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Fertilizer Subsidy Programme in Ghana: Evidence of Performance after Six Years of Implementation

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Abstract
This study relied mainly on production data from the Ministry of Food and Agriculture, Ghana and FAOSTATS between 2007 and 2012. Comparative and relative analysis of secondary data on the annual evolution of fertilizer subsidy budgets with total crop production and area expansion trends were used to assess the usefulness or otherwise of the programme. Ghana's fertilizer subsidy programme still seems to be ineffective almost six years after commencement. Since inception in 2008, a total of GH¢202.5 million has been invested. The evidence however suggests that little has been achieved by way of output growth that can be attributed to fertilizer use. Although the relationship between crop output and budget spending on subsidy was generally positive, it was not significant even at the 10% level, thus weakening the possible impact of the subsidy programme and corroborating claims that most of the recorded growth in agriculture is due to land area expansion as opposed to yield increases. This study alludes to the increasing interest that sustainability concerns must be factored into such subsidy programmes. There is therefore the need for government audit the current programme and fashion out better implementation strategies, possibly adopt the *smart approach* which has been shown to be more focused and result oriented.
Keywords: Subsidy, smart subsidy, fertilizer, food crops, industrial crops, cereals, vegetables, sustainability

1.0 INTRODUCTION

Crop farmers in Africa face many challenges that collectively undermine their productivity and food security. Years of unsustainable nutrient mining has reduced soils in Africa to one of the poorest in the world (AU, 2006). It is estimated that the continent loses the equivalent of $4 billion worth of soil nutrients annually, thereby weakening its capacity to sustain plant life. Given the poor natural attributes of the soils, coupled with poor management practices, there is consensus that significant increase in inorganic fertilizer use is necessary to restore and maintain their fertility in order to enhance productivity (Minot and Benson, 2009). However, African farmers may not be in a position to optimise fertilizer use because either they cannot afford or the fertilizer may not be readily available. Indeed, it is alleged that fertilizers sold in sub-Saharan Africa are the most expensive in the world (Mokwunye, 2011). Thus, while the soils are highly deficient in nutrients, fertilizer use is very low, constituting only about 3% of global consumption with 7 kg/ha application rate as opposed to more than 150 kg/ha in Asia (Druilhe & Barreiro-Hurlé, 2012). Under such circumstances, subsidy programmes will be economically justified to address the market failures and poor incentives faced by the farmers.

Subsidy programmes were suspended in Africa following the Structural Adjustment (SAP) and market liberalization programmes of the 1980s and 1990s. From early 2000, the combined effect of production stagnation, declining fertility and rising food insecurity triggered fresh interest in promoting input subsidies as a tool for addressing food insecurity. In response, the Africa Fertilizer Summit of 2006 was held in Abuja to address the problems. The summit led to the "Abuja Declaration on Fertilizer for Green Revolution" which saw member states resolve to increase fertilizer use to 50 kg/ha by 2015 (AU, 2006). Leaders at the summit also proposed the *smart subsidy* plan and pledged to invest 10% of their national budgets in agriculture by 2008, in order to raise productivity by 6% or more. These proposals were adopted because reports across the world suggest that some governments implemented similar programmes and successfully achieved the desired results (Abdoulaye & Sanders, 2005; Crawford et al., 2006; Dorward et al., 2004; Morris et al, 2007).

1.1 *Subsidy Programmes in Ghana*

Government re-introduced the fertilizer subsidy programme in 2008 with innovations that sought to *avoid the drawbacks of the past.* The rationale was to increase productivity/production in line with government's commitment to ensuring food security and improving the living standards of Ghanaians. The new programme, per recommendations of the Abuja Summit was expected to help increase *usage to at least 50 kg/ha by 2015.* The countrywide programme started with an initial number of vouchers covering 600,000 bags of 50 kg inorganic fertilizers (subsidised cost of US $15 million). Farmers obtained the subsidy in the form of fertilizer-specific and/or region-specific vouchers (Banful, 2009). Over the period, government spokespersons either published or announced conflicting figures concerning the actual quantities of fertilizer and/or money equivalent

dedicated to the programme (Awuah, 2011; BNFT, 2012; Lewis, 2012; Development Institute, 2012). Table 1 shows summary (average) of the investment made since the programme started (2008-2012).

Table 1: Annual quantity and cost of fertilizer subsidy in Ghana (2008-2012)

Year of disbursement	2008	2009	2010	2011	2012	**Total**
Quantity ('000 Tons)	43.2	72.8	91.2	176.3	173.8	**557.2**
Subsidy cost (GH¢ Million)	20,654	34,400	30,002	78,746	117,437	**202,493**

Source: MOFA, 2013

Meanwhile, the figures on amounts disbursed for the fertilizer subsidy programme have been challenged. For instance, the budget for 2012 indicates expenditure level of GH¢20,581 billion with an allocation of GH¢ 292,479 million to MOFA (GOG, 2013). While this represents 1.4% of budget allocation to agriculture, government officials made conflicting claims to the effect that 9% of budget allocation went to agriculture. It is important to note that the 1.4% of budget allocation was far short of the proposed 10% at the Abuja summit. Available evidence albeit limited, suggests that not much has been achieved in this regard. Official data *on fertilizer usage for arable crop production in Ghana are currently not available. The situation seems to corroborate observations that there is an apparent "indirect" relationship between* fertilizer policies and use in Africa *(Minot and Benson, 2009)*. The report suggests that since 1981 fertilizer use has stagnated at around 1.9-2.2 million metric tons. Jama et al. (2013) *however, portray a more positive application rate for Ghana in 2009 (20kg/ha) contrary to the 10kg/ha rate that was challenged. Aside these claims, mainly from foreign independent sources, the lack of data at the central institution responsible for implementation of the subsidy programme (MOFA) indicates the gravity of the implementation challenges, perhaps making it difficult for progress to be assessed accurately and objectively.*

1.2 *Opposition to Fertilizer Subsidy Programmes*

Available evidence suggests that performance of fertilizer subsidy programmes has largely been unsatisfactory (Morris et al, 2007) due to sustainability challenges. Conventional economic analysis demonstrates that in perfectly competitive markets subsidies are not desirable as they result in inefficiencies and welfare losses (Crawford et al., 2006). Other experts also argue that beyond the short-term, subsidies become fiscally unsustainable due to prohibitive administrative costs, and are less efficient in transferring income to agricultural households (Filipski and Taylor, 2011). Subsidy programmes have often been criticised and in some instances fiercely resisted. The situation of Malawi, as Chinsinga (2008) notes, is a clear example. The critics argue that such programmes are too expensive and yet benefit the wrong people. Aside from being inefficient, subsidy programmes are believed to distort markets by encouraging abuse of usage (Banful, 2010). One major concern about fertilizer subsidies is how much of the subsidised amount gets to the intended target as against how much ends in wrong pockets. The governments of Malawi went round this challenge among others by implementing the s*mart subsidy* programme that has transformed the country from a "food needy" status to a self-reliant one, evidenced by consistent production surplus of maize over and above the country's annual requirement estimated at 2.1 million metric tons (Chinsinga, 2008).

1.3 *Sustainability of Fertilizer Subsidy Programmes*

Sustainability can be perceived from two angles. The first, dubbed 'financial sustainability' measures costs as a percentage of agricultural/national budgets and GDP. Evidence from the Ghanaian situation reveals that between 2008 and 2012, the annual cost of fertilizer subsidy to the Ghanaian taxpayer increased from GH¢20.6 million to GH¢117.4 million, representing about 468% rise (see table 1). Other country experiences however show that increasing the scale of subsidy programmes and related costs put enormous fiscal pressure on national budgets and risks raising the magnitude of implementation challenges (diversion, displacement and market distortions risks). The situation of Malawi for instance, is cited by Chinsinga (2008). Druilhe and Barreiro-Hurlé (2012) also cite examples from fifteen African countries, including Ghana. The second point focuses on strategies for phasing out the programme over time; a position put forward at Abuja with emphasis on feasible exit strategy. The *smart subsidy* concept was designed to enhance the welfare of farmers. It is described in literature as one that involves ***S****pecific* targeting of farmers who would normally not use purchased inputs. It should as well deliver ***M****easurable* impacts, ***A****chievable* goals and be ***R****esults* oriented with an implementation schedule that is ***T****ime* bound with feasible exit strategy (Minde et al., 2008). Chinsinga (2008) further notes that though the planning and implementation of the *smart* programme in Malawi was politically influenced to shore up government's popularity, it was planned to be sustainable. The programme in Ghana, based on available evidence has not met the requirements of a smart design. Yawson et al., (2010), observes a number of implementation challenges that negatively affected the sustainability of the programmes in Ghana. These include availability of the input to farmers as and when needed as well as limited effect (observed) of the fertilizers on yield. This problem, the authors note, was due to among other things lack of technical support and extension advice on best agronomic practices during the implementation phase. There is also the need to prioritise farmer

needs in terms of the type of crop grown and fertiliser needed. In line with these challenges, African governments are encouraged to adhere strictly to the *smart* plan agreed at the Abuja summit to ensure sustainability.

2.0 METHODOLOGY

The study was carried out using secondary data from FAO statistics website, literature, reports and media publications on fertilizer subsidy issues in Ghana and elsewhere. The data covered areas like annual budgets between 2008 and 2012, agricultural production for different crop categories as well as area allocation. Key informant interviews were conducted with officials in charge of the subsidy programme at the national and regional levels. Due to difficulty obtaining annual data the actual quantities (of fertilizer) used by farmers, the study assumed that a useful programme will under normal circumstance lead to improved rate of application which will significantly reflect in output levels. Comparative analysis of the annual evolution of subsidy budgets with total crop production and area expansion trend was done to give an indication of the usefulness of the programme. Relative analysis of the subsidy budgets and resource (land) expansion as well as production trends was also carried out. The analysis focused on four crop categories, including cereals, root/tuber crops, industrial crops and vegetables. Production data (national) from MOFA and FAOSTATS were used in the analysis.

3.0 RESULTS AND DISCUSSION

3.1 *Effect of Price Change on the Fertilizer Subsidy Programme in Ghana*

Subsidized fertilizers in Ghana are mostly targeted at staple crops, primarily maize, rice, sorghum, cowpea among others. Similar programmes have been extended to cover cash crops like cotton and cocoa. Between 2008 and 2012 overall annual cost of fertilizer subsidy to the Ghanaian taxpayer increased from GH¢20.6 million to GH¢117.4 million, representing about 468% rise in national budget commitment to the programme. This was expected to help keep the price of fertilizers relatively stable and affordable over the period. Available evidence however suggest that price of NPK (15-15-15) for instance increased by 66% in 2008 relative to the 2007 prices. The price increased further by over 20% in 2009. It was in 2010 that the price fell by 13.4% relative to the 2009 prices. This trend seems to defeat the objective of the programme in Ghana, which could be the consequence of inconsistencies in the level of disbursement as well as bad timing that often characterised the disbursement of funds (figure 1). We observed that government had irregularly disbursed subsidy funds to beneficiaries. It was expected that the timing and amount of disbursement would be regular once the programme starts. The evidence however shows a contrary position. Late disbursement of subsidy funds, long after the beginning of the season defeats its purpose since the beneficiaries may fail to utilise the incentive for their farming activities. Figure 1 shows that the first disbursement was 70% improvement on the previous year's commitment to subsidies. The programme suffered some setback just one year later (2009/2010) when disbursement tumbled by almost 13% relative to the preceding year. There was once again a huge improvement the year after and then a drastic fall in the 2011/2012 production season. This can certainly not support a sustainable programme as important as the fertilizer subsidy for farmers.

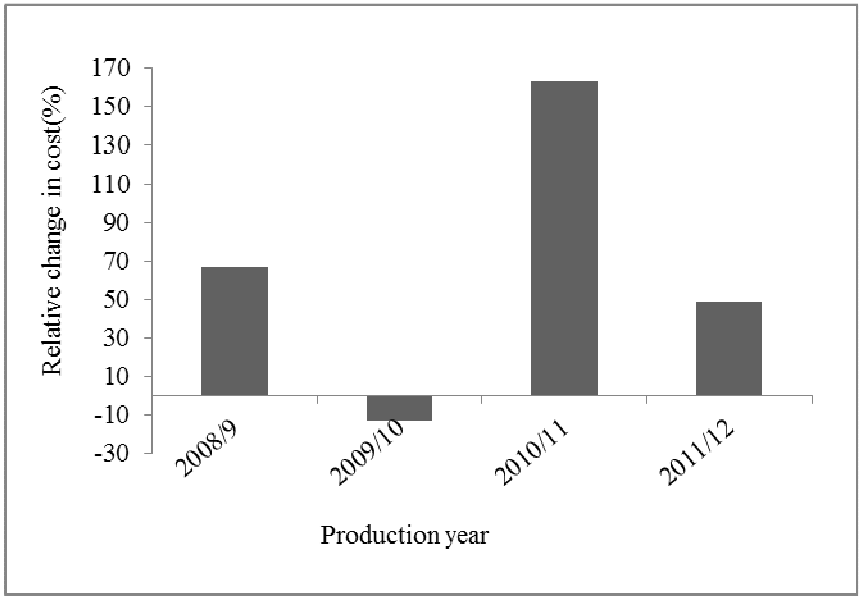

Figure 1: Relative change in cost of subsidy (2008-12)

3.2 *Effect on cereal production*

The results show that total production (national) of maize and rice increased substantially in 2008 and 2009, by 21% and 10% for maize and 58% and 30% for rice respectively. Although some argue that these numbers should not be considered as outcome estimates as a number of factors not related to fertilizer may affect production, it is also established that land expansion explains the greater part of output expansion in the African sub-region (Breisinger et al., 2008). Figure 2 shows that while total output of maize and rice improved significantly, that for millet and sorghum remained flat after an initial marginal increase.

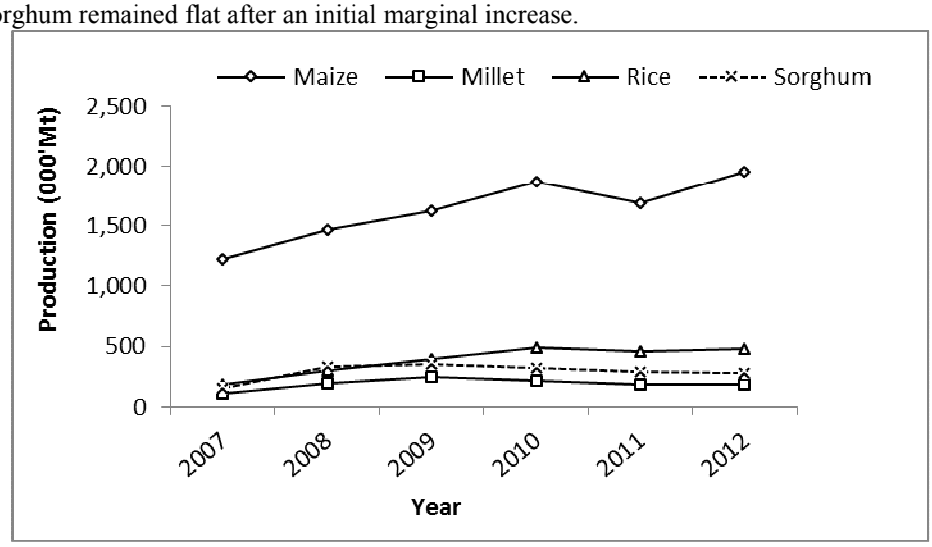

Figure 2: Output trend for cereals (2007-2012)

We observe from the data that the subsidy period witnessed substantial increases in land allocated to cereal production. Total area allocation to maize and rice increased by about 32% and 74% respectively, with a corresponding production increase of 60% and 160% (table 2). The report was similar for millet and sorghum.

Table 2: Relative change in output and acreage (%) for cereals (2007- 2012)

	Change in output (%)					Overall (%)	Area Expansion (%)
	2007/08	2008/09	2009/10	2010/11	2011/12	(2007-2012)	(2007-2012)
Maize	20.5	10.2	15.6	-10.0	15.8	59.9	32.0
Millet	71.7	26.8	-11.0	-16.0	-2.2	58.9	6.0
Rice	63.2	29.4	25.8	-5.7	3.7	160.0	74.3
Sorghum	113.5	6.0	-7.7	-11.4	-2.4	80.6	11.1

Source: FAOSTATS & MOFA data

Universal subsidy programmes were implemented in West Africa while targeted subsidies were instituted in East and Southern Africa. Like other West African countries, Ghana is implementing the universal price subsidy, which targets specific crops. The study thus examined how annual expenditure on subsidies have influenced national output of the various crops over the period under study. The correlation coefficient between output of the four cereals and the annual cost of subsidy was determined to be 0.64, 0.59, -0.89 and -0.64 for maize, millet rice and sorghum respectively. While the correlation was positive for maize and millet, it was not statistically significant even at the 10% level. This suggests a zero statistical relationship between these variables over the period under consideration. On the other hand, the correlation was negative for rice and sorghum and significant at the 5% level, also proving counter to the main idea behind the subsidy programme for the two cereals.

3.3 *Effects on Root and tuber crop production*

Figure 3 shows that output for cassava and yam increased by 42% and 52% respectively over the period while that for cocoyam declined by almost 18%.

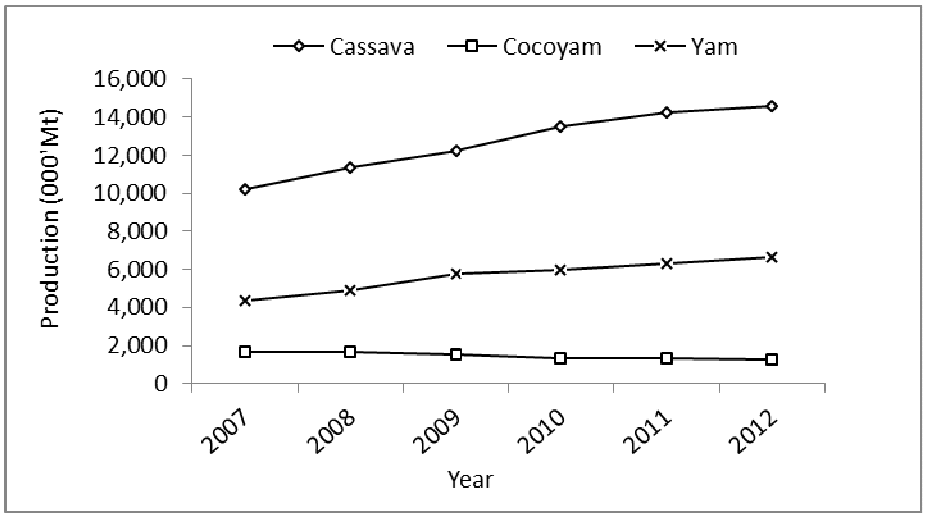

Figure 3: Output trend for root and tuber crops

A corresponding 8.5% increase in harvested area for cassava, 31% for yam and almost 18% decline in area harvested to cocoyam was recorded during the implementation period. These results seem to corroborate earlier suggestions that output growth in the sub-region is mainly achieved through expansion in cultivable area. Harvested area for root and tuber crops grew by 8.5%, -17.7% and 31.5% for cassava, cocoyam and yam respectively, which corresponds with an overall change of 42.4%, -25% and 51.7% change in output. The results seem to suggest some level of association between change in output and area expansion. Authenticating this claim further is the fact that these root and tuber crops are mostly cultivated without application of chemical fertilizers.

Table 3: Relative change in output and acreage (%) for root/tuber crops (2007-2012)

	Relative change in output (%)					**Overall (%)**	**Area Expansion (%)**
	2007/8	2008/9	2009/10	2010/11	2011/12	**(2007-2012)**	**(2007-2012)**
Cassava	11.0	7.8	10.4	5.5	2.1	42.4	8.5
Cocoyam	-0.1	-10.9	-9.9	-4.1	-2.3	-24.9	-17.6
Yam	11.9	18.0	3.1	5.6	5.5	51.7	31.5

Source: FAOSTATS & MOFA data

3.4 *Effect on vegetable production*

Tomato production increased between 2007 and 2009 after which it stabilized (figure 3). Onion production also rose in 2009 at the time when the second subsidy disbursement of GH¢37 million was made. In other words, the first disbursement did not affect production as shown in figure 3.

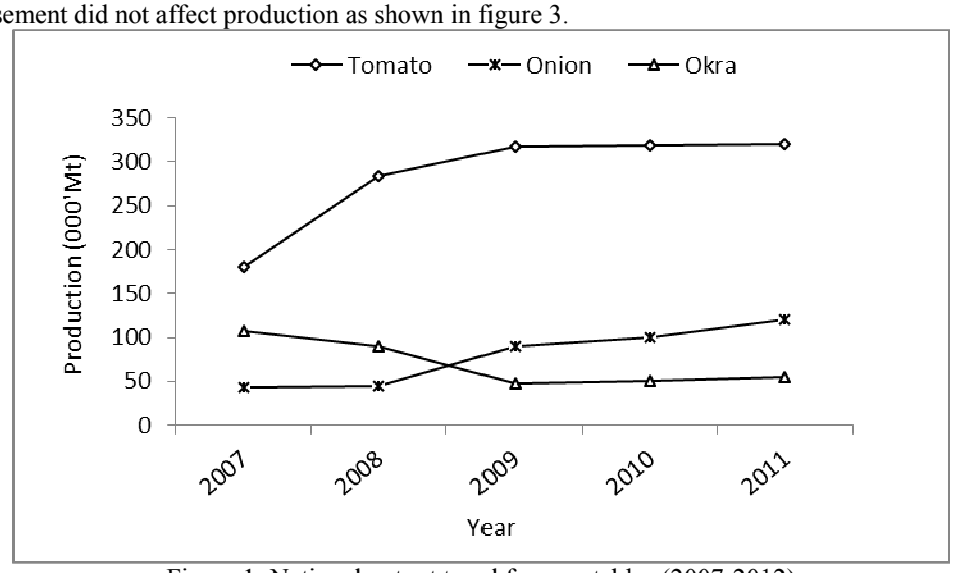

Figure 1: National output trend for vegetables (2007-2012)

Table 4 also shows that relative change in output for tomato was higher before the programme started in 2008. The overall change in output for tomato and onion saw some 48% and 34% increase in land allocation

to the crops respectively. It is also evident that the decline in output of okra saw a massive decline in area allocation to the crop. While the correlation coefficient between output of okro and onion, and the annual cost of subsidy were determined be positive (0.13) and (0.18) they both were statistically insignificant. The correlation coefficient for okro however showed a negative relationship (-0.21) which is also statistically not significant.

Table 4: Relative change in output and acreage (%) for major vegetables (2007-2011)

	Relative change in output (%)				Overall (%)	Area Expansion (%)
	2007/8	2008/9	2009/10	2010/11	**(2007-2011)**	**(2007-2011)**
Tomato	57.8	11.8	0.3	0.6	78.1	48.2
Onion	2.3	104.5	11.1	20.0	179.1	34.0
Okra	-16.7	-47.8	6.4	10.0	-49.1	-85.6

Source: FAOSTATS & MOFA data

3.5 *Effect on industrial crop production*

Cotton was the only industrial crop that recorded consistent growth in total output (Figure 4). Again, the rate of growth before the start of the subsidy programme (2007-08) was higher than after. The rate of output growth for oil palm was almost the same between 2007 and 2009 after which it declined annually until 2012. Meanwhile, cocoa production remained unchanged (at 2007 level) through to 2012.

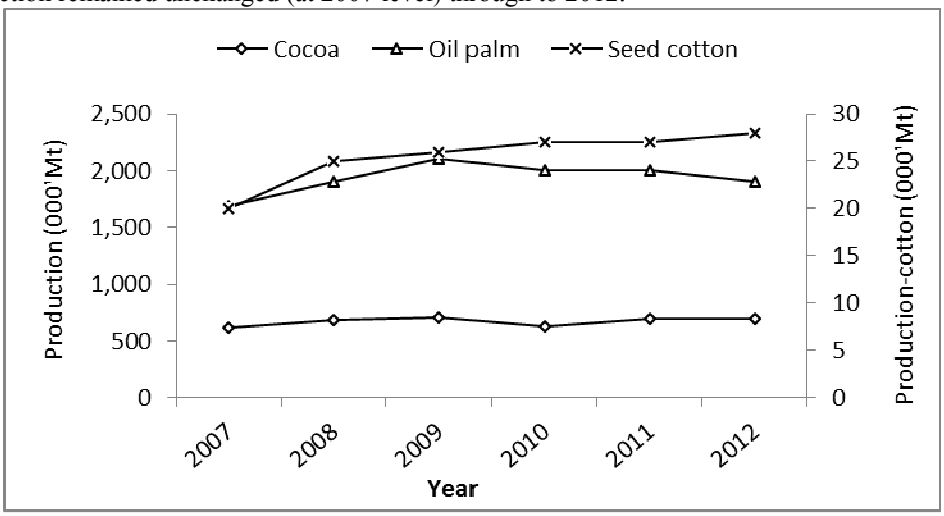

Figure 2: National output trend for major industrial crops (2007-2012)

The overall change in output for the cash crops was accompanied by over 9% increase in area allocation for cocoa, 8% and 16.7% expansion for cotton and oil palm respectively. The results cocoa did not show any significant relationship with budgetary allocation for the subsidy programme. The correlation was positive for cocoa (0.23) and cotton (0.18) but statistically not significant even at the 10% level, suggesting that output growth for all the crops including cocoa cannot justify the amount that government spent on fertilizer subsidies in the country. It is therefore safe to suggest that Ghana's fertilizer subsidy programme has not had the expected effect so far.

Table 5: Relative change in output and acreage (%) for cash crops (2007-2012)

	Relative change in output (%)					Overall (%)	Area Expansion (%)
	2007/8	2008/9	2009/10	2010/11	2011/12	**(2007-2012)**	**(2007-2012)**
Cocoa	10.7	4.4	-11.1	10.8	0.1	13.8	9.4
Cotton	25.0	4.0	3.8	0.0	3.7	40.0	8.0
Oil palm	12.6	10.9	-4.8	0.0	-5.2	12.8	16.7

Source: FAOSTATS & MOFA data

4.0 CONCLUSION

After six years of implementation, Ghana's fertilizer subsidy programme seems to be largely ineffective in spite of the huge budgetary allocation so far. Since its inception in 2008, a total of GH¢202.5 million has been invested to subsidise 557.2 tonnes of fertilizer. The evidence however suggests that not much has been achieved by way of improvement in rate of application as well as growth in output. In other words, recorded growth increases are most often associated with increasing allocation of farmland, thus weakening the possible impact of the subsidy programme. So far, it is unclear where the subsidy investment went because the evidence, does not

justify the high financial commitment. Moreover, the opportunity cost of devoting public funds to subsidizing fertilizer instead of investing in other development projects is substantial. We believe that a subsidy programme that does not affect productivity and output is not worth pursuing and must either be revised in a robust manner or stopped in order to save scarce resources, which may be benefitting the wrong people. Lack of clear-cut targeting and effective monitoring of the programme opens it for blatant abuse.

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