


# FACTORS AFFECTING ACCESS TO EXTENSION SERVICE AMONG CASHEW NUT FARMERS IN KILIFI COUNTY, KENYA

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## ABSTRACT

The main aim of the paper was to determine the factors that affect access of extension service among smallholder cashew nut producers. The study was conducted in Kilifi County in coastal Kenya which has favourable climatic conditions and a long history of cashew nut production. A structured interview guide was used to collect data from 123 cashew nut farmers which were then analyzed using logistic regression model. Results show that the determinants of access of extension service include gender, education, age, household size and the size of land area cultivated. The study established management neglect of cashew nut plantations which would otherwise be amended through access of extension services. It is thus imperative that favourable policies based on the identified variables be formulated.

**Keywords:** *Cashew Nut Farmers, Extension, Logistic Regression*

## INTRODUCTION

Kilifi County lies between latitudes 3°16'south and about 4° south, and longitudes 39° east and 40° east in the coastal region of Kenya. It covers an area of 12,609.7 km$^2$. It borders Kwale County to the south west, Taita Taveta County to the west, Tana River County to the north, Mombasa County to the south, and Indian Ocean to the east (GOK, 2009). The vastness of the County makes it to experience different agro climatic zones. The County has three main agro ecological zones namely agro ecological zones I, II, and III (GOK 2009, Waithaka, 2002). The definition of a zone is based on the distance from the Indian Ocean coast line. Zone I lies 0 to 15 km from the coast line, zone II extends from 15 to 35 km from the coast line, and zone III extends from 35 km and beyond.

Agriculture is the mainstay of the majority of the people in the county. The main food crop produced is maize while cash crops grown include coconuts, cashew nuts, citrus fruits and mangoes (GOK, 2009, NEMA 2009). These crops are grown in smallholder farms which average 5.4ha. The growth of agriculture sector is faced with many challenges which include unfavourable land tenure, crop diseases,

unavailability of modern agricultural inputs, inadequate soil management techniques, post harvest losses and low acreage due to low use of modern farming methods and unfavourable climatic conditions which causes drought and perennial food shortages in the semi-arid areas (GOK, 2009).

**Agricultural Extension**

Agricultural extension is the function of providing need- and demand-based knowledge in agronomic techniques and skills to rural communities in a systematic, participatory manner, with the objective of improving their production, income, and (by implication) quality of life. It is a source of information on current and emerging technologies. Adeogun et al. (2008) say that the main source of technology is through extension services. Extension is essentially education and it aims to bring about positive behavioral changes among farmers. Ideally extension should be a two way process through which farmers get access to modern technologies and on the other hand research institutions get to know the challenges facing farmers which in turn will feed into new research to overcome these challenges.

**Conceptualizing Extension Services**

Extension service can be viewed as a good that is tradable in the market. It is subject to demand and supply. Access to extension by a farmer denotes a demand for that good. There are several factors that may determine how much of this good is demanded or what governs the demand of this good. Following (Greene and Ng'ong'ola, 1993; Adeogun et al., 2008; Hadi et al., 2010) this scenario can be conceptualized as follows:

$$Y_i = g(I_i) \tag{1}$$

$$I_i = \beta_0 + \sum_{j=1}^{n} \beta_j X_{ji} \tag{2}$$

Where $Y_i$ is the observed response for the $i^{th}$ observation ($Y_i = 1$ for access and $Y_i = 0$ otherwise
$I_i$ is an underlying and unobserved stimulus index for the $i^{th}$ observation.
g is a functional relationship between field observation ($Y_i$) and stimulus index ($I_i$)
$X_{ji}$ is the $j^{th}$ explanatory variable for the $i^{th}$ observation
i = 1, 2, …, n is the sample size
j = 1, 2, …, k is the total number of explanatory variables

**The model**

The probability of access to extension given certain characteristics can be calculated based on the following model (Burton et al., 2014):

$$P(D=1|\ X) = \left[\frac{\exp(\sum \beta X)}{1+\exp(\sum \beta X)}\right] \tag{3}$$

Where P(D=1|X) is the probability that a farmer access extension service given X
D is a qualitative variable indicating access to extension with 1 indicating access, 0 indicating otherwise.
X is a set of k explanatory variables that influence access to extension
β is a set of k parameters to be estimated

Greene and Ng'ong'ola (1993) posits that the underlying stimulus index $I_i$ is a random variable which predicts the probability of access to extension. This can be presented as:

$$P_i = \frac{e^{I_i}}{1+e^{I_i}} \tag{4}$$

Thus for the ith farmer:

$$I_i = \ln \frac{P_i}{1-P_i} = \beta_0 + \sum_{j=1}^{k} \beta_i X_{ji} \tag{5}$$

The relative effect of each explanatory variable ($X_{ji}$) on the probability of access to extension service is measured by differentiating with respect to $X_{ji}$. These yields:

$$\frac{\partial P_i}{\partial X_{ji}} = \left[\frac{e^{I_i}}{1+e^{I_i}}\right]\left[\frac{i}{X_{ji}}\right] \quad (6)$$

Table 1 below gives the factors that were thought to affect access to extension services. These were the factors which were assessed in the field.

**Table 1. Explanatory variables affecting access to extension**

| Explanatory variable (Xj) | Binary variable value | Description |
|---|---|---|
| Gender | 0 | Female |
| | 1 | Male |
| Education | 0 | No formal education |
| | 1 | Primary level |
| | 2 | Post primary |
| Access to credit | 1 | Yes |
| | 0 | No access |
| Age | Years | Continuous variable |
| Household size | Persons | Continuous variable |
| Size of land cultivated | Acres | Continuous variable |

**Data Collection**

The data used was collected from cashew nut farmers most of whom also doubled up as maize farmers. Cashew crop is commonly intercropped with other crops chiefly maize. Data was collected from agro-ecological zones I and II.

**RESULTS AND DISCUSSION**

The logistic regression results are as presented in table 2 below. Five variables that are thought to affect access to extension were studied and the parameters obtained are as presented in the table. The logit regression outcomes are presented in table 2 above. The gender of the household head and the size of the land cultivated were negatively correlated with the dependent variable. The household size, age of the household head and the level of education of the household head were positively correlated with the dependent variable.

**Table 2. Logistic regression results**

| Variable | Parameter estimate | Std. error | z | p>(z) |
|---|---|---|---|---|
| Household size | 0.0382 | 0.023 | 1.27 | 0.202 |
| Gender | -0.973 | 0.523 | -1.86 | 0.063* |
| Education level | 0.265 | 0.455 | 0.58 | 0.561 |
| Age | 0.017 | 0.023 | 0.76 | 0.448 |
| Land cultivated | -0.087 | 0.083 | -1.06 | 0.290 |
| Constant | -0.220 | 1.450 | -0.15 | 0.879 |

*significant at 10%

All the independent variables examined were not significant except gender which was significant at the 10 per cent level. A surprising finding here was that age is positively correlated with access to extension. The implication is that older farmers tend to be more receptive to extension services and actually attend extension visits. This goes against the thinking that the young who are more educated and more receptive to new technologies should be the one in the forefront of attending extension visits. That the level of education is positively correlated with extension is not surprising. Education is a form of empowerment, a social capital such that when one has it, it makes it easier for the person to acquire

more. Given that in most cases extension lingo is not in local languages the one with education is at an advantage of accessing it. Some of the extension agents may also not be able to speak the local language.

The results also suggest that those households with more members have a higher utility for extension visits. This may be because of need to produce more to meet the household needs in light of limited resources especially land. They thus see adoption of modern technology through extension visit as a way out of the situation. The land size cultivated had a negative sign meaning that the larger the land the less the need to go for extension visit. The reasoning could be that the output is enough to meet the household needs because land is not a limiting factor, hence the low utility for extension services. (Adeogun et al., 2008) found similar results in a study of hybrid clarias in Lagos state, Nigeria.

## CONCLUSION

It was found that gender affect access to extension. This then calls for gender sensitive approach to provision of extension. It was also noted that the size of land cultivated affect the demand of extension. Farmers may be going for quantity instead of quality. There is thus a need for farmers to consider the productivity per unit of land instead of just looking at the total output. The efficiency of input use should be the guiding factor.

## REFERENCES


Adeogun O.A., A.M. Ajana, O.A. Ayinla, M.T. Yarhere and M.O. Adeogun. (2008). Application of Logit Model in Adoption Decision: A Study of Hybrid Clarias in Lagos State, Nigeria. American-Eurasian J. Agric. and Environ. Sci., 4 (4): 468-472.

Burton C. E., Roland K. R., and James A. L. (2014). A Logit Analysis of Precision Farming Technology Adoption in Tennessee

Greene, D.A.G and Ng'ong'ola, D.H. (1993). Factors affecting fertilizer adoption in less developed countries: An application of multivariate logistic analysis in Malawi. Journal of agricultural economics Vol. 44, No.1

GOK. (1999). Coast Provincial Directorate of Agriculture Annual Report 1999

Had, F., Silong, D and Sarkar, S.K. (2010). Application of Logit Model in Innovation Adoption: A Study on Biotechnology Academic Researchers in Malaysia. American-Eurasian J. Agric. and Environ. Sci., 9 (3):282-287

NEMA (2009). State of the Coast Report: Towards Integrated Management of Coastal and Marine Resources in Kenya. National Environmental Management Authority (NEMA), Nairobi 88pp.

Waithaka, J. 2002. Assessment of situation and development prospects for the cashew nut sector, Kenya


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