

## **GHANA'S FERTILIZER SUBSIDY POLICY: EARLY FIELD LESSONS FROM FARMERS IN THE CENTRAL REGION**

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### **ABSTRACT**

This paper presents early field lessons on Ghana's Fertilizer Subsidy Program from two farming communities in the Central Region. A combination of quantitative and qualitative approach was used to assess the availability, access, and use of subsidized fertilizer by small-holder farmers in the two communities. The findings show that there is considerable scope for improvement in the distribution of coupons and fertilizers to ensure higher effectiveness of fertilizer and to render farmers' participation in the program more sustainable. Price and non-price factors combine to constrain access to subsidized fertilizer. Finally, few farmers have actually benefited from the subsidy program. The respondents, though were generally dissatisfied, conceded that the program is essential and needs to be continued. The paper signals the need for adjustments, which could have macro-scale implications for the sustainable management of the subsidy program.

**Key words:** Fertilizer subsidy and food security, small-holder farmers, sustainability

### **INTRODUCTION**

Agriculture is a key economic sector to many African countries as it employs most of the rural population and contributes significantly to household income, gross domestic product (GDP), foreign exchange earnings, and food and nutritional security. Food production in Africa suffers from numerous constraints, including diminishing arable land due to urbanization and land degradation, weak land tenure system, declining soil fertility, limited irrigation facilities and dwindling water resources, climate variability, unimproved planting materials, low access to credit, poor marketing and distribution system, and, above all, high cost of agricultural inputs, particularly fertilizer (Croppenstedt, Demeke & Meschi, 2003; Alfsen, Bye, Glomsrod & Wiig, 1997). These constraints collectively undermine the sustainability of food security, in particular, and agricultural productivity, in general. Food production in Africa is predominantly undertaken by small-holder farmers, with farm sizes barely larger than two hectares. This situation, in combination with other factors, has resulted in food production consistently lagging behind population growth. The deficit in food supply is balanced by imports. However, the reliance on food imports to balance expected food supply deficits by the year 2020 may not be economically sustainable

(Heisey & Mwangi, 1996; Mwangi, 1995). This raises the imperative for increased domestic food production and justifies the call for a green revolution in Africa. High input of inorganic fertilizer has been a key component of Green Revolutions around the world (Kelly, Adesina, & Gordon, 2003; Tomich, Kilby, & Johnston, 1995; Kherallah, Delgado, Gabre-Madhin, Minot, & Johnson, 2002; Viyas, 1983; Reuler & Prins, 1993). Higher rate of soil fertility decline and consistent lower crop yields necessitate increased use of inorganic fertilizer in Africa (Alfsen et al., 1997; Xu, Burke, Jayne, & Govereh, 2009; Larson, 1993). However, the high cost of inorganic fertilizer prevents particularly small-holder farmers, who are resource-poor (predominantly within low income bracket), from using the required levels of fertilizer to boost crop production.

In 2006, the average use of inorganic fertilizer in Africa was 8 kg/ha compared to 73 kg/ha in Latin America and 135 kg/ha in Asia (MOFA, 2008). In response to the need for higher fertilizer use in Africa, the Africa Fertilizer Summit was held in Abuja (Nigeria), in 2006, under the auspices of the African Union (AU), New Partnership for African Development (NEPAD) and the Government of Nigeria. One of the important outputs of that summit was the Abuja Declaration on Fertilizer for African Green Revolution, in which AU Member States resolved to increase timely access to fertilizer by farmers and to raise fertilizer use to an average of 50 kg/ha by 2015 (AU, 2006). As an immediate measure, the declaration proposed, among others, the elimination of taxes and tariffs on fertilizer and raw materials for fertilizer. The introduction of smart subsidy was one of the five main action points agreed upon to actuate the declaration. The purpose of the smart subsidy was to make fertilizer increasingly available to small-holder farmers in AU Member States. Significantly, the AU Member States pledged to invest 10% of their national budget in agriculture by the year 2008 (AU, 2006). Many governments around the world have implemented fertilizer subsidy programs to raise the level of fertilizer use by small-holder farmers (Crawford, Jayne & Kell, 2006; Gladwin, Randall, Schmitz & Schuh, 2002; Morris, Kelly, Kopicki & Byerlee, 2007; Abdoulaye & Sanders, 2005; Dorward, Kydd, Morrison & Urey, 2004; Minot, 2002).

Ghana's political economy was seriously stressed in 2007 by multiple factors: energy crisis due to the drying of the Akosombo Dam and high cost of crude oil, shortages, and price hikes in global food supply (the global food crisis) and the specter of national elections in the succeeding year. At the same time, the prices of inorganic fertilizer shot up significantly while domestic production of staple food fell sharply. It appears these factors combined to provide the stimulus required to actuate the Abuja Declaration. One of the key responses of government to the food situation was the removal of import taxes on rice and edible oil and the introduction of a nation-wide fertilizer subsidy program (covering four types of inorganic fertilizer) in June 2008. Unit fertilizer use in Ghana has declined from 21.9 kg/ha in 1978 to 8 kg/ha in 2006 (MOFA, 2008). The objective of the subsidy program was to forestall further decrease in fertilizer use (and, consequently, staple food production) by restoring fertilizer prices to the 2007 levels and ensuring uniformity in prices across the country. Reducing food

insecurity, hunger and malnutrition, and rural poverty, which are consistent with the Millennium Development Goals, are among the goals of the subsidy program. In 2008, Ghana Government subsidized 600,000 bags (50 kg) of inorganic fertilizer at a cost of US \$14,067,964 (as against a budgeted amount of US \$11,000,000). In 2009, the Minister of Agriculture announced that government has made available GH¢37 million (approximately US \$26,428,571) to support the program and that government will absorb all cost in excess of the 2008 prices. This was necessary to forestall an estimated reduction of 70% in fertilizer use due to price increases (in fact, the price increase had been caused by the depreciation of the Cedi against major currencies) that could lead to a potential decline of 20% in cereal production alone. This means subsidized fertilizer would be sold at the same price as in 2008, and would be uniform across the country. Table 1 shows the market and subsidized fertilizer prices in 2008.

Table 1: Market and subsidized prices of 50 kg fertilizer in 2008

Fertilizer	Market price (GH¢)	Subsidized price (GH¢)
Urea	49	26
Sulfate of ammonia	31	18
NPK 15:15:15	48	26
NPK 23:10:15	45	24

1 US Dollar = 1.4 Ghana Cedis

Under this program, farmers buy subsidized fertilizer with region-specific and fertilizer-specific coupons distributed by the Ministry of Food and Agriculture (MOFA) through its District Directorates and extension officers. There are usually problems associated with the distribution and access to fertilizer by small-holder farmers in fertilizer subsidy programs that have been implemented in many countries. The objective of this study was to assess the perspectives of small-holder farmers in Bremen Essikuma and Bremen Jamra in the Essikuma Odoben Brakwa District (Central Region) on issues related to the availability, accessibility, and use of subsidized fertilizers.

## METHODOLOGY

Both Bremen Essikuma and Bremen Jamra are in the Essikuma Odoben Brakwa District in the Central Region of Ghana. This district is one of the predominantly agricultural districts in the Central Region, with primarily small-holder farmers. Bremen Essikuma is the most populated town and the capital of the district, with farming as the main economic activity. However, Bremen Jamra is a small farming community. According to the implementation plan of the subsidy program, subsidized fertilizers were to be made available at retail points in district capitals. The choice of Bremen Essikuma and Bremen Jamra, therefore, offers an opportunity to ascertain

whether there are differences in the availability and access to subsidized fertilizers by small-holder farmers in a district capital and a typical farming community.

The study employed a combination of quantitative and qualitative approach (but largely qualitative methods) to generate data about the perspectives of the farmers on the availability, accessibility, and use of subsidized fertilizer. A total of 90 farmers (60 from Bremen Essikuma and 30 from Bremen Jamra) were randomly selected for interviews. Questionnaire was the main instrument of data collection. Face-to-face interview of farmers was done using a semi-structured questionnaire with both closed and open-ended questions. The interviews were conducted between September and October 2009 (after the major farming season).

Among other variables, the questionnaire mainly elicited responses on the respondents' perspectives on the availability, accessibility, and use of subsidized fertilizers, as well as recommendations for improving the program in the district. Demographic information collected included age, gender, educational level, main source of income, and years of farming experience. The age of respondents ranged between 21 and 68 years. Percentages of female and male respondents were 52% and 48%, respectively. On educational level, 14% had no formal education, 48% had primary education, 22% had secondary education while 16% had post-secondary education. Farming was identified as the main source of income by 82% of the respondents. Years of farming experience ranged between 3 and 32 years.

On availability, farmers were asked, among others, to express their thoughts on the timing and type of fertilizer availability, quantity, and sources of information on availability. With regard to accessibility, farmers were asked, among others, to express their opinion on the affordability of the subsidized fertilizer, transaction cost of accessing the fertilizer, main constraints to access apart from the price of subsidized fertilizers, and whether there was equity and fairness in the distribution of coupons. Regarding use of subsidized fertilizer, farmers were asked to express their thoughts on the support services that accompany the purchase of the subsidized fertilizer (e.g. assistance or information from extension officers), their knowledge of fertilizer requirements of the crops they grow, effects of fertilizer use on the yield of their crops, etc. However, some of the questions used a Likert-type scale to generate responses. For example, the overall satisfaction of farmers on the availability, accessibility, and use of fertilizer was each measured with a 5-point Likert-type scale (1 = Very Satisfied; 2 = Satisfied; 3 = Indifferent; 4 = Dissatisfied; 5 = Very Dissatisfied). Relevant follow-up questions were asked, whenever necessary, to either clarify or confirm a point. Responses were recorded and, whenever possible, processed immediately to minimize loss of relevant information.

## **RESULTS AND DISCUSSIONS**

The study sought to elicit farmers' thoughts on the fertilizer subsidy program on three major variables: availability, accessibility, and use. Most of the respondents expressed their appreciation for the fertilizer subsidy program.

### **Availability of Subsidized Fertilizer**

On the availability of fertilizer, majority of the respondents indicated that the fertilizer was not available during the planting season when it was most needed. About 82% of the respondents indicated that there was no subsidized fertilizer during the planting time, and that was the most critical time for fertilizer application to them. Interestingly, the prospects of subsidized fertilizer did not give them the incentive to buy fertilizer from the open market and, when the subsidized fertilizer was available, they did not receive related information on time. Later, some of those who got the subsidized fertilizer applied it, but did not observe any significant effects on the plants or the yield, while others hoarded the fertilizer or the coupon for the subsequent planting season. Majority of the respondents indicated that they were much more familiar with the fertilizer grade NPK 15:15:15 (i.e. for each unit of the compound fertilizer, the active ingredients comprise 15% each of nitrogen, phosphorus and potassium respectively) and insisted on coupons for this specifically. However, due to the limited supply of this type or grade of fertilizer or coupons, some farmers did not have the inclination to try other grades or types of fertilizer and, therefore, did not participate in the subsidy program for both 2008 and 2009 planting seasons. A few switched to sulfate of ammonia because it was cheaper. Actually, of the four types of subsidized fertilizer, NPK 15:15:15 is the highest in quantity supplied, followed by NPK 23:10:05. Urea is the least supplied. Even though very few respondents, particularly in Bremen Essikuma, wanted urea, it was simply not available. The respondents indicated that they were not aware of the maximum quantity of fertilizer each farmer was entitled to, but the officers in charge of the coupons determined the quantity one could get through the coupon distribution. Consequently, some got two or more coupons, while others had just one coupon or none. Most of the respondents did not get coupons in 2008, but this number decreased insignificantly in 2009. On the source of information on fertilizer availability, the responses indicated that there was no formal channel, so farmers had to verify themselves from the district office of MOFA or rely on contacts outside the district. Particularly, farmers at Bremen Jamra relied on their contacts at Bremen Essikuma, Agona Swedru, or Cape Coast to obtain information about the availability of coupons and/or fertilizer. Whenever information from these contacts was not possible, they have to travel to obtain information on when coupons or fertilizer would be available. This serves as a disincentive for some of them to participate in the subsidy program. Surprisingly, two farmers from Bremen Essikuma managed to obtain coupons from Cape Coast. On satisfaction with the availability of fertilizer, 82%

indicated that they were very dissatisfied, while 14% were dissatisfied. The rest said the program was still young to be assessed in terms of satisfaction.

### **Access to Subsidized Fertilizer**

Under accessibility, only 28% of the respondents (mostly from Bremen Essikuma) agreed that the subsidized fertilizer was affordable, while the rest said it was not affordable. A significant number of respondents indicated that they could not afford the market price of fertilizer in 2007 and, therefore, still could not afford the subsidized price, which is the same as the prevailing price in 2007. From the perspective of the respondents, the affordability also relates to the cumulative cost of the total quantity of fertilizer required for a significant increase in yield, transport cost of the fertilizer, the potential post-harvest losses they stood to incur after a bumper harvest, and the total absence of a ready market for their produce. Even though some respondents found the fertilizer affordable, they indicated that the transaction cost was high and, therefore, a disincentive. Particularly for respondents in Bremen Jamra, the greatest transaction cost relates to active search for information on availability of coupons and/or fertilizer and the transportation of the fertilizer. The cost of the active search for information includes phone calls and physical transportation, which is expensive. Sometimes, they travel to Bremen Essikuma, Agona Swedru, or Cape Coast, but cannot get subsidized fertilizer. Some of the respondents said their farm sizes were too small to justify their participation in the program. Apart from direct monetary cost and factors related to availability, the respondents identified weak communication of information from extension officers, corrupt tendencies, and bureaucratic bottlenecks as the main factors that constrained access to the subsidized fertilizer. With regard to equity and fairness in the distribution of coupons, majority of the respondents agreed that the distribution was considerably fair. However, some respondents in Bremen Jamra felt the program was not fair to them; and the following quote from one of the respondents summarizes their feeling: “the program is not fair to those of us in the village who needed the fertilizer most and who produced the bulk of food in the local markets. By placing the distribution centers in the district capitals, the program had already marginalized us”. A few of the respondents felt some farmers were favored on grounds of partisan (political) affiliation, while others used their power and connections to influence the process. Some of the respondents felt the program was a political gimmick aimed at influencing farmers to vote for the ruling party in the 2008 elections. In all, majority (92%) of the respondents were dissatisfied with the accessibility of subsidized fertilizer.

### **Use of Subsidized Fertilizer**

On the use of fertilizer, 62% of the respondents indicated that they have adequate knowledge about the fertilizer requirements of the crops they grow. However, some did not have sufficient money to purchase enough fertilizer (even at the subsidized rate) for their entire crop fields. Consequently, they purchased the quantity they can afford and applied it on a portion of the field. Eighteen percent (18%) said they did not know the fertilizer requirement

of their crops, while the rest said they knew the requirements of some of the crops they grow. These farmers apply any type or grade of fertilizer they can get access to. With reference to experience with fertilizer use before the subsidy program, 22% of the respondents had used fertilizer regularly on their food crops (incidentally, most of these are also cocoa farmers), 52% never used fertilizer (because they could not afford it), while the rest used fertilizer sparingly (as and when they could afford it). Most of the respondents indicated that the extension officers explained to them how they should apply the fertilizer. However, since there are few extension officers in the district, the farmers usually rely on their instincts, experience, or their colleagues for assistance in the field when the fertilizer is being applied. Only 8 of the respondents benefited from the program in 2008 and 14 benefited from it in 2009 and have yet to witness any significant improvement in yield. Interestingly, few farmers had to team up to purchase and share the fertilizer. Overall, majority of the respondents (86%) indicated dissatisfaction with the program so far. Almost all the respondents thought the program is very good and should be continued with some refinement. Most of the suggestions for improving the program related to timely availability of the right type and quantity of fertilizer, increase in the subsidy amount to further lower fertilizer prices, and improvement in communication on the availability of coupons and/or fertilizer.

## **DISCUSSION**

Fertilizer subsidy programs have engendered significant increases in food production in some parts of the world, while in Africa results are mixed. There is still an ongoing debate on the utility of the role of government in raising fertilizer use by small-holder farmers (Crawford et al., 2006; Gladwin et al., 2002; Morris et al., 2007; Dorward et al, 2004; Minot, 2002). The success of Ghana's fertilizer subsidy program hinges on effective management of the program and the enthusiasm and confidence of the beneficiaries. Management, in this context, relates to the availability of fertilizer at the right time and place and in the right quantity; easy access to fertilizer at a low transaction cost; and ensuring the actual use of the right quantities of the fertilizer. This translates into streamlining institutional structures for the program, depoliticization and ensuring transparency and accountability in the program. Ultimately, these measures are central to the sustainability of the program.

The results of the study show that there was a delay in the release of both coupons and fertilizers to farmers in the study area. This has detrimental consequences for crop production, the subsidy program, and fertilizer market, in general. Farmers awaiting the subsidized fertilizer did not have the incentive to buy fertilizer from the open market, a situation that could affect crop production and fertilizer retailers. Also, the delay in the availability of subsidized fertilizer can diminish confidence in the program and create apathy in farmers. This will reduce patronage of the program after so much money has been injected into it. The delays also reduce the effectiveness of the fertilizer. Those who used the fertilizer in both 2008 and 2009 did not realize any significant increase in yield due to late application. In 2009, the late onset of the rains combined with the late application of fertilizer to

raise the cost to farmers as there was a near crop failure. The late arrival of the coupons and/or fertilizers can be attributed to bureaucratic difficulties with the distribution of vouchers and/or fertilizers at different administrative scales. Desai and Ghandi (1990) argue that, with regard to fertilizer policy choices, supply side factors are more important than demand side factors in the maintenance of equilibrium. More so, four processes determine changes in a country's fertilizer consumption (Desai and Bruce, 1987): (i) those that influence the agronomic potential for fertilizer use; (ii) those that convert the potential into farmers' effective demand for fertilizer; (iii) those that determine the growth of aggregate fertilizer supply; and (iv) those that develop the fertilizer distribution system. Heisey and Mwangi (1996) point out that, policy analysts often focus on price policy, which strongly influences process (ii) than the other processes. It is likely that the delay in availability of fertilizer is also attributable to the narrow focus on price policy without sufficient consideration for the distribution system. The objective of the subsidy program is to make fertilizer available and accessible to small-holder food crop producers, but this appears to be far from the reality in the study area. The fact that supply of subsidized fertilizer ended at the district capital meant that small retailers who take fertilizer to the deepest parts of rural areas were left out. The elimination of these small retailers could emanate from the fact that the subsidy program relies on a private-public partnership approach in which government is using existing private sector fertilizer distribution channels. Consequently, those small retailers that are not directly linked to the fertilizer importing companies or other bigger distribution companies or retailers are automatically outside the subsidy program. More so, issues of credit and logistical arrangement on the part of importers could also feed into the delay in fertilizer shipment to Ghana and consequently distribution to farmers. Also, the delay in the availability of the fertilizers is attributable to the timing of the initiative itself and late arrival of coupons from the printing companies. In 2008, the program set off when sowing of crops might have already taken place. In 2009, the announcement of government support for the program was made in May, when the planting season had commenced. Even though the time horizon of the program is not yet clear, it is important that refinements are introduced in the procurement and distribution of coupons and fertilizers through proactive arrangements. Some authors (Croppenstedt et al., 2003; Kelly et al., 2003; Daramola, 1989) pointed out that chaotic and untimely fertilizer supply is one of the most important reasons for non-adoption of fertilizer subsidy programs by farmers and this, definitely, is antagonistic to the sustainability of the program. Government should, thus, critically think through the program, make a time-bound commitment to the program, and create actionable timelines for it. This is critical if the program is to achieve its own objectives and minimize collateral damage to food production and the fertilizer retail market. The finding also has implications for stakeholder consultation in the implementation of the program. It appears that, before the program took off, the farmers in the study area were not consulted on their preference for different types of fertilizer and their consideration of the most critical period of fertilizer application. This finding could also have regional and national implications since the program does not distinguish among farmers on the basis of scale of



production or type of crop produced. This is corroborated by the shortage of coupons for NPK 15-15-15 and the fertilizer itself and shows there is scope for further consultation with farmers to fine-tune the program.

With regard to access, majority of the respondents find even the subsidized fertilizer expensive. It is this same reason that has largely accounted for the low usage of fertilizer by most small-holder farmers. The low scale of production and lack of marketing structures add to the lower patronage of fertilizer. Higher transaction costs emanating from the need to transport fertilizer and the active search for information further limit interest in the subsidy program (Croppenstedt et al., 2003; Xu et al., 2009). This shows, therefore, that there is the need to link the subsidy program to other issues, such as marketing, infrastructure development, credit facilities, and supply of improved planting materials (Fan, Gulati & Thorat, 2007). There is also the need to focus the program on specific farmers based on the scale of production and type of crop produced. More so, some form of extra support is necessary for farmers in remote areas from the supply centers to encourage their participation in order to achieve the objectives of the program. It was noticed during the interview that there have been instances in which some farmers have used other farmers (who are not interested in the program) as conduit to access fertilizer. The farmers who acted as conduits acted on a promise of reward from the supposedly richer farmers. Focusing the program on a specific target, farmers can reduce these tendencies. The disincentive emanating from high transaction cost due to the search for information can be removed by improving communication through the creation of formal communication channels and improvement in information systems management with regard to the delivery of support services to farmers. It appears from the study that without extra support (such as credit) to small-holder farmers in remote rural areas, the program may only succeed in stabilizing fertilizer used at the levels that prevailed before the program, but not necessarily an expansion in the number of small-holder farmers using fertilizer. Thus, it is likely that an increase in fertilizer use will come from the same farmers who used fertilizer prior to the program. A comprehensive evaluation of the program is necessary to inform decision-making on how to close the aforementioned loops.

The study also reveals that very few farmers have actually benefited from the program and have actually used subsidized fertilizer. It is interesting to note that 22% of the respondents used fertilizer regularly on their farm; but only 14 (approximately 16%) of the respondents have benefited from the program, while the rest did not apply any fertilizer in 2009. This indicates a possible decrease in the use of fertilizer. The decrease in the number of farmers who used fertilizer could be attributed to the late availability of coupons and fertilizers and the disincentive to purchase fertilizer from the fertilizer retailers in the open market. This suggests that the anticipation of cheaper fertilizer actually lowered the motivation of farmers to purchase unsubsidized fertilizer, even when the subsidized fertilizer was not available. This reduction can also be attributed to the actual shortage of the familiar NPK 15:15:15 in the subsidy program in the study area. Unfortunately, some of the farmers and

conventional retailers thought it was illegal to purchase or sell fertilizer without a coupon. This perception could contribute significantly to the reduction in the number of farmers who used fertilizers regularly before the program; a situation that corroborates the potential damage the program can unleash on food production, fertilizer use, and fertilizer market if it is not properly managed. It is important that steps are taken to quickly correct this erroneous impression created by the program. The refinement of the program should also include steps to ensure the actual application of the subsidized fertilizer at the right time and in the right quantities to justify the investment in the program and create verifiable evidence of the benefit of the program.

Clearly, the respondents were not happy with the way the program is running, even though they concede that it is a laudable initiative. Effort must, therefore, be made to improve the program in terms of the availability, access, and use of the subsidized fertilizer. Ghana Government could, through the subsidy program, prepare the environment in which a vibrant fertilizer private sector can evolve and thrive and that fosters institutional and infrastructural improvement to enhance fertilizer distribution and use (Kelly et al., 2003; Kherallah et al, 2002; Xu et al., 2009; Ndayisenga & Schuh, 1995; Asenso-Okyere, 1994).

One of the key strengths of the program is the use of extension agents to distribute the vouchers, a choice that was smart and innovative for several reasons. The extension agents are supposed to be in contact with farmers and should, therefore, know the true farmers as opposed to imposters, who would want to abuse the program by obtaining and reselling the fertilizer. Using the extension agents to distribute the vouchers also has the potential of minimizing the use of the program as an instrument of political patronage. This is because extension officers, by their constitution, cut across tribes or ethnic groups, regions, religions, and political persuasions. Also, the use of extension agents should minimize power-peddling and constrain local political/party patrons from hijacking, politicizing, or abusing the program for political or personal gains. More so, tying voucher distribution to the operational areas of extension agents could minimize favoritism and make the coupons highly accessible to farmers. It can also increase the respect for extension agents, intensify interactions, and improve relations between farmers and their extension agents. The dialectical danger in this is that the extension agents could use their new roles as instruments of power to boost their ego inordinately and promote themselves and their interests. For example, the respondents indicated corrupt tendencies on the part of the extension agents. Strict supervision and swift response to complaints of this nature should curb this tendency. This new role also puts the credibility of the extension agents in a precarious situation in the event of shortage of coupons. However, some of the respondents actually did not know which extension officer was responsible for them, or their extension service operational area. This could account for the fruitless and frustrating trips to MOFA offices and phone calls to obtain information on vouchers and/or fertilizers.

## **CONCLUSIONS AND RECOMMENDATIONS**

This study assessed the 2008 fertilizer subsidy program in Ghana, using two farming communities (Bremen Essikuma and Bremen Jamra) in the Central Region. The program was assessed on the availability, access, and use of subsidized fertilizer by farmers in the study area. The findings indicate that there are difficulties with the availability of coupons and fertilizers. Particularly, the availability of coupons and the fertilizers are not synchronized to allow effective access to the fertilizer. More so, the delays in fertilizer availability lowered the effectiveness of the fertilizer due to late application and the motivation of farmers to use the subsidized fertilizer. There is also scope for improving the communication channels between extension officers, who distribute the coupons, and the ultimate beneficiaries. Apart from the fact that the subsidized price is still not affordable to majority of the respondents, the study also showed that access to subsidized fertilizer is further constrained by other non-price factors, such as poor communication, high cost of transport, and the perceived burden of contending with deterioration of produce due to the absence of ready market. Consequently, the subsidy program, alone, may not meet the expectations of small-holder farmers, particularly those in remote rural areas. It is important that the subsidy program is linked with other sectoral policies and/or programs, such as improvement in transportation infrastructure. Again, due to the subsidy program, even the number of farmers who used fertilizer regularly has reduced. This indicates a possible reduction in the use of fertilizer. It was found that some respondents thought it was illegal to buy fertilizer without a coupon. This prevented them from purchasing fertilizer from the local retailers, even in the absence of subsidized fertilizer. This situation, if not remedied quickly, can generate collateral damage to food production, fertilizer use, and the fertilizer retail market. Since distribution centers are located in the district capitals, the program, unintentionally, excludes small retailers and distribution channels that reach the center of the rural areas. Overall, while the respondents find the program important and insist on its continuation, refinements are critical to the successful achievement of its objective of increasing and sustaining fertilizer use and food production, particularly among small-holder farmers in the rural areas. Ghana Government must, therefore, make a time-bound commitment to the program, think through the financing and distribution mechanisms, and make actionable maps with timelines to ensure the sustainability of the program. These actions must be aimed at addressing the bottlenecks associated with timely availability, accessibility, and actual use of subsidized fertilizer at the right time and in the right quantities. Communication efforts and active campaign are also necessary because they minimize the tendency to politicize the program and minimize the damage this can unleash.

It is suggested that the subsidy program is lodged within a broader matrix of agricultural development and overall national development strategies to make it more sustainable. This is important for two reasons. One, it will allow the subsidy program to have explicit linkages with other relevant development issues, such as infrastructural development, production and market information management, the advancement of credit facilities, and post-

harvest handling activities. Two, it will allow the subsidy program to create conditions suitable for the evolution of a comprehensive fertilizer policy, which is consistent with other sectoral policies and development goals. It is also suggested that a study covering a larger spatial scale is undertaken to assess the effectiveness of the program in terms of the availability, access and use of the subsidized fertilizer, and its impacts on crop production and farmers.

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