Effects of Farmer Support Programmes on Maize Production: The Case of the Millennium Development Authority Programme in the Sekyere East District of Ghana

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ABSTRACT
This study examined effects of farmer support programmes on maize production in the Sekyere East District of Ghana using the Millennium Development Authority Programme (MiDA) as a case study. Data was collected from 100 beneficiaries and 100 non-beneficiary maize farmers of the MiDA programme. Frequencies, percentages, means, standard deviations, the student *t test* and simple regression analysis in the Statistical Package for Social Sciences were used to analyse the data. Overall extent of technology adoption was high (61.5%) among maize farmers. Although there were observed differences in yields, a *t test* showed that there was no significant difference ($p>0.05$) between the yields of beneficiaries (1.45bags/acre) and non-beneficiaries (1.63bags/acre) of the MiDA programme. There existed a statistically significant relationship ($p<0.05$) between yield obtained by Non-MiDA farmers and adoption of technologies. Beneficiaries of the MiDA programme identified delay of funds and input distribution as the major problem affecting the success of the MiDA programme. There should be a gender balance in selection of beneficiaries. Also, there should be an intensification of the activities of MiDA in the District since the yields of beneficiaries do not have a comparative advantage over the non-beneficiaries.
Keywords: Adoption, Farmer, Maize, Technology, Yield

INTRODUCTION
Agriculture is the main economic activity of the majority of the Ghanaian population as it contributes over 35% of Gross Domestic Product (GDP) and employs about 55% of Ghana's labour force (CIA, 2009). However, the country still remains highly dependent on food imports from developed countries (EIU, 2007). Whiles food production has tripled in developing countries especially Asia in the last 30 years, the scenario has been the opposite in Sub-Saharan Africa where the population keeps increasing (Pinstrup-Andersen *et al.*, 1999). In Ghana, food self-sufficiency has only been achieved in starchy staples such as cassava, yam and plantain, while rice and maize production falls far below demand (EIU, 2007). However, according to ODI (2003), farm support from agencies like the Government, Foreign donors and other Non-Governmental Organisations will intervene in diverse ways in the pursuit of attaining food self-sufficiency. Farmers will be provided with subsidies to increase their productivity levels.

The United States government introduced the Millennium Challenge Account (MCA) through the Government of Ghana to help reduce global poverty through increased economic growth by investing in areas like agriculture. Through the MCA the Millennium Development Authority (MiDA) programme was set up to meet this objective (MiDA, 2009). In the programme, maize farmers in the Sekyere East District

and other districts in Ghana were given technical support (introduced to various technologies) as well as a 'starter pack' to help boost production. The starter pack was made up of farm inputs such as seeds, fertilizers, wellington boots and money. The farmers have been engaged in production for about four years now using these supports given to them by the MiDA programme. The study therefore seeks to assess the effect of the technical support provided by MiDA on the yield of the beneficiaries. The specific objectives of the study were:

- To compare the yields of beneficiaries and non-beneficiaries.
- To identify the technologies adopted by respondents.
- To determine the extent of technology adoption by respondents.
- To determine the effect of technology adoption on yield of respondents.
- To identify the constraints militating against the MiDA programme.

RESEARCH METHODOLOGY

This study was carried out in the Sekyere East District of the Ashanti Region of Ghana. For the purpose of this study, the population is defined as all maize farmers in the Sekyere East District. The population of maize farmers in the District is estimated around 350. A total of 200 farmers were accessible. The total sample was stratified into beneficiaries and non-beneficiaries. This was done in order to have a fair idea of how the MiDA programme has affected the beneficiaries and how it could affect non-beneficiaries. The sample size was made up of 100 each of beneficiaries and non-beneficiaries of the MiDA programme. Out of this number, 50 farmers were selected from four communities; Asukawkaw, Akuakrom, Naama and Feyiase using the simple random sampling technique. Each individual respondent was chosen randomly and by chance such they all had the same probability of being chosen. Every respondent was assigned a unique number. The numbers were placed in a bowl and thoroughly mixed. Then, a blind-folded research team member selected 25 from each community (beneficiaries and non-beneficiaries).

Data was collected by the use of face-to-face interview with respondents using a research instrument (questionnaire). This was made up of both closed and open-ended questions. Data collected were entered into the Statistical Package for Social Sciences (SPSS) Version 17.0 and Statgraphics for analysis. Frequencies, percentages, means, standard deviations, the student *t test* and simple regression in SPSS were used to analyse the data obtained from the maize farmers.

RESULTS AND DISCUSSIONS

Demographic Characteristics of Respondents

Majority of the respondents (56%) were males while 44.0% were females (Table 1). This shows a fair representation of women in maize farming in the Sekyere East district. Similarly, Fanadzo *et al.*, (2010) noted that in the Republic of South Africa, the majority of maize farmers were males (85%) whiles the females were 15%. Contrary to these findings are the results of a study conducted by Damisa *et al.*, (2007) which showed that women in Africa are responsible for about 60% of African agricultural workforce. The disparities in these results could probably be attributed to the fact that certain parts of Africa still have men in domination when it comes to agriculture and women contribution are never documented (FAO, 1998; Korieh, 2001). However, recently, women have played a significant role in agriculture (FAO, 1998).

Table 1: Demographic Characteristics of Respondents from Sekyere East District of Ghana

Demographic Characteristics	MiDA Farmers		Non-MiDA Farmers		Total
	Frequency	Percent	Frequency	Percent	Percent
Gender of Respondents					
Male	57	57.0	55	55.0	56.0
Female	43	43.0	45	45.0	44.0
Age of Respondents					
Below 36 years	33	33.0	25	25.0	29.0
36-45 years	35	35.0	39	39.0	37.0
46-55 years	20	20.0	27	27.0	23.5
Above 55 years	12	12.0	9	9.0	10.5
Educational Level					
None	8	8.0	8	8.0	8.0
Primary	67	67.0	63	63.0	65.0
SHS	22	22.0	26	26.0	24.0
Tertiary	3	3.0	3	3.0	3.0
Household Size					
<3	2	2.0	19	19.0	10.5
3-4	16	16.0	23	23.0	19.5
5-6	34	34.0	29	29.0	31.5
7-8	16	16.0	13	13.0	14.5
>8	32	32.0	16	16.0	24.0
Working Experience					
< 11years	66	66.0	64	64.0	66.0
11-20years	20	20.0	27	27.0	20.0
21-30years	8	8.0	7	7.0	8.0
31-40years	4	4.0	2	2.0	4.0
> 40years	2	2.0	0	0.0	2.0

About 66% of the maize farmers were below the age of 45 years whiles 34% were above the age of 45 (Table 1). The result means that maize farmers in the Sekyere East District of Ghana are mostly of the youth population. Martinsen (2007) noted that in China, Japan, Korea and other Asian countries, farming has been left for people in their old ages. He further noted that Japanese youth rarely enter agriculture as the aged made up over 50% of the agricultural population. This result obtained for this study serves to give agriculture a promising future since there is an active participation of the youth in maize farming in the Sekyere East District.

The level of education among farmers in the District was rather low as over 70% of the maize farmers have not attained senior high school education (Table 1). Hossain *et al.*, (1992) and Oyekale & Idjesa (2009) noted that this low state of education affects the level of technology adoption and skill acquisition among farmers.

Majority of the respondents (69%) had a household size of more than five (Table 1). Similarly, Fanadzo *et al.*, (2010) reported that in South Africa, the mean household size of maize farmers was 5 people. With such a large farm household size, farmers are likely to have enough labour for their farm activities and this is also likely to affect the level of adoption of technologies (Arene *et al.*, 2000).

Sixty six percent (66%) of the respondents have been in maize farming for less than 11 years whiles 34% have had a working experience of more than 11 years (Table 1). Relatively, maize farmers in the District can be said to be inexperienced. The effect this is likely to have on technology adoption is that, inexperienced farmers will try new things they deemed fit to increase their productivity levels than the relatively experienced farmers. Adekoya (2005) noted

that this state of inexperience in the farming industry can result in low production and income for the farmers.

Comparing the Yields of MiDA and Non-MiDA Farmers

The mean yield obtained by MiDA farmers was 1.45bags/acre whiles that of the Non-MiDA farmers was 1.63bags/acre. The yields obtained by Non-MiDA farmers were slightly higher than that of the MiDA farmers (Table 2). The observed differences in yield may be just a matter of random fluctuations. The mean yields can therefore be said to be equal. A paired sample *t test* (1.529) of the mean yields of both farmer groups does not show significance ($p>0.05$). This result confirms that of Chilot *et al.*, (1998) who showed that there has not being significant increases in yield of cereal farmers who adopted available technologies as compared to those who did not.

Table 2: Average Yields of Maize Farmers in Sekyere East District of Ghana

Average Yields	N	Mean	Std. Deviation	Std. Error Mean
MiDA farmers	100	1.45	1.06	0.11
Non-MiDA farmers	100	1.63	0.70	0.07

Technologies Adopted By Maize Farmers

All the respondents were aware of all the technologies listed above. However, differences show in the types of technologies they have applied to their maize farms (Table 3). The technology that had been adopted most by the farmers was spacing (190). This was followed by seed rate application (188); timely sowing of maize (186), timely harvesting (165), seed treatment before sowing (123), varieties used (120) and disease and pest application (112). On maize production technologies, FAO (1997) noted that the use of improved seed-fertilizer technology remains patchy in many developing countries growing white maize, as does the use of more sophisticated, management-intensive technologies. They further added that for new technologies to be available to farmers, dynamic agricultural research programmes that take into account the needs of client farmers, as well as extension services that work actively with farmers as they learn about new methods of maize cultivation are necessary.

Table 3: Technologies Adopted by Maize Farmers by Sekyere East District of Ghana

Available Technologies	Awareness		Application	
	Yes	No	Yes	No
Seed Rate Application (9kg/acre)	200	0	188	12
Varieties used	200	0	120	80
Seed Treatment before sowing	200	0	123	77
Timely Sowing of maize	200	0	186	14
Spacing (80cm×40cm)	200	0	190	10
Fertilizer Application	200	0	99	101
Disease and Pest application	200	0	112	88
Timely Harvesting	200	0	165	35
Post Harvest Handling	200	0	91	109

Extent of Adoption of Technology

Maize farmers in the District have been introduced to various technologies. However, the technologies introduced by the MiDA programme were used for the assessment. Non-MiDA farmers had also been introduced to similar technologies by other organisations (Table 4). The measure of adoption was done such that respondents who had adopted less than three of the

technologies above were considered to be low adopters, respondents who adopted three-six of the technologies were considered to be moderate adopters and farmers who adopted seven-nine of the technologies were considered to be high adopters. The majority of the maize farmers (61.5%) were high adopters of the technologies, 20.0% were moderate adopter whiles 18.5% were low adopters (Table 4). Similar technologies have been introduced to maize farmers in Tanzania and Nigeria and adoption rates were high (Kaliba *et al.*, 1998; Adekoya & Babaleye, 2009). The reason for the high adoption could be because maize is a major ingredient in most Ghanaian homes; hence farmers will adopt available technologies so as to meet their consumption needs.

Table 4: Overall Level of Technology Adoption by Sekyere East District of Ghana

Overall Adoption	MiDA Farmers		Non-MiDA Farmers		Total
	Frequency	Total	Frequency	Percent	Percent
Low Level	12	12.0	25	25.0	18.5
Moderate Level	20	20.0	20	20.0	20.0
High Level	68	68.0	55	55.0	61.5
Total	100	100.0	100	100.0	100.0

Effect of Technology Adoption on Yield

A simple linear regression model was used to describe the relationship between yield of Non-MIDA farmers and adoption of technologies. Results showed that there was a statistically significant relationship ($p<0.05$) between the yield obtained by Non-MiDA farmers and adoption of maize technologies. The result implies that the higher the adoption of available beneficiaries of the MiDA programme. However, there were observed little differences, which could be attributed to random fluctuations in respondent selection. technologies by the Non-MiDA maize farmers, the higher their yield. Hence, for every 100 percent increase in rate of adoption of maize technologies, output (yield) is likely to increase by 12 percent. FAO (1997) and Morris *et al.*, (1999) have similarly proved that the adoption of new technology propels an increase in maize yields.

Problems Militating Against the Smooth Running of the MiDA Programme

Beneficiaries were asked to identify the problems they have been facing in the programme. Most of the beneficiaries (56%) considered delay of funds and input distribution as the major problem affecting the programmes' success, 25% indicated inadequate number of facilitators whiles 19% inadequate amount of funds and inputs as a problem (Table 5). FAO (1997) enumerated some of the problems of maize production to be insufficient appreciation of farmer preferences and circumstances in the development of materials for production in support programmes.

Table 5: Problems of MiDA Beneficiaries in Sekyere East District of Ghana

Problems	Frequency	Percent
Delay of the distribution of funds and inputs	56	56.0
Inadequate amount of funds and inputs	19	19.0
Inadequate number of facilitators	25	25.0
Total	100	100.0

CONCLUSIONS AND RECOMMENDATIONS

There was no significant difference between the yields of beneficiaries and non-

All the respondents were aware of all the technologies listed for this study. The level of technology adoption among maize farmers in the Sekyere East District of

Ghana was high, thus very encouraging. This could serve as the basis for the provision of other technical training programmes to benefit other farmers. The MiDA programme could not serve one of its objectives of improving the yields of beneficiary farmers since the results showed that the yields of Non-MiDA farmers increased with the adoption of maize technologies. Beneficiaries of the MiDA programme identified delay of funds and input distribution as the major problem affecting the success of the MiDA programme. There should also be gender balance in the selection of the beneficiaries. Intensification and increase in the activities of MiDA programme in the District since the yields of beneficiaries of the support programme do not have a comparative advantage over the non-beneficiaries. Results also showed that the higher the adoption of available technologies by the Non-MiDA farmers, the higher their maize yield. The problems militating against the smooth running of the programme must be quickly addressed if the intended objectives of the MiDA programme are to be materialised in the District. This can be done by ensuring that inputs and funds required by the farmers to start production are distributed on time. A further study should be carried out to assess the supervisory, monitoring and evaluation aspect of the programme so as to be able to effectively measure the overall success of the MiDA programme.

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