



Ghana's Fertilizer Subsidy Programme: Assessing Farmer Participation and Perceptions of its Effectiveness

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ABSTRACT

In 2008, the Government of Ghana introduced a national fertiliser subsidy programme to promote the production of cereals in the country. Documented evidence of the impact of the programme, factors affecting participation, and the perceptions of farmers about its effectiveness remains scanty and hard to find. This study therefore sought to investigate the factors affecting participation in the subsidy programme as well as farmers' perceptions about its effectiveness using data from a cross-section of 300 farm households in northern Ghana. The study employed a probit model to assess the factors affecting participation in the subsidy programme while descriptive statistics were used to present the findings on farmers' perceptions. The results indicated that participation in the subsidy programme is significantly influenced by educational status and farming experience of the household head, contact with agricultural extension agents, herd size, degree of specialisation in rice production, use of farm mechanisation and location of the farm. Furthermore, farmers perceived the subsidy programme to be ineffective in terms of timeliness, availability and distribution of subsidised fertiliser, access to coupons (vouchers), and distance to fertiliser depots. The findings underscore the need to ensure adequate and timely supply of subsidised fertiliser, improve communication on the availability of both fertiliser coupons and subsidised fertiliser, as well as increase in the number of extension workers to enhance the effectiveness of the subsidy programme.

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INTRODUCTION

Inorganic fertilisers enhance agricultural production and contribute to agricultural productivity-growth. Application of the recommended amounts of inorganic fertilisers enables farmers to achieve optimum yield and contributes to soil amendment in areas with fragile soils (Alfsen et al., 1997; Xu et al., 2009; Larson, 1993). Fertiliser application rates in sub-Saharan Africa,

however, are the lowest compared to other parts of the world thus raising concerns about the prospects of agricultural productivity growth in these countries. For example, the average fertiliser application rate was only 13 kg/ha in 2008 for sub-Saharan Africa, compared with an average of 94 kg/ha in other developing countries (Minot and Benson, 2009). According to Ghana's Ministry of Food and Agriculture (MoFA), the country witnessed a decrease in unit fertiliser use from 21.9 kg/ha

in 1978 to 8 kg/ha in 2006 (MoFA, 2008). The low use of fertiliser by African farmers is partly responsible for the continent's low agricultural productivity (Morris et al. 2007). According to Morris et al., (2007), historical evidence shows that growth in agricultural productivity have been achieved through considerable increase in the use of chemical fertiliser. The abysmally low fertiliser application rate in Sub-Saharan Africa led to the Africa Fertiliser Summit in Abuja, Nigeria in 2006 under the auspices of the African Union (AU), the New Partnership for African Development (NEPAD) and the Government of Nigeria to find ways to increase fertiliser use on the continent. This led to the Abuja Declaration on Fertiliser for African Green Revolution, by which AU Member States pledged to increase fertiliser use to 50 kg/ha on average by 2015 (AU, 2006). AU member states were also expected to eliminate taxes and tariffs on fertiliser and raw materials for fertiliser and allocate 10% of their national budget to agriculture by 2008.

Many governments around the world have implemented fertiliser subsidy programmes to increase fertiliser use by farmers (Crawford et al., 2006; Gladwin et al., 2002; Morris et al., 2007; Abdoulaye and Sanders, 2005; Dorward et al., 2004). The re-emergence of fertiliser subsidies has been necessitated by rising food security concerns especially in most Sub-Saharan African countries. After widespread liberalisation and government withdrawal from the fertiliser sector in most Sub-Saharan African countries, there is now renewed interest by African governments to provide agricultural inputs to farmers. This is in recognition of fertiliser subsidies as necessary prerequisite to increase agricultural productivity in Sub-Saharan Africa (Morris et al., 2007).

There is substantial evidence indicating that withdrawing fertiliser subsidies leads to low use of fertiliser by farmers. Shepherd (1989) reported a decline in the demand for fertiliser due to reduction in fertiliser subsidies in Senegal. Asenso-Okyere (1994) also reported that removing fertiliser subsidies in the absence of credit and remunerative output prices has resulted in falling demand for fertiliser in Ghana.

In the light of the foregoing, the current paper sets out to investigate the factors influencing participation in Ghana's fertiliser subsidy programme as well as the perceptions of farmers regarding the effectiveness of the programme. The findings of the study will help

implementers of the subsidy programme to remove bottlenecks in implementation and improve fertiliser delivery to smallholder farmers who produce the bulk of the country's food.

Agricultural input subsidies remain a long-standing contentious strategy of sub-Saharan African governments and their development partners to promote agriculture and food security (Lunduka et al., 2013). Jayne and Rashid (2013) similarly observed that fertiliser subsidy programmes are contentious policy debates in Africa, adding that the literature on these programmes remain polarised (e.g. Denning et al., 2009; Dorward and Chirwa, 2011; Druilhe and Barreiro-Hurle, 2012; Morris et al., 2007; Sachs, 2012; World Bank, 2007). After phasing out agricultural input subsidy programmes in the late 1980s and early 1990s as part of structural adjustment programmes (SAPs), many countries in sub-Saharan Africa have re-introduced agricultural input subsidies. Notable among these are Malawi, Kenya, Zimbabwe, Zambia, Ghana, Mali, Nigeria, Tanzania, Ethiopia and Senegal. These subsidy programmes have been seen as replacement of the former programmes under SAP.

In theory, input subsidies reduce cost and therefore are expected to increase input profitability and financial capital constraints of farmers, thereby encouraging adoption of modern inputs to improve production (Lunduka et al., 2013). Despite the theoretical underpinnings, there are concerns about the cost of implementing large scale input subsidy programmes in terms of long-term benefits, as it is feared funding is likely to be directed away from other potentially more beneficial agricultural investments (Fan et al., 2009; Jayne et al., 2013).

Malawi's Farm Input Subsidy Programme (FISP) is a critical test case situation or "model" used by researchers to assess current input subsidy programmes (ISPs) in sub-Saharan Africa (SSA). As noted by Lunduka et al. (2013), impact studies of Malawi's FISP provide interesting and sometimes conflicting findings. Official government reports indicate that the programme has increased the use of modern maize seed varieties and chemical fertiliser by smallholder farmers. Dorward and Chirwa (2011) reported that along with favourable rains, the programme has led to increased maize production and productivity, thus improving national and household food security. However, the programme is not without criticisms.

Concerns have been raised on the programme's effectiveness and efficiency in raising maize productivity, its ability to impact the development of sustainable commercial input markets, the possibility of crowding out other investments, and its overall return on investment as well as its sustainability (Ricker-Gilbert et al. 2013 and Holden and Lunduka, 2012). However, despite these observed lapses in implementation, Malawi's FISP still offers useful lessons for ISPs in sub-Saharan Africa where fertiliser use remains the lowest compared to other parts of the world. The poor natural endowments of African soils worsened by poor management and sometimes unsustainable soil practices suggest the need for increased fertiliser use in Africa. As Minot and Benson (2009) pointed out, there is broad consensus that substantial increases in the use of chemical fertiliser are required to restore and maintain the fertility of African soils and enhance their productivity.

Consensus on the re-introduction of FISP in Africa was reached at the Abuja Declaration in 2006. As noted by Jayne et al. (2013), the Abuja Declaration was a watershed moment in the agricultural policy environment in SSA. The introduction of fertiliser input subsidy was one of the five key points agreed upon by member states to make fertiliser increasingly available to smallholder farmers in the AU member states. The revival of input subsidies was seen as a means to raise fertiliser use and agricultural productivity in the region. The need to meet these goals was further heightened by the subsequent surges in the world food and fertiliser prices in 2007 and 2008 (Jayne et al. 2013).

In 2008, the government of Ghana re-introduced fertiliser subsidies through a voucher-based system aimed at promoting fertiliser use and improving the productivity of smallholder farmers. The subsidy programme was implemented by the Directorate of Agricultural Extension Services (DAES) of the Ministry of Food and Agriculture (MOFA). Four types of inorganic fertilisers, namely, NPK-15:15:15, NPK-23:10:05, urea, and sulphate of ammonia were subsidised by the government of Ghana. The subsidy covered all arable crop farmers but farmers were encouraged to use the fertilisers on the major food crops – maize and rice. Under the system, fertiliser companies are given a quota to supply fertiliser to farmers across the country. Administratively, Ghana is divided into ten Regions. Each region is given a quota depending on the type of crops grown and the

corresponding fertiliser needs. The fertiliser distribution companies are mandated to sell the fertiliser to farmers at a government-approved subsidised price. Farmers are required to obtain chits or coupons from the Ministry of Food and Agriculture (MOFA) in their respective districts which they use to buy the subsidised fertiliser from the private distributors. The government pays the difference in the price of the fertiliser to the fertiliser companies after the distribution to farmers. At the onset of the programme, farmers were given cards bearing their photograph and location/residence to use in accessing subsidised fertiliser. The Ministry of Food and Agriculture is the only source of coupons for the acquisition of subsidised fertiliser. Extension agents play an important role in the programme as the link between farmers and the Ministry of Food and Agriculture.

MATERIALS AND METHODS

Study area, sampling and data

The study was undertaken in three districts of northern Ghana namely the Tolon-Kumbungu, Kassena-Nankana and Bolgatanga Districts. The data used in the study formed part of a household survey data collected in 2014 by the first author for a doctoral study on rice production efficiency in northern Ghana. The study area is characterised by smallholder production units using mainly unsophisticated farming equipment. Majority of these farm households produce multiple crops and use relatively low amounts of fertiliser in production leading to low farm productivity. The area is characterized by a single rainfall regime that begins in June and ends in October. The bulk of the country's rice is produced in this area.

Multistage stratified random sampling was used to select respondents for the study. Three districts were first selected in northern Ghana followed by a random sampling of five communities from each of the districts. The choice of each district was influenced by the availability of an irrigation scheme for rice production. Farm households were subsequently stratified into irrigators and non-irrigators. A total of 300 farm households were selected for the study.

Empirical model of farmer participation in subsidy programme

The assessment of farmer participation in input subsidy programmes provides valuable information on the

effectiveness of such programmes which is necessary to enhance the productivity of smallholders. Programme participation studies usually rely on cross-sectional data pertaining to household demographic and farm characteristics, institutional and geographical factors. The household demographics typically include age, sex, educational level (or status), household size, among others. Farm characteristics usually include farm size, farm income and crop varieties planted. The institutional factors generally include access to inputs, irrigation, credit, and extension services. Geographical factors such as location of the farm, distance to major facilities like nearest market and input selling point are helpful in modelling farmer participation in programmes. These factors help to explain farmer participation in agricultural programmes which, invariably, helps to identify the reasons for non-participation. Understanding the factors leading to non-participation is one way to ensure non-exclusion in programme participation.

Participation in Ghana's fertiliser subsidy programme is a binary outcome hence, a binary choice model was assumed for the study. Among the binary choice models, the probit model was preferred due to its widespread application in similar studies (Mustapha et al. 2016; Chirwa et al. 2011). Subsidy programme participation was modelled as an index function. In other words, whereas there is an underlying continuous latent variable Z_i^* for subsidy participation, we only observe the alternative outcomes of participation (when $Z = 1$) and non-participation (when $Z = 0$). The latent continuous variable is related to the observed alternative outcomes as shown in equation (1):

$$Z_i^* = Pr(Z = 1) = \varphi w_i + u_i$$

$$Z_i = \begin{cases} 1 & \text{if } Z_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (1)$$

where Z_i^* is the latent variable measuring the probability of participation in the subsidy programme, w_i represents a vector of explanatory variables, i stands for the i th farmer, and φ is a vector of parameters to be estimated and u_i is an error term.

The empirical probit model for participation in the fertiliser subsidy programme was expressed as follows:

$$Z_i^* = \varphi_0 + \varphi_1 EDU_i + \varphi_2 EXT_i + \varphi_3 EXP_i + \varphi_4 HHS_i + \varphi_5 PDNSYS_i + \varphi_6 DIST_i + \varphi_7 HERD_i + \varphi_8 SPEC_i + \varphi_9 REG_i + \varphi_{10} MECH_i + u_i \quad (2)$$

where Z_i^* and φ are as previously defined.

Participation in agricultural programmes is affected by several factors including household demographic and farm characteristics as well as institutional and geographical factors. The household demographic factors included in the study are educational status (EDU), years of farming experience (EXPER), and household size (HHSIZE). The farm characteristic included in the probit participation model was the share of land under rice cultivation (DGSPEC). The institutional factors included access to irrigation (PDNSYS), agricultural mechanisation (MECH) and extension services (EXT). Other factors such as location of the farm (REG) and distance to the nearest market (MKTDIST) were also included in the model. Finally, herd size (the number of cattle owned by the household) (HERDSZ) was included as a wealth indicator.

RESULTS AND DISCUSSION

Characteristics of the respondents

Table 1 presents the characteristics of the respondents in the study. The respondents had an average of 7 household members and 21 years of farming experience. Close to 43% had ever attended school, 63% had access to extension services, and 65% used farm machinery (tractor services) in land preparation. The respondents had 2 cattle per household and travelled 8 km to the nearest market. Thirty-three (33) percent of the respondents came from the Northern Region while on average the respondents allocated 45% of their land to the cultivation of rice. Participants in the subsidy programme were more experienced in farming and had higher participation in agricultural extension but lower adoption of farm mechanisation. Participants in the subsidy programme also owned more cattle but allocated less of their total land endowment to rice production. In terms of regional distribution, the percentage of participants from the Northern Region was higher than those from the Upper East Region.

Table 1a. Characteristics of respondents in the subsidy programme

Variable	Mean	S. D.	Min.	Max.
Educational status	0.433	0.496	0	1
Extension contact	0.633	0.483	0	1
Household size	9.650	7.204	1	71
Farming experience	20.60	12.24	2	60
Regional dummy	0.333	0.472	0	1
Specialisation	45.37	25.11	3.6	100
Adopt mechanisation	0.650	0.478	0	1
Herd size	2.120	4.332	0	34
Market distance	7.918	4.303	2	18

Smallholder agriculture in Ghana is characterised by high illiteracy rate which is a disincentive to adoption decisions and productivity growth. Educated farmers are more open to new ideas and more likely to innovate. As shown by Asante et al. (2014), education enables farmers to access and process information thus making educated farmers more likely to adopt improved technologies. The relatively large family size of the respondents is typical of most rural farm families which regard household members as important source of farm labour. Even though a high number of farmers had access to extension services, the number of extension contacts as revealed by the data was very low.

Table 1b. Characteristics of participants and non-participants in the subsidy programme

Variable	Participants N = 180		Non- participants N = 120		Mean diff.
	Mean	S. D.	Mean	S. D.	
Educational status	0.456	0.499	0.400	0.492	0.056
Extension contact	0.678	0.469	0.567	0.498	0.111**
Household size	9.700	7.267	9.575	7.139	0.125
Experience	22.08	12.51	18.38	11.51	3.700**
Regional dummy	0.378	0.486	0.267	0.444	0.111**
Specialisation	43.36	24.19	48.40	26.24	-5.043*
Mechanisation	0.706	0.457	0.567	0.498	0.139**
Herd size	2.494	4.953	1.558	3.119	0.936*
Market distance	7.669	4.429	8.292	4.096	-0.622

** and * indicate statistical significance at 5% and 10% level respectively.

The insufficient contact with extension agents is often attributed to inadequate number of extension agents and lack of logistics for extension staff to carry out their functions. Emmanuel et al. (2016) and Ragasa et al. (2013) observed that African smallholders usually do not receive enough assistance from extension services, which has implication for farmers' access to inputs, adoption of improved technologies, and farm productivity. As farmers become more experienced in production, they are expected to learn new techniques and acquire technical competencies and skills that improve their level of productivity. The study also showed that majority of the farmers use farm machinery in production. The establishment of mechanisation centres to serve the needs of farming communities is promoting the use of tractors in land preparation by smallholder farmers. The use of farm machinery is expected to increase productivity of farmers as indicated by Singh (2015) and Stavitsky (2017).

Determinants of participation in the subsidy programme

The result of the probit analysis of the determinants of smallholder farmers' access to subsidised fertiliser is presented in Table 2.

Overall, the model reveals a good fit indicated by the Chi-squared statistic. Seven out of the ten explanatory variables included in the model had statistically significant influence on participation in the subsidy programme. Participation in the subsidy programme was found to be positively and significantly related to the years of farming experience, contact with extension agents, the size of herd (indicator for wealth) and the use of farm mechanisation. The results confirm a priori expectations of the direction of influence of these variables. The degree of specialisation in rice farming was however negatively related to participation in the subsidy programme. In addition, access to subsidised fertiliser was affected by geographical location and educational status of the household head.

Table 2. Determinants of participation in the subsidy programme

Variable	Coefficient	Std. Err.	Marginal Effect
Educational status	0.288*	0.159	0.110
Extension contact	0.410**	0.170	0.159
Household size	-0.012	0.012	-0.005
Farming experience	0.012*	0.007	0.004
Regional dummy	0.372*	0.207	0.140
Specialisation	-0.007**	0.003	-0.003
Adopt mechanisation	0.378**	0.180	0.147
Herd size	0.035*	0.020	0.014
Market distance	-0.012	0.018	-0.005
Constant	-0.272	0.329	

** and * indicate statistical significance at 5% and 10% level respectively.

The relationship between educational status and participation in the subsidy programme was positive and significant at 10 percent level. Hence, households with educated heads were more likely to participate in the subsidy programme. The probability of participation in the subsidy programme was 0.11 higher for educated household heads relative to uneducated household heads. The study also showed that participation in the subsidy programme was positively and significantly related to the years of farming experience of the household head at 10 percent level. An additional year of farming experience increases the likelihood of participation in the subsidy programme by 0.004.

Furthermore, farmers who contacted extension agents were more likely to participate in the fertiliser subsidy programme. The extension dummy variable was significant at 5 percent level. Having contact with an extension agent increased the probability of participation in the subsidy programme by 0.159. It was also observed that the coefficient of herd size was positive and significantly related to participation in the fertiliser subsidy programme. The herd size variable was significant at 10 percent level. A unit increase in the number of cattle owned by the household increases the probability of participation in the subsidy programme by 0.014.

The study also showed a positively significant relationship between participation in the subsidy programme and adoption of farm mechanisation. The estimated marginal effect indicated that the probability of participation in the subsidy programme increased by 0.15

if the farm household employed mechanisation in production. In addition, the study found the coefficient of the degree of specialisation in rice production to be negative and significant at 5 percent level. Hence, farmers who allocated a greater proportion of their land to rice cultivation had a lower propensity to participate in the subsidy programme. The result is contrary to a priori expectation. A unit increase in the proportion of total land allocated to rice production reduced the probability of participation in the subsidy programme by 0.003.

The extant literature alludes to the important role that education plays in farmers' participation in agricultural programmes. Participation in the subsidy programme was shown to increase with education because educated farmers are more open to new ideas and more likely to innovate. The result is consistent with the findings of Chibwana et al. (2009) who found that better-educated farmers received greater benefits from Malawi's Farm Input Subsidy Programme (FISP). Shively and Ricker-Gilbert (2013) also observed that educated farmers in Malawi were more likely to receive more subsidy coupons than the recommended quantity. As indicated by Asante et al. (2014), education enables farmers to access and process information thus making educated farmers more likely to adopt improved technologies. Educated farmers are also more likely to be exposed to extension agents and more knowledgeable about government policies and programmes such as the fertiliser subsidy programme.

The result of the study supports the notion that farming experience enhances farmers' participation in agricultural programmes. Household heads with several years of farming experience have extensive knowledge about farming and may be able to obtain information about government programmes such as the subsidy programme which can enhance participation in subsidised fertiliser. Also, the findings of the study showed that extension agents play an important role in Ghana's fertiliser subsidy programme. Extension agents help to identify beneficiary farmers in their operational areas and carry out the distribution of fertiliser coupons. As a result, farmers who received extension visits had higher likelihood to participate in the subsidy programme. The result agrees with Imoru and Ayamga (2015) who studied the effects of Ghana's fertiliser subsidy programme on fertiliser use by maize farmers in northern Ghana.

Wealth status plays a key role in smallholders' participation in agricultural and social programmes in many developing countries. For example, Chibwana et al. (2009) found that poorer farmers were less likely to receive subsidy vouchers in Malawi. Wealthier households, proxied by the number of cattle owned, have more social influence which is expected to influence participation in agricultural programmes and access to services. The result agrees with the findings of Shively and Ricker-Gilbert (2013) who observed that poor households were more likely not to receive subsidy voucher in Malawi.

The formation of mechanisation centres in many rural areas is expected to enhance communication and information sharing among rural farmers thereby enhancing participation in agricultural programmes such as the fertiliser subsidy programme. In addition, farmers with greater degree of specialisation in rice production are expected to be commercially oriented producers since rice is an important cash crop for smallholder farm families. These farmers are therefore expected to be more proactive in seeking information relating to government support to farmers, such as the fertiliser subsidy programme, resulting in higher participation in the subsidy programme.

Even though the allocation of subsidised fertiliser is based on the needs of farmers across the country, the result indicates that access to subsidised fertiliser is not uniform across geographical locations. The implication of the finding is that geographical location plays a role in smallholders' access to subsidised fertiliser. The result accords with Shively and Ricker-Gilbert (2013) who found that programme limitations, regional differences and local idiosyncrasies hinder households in Malawi from receiving the required fertiliser and seed packages as recommended by the Farm Input Subsidy Programme (FISP). According to the authors, this discrepancy ranges from receiving nothing to receiving more than twice the recommended quantity.

Assessment of farmers' perceptions of the fertiliser subsidy programme

The timely supply of agricultural inputs especially chemical fertiliser is very crucial to crop productivity, hence the need to ensure timely supply of fertiliser to farmers. The study showed that majority of the farmers (76%) felt that subsidised fertiliser was not supplied to

them on time (Table 3). This is a drawback to the effectiveness of the subsidy programme.

Table 3. Perceptions of timeliness of fertiliser supply

Timeliness	Frequency	Percent	Cumulative
Timely	67	22.3	22.3
Not timely	182	60.7	83.0
Not timely at all	47	15.7	98.7
No response	4	1.3	100.0
Total	300	100.0	

Farmers' perception about the efficiency of distribution of subsidised fertiliser is presented in Table 4. As indicated by the responses, majority (59%) of the respondents were of the view that the distribution of subsidised fertiliser was either inefficient or very inefficient. As mentioned by farmers during the field survey, it was not uncommon to find farmers who obtained subsidised fertiliser from operational areas they did not belong to. Farmers were also of the view that the officers in charge of the distribution sometimes allocate subsidised fertiliser meant to farmers in their communities to those outside the community.

Table 4. Perceptions of efficiency of subsidised fertiliser distribution

Distribution	Frequency	Percent	Cumulative
Very efficient	4	1.3	1.3
Efficient	115	38.3	39.6
Inefficient	160	53.3	92.9
Very inefficient	17	5.7	98.6
No response	4	1.3	99.9
Total	300	100.0	

An important consideration in the subsidy programme is whether fertiliser is made readily available to farmers. As shown by the responses of farmers in Table 5, fertiliser depots are located far from the residence or farms of the respondents. Only 19% of the respondents perceived the distance to the source of subsidised fertiliser to be either near or very near. Most of the respondents are rural farmers and live a distance away from the fertiliser depots. Efforts to bring subsidised fertiliser closer to farmers will enhance the effectiveness of the subsidy programme in Ghana.

Table 5. Perceptions of the distance to the source of fertiliser

Distance	Frequency	Percent	Cumulative
Very far	45	15.0	15.0
Far	190	63.3	78.3
Near	52	17.3	95.6
Very near	6	2.0	97.6
No response	7	2.3	99.9
Total	300	100.0	

Table 6 shows that 81% of the respondents travel to acquire subsidised fertiliser. This shows that fertiliser is not supplied close to where the farmers live. This is likely to affect the effectiveness of the subsidy programme. Efforts to bring the subsidised fertiliser close to farmers will enhance the effectiveness of the subsidy programme as well as benefits farmers derive from participating in the subsidy programme.

Table 6. Whether farmer travels to buy subsidised fertiliser

Travel to buy	Frequency	Percent	Cumulative
Yes	242	80.7	80.7
No	49	16.3	97.0
No response	9	3.0	100.0
Total	291	100.0	

The price of fertiliser is an important factor that influences the perceptions of farmers because of its direct relation to profitability of the farm business. The respondents were unanimous in their opinion that the current price of subsidised fertiliser is high; 78% of respondents rated the price as either high or very high (Table 7). At the time of the survey, farmers were expected to pay GH¢ 51.00 for a 50kg bag of compound fertiliser (NPK) which cost GH¢ 71.50.

Table 7. Perceptions of the price of subsidised fertiliser

Price	Frequency	Percent	Cumulative
Very high	70	23.3	23.3
High	164	54.7	78.0
Low	62	20.7	98.7
Very low	1	0.3	99.0
No response	3	1.0	100.0
Total	300	100	

Respondents were asked to assess the overall performance of the fertiliser subsidy programme, based on their rating of the other features of the programme. The result is presented in Table 8. It emerged that nearly half of the respondents considered the overall performance as good (satisfactory) with 6.3 percent considering the performance as very good (very satisfactory). Close to one-third of the respondents rated the overall performance of the programme as poor (unsatisfactory) with 10 percent of them regarding the overall performance as very poor (very unsatisfactory).

Table 8. Perceptions of overall performance of the fertiliser subsidy programme

Performance	Frequency	Percent	Cumulative
Very good	19	6.3	6.3
Good	153	51.0	57.3
Poor	94	31.3	88.6
Very poor	30	10.0	98.6
No response	4	1.3	99.9
Total	300	100.0	

Finally, farmers were asked to rate their overall satisfaction with the subsidy programme, considering all the factors considered above. It emerged that exactly half of the respondents were dissatisfied with the current state and operation of the fertiliser subsidy programme in Ghana with 46 percent indicated their satisfaction with the programme (Table 9). Reasons provided by respondents for their dissatisfaction with the subsidy programme included late supply of subsidised fertiliser, difficulty in obtaining fertiliser coupons, long distances to fertiliser depots, high price of fertiliser and shortage of subsidised fertiliser (farmers are unable to acquire subsidised fertiliser despite having a coupon).

Table 9. Overall satisfaction with the subsidy programme

Satisfied	Frequency	Percent	Cumulative
Yes	137	45.7	45.7
No	150	50.0	95.7
No response	13	4.3	100.0
Total	300	100	

The study highlights the perceptions of farmers about the national fertiliser subsidy programme in Ghana. Farmers are of the view that fertiliser price must be revised downwards despite the huge government subsidy on the input. Arguments regarding the huge government

financial input into input subsidies in Africa have been put forth by several authors. However, following decline in farm productivity and increasing poverty among rural farmers, governments in Africa including Ghana, Kenya and a few others have reintroduced fertiliser subsidy programmes to increase fertiliser use as a means to improve farm productivity and reduce rural poverty. Judging from the current budgetary constraints facing many African countries it is very unlikely that the price of subsidised fertiliser will see a downward adjustment.

Smallholder farmers perceive the subsidy programme to be ineffective in terms of timeliness, availability and distribution of the input, access to coupons (vouchers), and distance to fertiliser depots. The finding is consistent with Yawson et al. (2010), who assessed farmers' perspective of Ghana's fertiliser subsidy programme and observed that Ghanaian farmers were dissatisfied with the availability, accessibility and price of subsidised fertiliser. Majority of the farmers, representing 86 percent, expressed dissatisfaction with the subsidy programme, while only 28 percent agreeing that the price was affordable. The authors noted that fertiliser subsidy programmes implemented in several countries have been associated with problems of distribution and access to fertiliser by smallholder farmers.

Farmers' personal satisfaction with the subsidy programme was rated lower than their evaluation of the overall performance of the programme. This reflects farmers' higher satisfaction with the establishment of the subsidy programme and relatively lower satisfaction with the how the subsidy programme meets their farming needs. In the study by Yawson et al. (2010), almost all the respondents agreed that the subsidy programme was very good and called for its continuation with some fine-tuning. The suggestions for fine-tuning the programme centred on timely availability of the input, adequate supply of fertiliser, reduction in the price of fertiliser, and effective communication on the availability of both coupons (vouchers) and subsidised fertiliser.

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CONCLUSIONS

The study examined Ghana's Fertiliser Subsidy Programme and the factors affecting participation and perceptions of farmers regarding its effectiveness. The study showed that participation in the subsidy programme is influenced by educational status and farming experience of the household head, contact with agricultural extension agents, herd size, degree of specialisation in rice production, use of farm mechanisation and location of the farm. Farmers perceive the subsidy programme to be ineffective in terms of timeliness, availability and distribution of the input, access to coupons (vouchers), and distance to fertiliser depots. This calls for measures to ensure that fertiliser is made available to farmers at the right time and in the right quantities. Improving communication on the availability of fertiliser coupons and subsidised fertiliser are required to ensure that farmers can get access to the subsidy. Extension staff are pivotal to the success of the subsidy programme, hence the need to increase the number of extension workers which currently remains very low. Creating a national, regional or district-level database of farmers and their fertiliser needs will ensure effective management and enhance performance of the programme.

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