energy, technology, loans (UN General Assembly 2017). Article 14 of the “The Convention on the Elimination of All Forms of Discrimination against Women” (which was adopted by the UN General Assembly 1979 which is often described as an international bill of rights for women) specifically highlights States’ obligations to eliminate discrimination against women in rural areas. Yet, despite such commitments, governments are not responding with sufficient urgency in order to address the needs and priorities of rural women (World Bank, 2019). In fact FAO (2018) estimates that if women farmers who are 43 per cent of the agricultural labour force in developing countries had

the same access as men, agricultural output in 34 developing countries would rise by an estimated average of up to 4% annually. This could reduce the number of undernourished people in those countries by as much as 17 per cent, translating to up to 150 million fewer hungry people (FAO, 2018).

Achieving the Millennium Goals will depend on the progress made in terms of improving agricultural and rural development (FAO, 2018). The poorest populations are, precisely, small farmers primarily from sub-Saharan Africa and agricultural workers in South-East Asia. And all improvements in rural areas are dependent upon acknowledging the different roles played by men and women. However, other studies like Wafula (2018) painted a different picture in the sense that the findings showed that giving women more access and control to factors of production would be fuelling domestic violence and chaos. This presents contrasting findings and the current study was to examine this situation and give recommendations on the same with regards to contribution of rural women education levels to food security in Likyani Sub County, Kakamega County, Kenya.

1.3. Research objectives

The overall objective of this study was to evaluate the contribution of rural women education levels to food security in Likuyani sub county, Kakamega County, Kenya.
The specific objectives were to:

i. Establish the levels of education of rural women and its influence on food security in Likuyani sub county, Kakamega County, Kenya.

1.4 Research Hypothesis

The study focused on the following null hypothesis corresponding to the specific objectives in section 1.3;

i. The level of education of rural women has no significant influence on food security in Likuyani sub-county, Kakamega County, Kenya?

2.0. LITERATURE REVIEW

2.1. Levels of education of rural women and their influence on food security.

Education is an additional factor which is thought to influence the food security status of households. Educational attainment by the household head could lead to awareness of the possible advantages of modernizing agriculture by means of technological inputs; enable them to read instructions on fertilizer packs and diversification of household incomes which, in turn, would enhance households' food supply (Najafi, 2003).The education of women is known to produce powerful effects on nearly every dimension of development, from lowering fertility

rates to raising productivity, to improving environmental management. Women are fully effective in contributing to food and nutrition security, discrimination against them must be eliminated and the value of their role promoted.

The level of education is believed to influence the use of improved technology in agriculture and, hence, farm productivity. The level of education determines the level of opportunities available to improve livelihood strategies, enhance food security, and reduce the level of poverty. It affects the level of exposure to new ideas and managerial capacity in production and the perception of the household members on how to adopt and integrate innovations into the household's survival strategies.

Mehra and Rojas (2018) in a study on women, education and food security in Malaysia using explanatory research design with a sample of 457 respondents using mixed methods approach with both questionnaires and interview schedules claim that rural women produce half of the world's food and, in developing countries, between 60 percent and 80 percent of food crops. The study found that educated women are more likely to spend their knowledge and skills in advancing farm work with more value added technologies thus ensuring food security. Women also are more likely than men to spend their income on the well-being of their families, including more nutritious foods, school fees for children and health care. Their study also asserts that a key failing of past efforts to reduce hunger and increase rural incomes has been the lack of attention paid to women as farmers, producers and farm workers – both wage and non-wage and especially the rural women who practice small scale farming. Small-scale women farmers represent the majority of rural poor populations in developing countries. Most low income women in developing countries live and work in rural areas, and agriculture is their primary source of employment. They produce both food and cash crops and have multiple and diverse roles. They work on their own plots and those of others; they work as unpaid or paid workers, employers and employees, and as wage- labourers in both on- and off farm enterprises (Mehra & Rojas, 2008).

The African Women Study Center (AWSC, 2014) Food Security Baseline Study was conducted in Nigeria using descriptive survey design with triangulation using focused group discussions and interview schedules. The study found that female headed households were more food insecure than the male headed ones. This could be attributed to various factors such as gender based discrimination, which renders female-headed households more vulnerable to food insecurity and poverty. Women in agriculture encounter many obstacles due to restricted land rights, inadequate education and outdated social traditions which usually limit their ability to improve the food security status of their households and communities at large. Women also face different forms of discrimination, such as greater reluctance on the part of input providers to lend

credit for fertilizer purchases to female headed households as compared to male headed households as well as fewer opportunities to borrow money or to buy food on credit.

Kassie *et al.*, (2012) in a study on gender in agriculture and women education in Kenya using correlation design with structured questionnaires and focused group discussions also found that in Kenya female headed households are 13% less likely to be food secure than male headed households. The study found that educated women are less likely to go to the farm. Their study also found that female headed households face 3% and 12% higher probability of chronic and transitory food insecurity, respectively, than male headed household and that male headed households have about 5 and 9 per cent higher probability of food security than female headed households.

The reviewed studies above clearly show that there is mixed results on as to how women education influences the situation of food security. Some findings insisted that educated women rarely go to the firm while other respondents insisted that educated women may use their education to advance the course of the farm. The current study endeavored to ascertain this contrast.

3.0. MATERIALS AND METHODS

The study population consisted of 30,685 rural women in Likuyani sub county, local leaders, community development officers, agricultural and Livestock officers, Environment and Natural Resource Officer, farmer co-operative officers, Credit agencies, Ministry of Industry and Trade, Ministry of Health and traders, Agribusiness and Agro-processors and NGOs, Ward and Community Administrators, Observation on events, Activities and Objects in regards to women, food security and environment.

This study used correlational research design. With a mix of qualitative and quantitative variables/indicators.This study used various research approaches where in-depth investigation of individuals (women) were done. Also sought to describe women and other participants, their beliefs, attitudes and behavior. This included questionnaire, interviews, FGDs and observations. The rural women population was selected for the study by use of multistage random sampling technique. Focus Group Discussion (FGD) was composed by members selected by quota sampling methods. Observations in the field of events, objects, process was selected by purposive sampling.

The validity of the instruments was determined by the researcher's supervisors and a panel of defense lecturers at the department. For reliability tests Cronbach alpha was applied for each variable which ranged from 0.717 to 0.858 thus for this study, Cronbach alpha statistic with a value of 0.7 or more was considered reliable. The test items were retained and used in this study

hence considered reliable with an average of 0.778 which is way above the threshold of 0.7, the tools were considered reliable. The researcher trained a team of research assistants on effective ways of administering tools before the actual commencement of the data collection exercise.

This study employed descriptive statistical methods in order to analyze the data that was collected. There was counter checking of the instruments/tools to ensure that they are fully answered. Coding of the data was done and there was the organization of the whole information before the analysis of the whole data. The questionnaires were sorted and edited to ascertain complete filling before actual analysis commenced. The quantitative data was coded and entered into the Statistical Package for the Social Sciences (SPSS). Qualitative data was first transcribed, categorized and reported in themes relevant to the study. Data was serialized and categorized according to the identified patterns of answers.

Quantitative data on the other hand was analyzed using frequencies, percentages and Pearson's correlation and regression coefficient of the collected data. The frequencies and percentages were used to determine the factors that have led to failure to recognize the role of rural women in food security and environmental sustainability.

4.0. FINDINGS ON LEVEL OF EDUCATIONAL OF RURAL WOMEN ON FOOD SECURITY

4.1. Descriptive Results for level of educational of rural women on food security

The statements were anchored on a five point Likert-type scale ranging from 1=Strongly Agree to 5= Strongly Disagree and respondents were asked to indicate the extent to which they agreed to the questionnaire statements during data collection. Descriptive statistics included percentage, frequency, mean and standard deviation. Mean is a measure of central tendency used to describe the most typical value in a set of values. Standard deviation shows how far the distribution is from the mean.

The respondents were asked to indicate the extent of agreement with each of the level of educational of rural women on food security statements. The pertinent results are presented in Table 1 where 1 is strongly disagree, 2-disagree, 3-Undecied, 4-agree and 5 –strongly agree.

Table 1: Level of educational of rural women on food security

Statements	1	2	3	4	5	Mean	Stdev
Educational attainment by the household head could lead to awareness of the possible advantages of modernizing agriculture by means of technological inputs	13.8 (54)	1.5 (6)	6.2 (24)	23.1 (90)	55.4 (216)	3.15	0.99
Educational attainment by the household head enables them to read instructions on fertilizer packs and diversification of household incomes which, in turn, would enhance households' food supply	12.3 (48)	1.5 (6)	4.6 (18)	16.9 (66)	64.6 (252)	3.17	0.91
The education of women is known for lowering fertility rates	3.1 (12)	12.3 (48)	12.3 (48)	7.7 (30)	64.6 (252)	3.48	1.11
The education of women is known for raising productivity	7.7 (30)	10.8 (42)	13.8 (54)	46.2 (180)	21.5 (84)	3.37	1.17
The education of women is known for improving environmental management	13.8 (54)	1.5 (6)	6.2 (24)	23.1 (90)	55.4 (216)	3.15	0.99
Educational attainment affects the level of exposure to new ideas and managerial capacity in production	13.8 (54)	1.5 (6)	6.2 (24)	23.1 (90)	55.4 (216)	3.15	0.99
Overall						**3.26**	**1.03**

From Table 1, 90(23.1%) of the respondents agreed that educational attainment by the household head could lead to awareness of the possible advantages of modernizing agriculture by means of technological inputs while 216(55.4%) strongly agreed. A mean of 2.15 and standard deviation of 0.99 implied that there is great deviation from the mean. Majority 306(78.5%) of the respondents agreed that educational attainment by the household head could lead to awareness of the possible advantages of modernizing agriculture by means of technological input.

The researcher found 66(16.9%) of the respondents agreed that educational attainment by the household head enables them to read instructions on fertilizer packs and diversification of household incomes which, in turn, would enhance households' food supply and 252(64.6%) strongly agreed on the same. A mean of 2.17 and standard deviation of 0.91 suggested that there is great deviation from the mean. Majority 318(81.5%) of the respondents agreed that educational attainment by the household head enables them to read instructions on fertilizer packs and diversification of household incomes which, in turn, would enhance households' food supply

In establishing whether the education of women is known for lowering fertility rates, 7.7% (30) agreed while 252(64.6%) strongly agreed that the education of women is known for lowering fertility rates. A mean of 2.48 and standard deviation of 1.11 indicated that there is great deviation from the mean. Therefore, majority of the respondents 72.3 %(282) agreed that the education of women is known for lowering fertility rates.

On whether the education of women is known for raising productivity 46.2 %(180) of the respondents agreed while 21.5 %(84) strongly agreed that the education of women is known for raising productivity with a mean of 2.37 and standard deviation of 1.17. This implies that there is great deviation from the mean. Majority of the respondents thus 67.7% (264) agreed that the education of women is known for raising productivity.

From the findings on whether the education of women is known for improving environmental management 32.1 % (90) respondents agreed the education of women is known for improving environmental management while 55.4%(216) strongly agreed. A mean of 2.15 and standard deviation of 0.99 implied that there is great deviation from the mean. Majority 78.5% (306) of the respondents agreed that the education of women is known for improving environmental management.

90(23.1%) of the respondents agreed that educational attainment affects the level of exposure to new ideas and managerial capacity in production while 36(55.4%) strongly agreed. A mean of 2.15 and standard deviation of 0.99 implied that there is great deviation from the mean. Majority 306(78.5%) of the respondents agreed that educational attainment affects the level of exposure to new ideas and managerial capacity in production

4.2. Inferential Results for level of educational of rural women on food security

The first research hypothesis of the study was the level of education of rural women has no significant influence on food security in Likuyani sub-county, Kakamega County, Kenya. The question sought to test the first hypothesis: **H_1:** The level of education of rural women has no

significant influence on food security in Likuyani sub-county. This was accomplished by use of Pearson correlation (r) and linear regression (R^2) with aid of SPSS version 24.

The Pearson correlation analysis was used to investigate the relationship between the level of education of rural women and food security in Likuyani sub-county. The study established a coefficient of correlation (r) as 0.396**. This shows that there exists a significant positive relationship between them. This implies that the food security increase with an increase in level of education of the rural women and vice versa.

Regression analysis was used to tell the amount of variance accounted for by one variable in predicting another variable. Regression analysis was conducted to find the proportion in the dependent variable (food security) which can be predicted from the independent variable (the level of education of rural women) **Table 2** shows the analysis results.

Table 2: Regression Results of the level of education of rural women and food security in Likuyani sub-county

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396[a]	.258	.144	.57426

a. Predictors: (Constant), the level of education of rural women

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.875	1	3.875	11.749	.001[b]
	Residual	20.776	388	.330		
	Total	24.423	389			

a. Dependent Variable: food security

b. Predictors: (Constant),

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.486	.469		5.302	.000
	the level of education of rural women	.423	.123	.396	3.428	.001

a. Dependent Variable: food security

The results revealed a coefficient of determination (r^2) of 0.258. Meaning the level of education of rural women can explain up to 15.7 % of the variance in food security. The F test gave a value of (1, 64) =11.749, P<0.01, which supports the goodness of fit of the model in explaining the variation in the dependent variable. It also means that the level of education of rural women is a useful predictor of food security. The unstandardized regression coefficient (β) value of level of educational of rural women was 0.423, p< .001. This indicated that a unit change in the level of education of rural women would result to change in food security by 0.423 significantly.

The regression equation to estimate the food security as a result of the level of education of rural women was hence stated as:

$$\mathbf{Y_{fp} = 2.486+0.423X_1}$$

The research hypothesis posited H_1: the level of education of rural women has no significant influence on food security in Likuyani sub-county was not accepted using both r and R^2. From the results, the level of education of rural women had significant positive effect on food security with P<0.01 and it significantly accounted 15.7% variance in food security. Therefore, the first hypothesis was not accepted as the level of education of rural women had a significant effect on food security.

Findings from the key informants reveal that respondents believed that educated women are less likely to suffer food insecurity compared to uneducated women. Educated women, they said, are likely to use their education to improve their farming. Most of the households were headed by men. Households that were headed by women were seen to have issues with food and most were not able to ably fend for their children. The households where women were educated such women did not participate in domestic farming since they head employment as their main source of income. However, women that had a job and did farming were seen to be stable financially since they used their job to support the farm.

The above findings are in agreement with findings of previous studies by (Najafi, 2003) on the influence of educational empowerment on household food supply. The study found that Education is an additional factor which is thought to influence the food security status of households. Findings further state that educational attainment by the household head could lead to awareness of the possible advantages of modernizing agriculture by means of technological inputs; enable them to read instructions on fertilizer packs and diversification of household incomes which, in turn, would enhance households' food supply (Najafi, 2003).The education of women is known to produce powerful effects on nearly every dimension of development, from lowering fertility rates to raising productivity, to improving environmental management. Women

are fully effective in contributing to food and nutrition security, discrimination against them must be eliminated and the value of their role promoted.

5.0. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary of Findings of the Variables in the Study

The study first sought to establish the influence of level of education of rural women on food security. The study established a coefficient of correlation (r) as 0.396**, P<0.01. This shows that there exists a significant positive relationship between them. This implies that the food security increase with an increase in level of education of the rural women and vice versa. The regression results revealed a coefficient of determination (r^2) of 0.258. Meaning the level of education of rural women can explain up to 15.7 % of the variance in food security. The F test gave a value of (1, 64) =11.749, P<0.01, which supports the goodness of fit of the model in explaining the variation in the dependent variable. It also means that the level of education of rural women is a useful predictor of food security.

5.2. Conclusions

The study was interested in knowing the effect of each of the variables on food security when all these constructs were entered as a block on the model. All of the variables had significant effect on food security. It was revealed that educational empowerment of rural women had largest unique significant contribution to the model and the least significant contribution was the level of income of rural women

The study hypothesis posited H_1: the level of education of rural women has no significant influence on food security in Likuyani sub-county was rejected using both r and R^2. From the results, the level of education of rural women had significant positive effect on food security. Therefore, the hypothesis is rejected as the level of education of rural women has a significant effect on food security.

5.3. Recommendations

The researcher made the following recommendation:

i. Government and other stakeholders should endeavor to put in place deliberate measures to empower women and girls especially on agriculture as a livelihood to foster food security.
ii. Women empowerment projects like women fund should be strengthen to boost women access to capital so that they diversify their sources of income and in turn supplement their investment into farming and food security.

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