Impact of Subsidized Farm Inputs in Maize Production by Smallholder Farmers in Rungwe District, Tanzania

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ABSTRACT

The aim of this study was to assess the impact of using subsidized farm inputs in maize production in Rungwe District. Study employed a cross-sectional research design. Both probability and non-probability sampling were use in selecting the respondents. Primary data were collected through interview while secondary data were collected through documentary review. Data were analysed using descriptive statistics and multiple linear regression. Findings revealed that subsidized farm inputs supplied to farmers were improved seeds, basal fertilizers and top fertilizer. Results revealed that before using subsidized inputs majority of respondents (46.2%) harvested not more than 2,000 kg per Ha. However, following use of subsidized inputs for maize, proportion of respondent harvesting that much dropped to 10.9%, with majority of respondents harvesting more than 2,000 kg per Ha. Famers' income also improved following use of subsidized maize inputs. Utilization of subsidized farm inputs was significantly influenced by the ability of the farmer to contribute the 50% of the price of the given inputs, awareness on availability of farm input subsidies and accessibility to extension services ($P< 0.05$). Other factors such as tradition and culture in farming practices and knowledge in application of inputs were not significant ($P>0.05$). The study concluded that both yields and income increased substantially among smallholder maize farmers who received and applied subsidized farm inputs.

Keywords: Input subsidy, smallholder farmers, maize

1.0 INTRODUCTION

All nations worldwide depend on the farm products in order to feed its citizens regardless whether this food is produce internally or imported from other countries. Since Tanzania got independence; agriculture became a major economic activity within the country. Agriculture in Tanzania accounts for more than one-quarter of GDP, provides 85% of exports, and employs about 80% of the work force (CIA World Fact Book, 2015). It is estimated that 80% of the economy of the country depend on agriculture, since it employs most of the Tanzanian who are living in rural areas. Agriculture is the primary economic activity in Tanzania, and nearly 70% of those engaged in agriculture are small-scale farmers. Although Tanzania is one among the countries which has large fertile land and good weather condition for both cash and food crops production, underproduction is still an obstacle for family food security as well as the nation as whole.

The main identified impediment to high agricultural production and food security in Tanzania is the low usage of fertilizers and improved seeds. Poverty level for farmers who depend on the sale of food crops is high (National Bureau of Statistics, 2002). Thus, the National Agricultural Input Voucher Scheme (NAIVS); implemented by the Government of Tanzania with support from the World Bank was launched as a smart-market subsidy targeted at providing small-scale farmers with access to critical agricultural inputs, such as fertilizers and improved seeds, at a 50% subsidy. It is aimed at high levels of food crop production, particularly for main staple crops such as maize and rice (Malhotra, 2013).

According to Ikunda (2012), subsidized crop inputs for crop production is a system introduced by the Government in the year 2008, with the aim of reaching 2.5 million local farmers in 65 districts. The system enables the chosen local farmer to get subsidies for crop production inputs at 50% reduced price compared with the market price for three years consecutively. The government started to use subsidized agricultural inputs voucher leaving the former procedures where companies were being contracted with government to supply fertilizer and sell it with the price agreed by the government and companies. The different between the subsidies price and the market price would be paid by the government to the companies after selling farm inputs to farmers (URT, 2012). This study was

carried out in order to assess the impact of subsidized farm inputs in maize production to famers in Rungwe district in Tanzania.

2.0 METHODOLOGY

2.1 Study Area

This study was conducted in Rungwe district. Rungwe district is located in Mbeya region. The study area covered two villages in two wards, that is, Kasyabone and Selya villages. These were selected because they were amoung the villages which received subsidized farm inputs and most farmers in theses villages are heavily involved in maize production compared to other villages.

2.2 Research Design

This study employed cross sectional research design. This design ensures collection of data from different groups of respondents at once (Bailey, 1994). A total of 91 households out of 1892 that received input subsidy were randomly chosen to be involved in the study. The sample size was calculated according to Yamane (1967).

Primary data were collected through interview and observation, while secondary data on the other hand were collected through documentary review.

2.3 Data Analysis

Both descriptive and inferential statistics were applied to analyze collected data. Multiple linear regression analysis was used to identify factors that significantly influencing farmers' involvement in subsidized farm inputs in maize production. The following model was used.

$Y = A + B_1X_1 + B_2X_2 + B_3 + X_3 B_4 X_4 + B_5X_5 + E;$ where by

Y = utilization level of subsidized farm inputs in maize production

X_1 = ability of a farmer to contribute the 50% required

X_2 = traditional and culture in farming practices

X_3 = awareness of farmers on availability of farm subsidies inputs.

X_4= accessibility of farmers to extension services.

X_5 = knowledge on application of inputs

B_1..... B_5 = Regression coefficients which corresponds to independent variables.

A= constant term

E = Error of expectation

3.0 RESULTS AND DISCUSSION

3.1 Social-Demographic Characteristics of Respondents

Results in Table 1 majority of respondents (87.9%) were within active working age (18 – 49 years). The age factor is important especially in the adoption of innovations and the ability to cope with the drudgery associated with crop production in general (Buba, 2005). Furthermore, majority of study participants (58.2%) were males, indicating that maize farming in the study area was a predominantly men activity as male are entitled to be head of households in most of the families in the study areas although this does not justify that men contribute much labour force in maize farming than women, as it is known in Tanzania that women are the one who contribute much labour force in farming activities. In contrast, in Malawi where fertilizers are provided to farmers irrespective of sex as subsidies, Chirwa *et al*. (2011) reported no significant men/women differences with regard to use. Education is not only endows one with the power to read and hence be informed, but it also allows one to communicate (Mwaniki, 2006). Results of this study indicate that most (54.9%) of the respondents had attained primary education while 19.8% and 16.5% had attained secondary and college education, with few (8.8%) with no formal education, a pattern reflecting good literacy level among farmers in the area.

Table 1: Social demographic characteristic of respondents (n= 91)

Variable	Frequency	Percentage
Age (years)		
18-33	34	37.4
34-49	46	50.5
50-65	11	12.1
Sex of respondents		
Male	53	58.2
Female	38	41.8
Level of education of respondents		
None	8	8.8
Primary Education	50	54.9
Secondary Education	18	19.8
Colleges and University	15	16.5

3.2 Types and Quantity of Subsidized Farm Inputs Supplied to Farmers

From the field, the study observed that there were three types of inputs that were supplied to the farmers; these are improved seeds, basal fertilizer and top fertilizer.

Findings in Table 2 revealed that most farmers (38.5%) received between 5 to 10 kilograms of improved seeds (38.5%), 50 to 150 kilograms of basal fertilizers (51.6%), and 50 to 150 kilograms of top fertilizer (58.2%). As with other inputs, most farmers received few quantities of improved maize seeds. Probably this may be due the reluctance of farmers in adopting new maize varieties hence most of them stick to their traditional seeds. This confirms results for the study by Smale *et al*. (1995) who found that farmers in Malawi favoured cultivation of local maize varieties to hybrids due to their better food processing and on-farm storage characteristics compared to most hybrid maize varieties.

Table 2: Type and quantity of subsidized farm inputs received by farmers

Types of inputs	Amount (Kg)	Frequency	Percentage
Improved seeds			
	5-10	38	38.5
	11 – 15	19	19.8
	16 – 20	13	14.3
	21 – 25	10	11.0
	26 – 30	11	12.1
	>31	4	4.4
Basal fertilizer			
	50 – 100	47	51.6
	150 – 200	25	27.5
	250 – 300	19	20.9
Top fertilizer			
	50 – 100	53	58.2
	150 – 200	27	29.7
	250 – 300	11	12.1

3.3 Impact of Subsidized Inputs Utilization in Maize Production

3.3.1 Yield before and after use of subsidized farm inputs

Most farmers (54.6%) used to cultivate between 1 to 2 acres. Results from Figure 1 reveal that before use of subsidized inputs most farmers (46.2%) were harvesting between 100 - 2,000 Kg per Ha, and few 3.3% were harvesting between 8,001 – 10,000 Kg per Ha. However, after start using subsidized inputs, only 10.9% of famers harvested 100 – 2,000 Kg per Ha, with 29.5%, 17.7%, 15.7 %, 14.2% and 12% harvesting 4,001-6,000, 6,001-8,000, and 8,001-10,000 and 12,000 Kg per Ha, respectively. These attest that provision and use of subsidized farm inputs have positive effect on maize production. The findings correspond with that of Bunde *et al*. (2014) from the study conducted in Kenya.

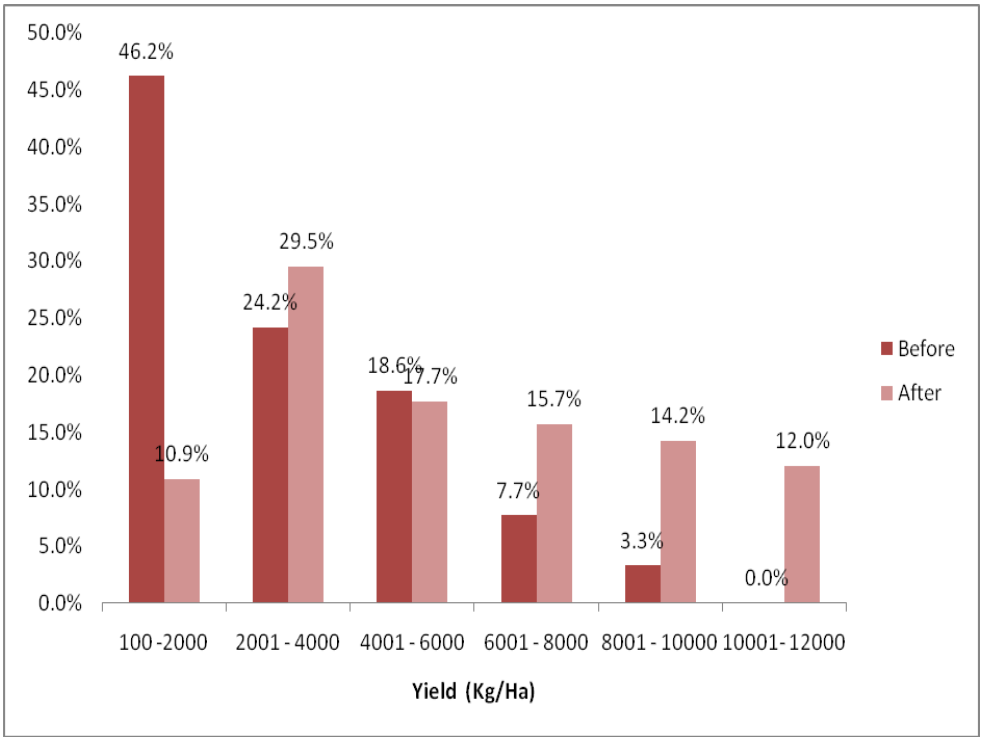

Figure 1: Yields before and after the use of subsidized farm inputs

3.3.2 Income earned before and after use subsidized farm inputs

Result in Figure 2, indicate that large number (39.6%) of the respondents received income between 100,000 - 550,000 Tsh and only 2.2% received 1,551,000 - 2,050,000 Tsh from maize production before use of subsidized farm inputs. After using subsidized farm inputs the percentage of respondents who received the

income of 100,000 - 550,000 Tsh drop from 39.6% to 5.4% and percentage of farmers who received income from 1,551,000 - 2,050,000 Tsh increased from 2.2% to 12.2%. Also there was no farmer who earned above 2,050,000 before they start to utilize farm inputs. However, after using farm inputs 13.5% and 41.8% of farmers earned between 2,051,000 – 2,500,000 Tsh and above 2.5 million shillings, respectively. This proves that use of subsidized farm inputs rised the income of local farmers in the study area. These findings are in agreement with (FAO, 2001), that increased use of inputs in agricultural production can raise the incomes of farmers so that can help them access social services and consumer goods.

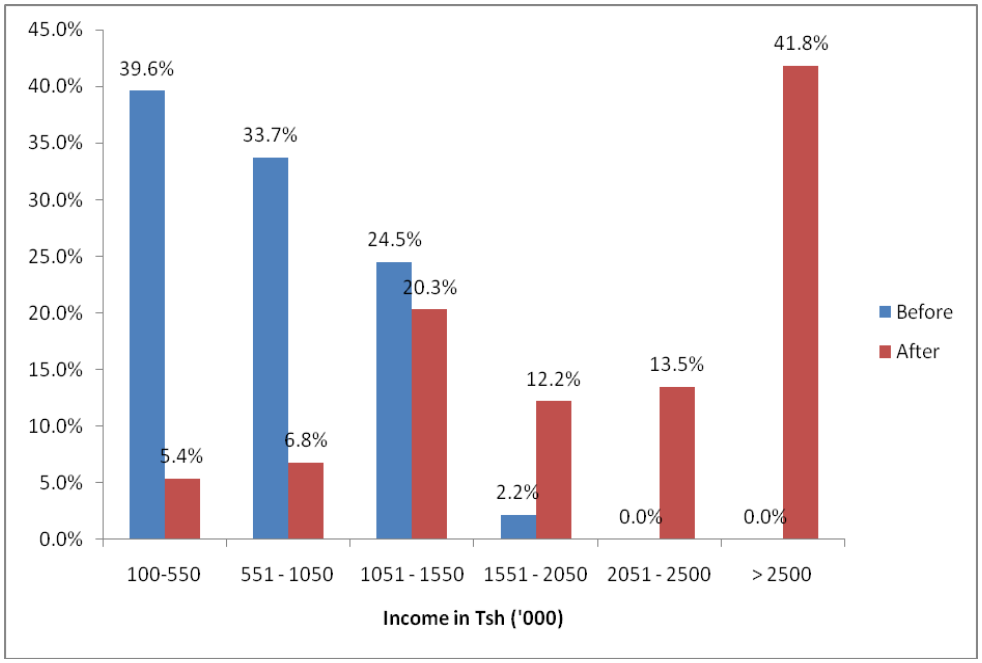

Figure 2: Income before and after the use of subsidized farm inputs in '000 Tsh

3.4 Factors Influencing Utilization of Subsidized Inputs in Maize Production

Table 3 depict results from regression analysis on the factors that influencing utilization of subsidized farm inputs in the study area. These results are presented and discussed in the following sections.

3.4.1 Accessibility to extension services

Utilization of subsidized farm inputs in maize production has been affected much by the accessibility to extension services accessibility to extension services significantly positively influenced the use of subsidized farm inputs ($P < 0.05$). Therefore extension services to local farmers is supposed to be adequate and easily accessible in order to improve maize production since most farmers will benefit from advise of using subsidized farm inputs. This observation concurs with that of Feder and Slade (1984); Igodan et al. (1988); Strauss et al. (1991); and Akromov (2010) who reported a positive relationship between extension services access and use improved technologies.

3.4.2 Ability of farmers to contribute 50% of the price of the inputs

The results of the analysis revealed that the relationship between the ability of farmers to contribute 50% of the price of inputs and the utilization of subsidized farm inputs is also significant ($P < 0.05$). This could be due to financial constraints facing most smallholder farmers in study area. Thus it seems that establishment of credit facilities can assist farmers to have cash for buying farm inputs. It has been argued that the role of credit in financing farmer investments in improved technologies such as high yielding seeds, fertiliser and machinery particularly in developing countries where smallholder farmers are generally financially constrained cannot be overstated. Constraints to credit access have been identified as some of the barriers to adoption and use of improved agricultural inputs in developing countries (Feder *et al*., 1985).

3.4.3 Awareness of availability of subsidized farm inputs for maize production

Findings in Table 3 reveal positive significant relationship between awareness on availability of subsidized inputs and their utilization ($P < 0.05$). Malhotra (2013) reported high (93%) percentage of farmers being aware of NAIV from the study conducted in Arusha, Kilimanjaro, Morogoro, Ruvuma, Iringa, Mbeya, Rukwa, and Kigoma. It is important for the local farmers to have more awareness on the availability of subsidized farm inputs in order for them to utilize those inputs in the production of maize. Farmer access to information on agricultural technologies through extension services is crucial in revealing the opportunities existing concerning new technologies related to agricultural development which in turn will

increase adoption rate of those technologies. This is in line with the observation by Strauss *et al*. (1991) and Langyintuo and Mekuria (2005).

3.4.4 Traditional and culture in farming practices

Results from Table 3 also shows that farmers tradition and culture in farming practices was not significantly influenced utilization of subsidized inputs in maize production (P>0.05). However, it is known that gender plays an important role in farmer use of agricultural technologies such as improved seeds, chemical fertilizers or animal traction, in production in African societies. Langyintuo and Mekuria (2005) urge for inclusion of gender in analysis of adoption studies by observing that extension services provision which is important in use of improved inputs is mainly conducted by men who are biased towards fellow men yet women are dominant in African agriculture.

3.4.5 Knowledge on the application of inputs

The results from Table 6 also indicate that knowledge on the application of inputs is not statistically significant (P>0.05). This surprisingly since it was indicated earlier that in the study area most farmers have sufficient knowledge on how to use farm inputs since more than 90% of respondents had attended formal education. More educated farmers are thus more likely to access information and advice from extension workers, which influence their adoption and use of improved inputs. According to Langyintuo and Mekuria, (2005) and Tabi *et al*. (2010) Educated farmers are believed to have higher ability to perceive, interpret and respond to new information about improved technologies than their peers with little or no education. Similarly Nkamleu and Adesina (2000) examined the effect of socioeconomic factors on the likelihood of farmer use of chemical fertiliser and pesticide in peri-urban lowland agricultural systems in Cameroon. Farmers who were more educated or had access to extension services were found to have higher chances of using fertiliser and pesticides.

Table 3: Regression results for factors influencing utilization of subsidized farm inputs in maize production

Factors	Beta	Standard Error	t	Sig.
(Constant)	.309	.239	1.291	.201
Awareness on availability of subsidized farm inputs	.244	.102	2.396	.019
Accessibility extension services	.391	.089	4.384	.000
Traditional and culture in farming practices	-.071	.058	-.219	.226
Knowledge on application of inputs	.022	.075	.299	.766
Ability to contribute 50 %	.305	.103	2.947	.004

4.0 CONCLUSION

Subsidized inputs provided to farmers were in three categories namely improved seeds, basal and top fertilizers. However, farmers were reluctant to utilize improved seeds, they prefer local seeds. Both yield and income improved substantially after utilization of subsidized farm inputs. On the factors that influence utilization of subsidized farm input; awareness on availability of farm subsidies inputs, accessibility to extension services and ability a farmer to contribute the 50% of the price of the given inputs significantly positively influenced utilization of subsidized farm inputs.

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