

Perception of Smallholder Farmers towards the *Kilimo Plus* Subsidy Program in Nakuru North District, Kenya

Nixon Murathi Kiratu¹, Margaret Ngigi² PhD, Patience M. Mshenga³ PhD
^{1, 2, 3}(Department of Agricultural Economics and Agribusiness Management, Egerton University, Kenya)

Abstract: *The perception of farmers towards a technology influences the farmer's uptake of that technology. This study examines the perception of smallholder farmers towards a fertilizer and certified seed subsidy program. Data from fifty two respondents was collected using a structured questionnaire and analysed using summation, median and mode. Results showed that the farmers perceived the subsidy program positively. The study recommends a further study on the factors that influenced the perception.*

Keywords: *Perception, farmer, subsidy, fertilizer, certified seed.*

I. Introduction

Perception relates to the interpretation of data that is from ones environs^[1]. Thus the perceptions that farmers have towards a technology is determined a great deal by the data they have gathered about it through experience, learning or training. The exposure that the farmer has had on an input determines the perception that a farmer has on the inputs and consequently the subsequent use of that input. In a country that is food insecure, improving agricultural productivity is a priority for the government especially taking into consideration that most smallholder farmers in the country neither use the recommended fertilizer application rate per hectare^[2] nor use certified seeds^[3].

The National Accelerated Agricultural Inputs Access Program (NAAIAP) was started by the Kenyan government in 2007. The program was designed to act as a safety net for poor farmers who did not have adequate resources to purchase farm inputs and thus address the Millennium Development Goal 1 of halving the extreme poor and hungry by 2015. The program was also part of the governments' response to the 2006 Fertilizer conference in Nigeria that came up with the "Abuja Declaration on Fertilizer for the African Green Revolution". This Declaration recognized nutrient depletion in African soils due to nutrient mining either without replacement or inadequate replacement. This has led to low productivity and an incapacitation of the farmers to meet neither their own food requirement nor the growing population food need^[4].

The *Kilimo Plus* program is a component of the NAAIAP that targets resource poor farmers who own less than a hectare of land. The farmers are given a *Kilimo Plus* starter kit comprising of 10 kg of certified maize seed, 50kg of base fertilizer, and 50kg of top dressing fertilizer. The beneficiary farmer must also attend training. The kit is supposed to aid the farmers to cultivate at least 0.4 hectares of land which is enough to provide enough food for an average household (five persons) at an annual per capita maize consumption of 125 kg^[5]. The grant is administered through a voucher issued to the farmer. The voucher enables the farmer to purchase inputs from accredited stockists who have undergone training. The stockists redeem the voucher from a government contracted financial provider. The program aims at increasing the farmers' income, food security and demand for fertilizer and certified seeds. However, in order to achieve this, it is paramount for the farmers to perceive the program positively. This is because the inherent perception of the program trickles down to the farmers' perception towards demand and use of the inputs.

One of the factors that determine the preference and demand for a product is its attributes. Economists have evidenced preference and demand for particular characteristics of a product based on the person's perception of the product's attributes^[6]. Also, the attributes and value of a new technology has been found to influence the decision of a farmer to adopt it or not. Therefore, the decision to take up a technology or not reflects the farmer's perception^[7]. It is thus of great interest to policy makers to know the perception of farmers towards the *Kilimo Plus* program since it will influence their decision to use the inputs in future.

Apart from a technology's attributes, other external factors such as suitability of the technology to the farmer's working environment and interference with activities deemed important also determines adoption^[8]. Hence factors such as non-farm income and activities will influence adoption or rejection of a technology. Therefore, the scheduling of program activities such as training influences the farmers' perception depending on whether the timing is appropriate to them. In regard to this, if farmers perceive that the activities being advocated by the program takes up time for other activities that are of importance to them, the farmers may perceive the technology negatively or shun it altogether.

In addition, the perceived risk associated with the technology also determines the farmers' acceptance of a technology. The level of risk that a farmer can take not only depends upon their attitude towards risk (risk

averse or risk taker), but also the wealth endowment. Wealth reduces the adverse effects of risks. As a consequence, wealthier farmers have been found to be risk takers unlike poor farmers who point out that risk aversion as one of the reason of not using technologies such as fertilizer is risk aversion^[9].

The benefits that the farmer accrues from the subsidy program also determine the farmers' embracement of the inputs. If the farmer perceives that the cost involved in adopting a technology is higher than benefits accruing from the adoption or that there is no benefit for adopting it, then the farmer's rational decision will be to not adopt the technology, in spite of its valid importance or benefit as relayed by the agricultural officers or technology promoters^[10].

Additionally, in the new field of institutional economics, intrinsic motivation is preferred than extrinsic motivation. Intrinsic motivation makes an individual to work out of their own motivation rather than motivation from an external source. In addition, extrinsic motivation also does fade away with time. Consequently, knowing the factors that influences the farmers' motivation toward participating in a technology will make training provided by subsidy programs such as the *Kilimo Plus* program effective. This will be achieved by focusing the trainings on motivating the farmers through benefits of using the inputs and as a result achieve intrinsic motivation. Several factors have been found to motivate farmer's participation in a new technology. The profit that the farmer will accrue from the technology has been found as one of the main motivating factor in technology adoption^[11]. The higher the profit the greater the effort the farmer will put in adopting the technology. The age of the farmer also has been found to influence technology adoption. Younger farmers have a higher propensity of adopting a new technology than old farmers. This may be because of the risk taking aspect of young farmers in contrast to old farmers^[12].

Gender especially of the household head also determines adoption of technology. Women, especially in developing countries have less access to technical information and training and this influences their predisposition to adopt new technology. The availability of family labour especially for resource poor farmers who cannot afford to hire labourers, also determines the adoption of technology especially when the technology is labour intensive^[13].

Moreover, factors that predispose the farmer to information also influence the farmers' perception and adoption of technology. This is brought about by the enlightenment the farmer gets. Such factors that predispose the farmer to information include extension services, education, farming experience, training and exposure to media^{[14][15]}.

Since the smallholder farmers are the target population for the *Kilimo Plus* program, their perception is of great interest to policy analysts, makers and other agricultural stakeholders. This study thus seeks to evidence the perception of smallholder farmers towards the *Kilimo Plus* subsidy program. The subsequent section handles the objective, justification and the scope and limitation of the study. This is followed by the materials and methods section that explains the materials and techniques used in the study. The results and discussion section presents the results and discusses them in relation to previous works. The conclusion section summarises the findings of the study.

II. Objectives

The general objective of this study was to contribute to food security and income of smallholder farmers by generating knowledge on smart subsidies. The specific objective of the study was to determine the perception of the smallholder farmers towards the *Kilimo Plus* program.

III. Justification of the Study

The farmers' perception towards a new technology determines the success or failure to adopt it. The decision of the farmer to uptake the activities of a program that introduces a new technology will be influenced by the farmer's experience of the program. Consequently, analyzing the farmers' perception of the *Kilimo Plus* program will help to understand the adoption behaviour since farmers perceive such interventions differently than agricultural extension officers, researchers and policy analysts. This is importance to program stakeholders because if the farmers' perception towards the program is negative (non-beneficial) then they will not adopt its practices even though it is truly beneficial.

IV. Scope and Limitation of the Study

The study covered Nakuru North District in Nakuru County, Kenya. The study involved the farmers in the district who benefited from the *Kilimo Plus* subsidy program who formed the participant group and farmers who were not in the program who were the non-participant group. It was also limited to smallholder farmers who produce maize in the district. Thus the study results may not apply to other farmers who grow other types of crops. The information given by the respondents was also dependent on the ability of the respondent to recall.

V. Materials and Methods

Multistage sampling was used in this study. The first stage was to purposively select Nakuru North district. In the second stage, purposive sampling was used to select farmers in the district who were maize farmers given that the *Kilimo Plus* program targeted maize farmers in the district. In the third stage, systematic random sampling was done to select the farmers who had participated in the *Kilimo Plus* program. The final stage was to select the non-participants who were sampled using simple random sampling. A total number of 400 respondents were selected. Data for the study was collected through interviewing the farmer’s with the aid of a structured questionnaire. The information collected was on their perception towards the *Kilimo Plus* subsidy program.

The analysis of the farmers’ perception was carried out conditional on the farmer being aware of the *Kilimo Plus* program. Consequently, out of the 400 farmers, only 52 were aware of the program and thus analysis was carried out based on the 52 respondents.

The Likert scale has been widely used in economics to gather information about attitudes, feelings and perception [16]. It ranks the responses on a scale and hence helps a researcher to order them. The analysis of the responses was done through summation of the questions regarding perception [16]. The responses were subjected to a reliability test to check if they are consistent in measuring perception using the Cronbach’s alpha. Cronbach defined the Cronbach’s alpha [17] as:

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K - 1)\bar{c})} \tag{1}$$

Where K is the items to be summated, \bar{c} is the average of all covariance’s between the items across the sample, \bar{v} is the average variance of each item and 1 is a constant. The Cronbach’s alpha reliability coefficient ranges between 0 and 1. The closer the Cronbach’s alpha coefficient is to one, the greater the internal consistency. If the Cronbach’s alpha is > 0.9, then the internal consistency is excellent, if it’s between 0.89-0.8 it’s good, if it’s between 0.79-0.7 it’s acceptable, if it’s between 0.69-0.6 it’s questionable, if it’s between 0.59-0.5 it’s poor, and if its < 0.5 it’s unacceptable [18].

VI. Results and Discussion

The perception of farmer’s towards the *Kilimo Plus* program was measured using a Likert scale that comprised of thirteen questions each having five ranks (poor, fair, average, good and excellent). The results are shown in Table 1. The thirteen questions were aimed at measuring the perception of the farmers towards the *Kilimo Plus* program. Consequently, the thirteen questions were subjected to a reliability analysis using the Cronbach’s alpha, which measures whether the questions measure the same variable as suggested by Cronbach [17]. The Cronbach’s alpha was 0.871 which is in the good range (0.8-0.89) meaning that there is 87.1% consistency in the thirteen questions in measuring perception as used by Gliem and Gliem [19].

Table 1: Likert Scale Results on Perception of Farmers towards the *Kilimo Plus* Program

| No | Perception Question | Percent | | | | |
|-----|--|---------|------|---------|------|-----------|
| | | Poor | Fair | Average | Good | Excellent |
| 1. | The program has helped poor farmers to produce more. | - | 7.7 | 34.6 | 42.3 | 15.4 |
| 2. | The program has helped poor farmers to pay school fees much easily | 3.8 | 7.7 | 23.1 | 55.8 | 9.6 |
| 3. | The program has helped poor farmers to not go hungry. | 1.9 | 1.9 | 21.2 | 53.8 | 21.2 |
| 4. | The program has increased farmers income. | 1.9 | 1.9 | 26.9 | 59.6 | 9.6 |
| 5. | The program has increased the number of agro dealers in the area. | 7.7 | 11.5 | 11.5 | 46.2 | 23.1 |
| 6. | The program has reduced the distance I walk to access fertilizer and seeds. | 3.8 | 5.8 | 13.5 | 48.1 | 28.8 |
| 7. | The program has made agricultural officers available. | - | 5.8 | 11.5 | 44.2 | 38.5 |
| 8. | The program has enabled me to gain knowledge. | 1.9 | 3.8 | 15.4 | 38.5 | 40.4 |
| 9. | The program diversified sources of livelihood. | 3.8 | 7.7 | 25.0 | 44.2 | 19.2 |
| 10. | The program has enabled me to start saving money. | 7.7 | 7.7 | 19.2 | 50.0 | 15.4 |
| 11. | The program has enabled me to open an account. (ANY, bank, group or SACCO) | 7.7 | 5.8 | 21.2 | 48.1 | 17.3 |
| 12. | The program enabled me to join/form a farmer group with other beneficiaries. | 5.8 | 3.8 | 23.1 | 57.7 | 9.6 |
| 13. | The program is? | - | - | 13.5 | 30.8 | 55.8 |

Cronbach’s Alpha = 0.871

The summated rating scale was used to analyse the perception as used by Likert [16]. Since the summation is not for a continuous variable but rather a categorical variable, non-parametric tests comprising of the mode and median were also used in the analysis. Table 2 shows the results of the analysis of the thirteen questions. The sum amounted to 2,581 and the mode and median were both 52. This means that the sum lies in between 2028 (3*13*52) and 2704 (4*13*52). Meaning that most of the respondents scored the program as good since the sum is in the good category as shown in Figure 1. But the mode and the median gave an exact

category since the ranking were not in a ratio form as suggested by Clason and Dormody [20]. The median and the mode thus show that the respondents ranked the program at rank 4 which is good ($4 \times 13 = 52$).

Table 2: Likert Summation, Median and Mode Statistics

| Statistic | Value |
|-----------|---------|
| | N=52 |
| Median | 52.00 |
| Mode | 52.00 |
| Sum | 2581.00 |

The ability of the farmers to rank the program as good shows that the subsidy has had a positive effect on the farmers and increased the farmers' knowledge on the benefits of using fertilizer and certified seeds. This is in line with the study by Druile and Barreiro-Hurle [21], who found out that subsidy, reduces the lack of knowledge of fertilizer use and its benefits. The positive perception of farmers also indicates that given a choice, the farmers would rather be in the *Kilimo Plus* program than not. This can be attributed to the knowledge of the benefits associated with the subsidy program. Mustafa-Msukwaet al. [22] found out that farmers willingly adopt and embrace technologies that contribute to their livelihoods positively.

The gender of the household head tested against the perception of the respondent towards the *Kilimo Plus* program was found not to be significant. This means that there was no significant difference in perception between the male headed households and the female headed households.

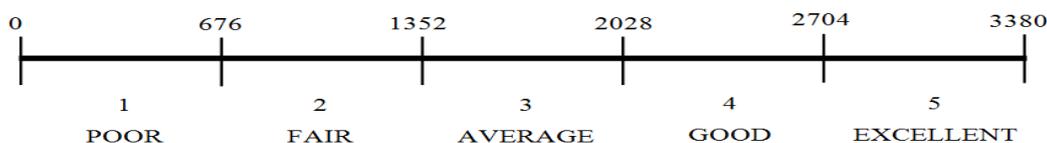


Figure 1: Scale of farmers' perception

VII. Conclusion

Most of the farmers ranked the *Kilimo Plus* program as good. This shows a positive perception of the farmers towards the program. Hence the programs had a positive influence on the perception of the farmers towards the use of fertilizer and certified seeds. In reference to the questions asked, the perception of the farmers emanated from knowledge of the benefits that the program had brought to the participants in the program. However, there is need for further research to find out whether the benefits are long lasting and the factors that influences the farmers' perception.

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