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Effects of Awareness of Fertilizer Subsidy on the Yield of Crops among Rural Farmers in Ghana

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Abstract

The study examines the effects of awareness of fertilizer subsidy on the yield of crops among rural farmers in Ghana. Random sampling was used to select six communities and 10 households per community. They include Bawku, Navrongo, Tolon kumbungu and Walewale from the Northern part and Ejura and Atebubu in the Southern part of Ghana. Primary data were collected from the sampled household by administering questionnaire. Descriptive statistics was used in analyzing the data and independent-samples t-test was used to compare the crop yield of farmers that are aware of the fertilizer subsidy program and unaware of the fertilizer subsidy program and mean was used to find the output of the beneficiaries and non-beneficiaries by using SPSS. Out of the 60 farmers interviewed in the study, male households head constituted majority 88.3%.Thepercentages of beneficiaries of the fertilizer subsidy program were 66.7% and that of the non-beneficiaries were 33.3%.Maize recorded the highest average output per acre 10.12kg/acre of beneficiaries of fertilizer subsidy program and the highest average output per acre 11.3kg/acre for the non-beneficiaries of the fertilizer subsidy program. Rice recorded the highest average output per acre 40.10kg/acre of beneficiaries before the fertilizer subsidy program and also recorded the highest average output per acre of beneficiaries after the fertilizer subsidy program. The results of the independent-samples T-test shows that, the group means 16.21 and 12.50 are significantly different because the value in the sig (2 tailed) row 0.01 and 0.03 are less than 0.05. This implies that, those farmers who were aware of the fertilizer subsidy program had higher crop yield than those who were unaware of the fertilizer subsidy program.

Keywords: Fertilizer, Subsidy, Awareness, Beneficiaries.

1. Introduction

The role of input subsidies in stimulating growth and addressing food security and poverty alleviation objectives has also re-emerged as an important agricultural policy debate (Dorward et al., 2008). Morris *et al* (2007) state that one of the emerging arguments in favor of fertilizer subsidies is that they act as safety nets for the poor and can provide a less costly way to ensure food security.

Escalating world food and fertilizer prices in 2007 and 2008 have created a sense of urgency in meeting productivity and social welfare goals and have put fertilizer promotion programs such as fertilizer subsidies high on the list of options for government and donor responses to the crisis (Dorward *et al*., 2008). Braun (2008) adds that high food prices have differentiated impacts across countries and populations groups and calls for urgent need for solutions. Dorward (2009) indicates that the impact of the input subsidy program is dependent on the system or form of fertilizer subsidy being perused by governments and other implementers.

Minot and Benson (2009) argue how fertilizer is provided to the farmer also matters and calls for new ways of designing subsidies so as to increase their effectiveness. Kherallah *et al* (2002) argue that if a fertilizer subsidy program has to work well, there is need to design it in such a way that fertilizer marketing competition is preserved and that poor farmer's benefit in a cost effective way.

Crawford *et al* (2006) state that fertilizer subsidies differ in terms of how they are organized as

well as the point at which they are applied: either to the farmer, the trader or the domestic fertilizer producer. Another way would be the form of the subsidy or how it is provided which can be through a cash payment, voucher/coupon, reduced market price or transport subsidy. Dorward (2009) argues that there is need to rethink the way input subsidy programs are designed as the impact of subsidy will vary depending on the type or nature of the subsidy and the level at which it is applied.

Chinsinga (2007) as well as Jayne *et al* (2002 and 2002) argue that there is no system that is perfect enough to counter the leakage to the unintended beneficiaries but the form or design of the subsidy also matters if they poor have to benefit. Beers and Moor (2005) in Minde *et al* (2008) argue that the effectiveness and efficiency of a subsidy program depend heavily on the specifics of implementation and that designs of subsidy programs should take into account a number of factors such as political acceptability, leakage of benefits to households outside the target group. This study therefore seeks to examine the effects of awareness of fertilizer subsidy on the yield of crops among rural farmers in Ghana.

2. Materials and Methods

Random sampling was used to select six communities and 10 households per community. They include Bawku, Navrongo, and Tolonkumbungu, Walewale from the Northern part and Ejura and Atebubu in the Southern part of Ghana. The research design and data collection involved both primary and secondary sources. Primary data were collected from the sampled household by administering questionnaire. The questionnaires captured information on the personal characteristics such as age, farmer based organization, land ownership, farmer group in the area. Age was computed in years. Various questions were prepared to gather information on household characteristics, farm characteristics and farm size (acre). Secondary sources include published and unpublished information about the study area and from the internet. The secondary information was collected from the Ministry of Food and Agriculture and the internet.

Descriptive statistics was used in analyzing the data and independent-samples t-test was used to compare the crop yield of farmers that are aware of the fertilizer subsidy program and unaware of the fertilizer subsidy program and mean was used to find the average output of the beneficiaries and non-beneficiaries of the fertilizer subsidy program by using $SPSS_{19}$.

3. Results and discussion

3.1 Socio-economic Characteristic of Household

From table 1, 88.3% of the sampled farmers are men. Out of the 60 farmers interviewed in the study, male households head constituted majority (88.3%). Majority of the farmers (53.4%) are between the age of 30-39. This implies that active youth are involve in farming.

Land ownership of the farmers is known to affect their farming activities. Evidence from this study reveals that (63.3%) of the farmers are sole owners, (15%) hired, (21.7%) family, and 53.3% of farmers belong to farmers group and 46.7% do not belong to any association. The study also reveals that about 93.3% are involved in farming for more than ten years.

Table 1.Personal and household characteristics of farmers

Variable	Frequency	Percentage
Gender		
Male	53	88.3
Female	7	11.7
Age distribution		
20-29	4	6.7
30-39	23	53.4
40-49	14	23.4
50-59	10	16.7
60-69	5	8.3
70-88	4	6.7
Land ownership		
Sole	38	63.3
Hired	9	15
Family	13	21.7
Farmer group		
Yes	32	53.3
No	28	46.7
Years of farming		
< 10	1	1.7
>10	53	93.3
= 10	3	5

Source: field survey, 2014

Table 2. Beneficiary and non-beneficiary of the fertilizer subsidy program

Variable	Frequency	Percentage
Beneficiary	40	66.7
Non Beneficiary	20	33.3

3.2 Beneficiary and Non-beneficiary of fertilizer subsidy program

From table 2, the percentage of beneficiaries of the fertilizer subsidy program were 66.7% and that of the non-beneficiaries were 33.3%. This implies that farmers who are beneficiaries (66.7%) would have

the advantage of increasing their productivity as well as farm size in other to maximize production.

3.3 Average Output per acre and Farm Size of Beneficiaries and Non-beneficiaries

The various crops grown by farmers in this study were maize, rice, pepper and beans. Table 3 below shows the average farm size and output per acre of beneficiaries and non-beneficiaries. Rice has the highest average farm size 11.30 acre, followed by beans 7.0 acre, maize 6.18 acre and lastly, pepper 3.40 acre. The average output per acre of the beneficiaries of the fertilizer subsidies were maize 10.12 kg/acre, rice 8.1 kg/acre, pepper 3.13 kg/acre and beans 7.08 kg/acre. Maize recorded the highest average output per acre 10.12 kg/acre of beneficiaries of fertilizer subsidy program. The average output per acre of non-beneficiaries of the fertilizer subsidy is 11.3 kg/acre, rice 9.2 kg/acre, pepper 4.3 kg/acre and beans 3.3 kg/acre. Maize recorded the highest average output per acre 11.3 kg/acre for the non-beneficiaries of the fertilizer subsidy program.

Table 3.Average output per acre of beneficiary and non-beneficiary of fertilizer subsidy program

Crops	Average farm size (acres)	Average output per acre	
		beneficiary	non-beneficiary
Maize	6.18	10.12	11.3
Rice	11.30	8.1	9.2
Pepper	3.40	3.13	4.3
Beans	7.08	2.2	3.3

Source: field survey, 2014

3.4 Average output per care of beneficiaries and non-beneficiaries before and after the fertilizer subsidy program

Table 4 shows the average output per care of beneficiaries before and after the fertilizer subsidy program. The average farm sizes for the beneficiaries before and after the fertilizer subsidy program were maize 6.18 acre, rice 11.30 acre, pepper 3.40 acre and beans 7.08 acre. Rice recorded the highest average farm size 11.30 acre. The average output per care before the fertilizer subsidy programs were maize 30.20 kg/acre, rice 40.10 kg/acre, pepper 20.00 kg/acre and beans 22.35 kg/acre. Rice recorded the highest average output per acre 40.10 kg/acre of beneficiaries before the fertilizer subsidy program. The average output per acre of beneficiaries after the fertilizer subsidy programs were maize 25.40 kg/acre, rice 30.20 kg/acre, pepper 19.30 kg/acre and beans 20.40 kg/acre. Rice recorded the highest average output per acre of beneficiaries after the fertilizer subsidy program.

3.5 Comparison of crop yield of awareness and unawareness of fertilizer subsidy program

Table 4 describes the variables used in the independent-samples T-test. The test (dependent) variables were crop yield of farmers that were aware and crop yield of farmers that were unaware which were in kilogram. The group (independent) variables in this study were defined as follows: Awareness- This was coded as a dichotomous variable with 1= aware and 2= unaware.

From table 5, the results of the independent-samples T-test shows that, the group means 16.21 and 12.50 are significantly different because the value in the sig (2 tailed) row 0.01 and 0.03 are less than 0.05.This implies that, those farmers who were aware of the fertilizer subsidy program had higher crop yield than those who were un aware of the fertilizer subsidy program.

Table 4. Average output per acre of beneficiaries before and after subsidy program

Crops	Average farm size (acres)	Beneficiary average output per acre before subsidy (kg/acre)	Beneficiary average output per acre after subsidy(kg/acre)
Maize	6.18	30.20	25.40
Rice	11.30	40.10	30.20
Pepper	3.40	20.00	19.30
Beans	7.08	22.35	20.40

Source: field survey, 2014

Table5. Results estimate of independent-samples T-test of crop yield of farmers that are aware and unaware of the fertilizer subsidy program

Dependent variables	Mean	Standard deviation	Sig(2-tailed)
Output of awareness	16.21	17.92	0.01
Output of unawareness	12.50	12.81	0.03

4. Conclusion and recommendations

Out of the 60 farmers interviewed in the study, male households head constituted majority 88.3%. The percentages of beneficiaries of the fertilizer subsidy program were 66.7% and that of the non-beneficiaries were 33.3%.Maize recorded the highest average output per acre 10.12 kg/acre of beneficiaries of fertilizer subsidy program and the highest average output per acre 11.3kg/acre for the non-beneficiaries of the fertilizer subsidy program. Rice recorded the highest average output per acre 40.10kg/acre of beneficiaries before the fertilizer subsidy program and also recorded the highest average output per acre of beneficiaries after the fertilizer subsidy program. The results of the independent-samples T-test shows that, the group means 16.21 and 12.50 are significantly different because the value in the sig (2 tailed) row 0.01 and 0.03 are less than 0.05. This implies that, those farmers who were aware of the fertilizer subsidy program had higher crop yield than those who were unaware of the fertilizer subsidy program.

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