Practices and Policy Options for the Improved Design and Implementation of Fertilizer Subsidy Programs in Sub-Saharan Africa

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Practices and Policy Options for the Improved Design and Implementation of Fertilizer Subsidy Programs in Sub-Saharan Africa

NEPAD Agency Policy Study

- Maria Wanzala-Mlobela (NEPAD Agency)
- Porfirio Fuentes (IFDC)
- Solomon Mkumbwa (FAO)

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IFDC
P.O. Box 2040
Muscle Shoals, Alabama 35662 USA

Telephone: +1 (256) 381-6600
Fax: +1 (256) 381-7408

www.ifdc.org

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Executive Summary

1. Introduction

Following the *2006 Abuja Declaration on Fertilizer for an African Green Revolution,* and with further impetus provided by the 2007/08 soaring food, fuel and fertilizer prices, African leaders put forward a political commitment to arrest land degradation and improve crop productivity by increasing fertilizer use to at least 50 kilograms per hectare (kg/ha) of arable land. Toward this commitment, several Sub-Saharan Africa (SSA) governments implemented fertilizer subsidies as a way to boost food production. While prices for fuel and fertilizers since the crisis have declined, those of food have merely stabilized, and remain at higher levels than pre-2007 prices. Despite this, it is likely that African governments will continue to subsidize fertilizer use by small and subsistence farmers for the foreseeable future. However, some analysts fear that the recent resurgence of fertilizer subsidies will erode past efforts and achievements in private sector fertilizer supply market development in SSA. In order to objectively intervene and support countries in SSA regarding the successful design and implementation of their fertilizer subsidy policies and programs, the African Union (AU)-New Partnership for Africa's Development (NEPAD) Coordinating Agency (NPCA), with technical and financial support from the Food and Agriculture Organization of the United Nations (FAO), the International Fertilizer Development Center (IFDC) and the Alliance for a Green Revolution in Africa (AGRA), commissioned this study: *Practices and Policy Options for the Improved Design and Implementation of Fertilizer Subsidy Programs in Sub-Saharan Africa.* The objective of the study is to identify major issues affecting the implementation of these subsidy programs and make recommendations to improve their management and implementation. It is believed that this study will assist in bringing about a more positive impact according to most countries' implicit and/or stated general objectives of increasing agricultural production, food security and rural incomes. The output of the study will be a set of recommendations in relation to: (1) the key lessons learned and identification of best practices; (2) key findings regarding the implementation of fertilizer subsidy programs in SSA; and (3) policy recommendations for the successful management and implementation of fertilizer subsidy programs.

2. Background: Fertilizer Subsidies in SSA

Between the 1960s and early 1980s, many African countries utilized conventional fertilizer subsidies which included the following key features: government importation and distribution of fertilizer; the sale of fertilizer at subsidized pan-territorial prices via state-owned enterprises; and universal program availability to all categories of farmers. The primary objective was to promote increased agricultural production by providing an incentive for the adoption of new technologies (by reducing the cost of fertilizer and mitigating the potential risks of using it incorrectly). However, in the 1980s and 1990s, the consensus among African governments, development organizations and donors was that conventional subsidies had been ineffective and costly in Africa; as a result, many African countries eliminated their subsidy programs. The recent past has seen a resurgence of fertilizer subsidy programs in Africa for the reasons cited above, but the general consensus regarding conventional subsidies still holds. Hence, African governments and their development partners are now looking to subsidies to address a much broader set of objectives than those addressed by the conventional subsidies. This has led to the development and endorsement of a new type of 'market-friendly subsidy,' which has been termed the 'SMART'[1] subsidy in literature. SMART subsidies include the following attributes: clear and non-contradictory objectives (for example, it is difficult for the same program to target the poorest farmers and also to achieve large increases in staple food crop production); the ability to promote pro-poor economic growth without reverting to a pure social safety net program

1 *SMART" subsidies are those involving (S)pecific targeting of farmers who would not otherwise use purchased inputs (or targeting areas where added fertilizer can contribute most to yield improvement); (M)easurable impacts; (A)chievable goals; a (R)esults orientation; and a (T)imely duration of implementation, i.e., being time-bound or having a feasible exit strategy. (Minde, I., T.S. Jayne, E. Crawford, J. Ariga and J. Goverreh. 2008. "Promoting Fertilizer Use in Africa: Current Issues and Empirical Evidence from Malawi, Zambia, and Kenya." ReSAKSS Working Paper No. 13).*

(or handouts without sustainable social and economic advancement); replenishment of soil fertility – the subsidy package should be appropriate in size and contain an optimal mix of inputs; a clear exit strategy; the empowerment of key actors (suppliers, poor farmers) through capacity building that will ensure a market's supply and demand sustainability after the subsidy ends; the promotion of market-based solutions to input supply; and the promotion of competition within the input supply chain.

SMART subsidies are intended to address the failure of conventional subsidies. Therefore, for a program to be SMART, it should have a minimum of the following design features: (a) targeted to a specific population; (b) contribute to competitive open market development; (c) have an exit strategy with a time limit on the support.

The fertilizer subsidy programs currently being implemented in SSA range from conventional, or 'non-market-friendly' subsidies, to 'market-friendly' subsidies (key features include the use of a targeting mechanism such as input vouchers to target poor farmers and delivery of the subsidized fertilizer via the private input distribution system), to subsidy programs with a combination of market-friendly and non-market-friendly features. The consensus in the literature on input subsidy programs is that market-friendly subsidy programs have more attributes of 'SMART' subsidies, and are therefore preferable to non-market-friendly subsidy programs.

3. Objectives of the Study

The general objective of this study is to provide a comparative analysis of the design, implementation modalities and performance of two types of subsidy programs in SSA: more market-friendly subsidy programs and less market-friendly subsidy programs. Based on the findings, the study identifies best practices and lessons that SSA governments may use to improve their implementation of subsidy programs with regard to these three performance measures.

4. Methodology

Data Collection

The analysis presented in this study is based on qualitative information and data drawn from country reports on fertilizer subsidy programs prepared by national consultants in eight SSA countries that are currently implementing fertilizer subsidy programs: Burkina Faso, Ghana, Malawi, Nigeria, Rwanda, Senegal, Tanzania and Zambia). These countries were purposefully selected, taking into consideration such factors as geographical representation, market size, inclusion of a mixture of coastal and landlocked countries and whether the country has implemented a fertilizer subsidy program for more than one cropping season. The approaches employed by the consultants to gather the data and information included: review of relevant literature; collection of secondary data; and in-country consultation, which included field visits. The consultants prepared country reports on their respective fertilizer subsidy under the guidance of a technical team comprised of fertilizer policy and marketing experts from IFDC, FAO and NEPAD. In addition to the country reports, the consolidated final study is supplemented by secondary data and information from multiple sources (most notably FAOSTAT and CountrySTAT) and existing studies on fertilizer subsidy programs in Africa conducted by the following institutions: IFDC, FAO, Michigan State University (MSU), the International Food Policy Research Institute (IFPRI) and the World Bank.

Analytical Approach

The general attributes of subsidy programs determine their design characteristics and implementation modalities. The design characteristics and implementation modalities have implications for the performance of the program. The general attributes of a subsidy program are: objectives of the subsidy program; timeframe; sustainability; modalities of delivery of subsidized inputs (market-based or through official channels); promotion of pro-poor growth versus a safety-net approach; and instruments used for implementation (if any).

The typical design characteristics of subsidy programs are: the quantity and type of fertilizer and other inputs in the input subsidy package; the amount of the subsidy; whether or not the subsidy will be targeted, and if so, the targeting instrument and criteria; whether the subsidy targets particular crops; the method of estimation of the subsidy requirement; the availability of complementary services (credit, extension, capacity building for agro-dealers, availability of post-harvest technologies and output market linkages); and the source of funds for the subsidy program.

The typical implementation modalities that are used are the following: the procurement system (government tender or direct price negotiation); institutional arrangements among the various players; the delivery mechanism for the fertilizer (government or private sector distribution network); and the existence of precautionary measures to reduce leakages and rent-seeking.

The performance of subsidy programs is typically evaluated at three levels: (a) farm-level; (b) impact on the private sector; and (c) the macroeconomic level, using a number of variables for analysis. This study limits its analysis to the supply-side of the fertilizer chain up to the farm-gate, due to the type of data and information that is available. Therefore, the key components of the subsidy programs that are evaluated include: the general attributes of a subsidy program (excluding the objective of each program); the key characteristics associated with these attributes that are commonly considered when designing a smart subsidy program for inputs; the typical implementation modalities of delivery of the subsidized inputs that are used; and the indicators that are used to measure the performance of these smart subsidy programs up to the farm-gate.

Methodology

The study purposefully adopts a qualitative approach in order to understand the various design characteristics and implementation modalities of the eight subsidy programs and the effect they may have on each program's performance ('market friendliness'). The measures of performance are: (a) accessibility by poor farmers to subsidized fertilizer; (b) availability of subsidized fertilizers to poor farmers; (c) impact of the subsidy programs on the development of the private distribution network; and (d) timeframe. A set of descriptive statements was developed for each of the four performance indicators to guide the analysis of the subsidy programs; specifically, the statements identify the design characteristics and implementation modalities of subsidy programs and assess their impact on performance.[2]

The analysis is undertaken in two stages. In Stage 1, for each subsidy program, the actual design characteristics are identified and analyzed in terms of how they were actually implemented and whether the hypothesized effects were actually achieved. Then the impact on performance is analyzed in qualitative terms – that is, whether the program design characteristic and its implementation modality had a positive or negative impact on performance. For example, if a subsidy program uses input vouchers as a mechanism to entitle poor farmers to the subsidized fertilizer, the hypothesis is that this will increase the accessibility of subsidized fertilizer to poor farmers. If the findings are that the use of input vouchers did indeed increase accessibility for poor farmers, the impact on accessibility will be positive, and the design feature is given a score of 1. Conversely, if the program uses input vouchers to target poor farmers but the findings indicate that this did not increase accessibility, the design feature is given a score of zero. Similarly, if the program does not use input vouchers and does not increase accessibility, it is also given a score of zero.

The performance of the subsidy programs is summarized in a table providing a scored list of the country fertilizer subsidy programs. The eight fertilizer subsidy programs are then divided into two groups based on their scores: More market-friendly subsidy programs are those with a score of more than 10; the less market-friendly subsidy programs are those with a score of 10 and below. In Stage 2 of the analysis, the study conducts a comparative analysis between the more market-friendly subsidy programs and the less market-friendly subsidy programs. The purpose of the comparative analysis is to identify the design features and implementation modalities that enhance the 'market friendliness' attributes of the fertilizer subsidy programs, and hence identify some of the best practices and lessons learned for the improved management and implementation of future subsidy programs.

The approach used is as follows: first, a set of hypotheses is developed, drawing from the analysis of the individual country subsidy programs regarding the relationship between design characteristics and implementation modalities on one hand and performance on the other, in terms of: potential expansion of the private sector; increased availability and accessibility of fertilizer; and the existence of a timeframe and exit strategy. It then compares the key design characteristics and implementation modalities of the more *market-friendly* programs with those of the *less market-friendly* programs and their respective effects on the performance indicators, vis-à-vis the hypotheses. The expectation is that in the majority of cases the findings for the more market-friendly subsidy programs will support the hypotheses because of their primary design characteristics. However, analyzing whether more market-friendly subsidy programs perform better than the less market-friendly subsidy programs because they have better design characteristics and implementation modalities is not the purpose of the comparative analysis. Rather, the two groups of subsidy programs have been created to provide a basis for comparison upon which to draw out key differences and similarities in design, implementation and hence performance, and on thus obtain key lessons and best practices that can improve the implementation of subsidy programs in SSA.

2 *As noted above, the study will limit its analysis to the supply-side of the fertilizer supply chain up to the farm-gate, therefore the performance indicators are: (1) accessibility by poor farmers to subsidy instruments (if any) and to subsidized fertilizer in terms of price; (2) availability to subsidized fertilizers for poor, smallholder and subsistence farmers in terms of quantity, time, place; (3) impact of the subsidy programs on the development of the private distribution network; and (4) timeframe – does the subsidy program have an exit strategy and a time limit, and is it enforced.*

5. Results

5.1 Stage 1: Performance Analysis of the Eight Fertilizer Subsidy Programs

Table 1. Summary of Performance Analysis of the Eight Country Fertilizer Subsidy Programs

Country (Year Subsidy Introduced)	Role of Government	Role of Private Sector	Input Voucher (Yes/No)	Other Attributes	Scores
More Market-Friendly Subsidy Programs					
Tanzania (2008)	Pay importers based on coupons Distributes coupons	Importation Wholesaling Transport Warehousing Retailing	Yes	Improved seed subsidy Extension service Credit support Quantity limit Pre-season registration	14
Rwanda (2007)	Importation Wholesaling	Transport Warehousing Retailing			12
Less Market-Friendly Subsidy Programs					
Malawi[a] (1997/98)	Purchase from importers Warehousing Retailing	Importation Transport	Yes	Improved seed subsidy Extension service No credit support Quantity limit Pre-season registration	10
Senegal (2005)			No	Extension service Credit support No quantity limit Pre-season registration	10
Zambia (2003)			No	Improved seed subsidy Extension service Credit support Quantity limit Pre-season registration	10
Burkina Faso (2008)	Importation Warehousing Transporting Retailing	No role	No	Extension service No credit support No quantity limit Pre-season registration	7
Ghana (2009)	Negotiates price Pays importers based on waybills	Importation Wholesaling Transport Warehousing Retailing	No	No quantity limit per beneficiary Pre-season registration Extension service No credit support	7
Nigeria (2002)	Purchase from importers Warehousing Retailing	Importation Transport	No	Extension service No credit support No quantity limit Pre-season registration	7

a. The Malawian Government also distributes input vouchers.

5.2 Stage 2: Results of the Comparative Analysis Between the More Market-Friendly and Less Market-Friendly Subsidy Programs

5.2.1 Key Features of More Market-Friendly Subsidy Programs Compared With Less Market-Friendly Subsidy Programs and Their Related Effects on Supporting the Development of the Private Fertilizer Supply Market

- *The private importation and distribution of subsidized fertilizer*, a key design characteristic of market-friendly subsidy programs, is an important design feature to include in order to improve the performance of the subsidy programs. It builds up the private distribution network instead of reducing private sector sales (or 'crowding out' the private sector).
- Nevertheless, there are issues regarding the implementation of this design feature that undercut its beneficial effects and which must be addressed to improve the performance of subsidy programs. In the cases where the private sector self-finances importation (and this is the case for both more market-friendly and less market-friendly subsidy programs), there are reported delays in payments by the government to the private sector for deliveries. This places a heavy financial burden on the private sector and discourages their participation in the subsidy program the following season. Secondly, although this design feature does not allow for restrictions by the government on who can participate in the market, importers may still exclude agro-dealers who are not part of their network from participation. The result is increased market concentration at the retail level, since only affiliated retailers are allowed to participate in the subsidy scheme. Importers may also exclude agro-dealers from the price setting negotiations with the government, which places agro-dealers at a disadvantage, as they are unable to ensure that their margins will be protected; hence, this practice weakens the retail network.
    - Lessons Learned: (a) The use of the private sector to import and distribute subsidized fertilizer should include a mechanism that will address the delays in payments to importers and agro-dealers; and (b) representatives of the private sector from all levels of the fertilizer supply chain should be included in any discussions with the government related to the design and implementation of the subsidy program.
    - Best Practices: One potential best practice with regard to a mechanism that can address the issue of late payments comes from Tanzania and Malawi. In order to alleviate the liquidity constraints (including foreign currency) faced by private importers for the expeditious importation of fertilizers, the governments of Tanzania and Malawi offer letters of credit to local importers through their central banks. This is a preferred model to the practice in Ghana, under which private importers must use their own international networks to source the working capital to finance the importation of fertilizer for the subsidy program; they later experience delayed payment by the government which ties-up their working capital.
- *Procurement Arrangements for Subsidized Fertilizer* – The use of an open and transparent tender in sourcing the services of the private sector for the subsidy program is expected to have a positive impact on private market development; it includes rather than excludes potential private importers from importation of subsidized fertilizer and also has the potential to enhance price competitiveness among the private importers. However, the findings from the comparative analysis show that for both the types of subsidy programs, the use of a tender for the procurement of subsidized fertilizer has a negative impact on the development of the private sector because: (a) the permission to bid on the government tender is restricted to selected importing companies, and political patronage plays a large role in determining who is or is not allowed to participate in the tender. This creates risk and uncertainty about which companies will win the tender from one year to the next and thus reduces the incentive to invest in the distribution network; (b) the exclusion of certain importing companies from participation reduces competition in the importing and distribution system and encourages concentration and collusion, as there is a tendency for the market to concentrate around those who are awarded the tenders and their linked wholesalers and retailers; and (c) the tender system results in late delivery of fertilizers to farmers due to bureaucratic processes, which result in late confirmation of the tender recipients and delays in subsequent payments. Importers who are awarded the tender wait until they receive confirmation from the government before they place their orders and import the fertilizer. This creates delays in acquisition of fertilizers, which ripple downward to the farm-gate.
    - Lesson Learned: The overall impact of this procurement arrangement (the use of tenders) on the development of the private fertilizer market in SSA has been negative.
    - Potential Best Practice: Given that the use of a tender system is so entrenched in the administration of fertilizer subsidy programs in SSA, it may be advisable to improve on the current system rather than introduce a new solution. Therefore, the recommendation would be that best practices and fair play in the use of tenders for fertilizer should be intentionally incorporated and applied by governments in SSA.

5.2.2 Key Features of More Market-Friendly Programs Compared With Less Market-Friendly Programs and Their Related Effects on Fertilizer Availability and Accessibility to the Poor Farmers

- *Subsidy Rate* – The hypothesis is that the subsidy rate can be an instrument for promoting fertilizer use if it is consistent and predictable, as this can enhance farmers' ability to save the top-up amount and purchase the fertilizer. It can also be used as part of an exit strategy to graduate farmers out of the subsidy program by gradually reducing the amount of the subsidy. The findings of the analysis are mixed, but overall they do not appear to support the hypothesis.
  - › Lesson Learned – Additional research is required to substantiate whether the subsidy rate is an important design feature for the improved performance of subsidy programs.
- *Use of Input Vouchers to Entitle Selected Beneficiarie*s – The hypothesis is that the use of input vouchers to entitle poor farmers will have a positive impact on enhancing accessibility to subsidized fertilizers by these farmers. Vouchers entitle individual beneficiaries to a price discount that is a saving equivalent to the face value of the voucher, and even more importantly, it provides better access to the subsidized product by the intended beneficiary. By distributing vouchers, a subsidy program increases the likelihood that the targeted beneficiaries will access the subsidized fertilizers. The findings support the hypothesis. The less market-friendly subsidy programs, which do not use input vouchers, experience the problem of crowding out the private sector; subsidized fertilizer was being made available to farmers who could otherwise afford to pay the full market price (referred to as leakages).

  Nevertheless, the more market-friendly subsidy programs also experienced problems in the use of input vouchers: the problem of counterfeit vouchers existed; and the system for the delivery and administration of vouchers is often too cumbersome and bureaucratic. The system involves too many people and has numerous steps, which introduces ample opportunities for rent-seeking; the implementation of the voucher system in some countries creates a burden to farmer recipients of the subsidy, since it requires multi-step procedures for farmers to acquire, validate and redeem the vouchers from numerous actors; the voucher system also creates a burden on the private sector, which is required to file a long trail of paperwork and implement several steps in order to validate and then redeem the vouchers from the government; insufficient availability of the subsidized product (i.e., no congruency between the number of vouchers and the amount of fertilizer product available in the market to honor those vouchers).
  - › Lesson Learned: The use of input vouchers is an important design feature for subsidy programs, as they improve their ability to target the intended beneficiaries. However, if the input voucher system is not implemented well, it can compromise the performance of the subsidy program. There is a need to simplify the distribution of vouchers and the subsidized product to make it more objective and transparent.
  - › Best Practices: Some of the best practices that simplify the distribution of vouchers come from Rwanda and Tanzania.
- *Complementary Services* – The hypothesis is that provisions of complementary services will have a positive impact on enhancing accessibility by poor farmers to subsidized fertilizers. By providing farmers with the means to pay the unsubsidized portion of the fertilizer price, the subsidy program increases accessibility for poor farmers. Similarly, by providing extension services to farmers, the subsidy program creates awareness of the availability of fertilizers and improves farmer knowledge of the benefits of fertilizer and correct use of the input, thus increasing the likelihood that poor farmers will use fertilizer, since it has become more accessible (in the sense of being more user-friendly). The findings from the comparative analysis support the hypothesis for credit, but are inconclusive of extension services.
  - › Lesson Learned – The main source of extension services in both types of subsidy programs is the staff of the Ministry of Agriculture. This is the case even where extension services are part of the subsidy package. As a result in most cases, delivery of extension services reportedly suffered because the time and energies of extension staff were stretched too thin between providing extension and implementing the subsidy programs.
  - › Best Practice – In Rwanda, the provision of extension services is a separate entity from the Ministry and paid for by the subsidy program. The findings from Rwanda reveal that the extension services component of the subsidy program played an important role in increasing yields and productivity. This was not the case for the other programs where the impacts of the extension services were inconclusive.
- *Rigorous Government Planning for the Fertilizer Requirement* – Rigorous planning entails the annual estimation of the fertilizer requirement, taking into account the number of targeted beneficiaries, the area planted and the crop mix, rather than simply increasing annual estimates by a set percentage. The hypothesis is that rigorous government planning regarding the fertilizer requirement will increase availability of the subsidized fertilizer to poor farmers because better planning will result in reduced leakages and less misallocation between regions (i.e., between surplus and deficit areas). The findings support the hypothesis. Moreover, the more market-friendly subsidy programs where the government engaged in rigorous planning increased the availability of subsidized fertilizer and there was less misallocation between

surplus and deficit regions. The less market-friendly subsidy programs where the government planning was not systematic and rigorous resulted in poorer results, such as the amount of subsidized fertilizer being much less than the actual needs of targeted farmers and the misallocation of subsidized fertilizers to different regions. Therefore, the findings indicate that proactive and rigorous government planning regarding the fertilizer requirement is an important design feature to include to improve the performance of subsidy programs.

  - Lesson Learned – An important lesson is the considerable cost involved in rigorously planning and administering these market-friendly programs. A cost-benefit analysis is required to assess whether the benefits in terms of increased output outweigh the costs of administration. It is also necessary to analyze whether the total costs of the subsidy program are less than the cost of importing the amount of food produced by the program.

- *Indirect Restrictions on the Participation of Non-Poor Farmers* – These restrictions on the participation of non-poor farmers entail: pre-screening and registration of beneficiaries; restrictions on the type of subsidized fertilizers to those used by poor small farmers and for staple food production; and restrictions on the maximum quantity of fertilizer per farmer. With regard to pre-screening and registration of beneficiaries, the hypothesis is that pre-screening and vetting of the eligible beneficiaries and generation of a list will effectively exclude non-poor farmers. With regard to the imposition of restrictions on the type of fertilizer to be subsidized to those used by poor farmers, the hypothesis is that by restricting the fertilizer types it includes, the subsidy program will be encouraging large farmers who grow cash crops (and therefore use different types of fertilizers) to self-exclude from the program, thereby reducing leakages of the subsidy to the non-poor and increasing accessibility for poor small farmers. Regarding restrictions on the maximum quantity of fertilizer per farmer, the hypothesis is that restricting the maximum quantity a farmer can purchase will have a positive impact on accessibility by poor farmers to subsidized fertilizers. Overall, the findings support the hypothesis, although there is not a significant difference in these findings between the more market-friendly and the less market-friendly programs. Both the more market-friendly programs (e.g., Rwanda and Tanzania) and less market-friendly subsidy programs (e.g., Zambia, Malawi and Senegal) generated lists of beneficiaries or farmers' registers and placed restrictions on fertilizer type and quantity; these programs reported better accessibility and fewer problems with leakages than programs which did not.

  - Lesson Learned – Given the similar findings for market-friendly and less market-friendly subsidy programs, the findings also imply that indirect restrictions alone are insufficient to curtail access by non-poor farmers to subsidized fertilizers; these measures need to be complemented with other instruments such as vouchers to reduce leakages. Additional research is required to reach a conclusion about the extent of leakages compared with the cost of controlling the leakage and the type of institutional arrangements that should be in place to effectively reduce the leakages.

- *Physical Access to Subsidized Fertilizer* – In addition to timely receipt of the right type of fertilizer at the right time, the distance that farmers travel to obtain the subsidized fertilizer is an important determinant of the accessibility of poor farmers to the product. The hypothesis is that distribution of the subsidized fertilizer by private agro-dealers reduces the distance farmers must travel to obtain the product. The findings supports this hypothesis; the more market-friendly subsidy programs used the agro-dealer network to distribute the subsidized fertilizer, whereas the less market-friendly programs typically used the Ministry of Agriculture or other public agencies' distribution networks to sell the subsidized fertilizers. The results indicate that improved physical accessibility to subsidized fertilizer is facilitated by the use of the private agro-dealer network rather than government distribution channels.

5.2.3 Timeframe

A specific timeframe for the subsidy program entails either a specific date for completion of the program or graduation of a group of beneficiaries after participation in the program for a specified period of time. It also implies an exit strategy. The hypothesis is that having a timeframe and exit strategy will improve the overall performance of the subsidy program because this will encourage governments to set goals and targets that are to be met within a specific time. It will also reduce the potential for entrenching a dependency syndrome among the beneficiaries and undermining their entrepreneurial abilities. With the exception of the more market-friendly subsidy program in Tanzania, none of the subsidy programs have a timeframe with an explicit exit strategy or mechanism to graduate farmers who have participated in the program for some specified period of time. Therefore, there is no basis for analysis of this variable and its impact on performance.

6. Conclusions, Recommendations and the Way Forward

6.1 Key Conclusion

Market-friendly orientations towards SMART subsidies have the potential to support the development of private fertilizer markets in SSA and increase the availability and accessibility of fertilizers to poor small farmers. Some African governments have made an attempt to implement market-friendly subsidies by introducing at least some of the basic attributes of SMART subsidies. Nevertheless, the findings of this study reveal that the results have not been as promising as expected. The reasons could be attributed to the fact that most countries in Africa, and especially those where there have been attempts to implement SMART subsidies, do not have the requisite supportive macro- and micro-economic conditions in place to allow for the development of a competitive fertilizer market which would support the implementation of a well-managed and efficacious fertilizer subsidy program. Therefore, given current conditions of implementation, it is unlikely that program outcomes will be sustainable in the long term and continue after program termination.

6.2 Recommendations

Governments tend to view fertilizer subsidies as a necessary recurring expenditure. However, there is a need for a paradigm shift when it comes to how subsidy programs are viewed. Rather than viewing them as expenditures, governments should think of subsidy programs as an investment in the agriculture sector, contributing toward making the agricultural sector self-sustaining. If the government accepts that subsidies will remain a part of the government budget for the foreseeable future, it should aim to make this expenditure as productive as possible. First and foremost, subsidy programs must be designed as temporary measures with a phase out strategy and a mixture of investment and expenditures. Expenditures, in this context, refer to setting up and implementing the subsidy program itself, while investments refer to measures that enhance the effectiveness of the subsidy program over the long term.

6.2.1 Overall Recommendation

Governments should withdraw from direct involvement in the importation and distribution of fertilizers. Instead, the governments should provide purchasing power support to poor farmers and enter into fair and competitive multi-year, mutually beneficial contracts with the private sector for the importation and distribution of fertilizers for the subsidy program.

6.2.2 Specific Supporting Recommendations

- *Subsidy programs should include subsidy complementary services.*

The subsidy program should include complementary services to make subsidized fertilizer accessible and its use more effective. The complementary services include extension services, improved seed, credit access, irrigation support and pesticide support.

- *Strengthen the capacity of the existing private fertilizer market.*

Where a country has a private sector, governments should provide support through the following measures: (a) acting as credit guarantee or issuance of letters of credit for importation of fertilizers; (b) encouraging importers to sell their fertilizers on auction to retailers as opposed to secretive selection; (c) building up the private import and distribution network by supporting and investing in training, exposure and credit facilities; (d) investing in improving the conditions for the fertilizer private sector to expand; and (e) training local importers and linking them with international networks of traders and financial institutions.

Engage adequately represented farmers' organizations and fertilizer traders' associations from the beginning of the program design through to implementation. The subsidy program should be designed in a way that allows for the involvement of farmers, importers and agro-dealers in the design and implementation of the subsidy programs.

- *Use input vouchers to entitle the targeted fertilizer subsidy beneficiaries.*

The selection of beneficiaries should be a transparent procedure and all selected farmers should be issued with vouchers that they can use on the open market to buy their fertilizers. The body responsible for selection and distribution of vouchers should be autonomous, but linked to the Ministry of Agriculture.

Beneficiary selection should not be done on the basis of politically sensitive documentation such as voter registration numbers, as this opens the process to political patronage and exclusion, and places an unnecessary burden on the registering teams.

Introduce a universal graduation/exit strategy element into the subsidy programs in support of sustainability.

The subsidy program should deliberately enforce entrepreneurial capacities of beneficiaries by enrolling beneficiaries for a pre-designed time period, after which they should be assessed and graduated either as small commercial farmers or referred to other social protection/welfare programs. This will ensure that farmers use their beneficiary rights and privileges effectively, and will avoid creating a dependency syndrome among them, avoid a fiscal imbalance and ensure sustainability of the program outcomes.

Way Forward

Upon finalization, the study will be presented to NPCA management by the technical team with their recommendations for the next steps for dissemination and use of the findings and recommendations. It is expected that NPCA will disseminate the document to its supporters: FAO, IFDC and AGRA with its intended follow-up actions.

Regarding recommendations from the technical team for the next steps, the team proposes to convene an expert consultation meeting of NEPAD, IFDC, FAO and AGRA, the experts from the team of reviewers, and the key national stakeholders in the fertilizer subsidy programs in the respective countries to discuss the following (but not limited to) action points:

1. How do we best get the lessons learned, best practices identified, and recommendations to the countries.
2. How do we maximize the impact of the recommendations on national fertilizer policy in general, and on the implementation of fertilizer subsidy programs in particular.
3. How do we address outstanding issues that require further investigation, particularly: (a) impact of the subsidy programs at the farm level (impact on yields, production and farm incomes); and (b) macro-economic cost/benefit analysis of the subsidy programs.
4. Promotion of peer review and cross country learning by policymakers and the private sector.

Practices and Policy Options for the Improved Design and Implementation of Fertilizer Subsidy Programs in Sub-Saharan Africa

Section 1. Introduction

1.1 Background

Increasing agricultural productivity is critical if agriculture is to play its roles of key income generator and driver of food security and overall economic growth in the countries of Africa. Essential for the sector to play its expected role is the use of modern production technologies, including productivity-enhancing agro-inputs such as fertilizer. However, fertilizer is costly and often out of the reach of smallholder and subsistence farmers. In 2007/08, fertilizer prices reached historically high levels, and although prices have since declined to pre-2007/08 crisis levels, they still remain high. As a result, an increasingly common policy response by governments in SSA has been to provide price support to farmers through the introduction of fertilizer subsidy programs in an effort to counter the effects of high fertilizer prices and reduce the input costs to farmers. The instability and volatility of fertilizer prices in the international market over the past five years makes it unlikely that this subsidy policy shift is temporary. However, in the majority of cases, these subsidies are being introduced with little guidance regarding the most effective way of designing, implementing and managing these programs. There is a need for a comprehensive study to identify the major issues to be considered and, on this basis, make recommendations to improve the implementation and management of fertilizer subsidy programs in Africa.

1.2 Evolution of Fertilizer Subsidies in SSA and Justification for Their Reintroduction

According to Dorward et al. (2009),[3] between the 1960s and the early 1980s, many African countries offered conventional fertilizer subsidies whereby state-owned enterprises monopolized the importation and distribution of fertilizer and other inputs. These inputs were distributed and sold at a subsidized pan-territorial price via state-owned enterprises, Ministries of Agriculture or cash crop parastatals (tobacco, tea, and cotton). These subsidies were universal in that they were implemented nationwide and were available either to all farmers or to farmers growing a particular crop, or those based in a particular region. The main objective of these conventional subsidies was to promote increased agricultural production through the adoption of new technologies. The basic idea behind these policies was that subsidies would provide an incentive for adoption in two ways: (a) by reducing the cost of the subsidized fertilizers and seeds, thus increasing their profitability; and (b) by reducing the risk to farmers in adopting these new technologies due to limited knowledge of the benefits of fertilizer use and lack of knowledge of its correct use – both of which made farmers reluctant to use their limited resources on these inputs. The subsidy programs were to be complemented by access to credit and to extension services for farmers. The idea was to maximize the probability so that farmers would fully benefit from the subsidy programs, eventually earning a sufficient return on their investments so that they could be gradually weaned off the program. Although conventional subsidy programs resulted in substantive increases in fertilizer use along with other benefits for farmers, a number of shortcomings and criticisms arose:

1. Difficulty controlling the costs of subsidy programs, particularly in the face of strong political pressure to expand coverage and/or increase subsidy rates to compensate for increases in fertilizer prices.
2. Strong political resistance to the scaling down or termination of subsidies.
3. Problems of diversion to large-scale/commercial farmers or leakages across the borders, which increase program costs and reduce effectiveness and efficiency.
4. Over-use or -adoption of input-intensive rather than economically efficient production methods as a result of artificially low input prices.

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3 *Dorward, A. 2009. "Rethinking Agricultural Input Subsidy Programmes in a Changing World," Paper presented for the Trade and Market Division, Food and Agriculture Organization of the United Nations (FAO), Centre for Development, Environment and Policy, School of Oriental and African Studies, University of London.*

5. Regressive benefits favoring the large farmer, who can afford subsidized inputs (poor farmers may not be able to afford the 'top-up' required to purchase subsidized inputs).
6. Market distortions, particularly the involvement of state-owned enterprises in the importation and/or distribution of subsidized inputs, which tends to crowd out and inhibit private sector investment in input supply systems. This provides opportunities for corruption and hence impedes sustainable development.

Therefore, a consensus was built among development practitioners and donors in the 1980s and 1990s that conventional subsidies had been ineffective and costly policy instruments in Africa and had contributed to government overspending and fiscal imbalance with the consequent macroeconomic problems. As a result of these criticisms, many African countries eliminated their subsidy programs. Beginning in 1985, many African countries went through a period of market liberalization, which marked the end of government monopolies on the importation and distribution of agricultural inputs and the marketing of outputs, characterized by the divestiture of public enterprises and the phasing out/elimination of subsidies. Governmental support shifted from fertilizer subsidies to fertilizer market development, which entailed the strengthening of the private sector to fill the void left by the state-owned enterprises through the training of agro-dealers, improvement of regulatory frameworks and provision of credit for agro-dealers, among other measures.

However, countries in SSA have implemented market liberalization measures to varying degrees, and as of today, not all fertilizer markets have been fully liberalized. Generally speaking, fertilizer markets in SSA are weak, underdeveloped and characterized by high transaction costs due to: diseconomies-of-scale resulting in high free on board (FOB) prices and high transport costs; high shipping costs to African ports; tariff and non-tariff trade barriers; and higher operating margins at every stage of the supply chain. Consequently, these markets clear at prices that are beyond the reach of the majority of small-scale and subsistence farmers. The high transaction costs are exacerbated by structural (supply-side and demand-side) constraints, which severely hinder the development of efficient and effective private sector-led fertilizer markets in Africa. On the supply-side, the main constraints are: continued government interventions in the activities of the fertilizer industry (production, procurement and distribution) despite liberalization; obsolete infrastructure (ports, roads, equipment); lack of or poor quality control; the high cost of finance; limited human capital in terms of quantity and quality; and weak market information systems (MIS). Demand-side constraints include: outdated fertilizer recommendations; nonexistent or inadequate research and extension support for farmers; lack of access to finance or credit for small-scale farmers to buy fertilizers; lack of or poor access to stable output markets to absorb increased production; and production risk due to smallholder farmers' almost exclusive reliance on rainfed agriculture. As a result, fertilizer markets in SSA have failed to reliably provide the right type of quality fertilizers to small-scale farmers in the rural interior in a timely manner and at an affordable price.

Currently, there are numerous efforts by African governments and international partners to address these constraints and support the development of private sector-led fertilizer markets through development programs and projects.[4] However, the solution requires implementing a complex combination of policy, technical and market development measures in a holistic manner, which by nature is a medium- to long-term proposition. In contrast, African governments are faced with real-time food security and poverty imperatives, which require a more immediate response to assist farmers to increase agricultural production that contributes to food security. To date, the short-term solution that has been adopted by the majority of countries to address these imperatives has been to depend more and more on the international markets and donor agencies to fill their food deficits. However, for a number of reasons, African governments have increasingly turned toward the re-introduction of fertilizer subsidy programs in an attempt to meet their food security imperatives, yet they have neglected to address the structural constraints that are hindering long-term and sustainable market development. Justifications for the re-introduction of fertilizer subsidies include:

- African politicians, non-governmental organizations (NGOs) and some policy analysts have pointed out the apparent failures of liberalized policies in supporting broad-based agricultural development, particularly: the sustainable intensification of staple food crop production; concerns about declining soil fertility, agricultural stagnation and rural poverty in Africa; and identification of input subsidies as a potential instrument for social protection policies.[5]
- Strong political demands for fertilizer subsidies in many countries due to the 'success' of the pioneering 2005 fertilizer subsidy program in Malawi.
- The soaring food prices of 2007/08, which served as a wake-up call for countries dependent on the market. With rising food prices, most food import-dependent poor countries failed to purchase adequate food stocks to meet their domestic

4 *Examples include: building agro-dealer networks by the Agricultural Market Development Trust (AGMARK)/Citizens Network for Foreign Affairs (CNFA) and IFDC; extension/large-scale demonstration plots by the Sasakawa-Global 2000 Programme (SG2000); and the integrated rural development approach being implemented by the Millennium Village Project.*

5 *Dorward, A. 2009.*

consumption requirements. Moreover, the emerging demand for biofuels as an energy alternative put further pressure on maize prices, and hence fertilizer prices.

- The oil crisis that caused an unprecedented increase in fertilizer prices from January 2007 to mid-2008 and pressured African governments to take steps to assist their farmers in accessing this critical agricultural input.
- Resolution 5 of the *Abuja Declaration on Fertilizer for an African Green Revolution*, the main outcome of the 2006 African Union (AU)/New Partnership for Africa's Development (NEPAD) Africa Fertilizer Summit, which called on African governments to introduce targeted subsidies as a key measure to promote an African Green Revolution.

1.3 Traditional Versus Market-Friendly Subsidy Programs in SSA

The recent past has seen a resurgence of fertilizer subsidy programs in Africa. However, there is a general consensus among African governments and development partners that conventional subsidies had unsatisfying results, and they are now looking to subsidies to address a much broader set of objectives than those addressed by the conventional subsidies. This has led to the development and endorsement of a new type of market-friendly subsidy that has been termed the 'SMART'[6] subsidy. According to Kelly et al. (2011),[7] SMART subsidies have the following attributes:

- Clear and non-contradictory objectives (for example, it is difficult for the same program to target the poorest farmers and also to achieve large increases in staple food crop production).
- Ability to promote pro-poor growth without reverting to a pure safety net program.
- A clear exit strategy.
- Empowerment of key actors (suppliers, poor farmers) through capacity building that will ensure sustainable supply and demand when the subsidy ends.
- Promotion of competitive markets and economic efficiency both nationally and regionally.

Dorward, A. (2009) stipulates that SMART subsidies generally address the following set of objectives: (a) short-term private input market development; (b) replenishment of soil fertility; (c) social protection for poor subsidy recipients; (d) national and household food security; and (e) meeting broad-based political demands. Morris et al. (2007) enumerate that the key features of SMART subsidies should be: (a) promoting fertilizer as part of a wider strategy; (b) promoting market-based solutions in input supply; (c) promoting competition in input supply; (d) insisting on economic efficiency; (e) empowering farmers; (f) involving an exit strategy; (g) ensuring sustainability; and (h) promoting pro-poor economic growth. According to Minde et al. (2008) and Tiba (2009), SMART subsidy programs are intended to address the failure of conventional subsidies to improve efficiency and effectiveness, and therefore, for a subsidy program to be SMART, it should have at least the following design features:

- *Targeted to a Specific Population* – Subsidies must be targeted specifically at those farmers who, due to lack of technical knowledge or to economic constraints, do not make use of the input being subsidized. These farmers typically represent the most poor and vulnerable rural dwellers. Targeting also reduces the risks of displacing commercial input sales to non-intended beneficiaries while promoting pro-poor growth.
- *Contribute to Competitive Open Market Development* – Subsidy programs must make use of and support the development of the private sector involved in input importation and distribution, with the purpose of introducing long-term sustainability in the supply of the input, even after the program has come to an end and. In the process, steps must be taken to introduce effectiveness and efficiency in the delivery of the subsidy and of the product/input being subsidized.
- *Exit Strategy* – Subsidy programs should have an exit strategy that places a time limit on the support. The exit strategy should be enforced so that it is viewed as credible to stakeholders; enforcement will also help control the costs of the program and reduce the risks of the program becoming a political tool to gain votes. If the program exit strategy is not enforced, it will lack credibility, and the stakeholders (private sector supply and farmer beneficiaries) will be less likely to prepare for self-sustained use of the inputs according to open and competitive market conditions.

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6 *'SMART' subsidies are those involving (S)pecific targeting of farmers who would not otherwise use purchased inputs (or targeting areas where added fertilizer can contribute most to yield improvement); (M)easurable impacts; (A)chievable goals; a (R)esults orientation; and a (T)imely duration of implementation, i.e., being time-bound or having a feasible exit strategy. (Minde, I., T.S. Jayne, E. Crawford, J. Ariga and J. Goverreh. 2008. "Promoting Fertilizer Use in Africa: Current Issues and Empirical Evidence from Malawi, Zambia, and Kenya." ReSAKSS Working Paper No. 13).*

7 *Kelly, V., E. Crawford, J. Ricker-Gilbert. 2011. "The New Generation of African Fertilizer Subsidies: Panacea or Pandora's Box," USAID/MSU Policy Synthesis No. 87.*

The fertilizer subsidy programs currently being implemented in SSA range from conventional or 'non-market-friendly' subsidies (key features include: government importation and distribution of subsidized fertilizer; subsidy on the price of the fertilizer; and universal availability to farmers) to 'market-friendly' subsidies (key features include the use of a targeting mechanism such as input vouchers to reach poor farmers and the delivery of the subsidized fertilizer via a private input distribution system) to subsidy programs with a combination of market-friendly and non-market friendly features. The consensus in the literature on input subsidy programs is that market-friendly subsidy programs have more attributes of 'SMART' subsidies, and are therefore preferable to non-market friendly subsidy programs.

Market-friendly subsidy programs were endorsed as one of the recommended policy responses by the AU-NEPAD Food Security Workshop convened in May 2008[8] as a response to the unprecedented and rapid increase in the prices of international agricultural commodities that began in 2007. Although prices peaked in early 2008 and declined thereafter, the predictions were that commodity prices would remain at higher levels for the foreseeable future.[9] Of major concern were the prices of staple foods, which comprise a substantial proportion of the diets of the poor in developing countries. Compared with average prices during 2002/03-2005/06, in 2008, average prices of wheat had increased by 90 percent, coarse grains by 60 percent and rice by 38 percent. Consumers worldwide were facing higher prices for basic foodstuffs such as bread, milk and meat, and hence the issue of food prices topped the global policy agenda. African governments and development partners were concerned that the high world market prices for staple foods would have a dramatically negative impact on the food and nutrition security of poor people in developing regions, particularly in Africa. The fear was that higher prices would further lower food consumption, and already high rates of chronic hunger and malnutrition would be exacerbated. Consequently, there was an urgent need to take steps and put measures in place to assist countries in Africa to respond to the crisis triggered by these high food prices and minimize the adverse impact on the most vulnerable in Africa. Accordingly, AU, through the NEPAD Agency, and in association with development partners, organized within the context of the Comprehensive Africa Agriculture Development Program (CAADP) a "Food and Nutrition Security Workshop to Accelerate Investments in Response to High Food Prices and Resulting Food Insecurity" that was held in South Africa in May 2008.[10] The purpose of the workshop was to prioritize interventions in response to the high food price crisis in the context of the AU-NEPAD CAADP framework. The objective was to translate the framework for CAADP Pillar 3 (Framework for African Food Security [FAFS]) into interventions that would address the immediate and short-term impact of the crisis and initiate measures that would meet medium- and long-term challenges of food security.[11]

A key concern of workshop participants was that high fertilizer prices would further reduce fertilizer use and hence reduce grain production and further jeopardize food security. Therefore, under one of the four thematic areas of the workshop – "Increased Food Supply Through Increased Production and Market Linkages" – a presentation by IFDC outlined the causes and scale of fertilizer price increases and tabled a proposal for a [subsidy] support program to supplement smallholder farmers' input purchasing capacity through the provision of vouchers and the use of the private sector distribution network to supply the supported input(s) in order to prevent decreases in fertilizer consumption and grain production. The workshop participants endorsed this recommendation in the Workshop Communiqué, which recommended the following immediate and short-term response to the crisis: "Intensify agricultural production through the use of targeted input subsidies, particularly fertilizer and improved seed, and enhance access to water and small-scale irrigation for agricultural production." Furthermore, during the 19th Summit of the NEPAD Heads of State and Government, June 2008, Egypt, a briefing note based on the Workshop Communiqué was prepared for discussion and endorsement by the African Union Heads of State and Government Implementation Committee (HSGIC). One of the short-term interventions that was endorsed by the Heads of State to undertake fast-impact food production programs in key areas included: "Carefully subsidized programs for seeds, fertilizers, irrigation, electricity and water should involve the private sector from the beginning and facilitate a transition from initial 'crash programs' to market-based arrangements. Therefore, a key follow-up intervention recommended by the AU-NEPAD workshop and endorsed by the HSGIC is the implementation of subsidies that are market-friendly, namely the use of input vouchers to target poor farmers and delivery of subsidized fertilizer via the private sector distribution network."

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8 AU-NEPAD Food Security Workshop, "Accelerating Investments in Response to High Food Prices and Food Insecurity," Pretoria, May 20-24, 2008.

9 Reasons for the high food prices included: historically low levels of grain stocks globally; rising demand for cereals worldwide due to population growth; changing diets towards more meat consumption in the rapidly growing economies such as China and India, the production of which requires more grain; weather-related supply shocks in major producing countries like Australia; higher energy prices leading to higher fertilizer and transport costs; increased demand for grains for biofuel production; and the impact of U.S. dollar devaluation leading to higher dollar-denominated prices. (AU-NEPAD Food Security Workshop "Accelerating Investments in Response to High Food Prices and Food Insecurity," Pretoria, May 20-24, 2008, Workshop Report).

10 The countries represented at the workshop were: Burkina Faso; Cameroon; Ethiopia; Kenya; Lesotho; Malawi; Mali; Mauritania; Mozambique; Niger; Sierra Leone; Senegal; Swaziland; Rwanda; Uganda and Zambia, with Egypt represented as an observer.

11 AU-NEPAD Food Security Workshop "Accelerating Investments in Response to High Food Prices and Food Insecurity," Pretoria, May 20-24, 2008, Workshop Report.

1.4 Objectives

The general objective of this study is to present a comparative analysis of the design, implementation modalities and performance of two types of subsidy programs in SSA: more market-friendly subsidy programs and less market-friendly subsidy programs. The measures of performance are: (a) accessibility by poor farmers to subsidized fertilizer; (b) availability of subsidized fertilizers to poor farmers; (c) impact of the subsidy programs on the development of the private distribution network; and (d) timeframe. Based on the findings, the study will identify some best practices and lessons that countries can use to improve their implementation of subsidy programs with regard to these three performance measures.

The specific objectives are to:

1. Describe the fertilizer market structure and fertilizer subsidy programs in eight countries in SSA in terms of their design characteristics and implementation modalities.
2. Analyze the performance (in qualitative terms) of the eight fertilizer subsidy programs in relation to their design and implementation modalities and rank them along a spectrum from most market-friendly to least market-friendly.[12]
3. Divide the subsidy programs in the eight countries into two groups (more market-friendly and less market-friendly subsidy programs) and provide a comparative analysis of their performance.
4. Identify key lessons and highlight best practices in the design and implementation of subsidy programs in SSA based on the comparative analysis.
5. Recommend policies and interventions that governments and development partners can adopt or incorporate to improve the implementation of subsidy programs in SSA.
6. Conduct a comparative analysis of the performance of smart versus non-smart subsidy programs.

Over the past few years, numerous studies on input subsidy programs have been implemented in various African countries by researchers at institutions such as IFDC, the International Food Policy Research Institute (IFPRI), Michigan State University (MSU), the School of Oriental and African Studies (SOAS), World Bank and FAO. These studies have identified key issues and problems with subsidy implementation and have analyzed their performance.[13] This study is expected to build on these existing studies to contribute to the body of knowledge on fertilizer subsidy programs in SSA; the study will analyze what works and what doesn't work, and provide recommendations for the improved design and implementation of subsidy programs in Africa.

1.5 Analytical Approach and Methodology

Data Collection

The analysis presented in this study is based on qualitative information and data drawn from country reports on fertilizer subsidy programs prepared by national consultants in eight SSA countries that are currently implementing fertilizer subsidy programs: Burkina Faso, Ghana, Malawi, Nigeria, Rwanda, Senegal, Tanzania and Zambia). These countries were purposefully selected, taking into consideration such factors as geographical representation, market size, inclusion of a mixture of coastal and landlocked countries and whether the country has implemented a fertilizer subsidy program for more than one cropping season. The approaches employed by the consultants to gather the data and information included: review of relevant literature; collection of secondary data; and in-country consultation, which included field visits. The consultants prepared country reports on their respective fertilizer subsidy under the guidance of a technical team comprised of fertilizer policy and marketing experts from IFDC, FAO and NEPAD. In addition to the country reports, the consolidated final study is supplemented by secondary data and information from multiple sources (most notably FAOSTAT and CountrySTAT) and existing studies on fertilizer subsidy programs in Africa conducted by the following institutions: IFDC, FAO, Michigan State University (MSU), the International Food Policy Research Institute (IFPRI) and the World Bank. It is believed that this study will contribute to the existing body of work on the performance of subsidy studies in SSA and will trigger more detailed empirical work using primary data.

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12 *The study will only assess the performance of the subsidy program in each country relative to the market-friendly criteria in order to assign the country to the appropriate group and create the comparative analysis. The performance of the subsidy programs in individual countries against their stated objectives should be the research topic for a follow-up study.*

13 *Kelly, V., et al., 2010; Gregory, I., 2006; Wiggins, S., et al., 2010; Morris, M., et al., 2009; Crawford, E., et al., 2006; Kelly, V., et al., 2007; Crawford, E., et al., 2003; Morris, M., et al., 2007; Bumb, B., et al., 2011; Wanzala, M. et al., 2009.*

Analytical Approach

The general attributes of subsidy programs determine the design characteristics and implementation modalities of subsidy programs. The design characteristics and implementation modalities have implications for the performance of the program. The general attributes of a subsidy program are: objectives of the subsidy program; timeframe; sustainability; modalities of delivery of subsidized inputs (market-based or through official channels); promotion of pro-poor growth versus a safety-net approach; and instruments used for implementation (if any). The typical design characteristics of subsidy programs are: quantity and type of fertilizer and other inputs in the input subsidy package; the amount of the subsidy; whether or not the subsidy will be targeted and, if so, the targeting instrument and criteria; whether the subsidy targets particular crops; the method of estimation of the subsidy requirement; the availability of complementary services (credit, extension, capacity building for agro-dealers, availability of post-harvest technologies and output market linkages); and the source of funds for the subsidy program.

The typical implementation modalities that are used are the following: the procurement system (government tender or direct price negotiation); institutional arrangements among the various players; the delivery mechanism for the fertilizer (government or private sector distribution network); and the existence of precautionary measures to reduce leakages and rent-seeking. Performance of subsidy programs is typically evaluated at three levels: (a) farm-level; (b) impact on the private sector; and (c) the macroeconomic level, using the following variables for analysis.

As noted earlier, this study will limit its analysis to the supply-side of the fertilizer supply chain up to the farm-gate, due to the type of data and information that are available. Therefore, the key components of the subsidy programs that will be used are: the general attributes of a smart subsidy program (excluding the objective of each program); the key characteristics associated with these attributes that are commonly considered when designing a smart subsidy program for inputs; the typical implementation modalities of delivery of the subsidized inputs that are used; and the indicators that are used to measure the performance of the smart subsidy programs up to the farm-gate.

Methodology

The study purposefully adopts a qualitative approach in order to understand the various design characteristics and implementation modalities of the eight subsidy programs and the effect they may have on each program's performance ('market friendliness'). The measures of performance are: (a) accessibility by poor farmers to subsidized fertilizer; (b) availability of subsidized fertilizers to poor farmers; (c) impact of the subsidy programs on the development of the private distribution network; and (d) timeframe. A set of descriptive statements was developed for each of the four performance indicators to guide the analysis of the subsidy programs; specifically, the statements identify the design characteristics and implementation modalities of subsidy programs and assess their impact on performance.[14] (Box 1)

The analysis is undertaken in two stages. In Stage 1, for each subsidy program, the actual design characteristics are identified and analyzed in terms of how they were actually implemented and whether the hypothesized effects were actually achieved. Then the impact on performance is analyzed in qualitative terms – that is, whether the program design characteristic and its implementation modality had a positive or negative impact on performance. For example, if a subsidy program uses input vouchers as a mechanism to entitle poor farmers to the subsidized fertilizer, the hypothesis is that this will increase the accessibility of subsidized fertilizer to poor farmers. If the findings are that the use of input vouchers did indeed increase accessibility for poor farmers, the impact on accessibility will be positive, and the design feature is given a score of 1. Conversely, if the program uses input vouchers to target poor farmers but the findings indicate that this did not increase accessibility, the design feature is given a score of zero. Similarly, if the program does not use input vouchers and does not increase accessibility, it is also given a score of zero.

The performance of the subsidy programs is summarized in a table providing a scored list of the country fertilizer subsidy programs. The eight fertilizer subsidy programs are then divided into two groups based on their scores: More market-friendly subsidy programs are those with a score of more than 10; the less market-friendly subsidy programs are those with a score of 10 and below. In Stage 2 of the analysis, the study conducts a comparative analysis between the more market-friendly subsidy programs and the less market-friendly subsidy programs. The purpose of the comparative analysis is to identify the design features and implementation modalities that enhance the 'market friendliness' attributes of the fertilizer

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14 *As noted above, the study will limit its analysis to the supply-side of the fertilizer supply chain up to the farm-gate, therefore the performance indicators are: (1) accessibility by poor farmers to subsidy instruments (if any) and to subsidized fertilizer in terms of price; (2) availability to subsidized fertilizers for poor, smallholder and subsistence farmers in terms of quantity, time, place; (3) impact of the subsidy programs on the development of the private distribution network; and (4) timeframe – does the subsidy program have an exit strategy and a time limit, and is it enforced.*

Box 1. Descriptive Statements Guiding the Analysis of Subsidy Programs

A set of descriptive statements were developed for each of the four performance indicators of the subsidy programs:

- Does the subsidy program increase access to fertilizer by poor farmers and limit leakages to the non-poor?
  - Is the subsidy rate fixed and well-defined or does it vary?
  - Does the program have a mechanism for giving entitlement to poor/small farmers?
  - Does the program have complementary investment/services targeted at the poor farmers (extension services, improved seeds, complementary credit facility to 'top-up' the unsubsidized portion of the input voucher)?
  - Does the program have direct and indirect restrictions to limit leakages to the non-poor farmers, specifically: the types of fertilizers subsidized are only those used most by poor farmers; restriction on the maximum quantity of fertilizer per farmer; pre-registration/screening of beneficiaries)?
- Does the subsidy program increase availability of fertilizer to poor farmers?
  - Has the quantity of fertilizer available to farmers increased due to the subsidy program?
  - Does the subsidy program decrease the distance between fertilizer outlets and the farm-gate?
  - Is the subsidized fertilizer delivered in a timely manner (before the planting season)?
- Does the subsidy program support the development of the private fertilizer market?
  - Is government directly involved in the importation and distribution of the fertilizers, or are these activities left to the private sector?
  - Does the government engage open procedures (e.g., open and non-discriminatory tender) when selecting the private sector engaged in the fertilizer market chain for the subsidized fertilizers (importers, distributors, agro-dealers, transporters, etc.)?
  - How are subsidies affecting the domestic market structure and conduct?
  - Is the payment arrangement for the subsidy to the private sector a deterring factor to increased private sector participation in the subsidy program?
- Does the subsidy program have a clear exit strategy?
  - Does the subsidy program have a timeframe and a clearly defined exit strategy?

subsidy programs, and hence identify some of the best practices and lessons learned for the improved management and implementation of future subsidy programs.

The approach used is as follows: first, a set of hypotheses is developed, drawing from the analysis of the individual country subsidy programs regarding the relationship between design characteristics and implementation modalities on one hand and performance on the other, in terms of: potential expansion of the private sector; increased availability and accessibility of fertilizer; and the existence of a timeframe and exit strategy. It then compares the key design characteristics and implementation modalities of the more *market-friendly* programs with those of the *less market-friendly* programs and their respective effects on the performance indicators, vis-à-vis the hypotheses. The expectation is that in the majority of cases the findings for the more market-friendly subsidy programs will support the hypotheses because of their primary design characteristics. However, analyzing whether more market-friendly subsidy programs perform better than the less market-friendly subsidy programs because they have better design characteristics and implementation modalities is not the purpose of the comparative analysis. Rather, the two groups of subsidy programs have been created to provide a basis for comparison upon which to draw out key differences and similarities in design, implementation and hence performance, and on thus obtain key lessons and best practices that can improve the implementation of subsidy programs in SSA.

1.6 Limitations of the Study

The main limitations of this study were funding and time constraints. Both constraints limited the amount of primary data that could be collected. Ideally, we would have analyzed performance of the subsidy programs at three levels: (a) impact at the farm-level; (b) impact on the private sector distribution network; and (c) impact at the macroeconomic level. However, this would have required additional resources and sufficient time to go to the farm-level and collect data. Instead, the bulk of the information that was collected in-country pertains to impact on the supply-side of the fertilizer value chain – that is,

the impact on the private distribution network and the availability and accessibility of farmers to the subsidized fertilizer. Moreover, much of this is qualitative information rather than hard data. Therefore, the analysis in this study will focus on the impact of the subsidy programs on the supply-side of the fertilizer supply chain. Secondly, it will focus on performance in relation to the key attributes of market-friendly programs in order to identify best practices and lessons.

The analytical approach also had its drawbacks. The hypotheses are in terms of likely impact of the design characteristics on the performance indicator. For example, it is likely that the use of input vouchers will increase accessibility. Therefore, the study will not be able to say to what degree input vouchers increased accessibility or whether, indeed, it was the input vouchers that increased accessibility rather than another design characteristic and its implementation modality. Secondly, the analysis is quite subjective, relying as it does on qualitative information. Finally, the same weight is assigned to each design characteristic in the performance analysis, which may bias the results.

1.7 Organization of the Study Report

Section 2 presents a brief description of the countries included in this study, describes the structure of the fertilizer markets in each of the study countries and describes each national fertilizer subsidy program in terms of its objectives, design characteristics and implementation modalities. Section 3 analyzes the performance of the fertilizer subsidy programs in relation to their design characteristics and implementation modalities. Section 4 divides the eight subsidy programs into more market-friendly and less-market friendly subsidy programs, provides a comparative analysis of these two groups of subsidy programs and identifies key lessons and 'best practices' in the design and implementation of subsidy programs in SSA. The final section (Section 5) draws conclusions and recommends policies and interventions which governments and development partners may consider for the implementation of well-designed and successful fertilizer subsidy programs in Africa.

Section 2. Fertilizer Marketing Structure and Fertilizer Subsidy Programs in Selected African Countries

This section will describe the eight fertilizer subsidy programs in this study in terms of their design characteristics and implementation modalities. Since the fertilizer market structure is a key consideration in the design and implementation of a subsidy program, the description of each country subsidy program is preceded by a brief description of the fertilizer marketing structure.

2.1 Burkina Faso

2.1.1 Country Background

The West African country of Burkina Faso has a per capita gross domestic product (GDP) of US $517, with 46 percent of the population living below the national poverty line. Agriculture is a key economic sector, with 82 percent of the population of 15.7 million involved in agricultural activity. The sector contributes 38 percent to the country's total GDP. Twenty-three percent of the arable land is under cultivation, mainly with staple food crops such as groundnuts, maize, millet and sorghum, and cash crops such as cotton, rice and some fruits and vegetables. The level of fertilizer used on cultivated crops is estimated at 9.0 kilograms per hectare (kg/ha), which is comparable to the average for SSA of 6.0 kg/ha.

2.1.2 Fertilizer Marketing Structure – Burkina Faso

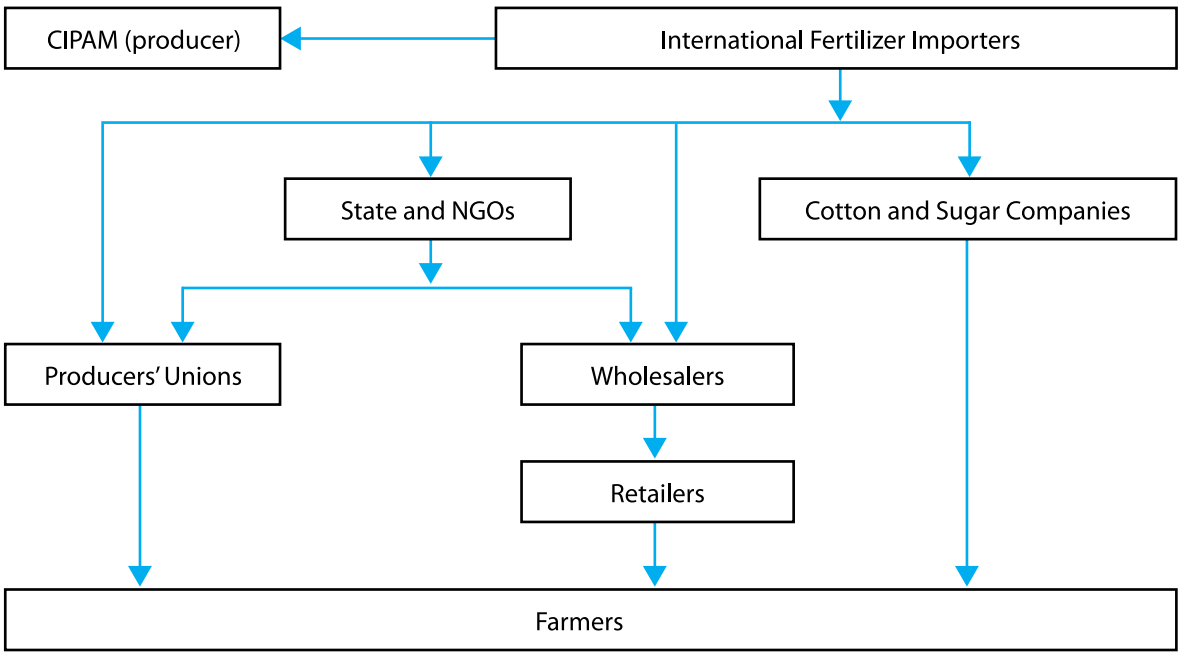
Burkina Faso imports 95 percent of its fertilizer requirement from international traders and from bordering countries such as Mali and Côte d'Ivoire. The remaining five percent is produced locally by the only fertilizer manufacturer in country, the Industrial Company of Agricultural and Tradable Productions (CIPAM), a subsidiary of the French-based company, Mambo Commodities. Created in 2003, CIPAM began fertilizer-manufacturing activities in 2007. The unit has a daily capacity of 1,500 metric tons (mt) – about 450,000 mt per year [mtpy]) – and implements its own agronomic research to develop and promote the use of locally produced fertilizer according to the crops grown. During the period 2005-09, CIPAM reached an annual average production of only 30,716 mt, or seven percent of its capacity. In addition to CIPAM, in Burkina Faso, there are five major fertilizer importers that typically perform the functions of both importers and wholesalers/distributors, with four

of them representing multinationals. Furthermore, the country has a law that controls and regulates all aspects of domestic fertilizer activities, including manufacturing, importation and trade on the national territory. The main points of this law are:

- The importer must obtain a national certificate of conformity (CNC) before engaging in these activities.
- The creation of a National Commission for the Control of Fertilizers (CONACE), which is responsible for implementing the national policy of control and promotion of fertilizer and regulation, research, education, training and the dissemination of information.

The fertilizer market supply chain structure, presented in Figure 1, depicts the main sources of fertilizer supply. In the first supply chain, the three main importing companies[15] import fertilizer and distribute it via a relatively thin network of wholesalers and retailers who typically sell fertilizers seasonally and in small volumes to smallholder farmers. In the second supply chain, CIPAM manufactures fertilizers and sells them mainly to farmer groups, and also supplies the wholesaler/retailer distribution network as well as SOFITEX, one of the three in-country cotton companies. In the third supply chain, the commercial farmers and plantations, namely the three in-country cotton companies (SOFITEX, FASOCOTON and SOCOMA) and one sugarcane plantation (SN SOSUCO), procure fertilizers from the importers for their own farming operations and their outgrower farmers. The fourth supply chain is the government fertilizer operation program, which is a form of subsidy whereby distribution to farmers is accomplished via the Ministry of Agriculture and the producer unions.

Figure 1. *Burkina Faso Fertilizer Supply Chain*



2.1.3 Fertilizer Subsidy Program – Burkina Faso

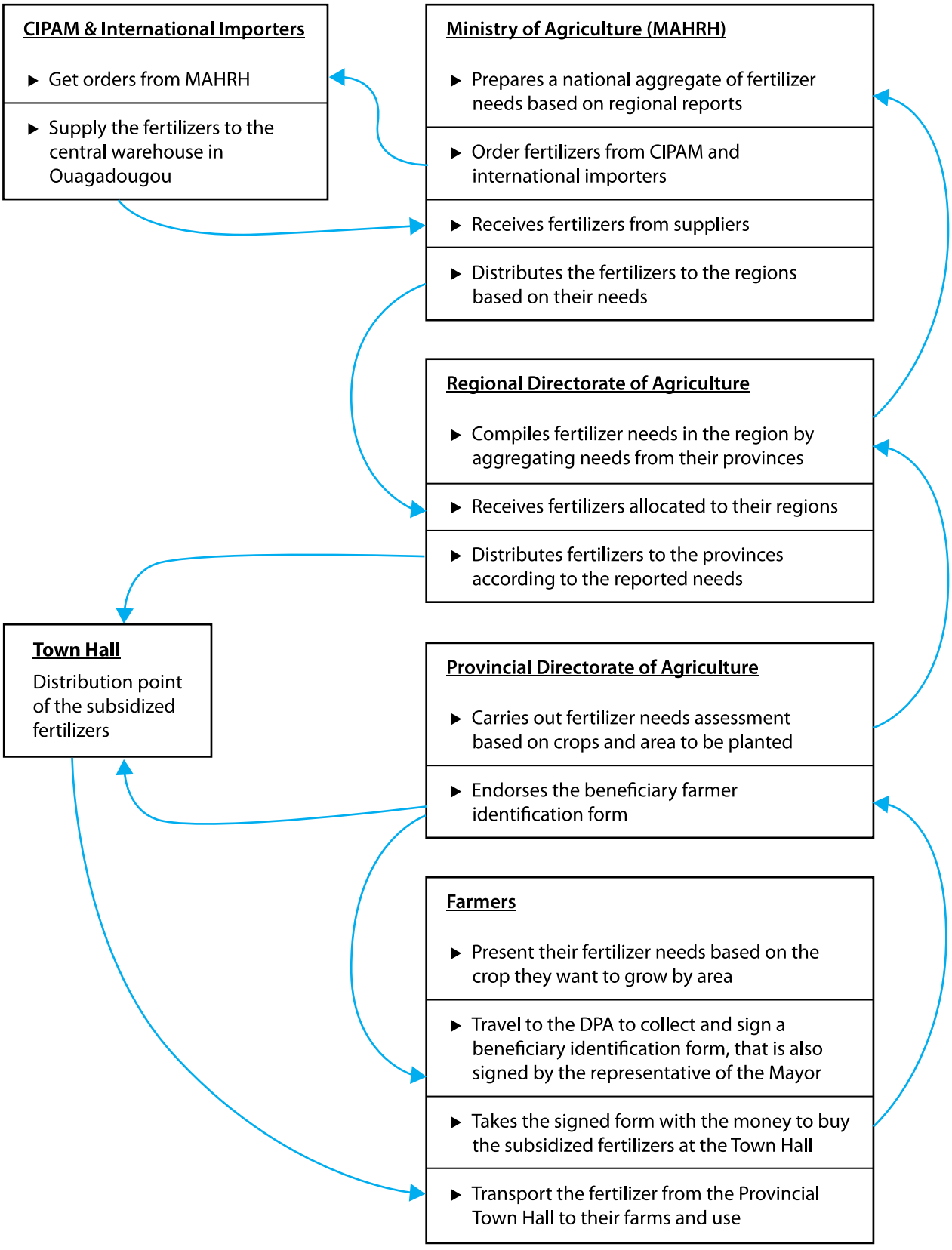
The Government of Burkina Faso does not have an officially recognized fertilizer subsidy program. The financial difficulties experienced by the three cotton companies in the country in 2005 and the food crisis of 2008 persuaded the government to undertake actions to support the production of cotton and staple food crops by facilitating access to fertilizers. This support is comprised of two components: the first is to provide financial support to the three cotton companies to purchase fertilizers; and the second is to implement a 'fertilizer operation' aimed at boosting the production of staple food crops, primarily maize and rice. The goal of the fertilizer support operation in Burkina Faso is "*to increase the current level of fertilizer use by reducing its cost and facilitating farmers' access to quality fertilizers*." Under the government 'fertilizer operation,' there is no prescribed fertilizer package per farmer, but it includes two types of fertilizers: nitrogen, phosphate and potassium (NPK) for basal application and urea for topdressing.

The fertilizer support program was first introduced in 2008/09 with exclusive funding from the national budget. It was continued in 2009/10 with support from the African Development Bank in addition to government funds. Total fertilizer imports in 2009/10 were 145,000 mt, whereas the actual amount of fertilizer consumed under the government subsidy

15 *Agridis representing Hydro CI, SCAB representing Potasses d'Alsace, and STEPC CI representing Amefert, Chemefert and Sodegrain.*

program was 25,013 mt. Therefore, subsidized fertilizers account for approximately 17 percent of the fertilizer consumed in Burkina Faso. The program was implemented again in 2010/11 financed with government funds only. At the time of this assessment, the government did not have an exit strategy for the fertilizer support program.

Figure 2. *Schematic Structure for the Implementation of the Fertilizer Operation in Burkina Faso*



The design and implementation of the fertilizer operation program has remained the same since its introduction in 2008/09. Under this program, the Ministry of Agriculture, Hydraulics and Fisheries (MAHRH) officials at the zonal level of each province determine the fertilizer requirements for all farmers growing maize and rice, estimated by multiplying the anticipated area to be planted by the standard fertilizer recommendations per hectare. These estimated amounts are then aggregated upward at the provincial level, then at the regional level and finally at the national level by the central MAHRH office. In many cases, due to insufficient service personnel and logistical challenges, regional needs are underestimated or overestimated, bringing about a misallocation of subsidized fertilizer; this creates a subsidized fertilizer surplus in some provinces, while other provinces experience a deficit.

After the fertilizer requirement has been estimated, the MAHRH imports the fertilizer from international traders or neighboring countries and distributes it using its own personnel and distribution network. The imported fertilizer is distributed regionally according to the stated fertilizer requirements for each region. The fertilizer is delivered directly to the regional offices and received by a committee comprised of regional officials from the directorates of agriculture, economy and finance and the regional chamber of commerce. Each regional office is responsible for transporting the fertilizers from the regional capital to the capital of each province. However, in the majority of cases, the provincial offices organize transport for their share of the subsidized fertilizer to the provincial capital and pass these costs on to the farmers.

Once the fertilizer is available in the provinces, farmers, individually or organized in a group, buy the subsidized fertilizer from the Provincial Director of Agriculture (PDA). The purchase is generally made on a cash basis, not credit. Credit facilities provided by suppliers have been widely abandoned due to farmers' failure (defaults) to reimburse the credit during the first year of the program implementation. If a farmer purchases fertilizer on an individual basis, then the quantity of fertilizer he or she can buy will be based on the planted surface declared. The farmer fills a form with the necessary identification information and provides information on the crops to be grown and the planted area to be cultivated. The form is then signed by an agent of the PDA; the farmer takes the signed form to the town hall to have it signed by the mayor's office. If the subsidized fertilizer is to be purchased by a group of farmers, the group goes to the PDA with their needs assessment. The assessment is verified by the head of the zonal area where the farmer group is based. In case of a dispute, the zonal head carries out an individual assessment of the area to be farmed by the group of farmers. Once a consensus is reached on the area, the group is allowed to purchase the corresponding quantity of subsidized fertilizer. It is the group's responsibility to distribute the fertilizer among its members proportionate to their needs. In cases where the amounts of fertilizer are misallocated – with some provinces receiving more than needed while others receive less – after the fact, arrangements are made to mobilize the subsidized product from surplus areas to deficit provinces, with the farmers bearing the cost of product re-allocation. This also causes delays in availability.

2.2 Ghana

2.2.1 Country Background

Ghana has a population of approximately 23.8 million, with 49 percent concentrated in rural areas. The GDP per capita is US $1,283, and the percentage of the population living below the national poverty line is relatively low at 28.5 percent. Agriculture is a key economic sector in Ghana, accounting for approximately 32 percent of the country's total GDP, 40 percent of export earnings and 50 percent of employment. Nineteen-plus percent of the arable land is under cultivation. The majority of the agriculture system (90 percent of farm holdings) is dominated by a large number of small rainfed farming operations (averaging 2.0 ha) with minimal or no mechanization and, in many cases, operating on marginal lands. These small farming operations produce mainly staple food crops (cassava and other roots, maize, millet, plantain bananas, rice and sorghum). Intensive agriculture using modern inputs like fertilizers and hybrid seed is basically confined to commercial, high-value, industrialized and export crops production (cocoa, cotton, palm oil, rubber and sugar) and more recently horticultural and tree crops. Fertilizer use is 7.3 kg/ha for arable land and permanent crops (the average for SSA is 7.0-kg/ha) (FAOSTAT, 2011).

2.2.2 Fertilizer Marketing Structure – Ghana

Although Ghana has deposits of phosphate rock, there are no fertilizer production facilities in-country; therefore, all of the fertilizer consumed in Ghana is imported from overseas. There are five main fertilizer-importing companies in Ghana; four are affiliates of international fertilizer firms (Yara Ghana Ltd., Wienco Ghana Ltd., Golden Stork and Dizengoff Ghana Ltd.), while Chemico Ltd. is a local company. The five, combined, import about 97 percent of the fertilizer that is

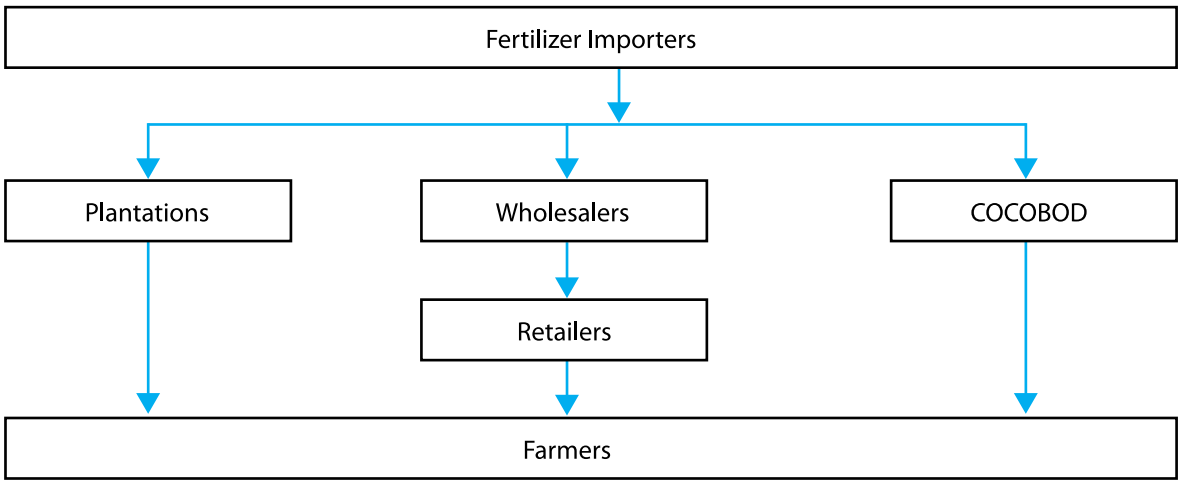
consumed in-country; the remaining three percent is imported by small importers or enters the country as aid-in-kind from donors like KRII. In addition, Wienco, Chemico and Golden Stork also have fertilizer-blending capacity.

In the past, the parastatal Cocoa Board of Ghana (COCOBOD), some commercial farms and plantations (oil palm, pineapple and other cash crops) and the Agricultural Development Bank also imported fertilizers, either for their clients or for their own use. However, more recently, given the demand for substantial financial resources and the time and logistics coordination required to import fertilizer, most of these organizations have outsourced nearly all of their fertilizer importing operations to the major fertilizer importers while retaining the distribution system within their own operations.

Importers are located in the Greater Accra region, while wholesalers are typically located in the larger regional capital cities. Most distributors are independent business people who use their own capital, borrow from banks or use importers' lines of credit for purchases. Retailers are small input businesses, which mainly use their own funds and seldom use credit from wholesalers. They sell their products to farmers in 50-kg bags or in smaller quantities according to the farmer's needs. Retailers are located within the peri-urban areas of towns and villages across the 158 districts of the country to provide easy access to farmers; nevertheless, in most cases, the retail shops are still at a considerable distance from the farm-gate.

The Ghanaian fertilizer market is comprised of three supply chains, divided at the first level of demand after importation. In the first supply chain, the main five importers import fertilizers on the basis of their own procurement decisions and in response to the government subsidy program. The imported fertilizer is sold via their affiliated distribution network of about 25 registered wholesalers (located mostly in the regional capitals) and about 2,700 district-level retailers (Krausova and Banful, 2010) that distribute fertilizers nationwide through a network of rural shops dealing with agricultural inputs. These retailers sell fertilizers to farmers at the market price or at the predetermined subsidized price established by government-importer negotiations.[16] In the second supply chain, COCOBOD imports fertilizer via two of the main importers and distributes it to cocoa farmers via its own distribution network of about 70 shops located in the main cocoa production region. Cocoa growers can also source fertilizers from local independent retailers. The third supply chain serves the plantations growing cash and commercial crops. These commercial farmers import via the four importers and distribute via their own distribution network to their outgrowers. Total fertilizer imports in 2009 were 335,180 mt. Of this total, the fertilizer distributed by the private sector for the government subsidy program was 88,000 mt, or 26 percent of the market.

Figure 3. *Ghana Fertilizer Supply Chain*



2.2.3 Fertilizer Subsidy Program – Ghana

In response to the 2007/08 oil and food crises, the Government of Ghana (GoG) introduced a comprehensive fertilizer subsidy program in 2009 to benefit millions of smallholder farmers who produced staple food crops. The stated goal of the fertilizer subsidy program is *"to mitigate the effects of the food crisis by increasing the use of fertilizer."* Smallholder producers of export crops (e.g., cocoa farmers who already had a subsidy program through the COCOBOD) were not explicitly excluded from the subsidy if they also produced staple food crops. Under this new subsidy program, the GoG made an

16 *The approach to the distribution of the subsidized fertilizer has changed; in 2008 the Ministry of Agriculture distributed input vouchers to farmers who used them to redeem the fertilizers from their local retailers. As of 2010/2011, a non-targeted (no voucher) approach has been adopted.*

annual budgetary allocation[17] to subsidize fertilizer based on historical fertilizer consumption by smallholder producers of staple food crops. In 2009/10, the subsidized amount of fertilizer was 26 percent of total imports. The remaining imported fertilizer was used by plantations and commercial crop growers.

Originally, the Ghana fertilizer subsidy program was targeted at food crops, making use of vouchers, regardless of who grows the crops, as long as they are grown in Ghana.

However, the 2008/09 subsidy program faced a number of challenges due to its implementation modalities, primarily those related to the redemption of input vouchers. In addition, the overhead and administrative costs of the voucher system were considered to be too high. Staff of the Ministry of Agriculture spent a great deal of time monitoring and administering the voucher system (allocating, endorsing and monitoring the distribution and redemption of vouchers), which took time away from their other duties – that is, in addition to the time spent by farmers traveling back and forth from their homesteads to the RDA office to gather endorsement signatures, a situation that discouraged many farmers to make use of the vouchers.

Due to the challenges of the fertilizer voucher system after the first year of implementation, the voucher system was replaced with the waybill receipt system in 2009/10. Key design features of the 2010 program are the elimination of vouchers and the inclusion of all farmers (small-, medium- and large-scale) who are involved in the production of various crops that use the types of fertilizer included in the subsidy program. Therefore, there is no targeting mechanism to specific crops or to beneficiaries. The types of fertilizer included in the subsidy program did not change and are those typically used in food crops production; therefore, the program is designed to attract farmers (small, medium or large) who will grow food crops. It should be noted that this design feature is still aligned with the objectives of the subsidy program.

This new waybill system was designed and implemented by the Ministry of Food and Agriculture (MOFA) in close collaboration with the major fertilizer companies, whereby each company has allocated quotas of various fertilizer types after price negotiations. The companies are to import fertilizers, clear shipments from the ports, pay all the charges and deliver allocated quantities of the various types of fertilizers to their main distributors in the designated regions and districts. Under this system, in 2010, farmers received on average a 40 percent subsidy per 50-kg bag of fertilizer, across all eligible fertilizer products.

The waybill process is as follows: the GoG invites tenders for the supply of fertilizer for its subsidy program and negotiates the domestic retail prices at which the fertilizer is to be sold with importers; the prices are quoted as delivered by importers to the retail point. The government importer-negotiated final subsidy price (at the retail level) is made possible by eliminating all of the operational costs of fertilizer importation and distribution (port handling charges, loading and transport costs and commissions and margins for the actors along the supply chain). All of these costs are absorbed by the importers, not the government.

The distributors buy the fertilizer from importers at full price and sell it to retailers at full price, or they sell it directly to farmers at the subsidized price. The estimated subsidy per 50-kg fertilizer bag is paid after sales and presentation and reconciliation of the relevant waybills at the district and regional level using designated forms.[18] In order to receive subsidy payments, at the end of the month, wholesalers/distributors and retailers who sold to farmers submit the waybills and completed forms (designated as A, B, C and D) on returns of stocks (opening stock, sales quantity, closing stock) of the subsidized fertilizers to MOFA for approval and to importers for payment of the subsidized amount. Importers then submit the documentation to the government for payment. All waybills for a given importing company and a given time period (normally, a month) are authenticated by the National Desk Officer for fertilizer and Director of Agricultural Extension Services and audited by the treasury before the amount due to a company is paid.

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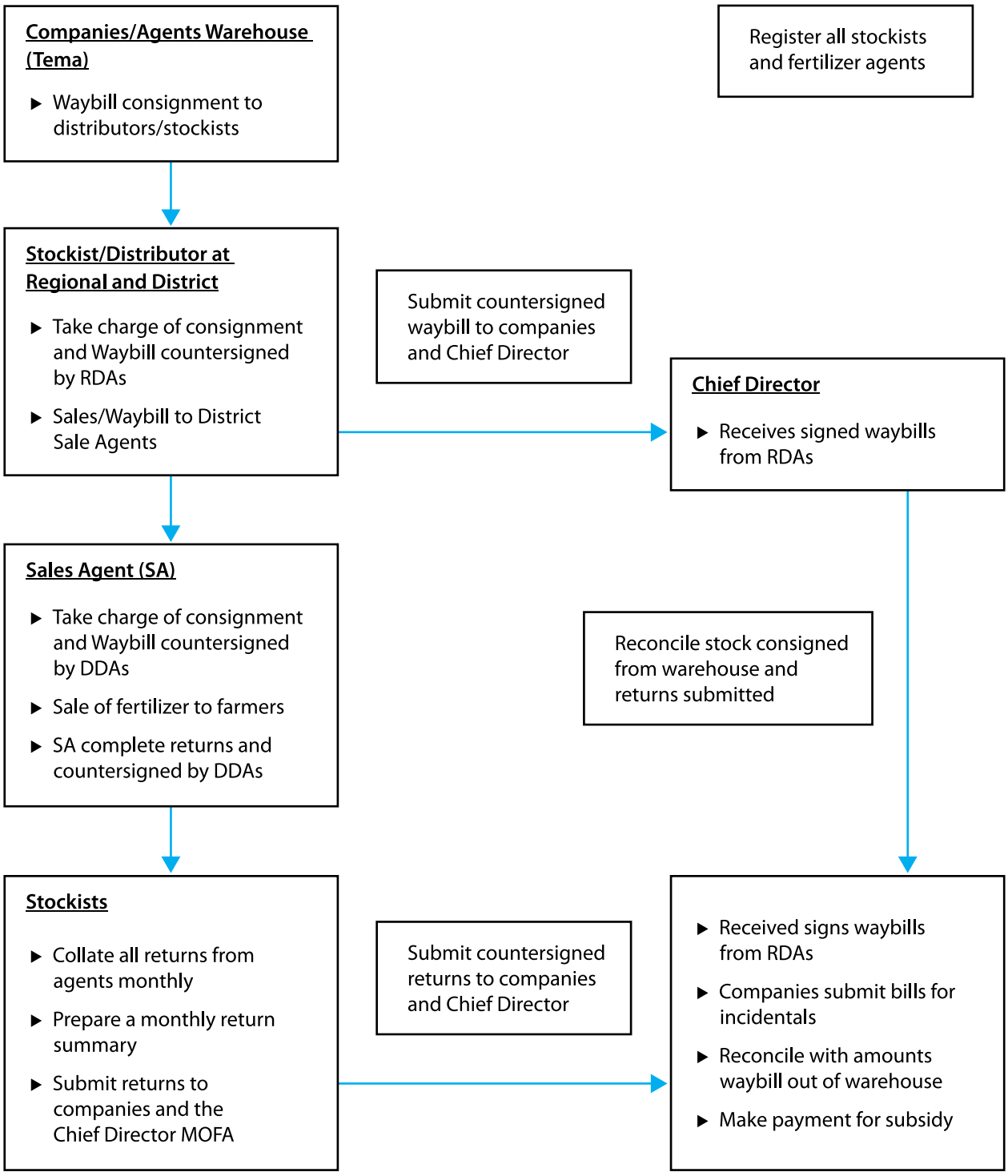
17 *In 2011, the fertilizer subsidy budget was GHC 69.8 million, approximately US $41,547,619.*

18 *At this point, the MOFA regional desk officer verifies and signs the waybill to record the quantity of fertilizer consigned to a distributor. The waybill is counterchecked and signed by the regional director of agriculture. The distributor then delivers the fertilizer to the registered retailers in the various districts with the relevant waybills and invoices. All fertilizer retailers across the country must be registered with the MOFA district offices. The district desk officer (MOFA) also inspects the waybill and signs it. When the fertilizer is received at the district level, the waybill is attached to a form "A." At the end of every month, all agents fill out form "A" indicating the quantity of the fertilizer sold and the balance thereof (which is verified and signed by the district desk officer for fertilizer and countersigned by the district director of agriculture) and submit the form "A" to their distributors. The distributors also transfer the quantity sold by different agents from the form "A" onto another form "B," which is signed by the regional desk officer and countersigned by the regional director. The form "B" is submitted by their distributors to the fertilizer companies or importers. The monthly sales returns from distributors for each region are compiled by the fertilizer companies onto form "C," then the sales for the regions are compiled onto form "D." The completed forms (forms A, B, C and D with the attached waybills) are submitted to MOFA – National Directorate of Agricultural Extension Services for verification by the National Desk Officer for fertilizer and countersigning by the director. After a successful verification and audit of a company's request for payment of the subsidy, the amount involved is approved for payment.*

Figure 4. Schematic Structure for the Implementation of the Revised Fertilizer Subsidy Program in Ghana



This waybill subsidy system has a number of advantages over the voucher system since it has eliminated some of the challenges and inefficiencies faced by MOFA in its subsidy and product delivery approach while providing more and better access to fertilizer by farmers. Farmers no longer have to go to extension agents to get vouchers (and risk refusal) or track down the RDAs to have the voucher signed before they can use it (and risk having to bribe them). They no longer have to deal with problems such as difficulties in getting vouchers from the extension agents and in locating the director to sign their vouchers. They are also no longer restricted to purchasing the amount of subsidized fertilizer stipulated by the voucher or indeed not being able to purchase subsidized fertilizer because they did not have a voucher. Instead, under the waybill system, farmers can just buy the subsidized fertilizer from any agro-dealer, in any region, at any time. Secondly, the waybill receipt system allows the participation of a larger number of retailers; with the voucher system, some retailers can collude

with extension agents and obtain the majority of vouchers for that district or area, thus excluding other retailers from participating in the program and, in the process, denying access to their farmer clientele.

However, as noted above, the new waybill receipt system has shifted the risk and created a huge administrative burden on the importer/distributor/agro-dealer network, a fact that is recognized by MOFA, but justified for the sake of effective monitoring of the subsidy program and to minimize cheating.

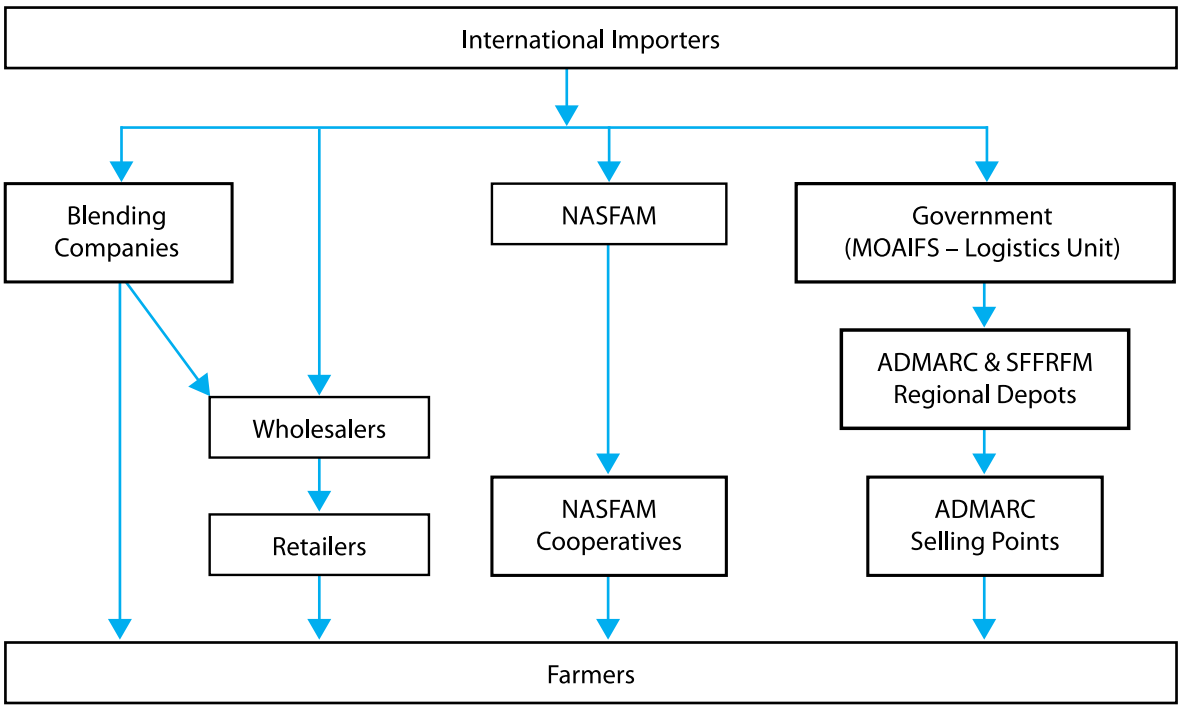
2.3 Malawi

2.3.1 Country Background

Malawi has an estimated population of approximately 13.6 million with 88 percent of the population living in rural areas. The GDP per capita is relatively low (US $343), and a very high percentage (55 percent) of the population lives below the national poverty line. Thirty-seven percent of the arable land is under cultivation. Maize is the main staple food crop grown by over 95 percent of all smallholders, and the main cash crops are coffee, cotton, sugar, tea and tobacco, which are mostly grown on plantations. Agriculture is a vital economic sector, accounting for 31 percent of the GDP and 85 percent of export earnings and employing 85 percent of the population. Most agricultural output comes from smallholder farms; 46 percent of smallholders own less than 1.0 ha of land and practice rainfed agriculture using none or very low levels of fertilizer and hybrid seeds. The level of fertilizer used per cultivated hectare declined from 40 kg/ha in 2006 to just under 27 kg/ha in 2009 (derived from FAO data, 2009).

2.3.2 Fertilizer Marketing Structure – Malawi

Figure 5. *Malawi Fertilizer Supply Chain*



Malawi imports almost its entire fertilizer requirement from the international market, via the ports of Beira and Nacala in Mozambique and the port of Dar es Salaam in Tanzania. There are also two blending companies in the country. The fertilizer market is comprised of a relatively well-developed network of four supply chains based on the first level of demand after the import level. In the first supply chain, fertilizer is imported by approximately 20 importers who distribute fertilizer via their own company-owned or -controlled wholesaler/distributors to 400 formal private and public retail outlets (farmer cooperative shops, shops owned by farmer associations, etc.) and 170 independent agro-dealers who are mostly based in rural areas. In the second supply chain, the blending companies procure fertilizers from importers, blend compound fertilizers and sell them to tea and coffee estates and to farmers via the private distribution network. In the third supply chain, the National Small Farmer Association of Malawi (NASFAM), a large farmers' cooperative, procures fertilizers from

importers and distributes fertilizers via its cooperative retail shops. The fourth supply chain is for the government fertilizer subsidy program. The government imports via the private sector and distributes via two parastatals, the Smallholder Farmers Fertilizer Revolving Fund of Malawi (SFFRFM) and the Agricultural Development and Marketing Corporation (ADMARC). Data on total commercial fertilizer imports for 2008/09 (the latest year for which data is available) were 5,819 mt (IFDC). However, according to the Ministry of Agriculture, 202,278 mt of fertilizer was distributed under the government subsidy program in 2008/09. This implies that almost 100 percent of the fertilizer imported and distributed in Malawi is subsidized.

2.3.3 Fertilizer Subsidy Program – Malawi

The current fertilizer subsidy program in Malawi, the Agricultural Input Subsidy Program (AISP), was introduced in 2005 with the main objective of improving national and household food security by increasing smallholder productivity and production through improved access to fertilizer and improved seeds. The program is managed by the Ministry of Agriculture and Food Security (MoAFS) and implemented by two parastatals, the SFFRFM and ADMARC, with the participation of the private sector. The AISP has run for five consecutive years, and although the basic characteristics of the program have remained the same since inception, the subsidy delivery design and scale of operations have evolved and there have been some changes over time (Table 1). First, in the first three seasons, total fertilizer supplied under AISP increased progressively from 131,388 mt in 2005/06 to peak at 216,553 mt in 2007/08 before falling to the current level of 161,495 mt for the 2009/10 season. Secondly, the cost of the program has increased over time due to the increase in fertilizer prices on the global market; between 2007/08 and 2008/09, international fertilizer prices increased by 242.7 percent for diammonium phosphate (DAP) and 141.3 percent for urea. This more than doubled the AISP total cost from Malawi Kwacha (MK) 16.35 billion to MK 39.8 billion in the same time period. On the local market, the price of a 50-kg bag of fertilizer increased on average by 108.41 percent; perhaps in an effort to counteract this impact, the government reduced the redemption price of subsidized fertilizer by 11.1 percent from MK 900 in 2007/08 to MK 800 in 2008/09.[19]

Table 1. *AISP Principal Program Features, 2005/06 to 2009/10 Seasons*

Variable	2005/06	2006/07	2007/08	2008/09	2009/10
Total subsidy (mt)	131,388	174,688	216,553	202,278	161,495
Total farm household beneficiaries (million)	2.5	2	-	1.6	1.6
Voucher value (MK/50-kg bag)	1,750	2,480	3,299	7,951	3,841
Redemption price (MK/50-kg bag)	950	950	900	800	500
Local market price of fertilizers (MK/50-kg)	2,700	3,430	4,199	8,751	4,341
Total program cost (MK 'million)	7,200	12,729	16,346	39,847	17,140
Total program cost (% national budget)	No data	8.2	9.0	16.2	6.8

Minde, Jayne, Crawford, Ariga and Govereh (2008:20) based on data from the World Bank (2008).
Source: Doward and Chirwa (2011).

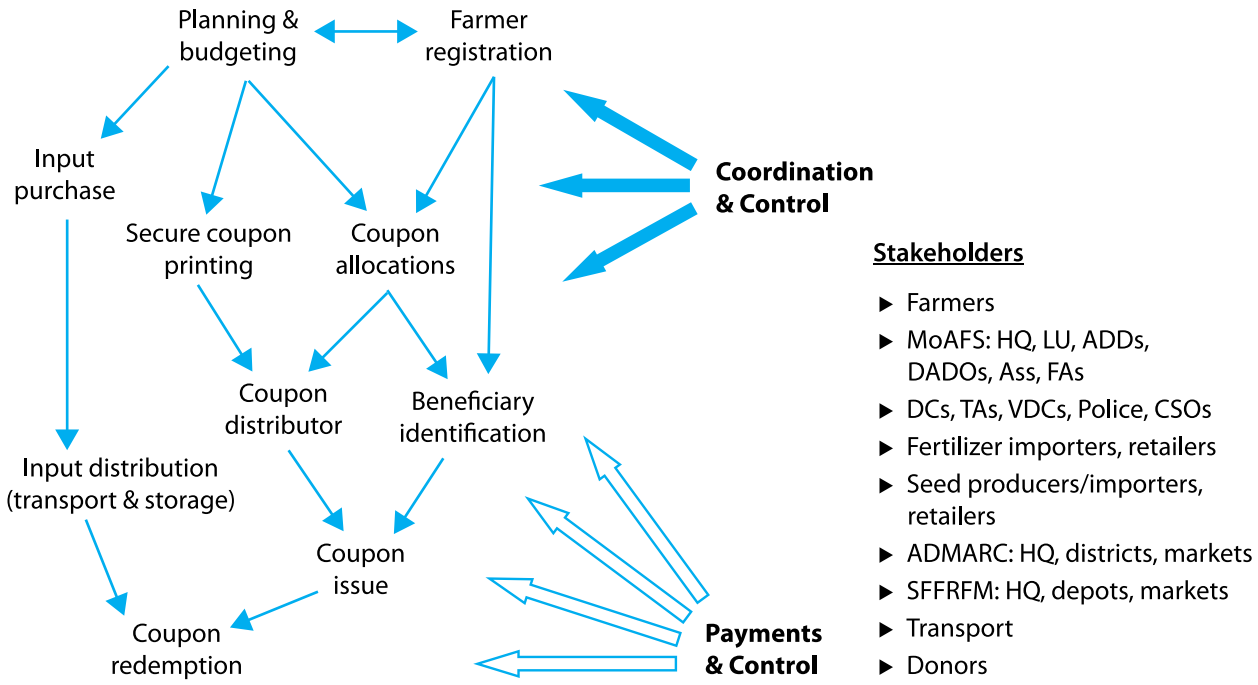
Finally, the quantity and type of inputs provided under the program have changed over time. Under AISP (2005/06), 2.5 million smallholders growing maize (or 50 percent of the smallholders in the country) received a 65 percent subsidy on 100 kg of fertilizers, plus 2.0-4.0 kg of open-pollinated variety (OPV) maize seed. Under the AISP (2008/09), over two million smallholders received a 70 percent subsidy on 100 kg of fertilizers and a 100 percent subsidy on 2.0 kg of hybrid maize seed or 4.0 kg of OPV maize seed. In addition, another one million households received flexible vouchers that could be redeemed for maize, legume or cotton seed. Moreover, tobacco, tea and coffee producers also received fertilizer subsidies, cotton farmers received subsidized pesticides and most smallholders received free grain storage chemicals. Under the AISP (2009/10), 1.6 million smallholders received an 88 percent subsidy on 100 kg of fertilizers; they also received a subsidy on 5 kg of hybrid maize seed or 10 kg of open-pollinated maize seed. The redemption value of the voucher for the seed companies (for hybrid maize seed) was MK 1,500. The seed companies could also apply discretionary cash 'top-up'

19 *This policy decision can be at least partially explained by the political environment. The 2008/09 season was also the last rainy season before the presidential elections in Malawi, and it may have been politically expedient to reduce the redemption price despite the international fertilizer prices hitting historical records.*

not exceeding MK 100. The same selected farmers also received a legume seed voucher that could be exchanged for a pack containing one of the following: beans, cowpeas, pigeon peas, groundnuts or soya. The package size for the legumes varied. Certified bean and groundnut packs were to be 1.0 kg. Soya, cowpea and pigeon pea packs were 1.2 kg, and tested bean and groundnut packs were 1.5 kg. However, the redemption value of the legume seed voucher was standard at MK 350.

Regarding the supply of the required fertilizer, the MoAFS announces tenders for both public and commercial companies to bid for the importation of fertilizers and delivery at the three main strategic branches of SFFRFM located in the north (Mzuzu), south (Blantyre) and central (Lilongwe) regions of Malawi. Next, ADMARC supervises the distribution of the fertilizer through private sector transporters (also awarded to bidders under government tenders) to the selected ADMARC and SFFRFM depots where the fertilizers are sold to farmers in exchange for the vouchers along with the payment of the redemption price.[20] MoAFS is responsible for organizing the printing and packaging of all of vouchers. The District Agricultural Development Officers (DADOs) of MoAFS, working with local community leaders, are responsible for the selection of the beneficiaries and the subsequent distribution of the vouchers. Vouchers are initially allocated to each district according to a distribution matrix constructed by the MoAFS. The voucher books are then distributed to each district. The Area Development Committee then decides how many vouchers each village will be awarded. The Village Level Committee is responsible for developing the criteria for targeting and identifying the beneficiaries and provides the broad guidelines for beneficiary selection, namely: (a) the beneficiary should not be a recipient of a similar program; (b) the beneficiary should be able to afford the discretionary cash ('top-up') required to redeem the fertilizer voucher; and the beneficiary should be a bona fide farmer from the area. The actual beneficiary selection takes place at the sub-village level (extension planning areas). The role of the Logistics Unit of the MoAFS in the beneficiary selection and voucher distribution process consists of updating the Farm Family registers used by the DADOs when manually recording the beneficiary names during the selection process. On completion of selection, the unit then produces the electronically generated Beneficiary Registers, which are used by the DADOs in the distribution of the vouchers.

Figure 6. *Schematic Structure for the Implementation of the Agricultural Input Subsidy Program in Malawi*



Key:

ADDs: Agricultural Development Divisions
ADMARC: Agricultural Development and Marketing Corporation
CSOs: Civil Society Organizations
DADOs: District Agricultural Development Officers
DCs: District Commissioners
FAs: Field Assistants
HQ: Headquarters
LU: Logistics Unit
MoAFS: Ministry of Agriculture and Food Security
SFFRFM: Smallholder Farmers Fertilizer Revolving Fund of Malawi
TAs: Traditional Authorities
VDCs: Village Development Committees

20 *In the 2007/08 season, both private and public suppliers were allowed to bid for distribution of the fertilizer only to be removed in the following season.*

2.4 Nigeria

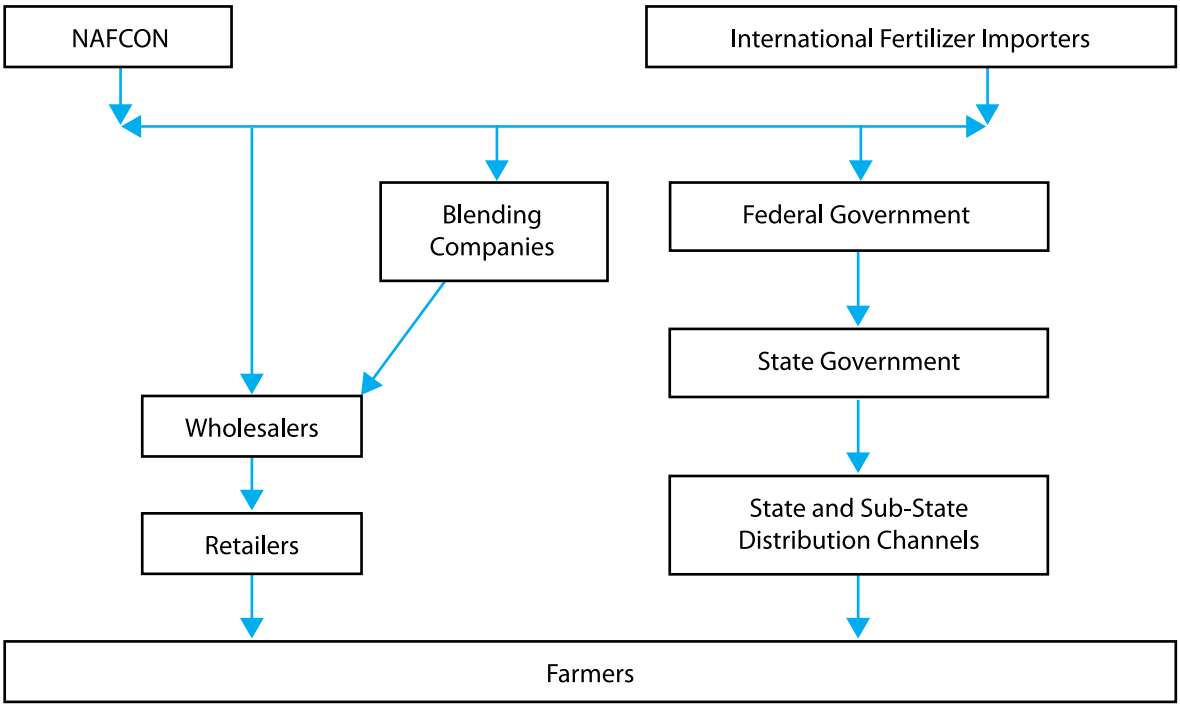
2.4.1 Country Background

Nigeria has an estimated population of approximately 154.7 million, and 51 percent of the population lives in rural areas. Despite a relatively high per capita GDP of US $1,222, 34 percent of the population lives below the national poverty line. Forty-one percent of the arable land is under cultivation. Most of this land is used for staple food, commercial and industrial crop production. The main staple food crops are cassava, maize, millet, sorghum and yams. The main cash crops produced include cocoa, cotton, palm oil and rubber. The agricultural sector accounts for about 33 percent of the GDP; five percent of foreign exchange (the oil sector accounts for 95 percent); and about 66 percent of employment. Most agriculture output comes from smallholder farms (typically less than 2.0 ha), which are characterized as resource poor and practice rainfed agriculture using no or very low levels of fertilizer or hybrid seeds. The level of fertilizer used per cultivated hectare is 8.4 kg/ha; although it is above the regional average of 7.5 kg/ha, it is considered low relative to other developing regions of the world.

2.4.2 Fertilizer Marketing Structure – Nigeria

Nigeria imports almost its entire fertilizer requirement from the international market. There are three main importers and 10-12 small importers serving both the federal and state governments' demands in addition to private demands (commercial farmers, plantations and the private sector market). One of the main importers is Notore, which owns the National Fertilizer Company of Nigeria (NAFCON) fertilizer plant, the only nitrogen-based fertilizer manufacturer in Nigeria and in the West Africa region. In spite of Nigeria's local fertilizer manufacturing facilities for urea and NPK, quantities produced are still relatively small, and consequently the vast majority of fertilizer consumed in the country is imported. The Nigerian fertilizer market is comprised of three supply chains. The first supply chain is the standard private sector-based supply chain, whereby importing companies procure fertilizer from overseas suppliers and sell it via the relatively well-developed private sector distribution network, comprised of approximately 30 wholesalers and 40,000 retailers located in local markets and semi-urban areas, who then sell the fertilizers to farmers. The second supply chain is comprised of fertilizer blending plants, which procure basic compound fertilizers from importers, blend, repackage and sell via a private network of wholesalers and retailers. The third supply chain is the subsidized fertilizer supply chain whereby the government contracts the private sector to procure fertilizer from international markets; the government distributes the fertilizer through federal and state official channels. Total fertilizer imports in 2009 were 600,000-800,000 mt; of this, the fertilizer distributed by the government subsidy program was 464,000 mt, or between 58 percent and 77 percent of the market.

Figure 7. Nigeria Fertilizer Supply Chain



2.4.3 Fertilizer Subsidy Program – Nigeria

The current fertilizer program was introduced by the Federal Government of Nigeria (FGN) as part of the Fertilizer Market Stabilization Scheme initiated in 1999. The program included the involvement of the state governments and private and public organizations for the procurement, transportation and distribution of imported and domestically produced fertilizer, and the participation of NAFCON for importation, production and distribution. The goal of the fertilizer program in Nigeria is to facilitate farmers' timely access to an adequate quantity and quality of fertilizers at competitive, yet affordable prices.

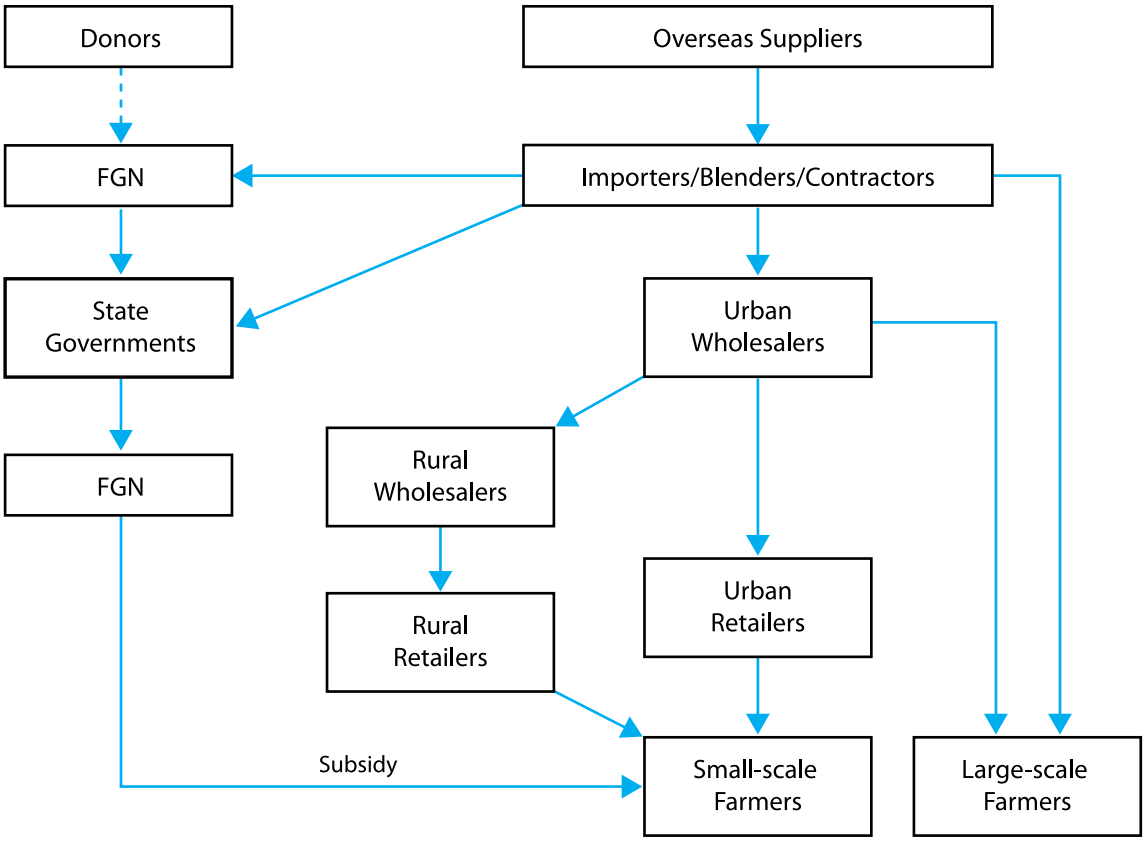
The Federal Ministry of Agriculture is not directly involved in importation, but it issues tenders to the local blenders and importers each year and procures the fertilizer from the winning bidders. Each year, the FGN consolidates orders from, and allocates funds to each of the states to pay 25 percent of the delivery cost to state warehouses as a means to subsidize fertilizer. This cost is paid at the source (importers or producers), depending on the federal budget allocation. In an effort to make the fertilizer subsidy program financially sustainable, the intention has been to establish a revolving fertilizer fund, funded by the states' remittances from the sales of the FGN-subsidized fertilizer (75 percent of the non-subsidized portion of the fertilizer price). In addition to the FGN subsidy, states and local government authorities (LGAs) can add to the amount of subsidized fertilizer supplied by the FGN through direct purchases from importers to complement their needs and/or add an additional subsidy. LGA commitments typically amount to as much as 40-60 percent, for a maximum of 85 percent combined FGN, state and LGA subsidies. A number of states also have their own fertilizer bulk-blending plants as a way of subsidizing fertilizer in their spheres of operation.

Under the subsidy program, the FGN begins negotiations with the states and suppliers between September and November of the preceding year, which may last until January of the following year. During these negotiations, prices and quantities supplied are determined for each importer based on tenders. The negotiated price is based on FOB market prices during or at the time of negotiation; consequently, the price is fixed at that point for the following cropping seasons. A single price for the whole of Nigeria is determined for each product, meaning that the cost of delivery must be standardized to all nominated state government storage sites in each state. All products must be supplied before the end of October of the year of the contract. Subsidized fertilizer products to be delivered are typically assigned to a state representative who is in charge of receiving the product at the warehouses. The fertilizers are distributed to farmers through established committees at the state, local government and ward levels. This is to ensure that the fertilizers reach the intended farmers who are expected to benefit from the subsidy program. The department coordinates regular monitoring by teams constituted from all the Departments of the Ministry to ensure smooth and problem-free distribution. These teams also follow up on the repayment of sales revenue from the states and the Federal Capital Territory (FCT).

In 2010, the FGN announced that it will completely withdraw from fertilizer procurement in support of the expansion of the private agro-dealer network. To facilitate a smooth transition and to ensure that fertilizer reaches the target beneficiaries, the FGN and some state governments began experimenting with a voucher program in 2009. Essentially, the government policy switched the focus of the program from subsidizing procurement to supporting farmers to be able to purchase fertilizer. As this was a new policy, the government initially introduced the program as a pilot voucher program in two states, Kano and Taraba, in 2009/10. The voucher program was expanded to two more states (Bauchi and Kwara) in 2010/11. It is expected that for the 2011/12 farming season, another state (Kaduna) will be added, and by the 2012/13 season, the voucher system will be implemented nationwide. The voucher system is targeted at specific crops (maize, millet, rice, sorghum and soya beans) and has two goals: (a) to guarantee that fertilizer reaches the farmers who need it most, and (b) to support the expansion of the private sector fertilizer supply and distribution channel to the rural interior, closer to farmers. That is, in addition to helping improve farmers' access to inputs, the voucher program is expected to provide training and technical assistance to both farmers and agro-dealers. Agro-dealers are trained to serve as private extension agents, to introduce new technologies and to teach their farmer-customers how to use such technology and inputs correctly. Nearly 10,000 chairmen of farmers' groups, extension officers, agro-dealers and 'master' trainers were trained through the 2009 program.

During the voucher pilot program, three fertilizer suppliers and over 150 private agro-dealers participated in the program. Participating farmers were provided with vouchers, redeemable at certified agricultural input dealers in the local market within their ward of residence. Beneficiary selection and inspection systems are in place to deter fraud and abuse and to ensure that fertilizer reaches smallholder farmers. The value of the voucher was N 2,000 (about US $13 in 2009) per 50-kg bag for two bags of NPK formulation and one bag of urea in Kano and on two bags each of NPK and urea in Taraba. Farmers were to pay the differential between the vouchers' value and the market price. Vouchers were allocated according to the volume of fertilizer product requested by the states from the federal government and distributed through suppliers to specific agro-dealers in the various local government areas.

Figure 8. *Schematic Structure for the Distribution System for Subsidized and Unsubsidized Fertilizer in Nigeria*



2.5 Rwanda

2.5.1 Country Background

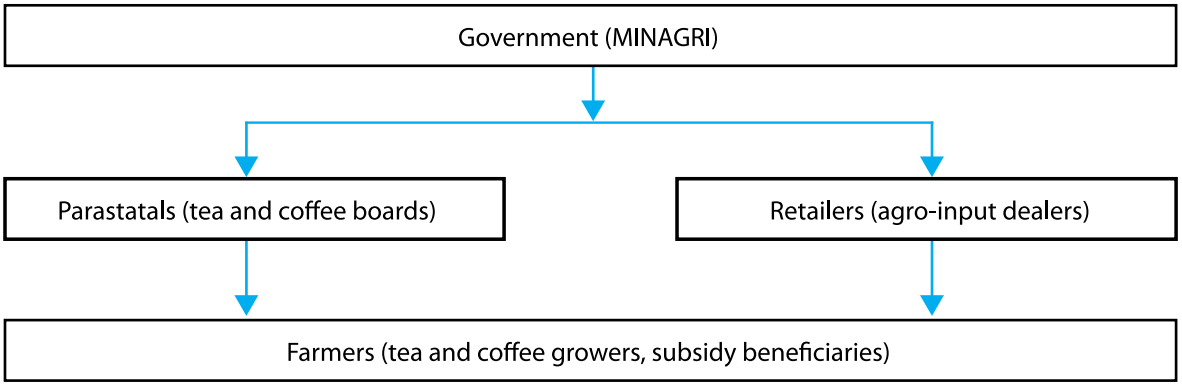
Rwanda has an estimated population of nearly10 million, with 81 percent living in rural areas and 60 percent living below the national poverty line. Rwanda has a per capita GDP of US $530, with agriculture as a critical economic sector, contributing 34 percent to GDP, 63 percent of foreign exchange and employing 90 percent of the economically active population. Fifty-two percent of the total land area is considered suitable for agriculture production and 90 percent of that total is on hillsides. The main staple crops grown are cassava, Irish potato, maize, rice, sweet potato and wheat, while the main commercial crops are coffee and tea. Most agriculture farmland is in the hands of smallholders with an extremely small average farm size of 0.3 ha, due to a high population density of 355 inhabitants per square kilometer, the highest in SSA (Morris et al., 2009). Therefore, there are severe limitations to expanding food production through crop extensification. Given these constraints, any increase in food production must come from agriculture intensification, which implies increasing yields on the same land area. Moreover, the country's topography and heavy seasonal rains make it prone to soil erosion; hence, there is a great need for farmers to implement soil conservation measures and continually replenish lost soil nutrients. The level of fertilizer used per cultivated hectare in Rwanda is extremely low, estimated at 4.0-10 kg/ha annually.

2.5.2 Fertilizer Marketing Structure

In Rwanda, there are no domestic fertilizer manufacturing facilities, only a small fertilizer blending plant. Most of Rwanda's fertilizer requirements are met via secondary imports from neighboring countries (Tanzania and Kenya) rather than procuring fertilizers directly from international traders. This is due to the country's small import requirement, which does not generate the economies-of-scale that would justify the use of the large shipping vessels of about 25,000 mt, typically used to transport fertilizer from major producing countries. There is virtually no importation of fertilizers by private importers, and all procurement and importation are done through government agencies, which include the national tea and coffee boards, and by donor-financed projects. However, the private sector actively participates in the distribution of fertilizers, whether subsidized or not. Rwanda's total fertilizer market is estimated at 33,442 mt, and of this, the fertilizer distributed under the government subsidy program in 2009/10 was 11,998 mt, or 36 percent of the market.

The fertilizer market in Rwanda is comprised of two supply chains. In the first supply chain, the government imports fertilizer based on demand requirements for the coffee and tea parastatals. These parastatals import directly or receive the fertilizer from the government and distribute the product via their own channels to their outgrowers. In the second supply chain, the government imports fertilizers to meet the requirements of the farmers participating in the government subsidy program and distributes the product via a thin network of 40 agro-dealers. The agro-dealers sell the subsidized fertilizer in exchange for a voucher (in the case of maize and wheat farmers), or at the subsidized fertilizer price set by the government (in the case of rice and potato farmers).

Figure 9. *Rwanda Fertilizer Supply Chain*



2.5.3 Fertilizer Subsidy Program – Rwanda

In 2007, the Government of Rwanda imported bulk fertilizer using its own funds, combining orders from the national tea and coffee boards (government parastatals) and fertilizer for food crops. This fertilizer was sold to farmers at actual landing cost; domestic transportation costs (from the capital of Kigali to the production zones) were absorbed by the government. The procurement of fertilizers in 2007 coincided with the launch of the current agricultural program, the Crop Intensification Program (CIP), which includes a direct subsidy on fertilizer. The objectives of the CIP are to: *raise productivity of the main food crops, boost food production and safeguard national food self-sufficiency.*[21] The first CIP (2007) was implemented as a pilot program, under which 9,000 mt of fertilizer were imported and distributed by the Ministry of Agriculture and Animal Resources (MINAGRI).

For the government, a key lesson from CIP 2007 was the need to phase out public sector involvement in the fertilizer market and promote the development of a private sector-led fertilizer market. Accordingly, under CIP 2008, the objectives were to encourage private firms to replace the government agencies in retail fertilizer distribution while continuing with the government policy of bulk imports to reduce the effect of the record-level global fertilizer prices that prevailed at that time. Therefore, one of the major medium-term goals of the CIP auction system has been to stimulate competition among private distributors and facilitate the maturity of these distributors in terms of business acumen and financial means to the point that they can procure and distribute fertilizers independently, hence providing an exit strategy for the government. Nevertheless, the government has not elaborated an exit strategy to date.[22]

The main objective of CIP (2009/10) was to make fertilizer easily available and accessible to smallholders. The program design, which is similar to CIP 2008, consisted of a fertilizer auction and the implementation of a fertilizer voucher program. As a first step, CIP determines the amount of fertilizer to be imported. The Rwanda Agricultural Development Authority (RADA)[23] contracts service providers to collaborate with the local governments to estimate seed and fertilizer

21 *CIP is comprised of five key interventions, which together form a strategic intervention package aimed at enabling smallholder farmers to increase productivity of major staple food crops. These are: (1) crop regionalization; (2) land use consolidation; (3) seed subsidy; (4) intensification of agricultural extension services; and (5) fertilizer subsidy.*

22 *Crop Intensification Program Evaluation Report, IFDC CATALIST Project, March 2010.*

23 *MINAGRI is the chief executive agency of the fertilizer subsidy program. It is responsible for planning and coordination, including procurement of the program's fertilizers. RADA is the major operations agency. RADA is a government organization operating under the supervision of MINAGRI, but with entity and financial autonomy. With respect to the current subsidy program, RADA is responsible for field operations including farmer targeting, estimation of fertilizer subsidy national requirements, providing extension services on appropriate fertilizer application rates, seeding rates and spacing and appropriate planting methods. To enhance its performance of these operational functions, RADA uses contracted service providers, who collaborate with MINAGRI's extension service officers at sector and district levels to provide technical assistance to farmers.*

requirements and generate a corresponding list of eligible target beneficiaries at district and provincial levels. Eligible target beneficiaries are farmers who consent to land use consolidation in accordance with the requirements of crop regionalization.[24] A list of the eligible target beneficiaries is prepared and the individual land areas contributed by each farmer are aggregated upward to the district level and across provinces in order to calculate the total national requirement.

Based on requirement estimates, MINAGRI issues a public tender and procures fertilizer from neighboring countries. Private traders and distributors are then invited to participate in an auction and present their bids to purchase and sell the MINAGRI-procured fertilizer. For a trader or distributor to qualify, they must meet the following criteria: (a) have experience in the marketing and distribution of agricultural inputs; (b) show proof of their experience by providing a trading license; and (c) provide evidence that they are operating as agricultural input traders. They are also required to have distribution linkages with at least four agricultural input stockists in at least one area that has been targeted for distribution of subsidized fertilizers. To facilitate the distribution process and increase the likelihood of program success, MINAGRI also organizes training workshops with RADA and IFDC for selected distributors and their appointed agro-dealers to raise awareness and understanding of the subsidy program, how it is administered and the roles of the various actors. The workshops also build distributors' and agro-dealers' capacity to participate in program implementation, which includes giving technical advice to farmers about correct fertilizer use. This selection and training process creates a pool of potential distributors to draw from for the auction. Qualifying distributors who meet all of the above criteria are informed by telephone. The approved list of qualifying distributors is also published in print media.

The selected traders and distributors participate in an open auction using an electronic bidding system in which each bidder is given about three minutes to make open bids for purchase on an electronic screen; the tender goes to the bidder offering the highest purchase price per metric ton of fertilizer. Bidding for distribution is done on lots for each zone. To allow distributors' margins to vary by zones (based on differentials in transportation costs), the total amount of imported fertilizer is divided into lots according to the distribution zones. In spite of the tender-bid process, fertilizer prices are fixed pan-territorially by the government. These price levels are determined on a cost-plus basis, in which MINAGRI offers a maximum margin over the government reserve (floor) price. Therefore, the government sets the maximum sale price for the winning distributors, so the higher the purchase price bid by a prospective distributor, the lower his or her profit margin will be.

The third step in the process entails distribution of the procured subsidized fertilizer to outlets closer to farmers. When the fertilizer arrives into the country, RADA serves as a central distribution point from which distributors that won bids collect their allocations for transportation to their respective distribution zones. There are two types of distributors: independent distributors and farmers' cooperatives/associations. The distributors transport fertilizers from the RADA central warehouses in Kigali to their rural warehouses; from there, they coordinate distribution to agro-dealers.

The fourth step is the distribution of the subsidized fertilizer using the electronic fertilizer voucher system. RADA contracts the voucher processing activity to service providers who issue vouchers according to the previously compiled list of eligible target beneficiaries. The vouchers are distributed to eligible farmers when they collect their CIP-subsidized seed. Farmers are required to produce their national ID card, which is scanned to produce an electronic record of the beneficiary farmer and then used to process and print the voucher. Under CIP 2009, each voucher qualifies the farmer to 50 kg of DAP and 25 kg of urea, enough for 0.5 ha. If the land is consolidated among several farmers to compose 0.5 ha, a voucher is issued to only one of the farmers. In order to acquire subsidized fertilizer, the farmer must present the voucher plus the cash to cover the unsubsidized portion of the market price to the agro-dealer in exchange for fertilizer. Transportation from the agro-dealer to the farms is the responsibility of the farmers, which is usually via bicycle. Agro-dealers then present collected vouchers to the bank for payment of the outstanding value of each.

In 2009A,[25] only 26 percent of all the fertilizer sold through the auction system was distributed by the CIP via vouchers to maize and wheat farmers (these farmers were entitled to an additional 50 percent off the price of the subsidized fertilizer being sold via the CIP). The balance of the subsidized fertilizer was sold at government-specified ceiling prices by private distributors, primarily to rice and potato farmers.

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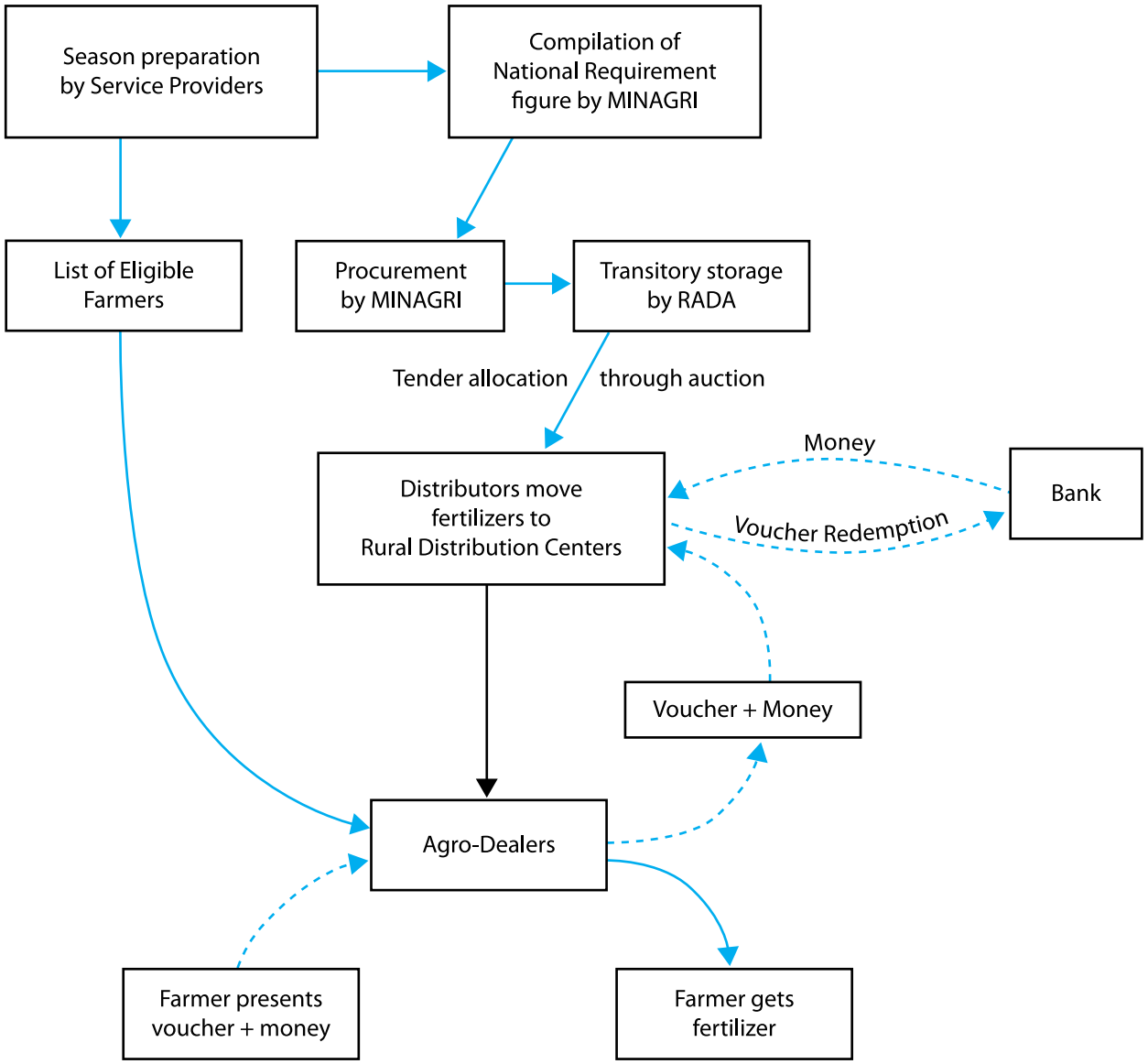
24 Crop regionalization refers to the practice of encouraging farmers to abandon the traditional practice of crop diversification for food security purposes and instead grow crops according to the agroclimatic and soil conditions of the area. Land use consolidation refers to an operational (not physical) practice whereby groups of neighboring smallholders agree to cultivate the same crop on their land using the same seed variety provided by the government agronomist.

25 The CIP has been implemented for four agricultural seasons: 2007/08, 2008/09, 2009/10 and 2010/11. The data and analysis will apply to the periods 2008/09 (referred to as 2009A) and 2009/10 unless stated otherwise.

Figure 10. Schematic Structure for the Implementation of the Fertilizer Subsidy Program in Rwanda



2.6 Senegal

2.6.1 Country Background

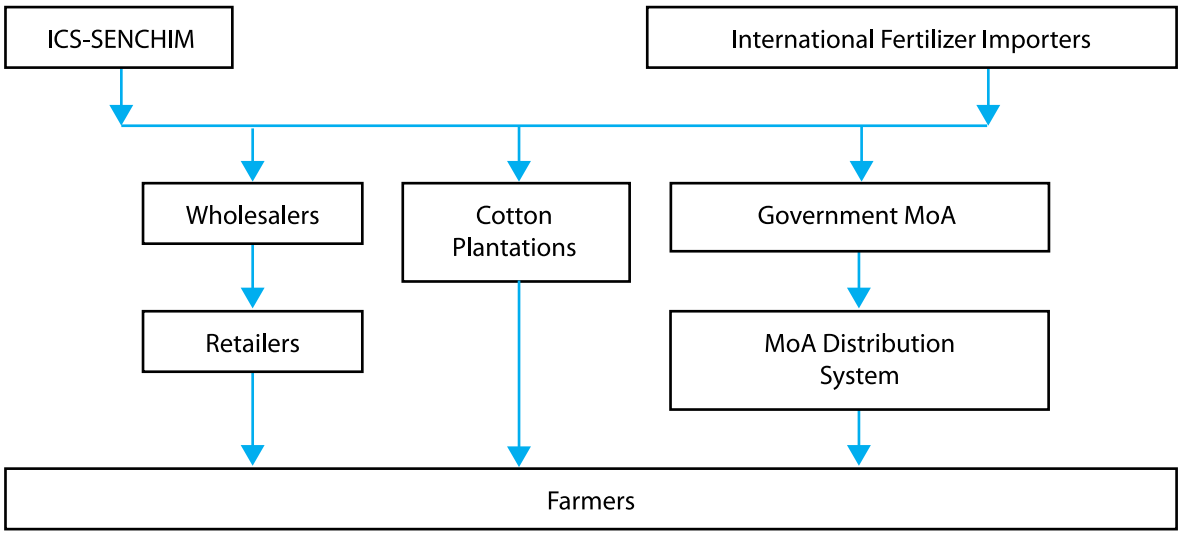
Senegal has an estimated population of 12.5 million, with 51 percent of the population living in rural areas. The GDP per capita is relatively high at US $1,042; nevertheless, 33 percent of the population lives below the national poverty line. Agriculture provides the main source of employment for 77 percent of the labor force and for the vast majority of rural households who rely on agriculture as their main source of food and income. Yet, only 18 percent of the total land area is under cultivation, and the agricultural sector's contribution to GDP is only 17 percent, which may partly explain the relatively high proportion of the population living below the poverty line. Most agriculture farmland is in the hands of smallholders, with an average farm size between 1.5 and 2.4 ha. The main staple crops grown are maize, millet, rice and sorghum, and the main commercial crops are Arabic gum and sugarcane, cotton, peanuts and horticultural crops. The level of fertilizer used per cultivated hectare in Senegal is extremely low – only 2.3 kg/ha – far below the regional average of 7.5 kg/ha.

2.6.2 Fertilizer Marketing Structure

Although Senegal has a national resource base for producing fertilizer (mainly phosphate rock), the sole fertilizer manufacturing plant in Senegal, ICS-SENCHIM (in charge of mining the rock and commercialization of the phosphate

products) produces very small quantities of blended product for the domestic market.[26] Consequently, the country sources the bulk of its fertilizer requirements by importation from international traders. There are five major importing companies in Senegal that distribute fertilizers via a thin network of wholesalers and retailers. Commercial farmers who cultivate cotton and other cash crops also procure fertilizers from importers and distribute the product to their farmers. The government procures fertilizer for the subsidy program via private importers who deliver the fertilizer to public and private regional warehouses, the point of collection for farmers. Therefore, the Senegal fertilizer market is comprised of three supply chains. In the first supply chain, the five main importers import and supply a thin network of wholesalers and retailers with fertilizers for sale to farmers. In the second supply chain, commercial farmers procure fertilizers from importers for their own use and/or for distribution to their outgrowers. The third supply chain, which dominates the fertilizer market in Senegal, is the government fertilizer subsidy program, whereby importation is undertaken by three of the five main importers and distribution is via the Ministry of Agriculture (MoA). The total fertilizer imports in the 2008/09 season were 73,100 mt; approximately 78 percent was procured and distributed via the government subsidy program.

Figure 11. *Senegal Fertilizer Supply Chain*



2.6.3 Fertilizer Subsidy Program – Senegal

The current Senegalese government subsidy program on fertilizer has been implemented since the year 2000 and became more relevant after the food crisis of 2008. It was initiated as part of the government commitment under the revised National Agricultural Policy (NAP) to revitalize the agricultural sector. The goal of the fertilizer program in Senegal is to facilitate farmers' timely access to an adequate quantity and quality of fertilizers at competitive but affordable prices.

Every year, the amount of fertilizer to be subsidized is based on estimated planted areas, government production goals, types of crops to be planted and, when possible, includes the expressed needs for the upcoming season by beneficiary farmers who are mainly smallholders producing staple foods and other crops. For simplicity, these estimates are increased by one to two percent every year. The level of the subsidy (in percentage terms) varies according to the fertilizer product and the market price. However, it is intended to cover up to 50 percent of the price paid by farmers for a 50-kg bag. The subsidy is also intended to cover up to 50 percent of the total annual estimated needs; in 2009, the amount of fertilizer supplied under the subsidy program represented about 48 percent of the total estimated demand as expressed by farmers.

The Senegalese government is not involved in the direct importation and distribution of fertilizer for the subsidy program, rather in procurement through the private sector based on a competitive tender-bid process. The tender determines the subsidized fertilizer price and the quantities to be imported and distributed within the subsidy program on a pan-territorial basis. For a company to participate in the tender process, it must be accredited by the government. By January of each year, the government accredits Senegalese importing companies to participate in the tender. These companies must meet the following criteria: (a) be legally established in Senegal and in good standing with the government; (b) demonstrate financial and technical capability to meet the terms of the contract; and (c) have experience in the acquisition and distribution of fertilizer and/or the ability to develop or support a distribution network into the rural interior. During late January/

26 *The fertilizer manufacturing plant in Senegal, SENCHIM, is a blending plant and a subsidiary of Chemical Industries of Senegal (ICS), a fertilizer-producing company. The bulk of fertilizer manufacturing in Senegal is concentrated on the production of phosphoric acid from the country's phosphate rock for exportation, mainly to India and Japan.*

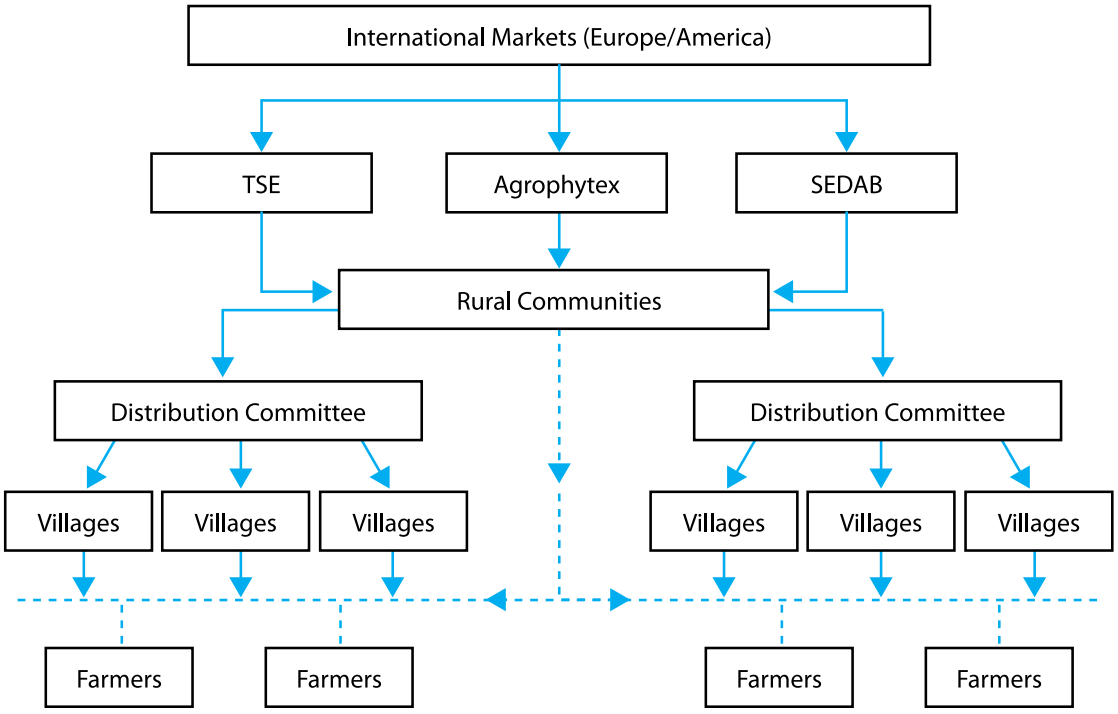
February, the MoA launches a call to tender to the accredited companies. The tender call specifies the fertilizer lots, the required quantities and types of fertilizer, a schedule of delivery for each lot (no later than May) and the specific delivery location in each region. In response to the call, each participating company must submit a letter of interest and fill out forms indicating their facilities (storage in rural areas, transportation, etc.), an authorization form from the international supplier or manufacturer, prices and a calendar of delivery to the tender-specified locations with a delivery guarantee consisting of a deposit or an insurance policy paid out by a financial institution in the case of non-compliance. The subsidized fertilizer price offered by the bidding companies includes goods delivered to the regional warehouses specified on the tender, so the price includes transportation and storage costs. The same price is to be paid by all farmers across the different regions in the country, since the chosen company will supply the same kind of fertilizer to all regions based on pre-assigned lots. Consequently, the supplying companies must estimate the average costs of delivery and storage for each lot before submitting their bid price. After evaluating the bids, the MoA assigns the lots to the lowest bidders of each lot. The lots are divided among the different regions and delivered to the warehouses in specific locations in each region as per the contracts, ready for collection by the farmers.

For the delivery of the subsidized product, the MoA authorizes the formation of Administrative Authorities consisting of committees at national, regional, departmental and local levels, responsible for monitoring (supervision and control) the operations of agricultural input sales, including fertilizer, marketing campaigns and responding to their respective constituencies. In each rural community, an ad hoc committee is created for the duration of the cropping season to allocate fertilizer to each farmer. The committee has representation from different economic and social groups in the community and is organized under the initiative of the state representative in the region and/or a representative of a department; this representative typically occupies the committee's chair.

The committee's role starts with the reception of the delivered fertilizer at the regional warehouse to ensure the quality and quantity according to the bid. The committee chairman signs a receipt slip once the product has been delivered and received at the local warehouse. The delivery receipt is one of the essential documents for the supplying company to claim the subsidy portion of the delivered price from the government treasury. Once the fertilizer has been delivered to the warehouse, an announcement is made requesting that farmers approach the committee and state the amount of fertilizer they require, according to the specific planted areas and crops.

The committee meets to deliberate on the eligibility criteria for assigning fertilizer to farmers in the community. The basic criterion is based on the government's intentions of benefiting the largest number of farmers possible, regardless of their financial means and planted area. Typically, subsidized fertilizer is assigned on a first-come, first-served basis considering the number of expected claims and the available quantity of fertilizer at a given regional warehouse. Based on the farmers' requests, the committee issues a document indicating the amount of subsidized fertilizer the farmer is allowed to purchase and the warehouse where they can retrieve the product (typically the local warehouse).

Figure 12. *Schematic Structure for the Implementation of the Fertilizer Subsidy Program in Senegal*



Farmers can purchase only the amount of fertilizer indicated in the document issued by the committee. At the time of retrieval, farmers must pay the non-subsidized portion of the price and sign (endorse) the document issued by the committee as well as a duplicated receipt from the supplier, which he must take back to the committee to be recorded as proof of fertilizer delivery from the supplier to the farmer. The committee records all sales made by each supplier's warehouse, and such records must be signed by the committee and the supplier's representative at the warehouse. These records are the second most important documents required by the supplier in order to receive payments from the government for the subsidy portion of the fertilizer price.

The subsidy payment is not issued directly to the farmers, but to the supplying companies who are reimbursed. Suppliers are only compensated for the fertilizer sold and not for the entire amount of fertilizer imported according to the assigned lot in the tender bid process. In order for the supplier to claim the reimbursement after the fertilizer has been sold, they must submit to the MoA the product delivery report signed by the committee chairman in addition to all sales receipts along with the signed document issued by the community fertilizer committee that allocates a given amount of fertilizer to the recipient farmers. The MoA verifies and consolidates the information provided with the community committee records previously signed by the distributor representative in the community warehouse and the committee chair. Once the MoA has verified all the provided documentation and proofs of sale, it issues an authorization to the treasury to process the payment to the provider.

2.7 Tanzania

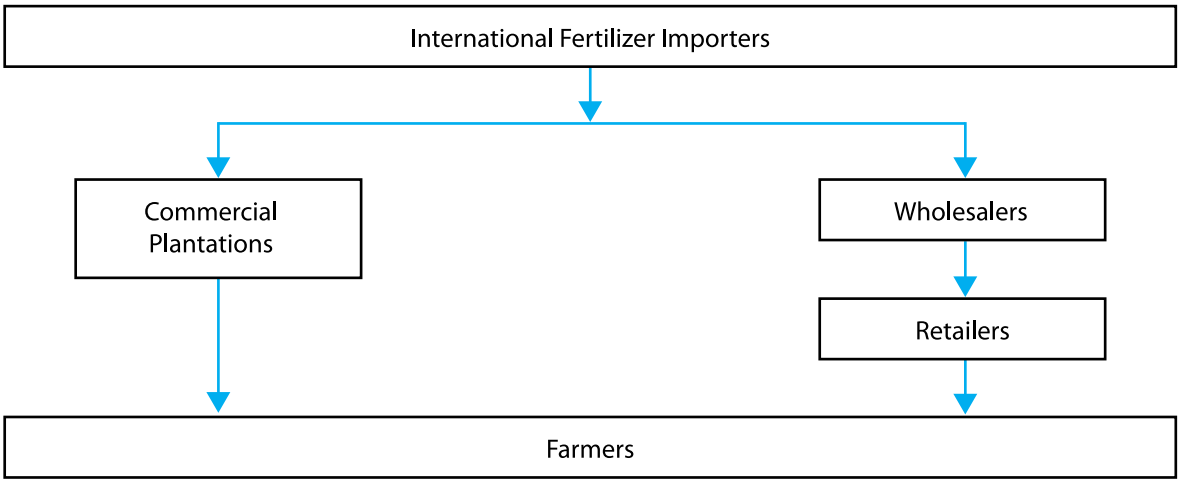
2.7.1 Country Background

Tanzania has an estimated population of 43.7 million, with 74 percent living in rural areas. The GDP per capita is US $527, and 35 percent of the population lives below the national poverty line. Agriculture is a critical economic sector, contributing 29 percent to GDP and 14 percent to foreign exchange while employing 77 percent of the labor force. Only 11 percent of the arable land is under cultivation. Most agricultural farmland is in the hands of smallholder farmers, with an average farm size less than 3.0 ha. The main staple crops grown are cassava, bananas, maize, potatoes, pulses and rice, and the main commercial crops are cashew nuts, coffee, cotton, sisal, sugarcane, tea and tobacco. The level of fertilizer used per cultivated hectare in Tanzania is about 6.0 kg/ha.

2.7.2 Fertilizer Marketing Structure

Tanzania sources virtually all of its fertilizer requirements from overseas suppliers. There are six importers, each of whom has strategically established depots at the regional or district level, or alternatively appoint and contract distribution agents. These depots or agents sell the fertilizer directly to farmers or to 2,345 agro-dealers spread countrywide who then sell the fertilizer to farmers. Commercial farmers import fertilizers via the main importers for their own use and/or distribute them to their outgrowers via their own distribution network. The government also imports and distributes fertilizer for the fertilizer subsidy program via the private import companies.

Figure 13. *Tanzania Fertilizer Supply Chain*

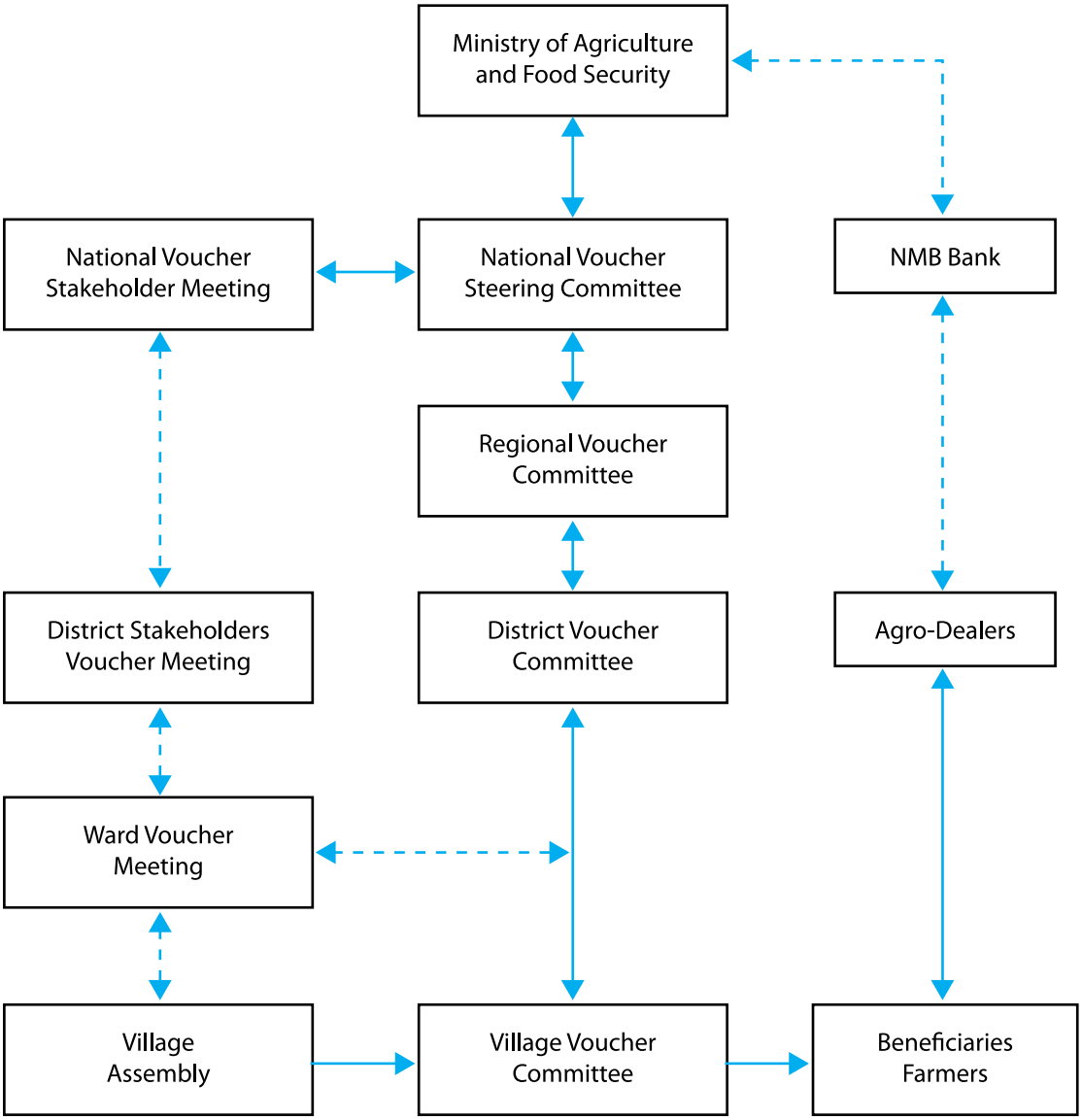


The Tanzanian fertilizer market is comprised of two main supply chains. In the first supply chain, fertilizer is imported by approximately six importers based on their own procurement decisions and the needs of the government subsidy program. The fertilizer is distributed via their own or contracted distribution outlets to independent agro-dealers who are mostly based in rural areas. These independent dealers sell fertilizer to farmers at the market price for cash or at the subsidized price (vouchers plus cash). The second supply chain is comprised of commercial farmers who import via the importers and use their own distribution networks to deliver the fertilizer to their farmers. Total fertilizer imports in 2009/10 were 263,390 mt; of this, the amount of fertilizer purchased and distributed by the private sector for the government subsidy program was 151,000 mt, or 57 percent of the market.

2.7.3 Fertilizer Subsidy Program – Tanzania

The Government of Tanzania (GoT) introduced the current fertilizer subsidy program, the National Agricultural Inputs Voucher Scheme (NAIVS), in 2008. The objectives of NAIVS are to: (a) ensure that subsidized inputs are accessible to the targeted farmers; (b) increase efficiency in the subsidy management process through increased clarity and transparency in the selection of farmers, allocation of input subsidies and redeeming processes; (c) strengthen the capacity of agro-dealers to access input credits and agribusiness skills; and (d) ensure proper use of inputs for increasing crop production and productivity. Other objectives are to: (a) facilitate fertilizer use in high-potential areas; (b) offset the rising cost of fertilizers; (c) stimulate production to reduce food prices; and (d) stimulate the development of the private distribution network. In 2007, the program was piloted in two districts; in 2008, it was scaled up to cover 53 districts, targeting 700,000 beneficiaries. In 2009/10, the program was expanded to cover 57 districts and targeted 1.5-2 million beneficiaries.

Figure 14. *Schematic Structure for the Implementation of the National Agricultural Input Voucher Scheme (NAIVS) in Tanzania*



The subsidized fertilizer package is one 50-kg bag of urea and one 50-kg bag of DAP, in addition to improved maize, rice or sorghum seed, and is implemented making use of vouchers. Once the voucher is issued to the farmer, it is the responsibility of each farmer to link with an agro-dealer who can supply the desired input at an agreed time and place. The inputs are sold at market price; the voucher is worth 50 percent of the market price of fertilizer. Therefore, the farmer presents the voucher to the agro-dealer and pays the difference between the face value of the voucher and the market price before taking ownership of the fertilizer. The agro-dealer, in turn, redeems the voucher by depositing it in the National Microfinance Bank (NMB). The NMB makes payments to agro-dealers in an amount equal to the face value of the vouchers. NMB transfers the money into the agro-dealer's account using the funds that have been transferred from the Ministry of Agriculture to an account that is designated for redeeming vouchers. NMB verifies the authenticity of the voucher, records the transaction and informs the MoA of the completion of the transaction.

The NAIVS subsidy program has a number of market-friendly subsidy characteristics. Specifically, the subsidized fertilizer is targeted to farmer beneficiaries using input vouchers, while the importation and distribution of the subsidized fertilizer are private sector-led in response to GoT communication on the quantity and value of the input vouchers to be distributed.

At the time of this assessment, the NAIVS program had an exit strategy. The three-year fertilizer subsidy program in Tanzania (2008/09 to 2010/11) was intended to end in December 2011. There were indications that the main donor (the World Bank) would terminate its support in 2011, and thereafter, the GoT was planning to continue funding the subsidy program from the national budget. According to the design of the program, smallholder farmers who participated in the program between 2008/09 and 2010/11 will no longer be eligible to participate in future government-supported fertilizer subsidy programs. The expectation is that they will have benefited sufficiently from participation in the program should be able to begin to purchase fertilizers at full market price and use them correctly.

2.8 Zambia

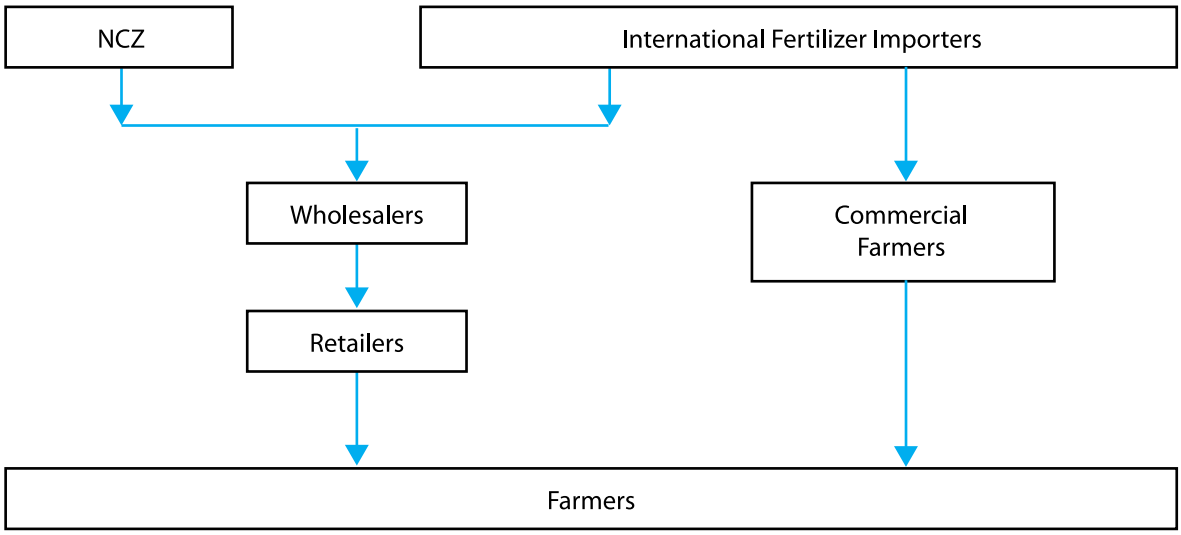
2.8.1 Country Background

Zambia has an estimated population of 13 million, with 64 percent of the total population living in rural areas. Zambia has a GDP per capita of US $1,253, and 68 percent of the population lives below the national poverty line. Agriculture contributes 19.7 percent to GDP and 20 percent to foreign exchange while employing 85 percent of the labor force. Only three percent of the arable land is cultivated. The main staple crop grown is maize and the main commercial crops are cotton, sugar and tobacco. The level of fertilizer used per cultivated hectare in Zambia is 50 kg/ha (a recent increase from about 11 kg/ha before the subsidies).

2.8.2 Fertilizer Marketing Structure

Zambia imports almost its entire fertilizer requirement from the international market via the ports of Beira and Nacala in Mozambique and Durban in South Africa. There is one manufacturing plant, the state-owned Nitrogen Chemicals of Zambia (NCZ). NCZ typically operates below capacity; for example, for the 2007/08 season, the NCZ was supposed to produce 80,000 mt of D-Compound but only managed to produce 32,000 mt. There are 13 importing companies that either import fully manufactured fertilizers or import basic compounds for blending. Commercial farmers are the main target of private importers/suppliers, but producers and distributors have also built a retail network of approximately 100 agro-dealers/stockists, mainly located in large towns and spread quite thinly across the country, supplying all farmers. Typically, there are only three to five agro-dealers to service a district; they generally do not specialize in fertilizer or input distribution (fertilizer sales are seasonal and it is just one of the many commodities on offer), and they tend to be located in large towns. Therefore, the fertilizer market in Zambia is comprised of four supply chains. In the first supply chain, importers supply fertilizers to farmers via the network of wholesalers and retailers. In the second supply chain, NCZ manufactures fertilizers and sells mainly to the local wholesalers and retailers and also supplies the government fertilizer subsidy program. In the third supply chain, commercial farmers procure fertilizers from importers for their own use or for distribution to their outgrowers. The fourth supply chain is the government fertilizer subsidy program whereby importation is by the private sector and distribution is by the Ministry of Agriculture. Total fertilizer consumption in Zambia was 191,172 mt in 2009/10, of which 100,000 mt or 52 percent of the market was distributed by the government as subsidized fertilizer.

Figure 15. Zambia Fertilizer Supply Chain



2.8.3 Fertilizer Subsidy Program – Zambia

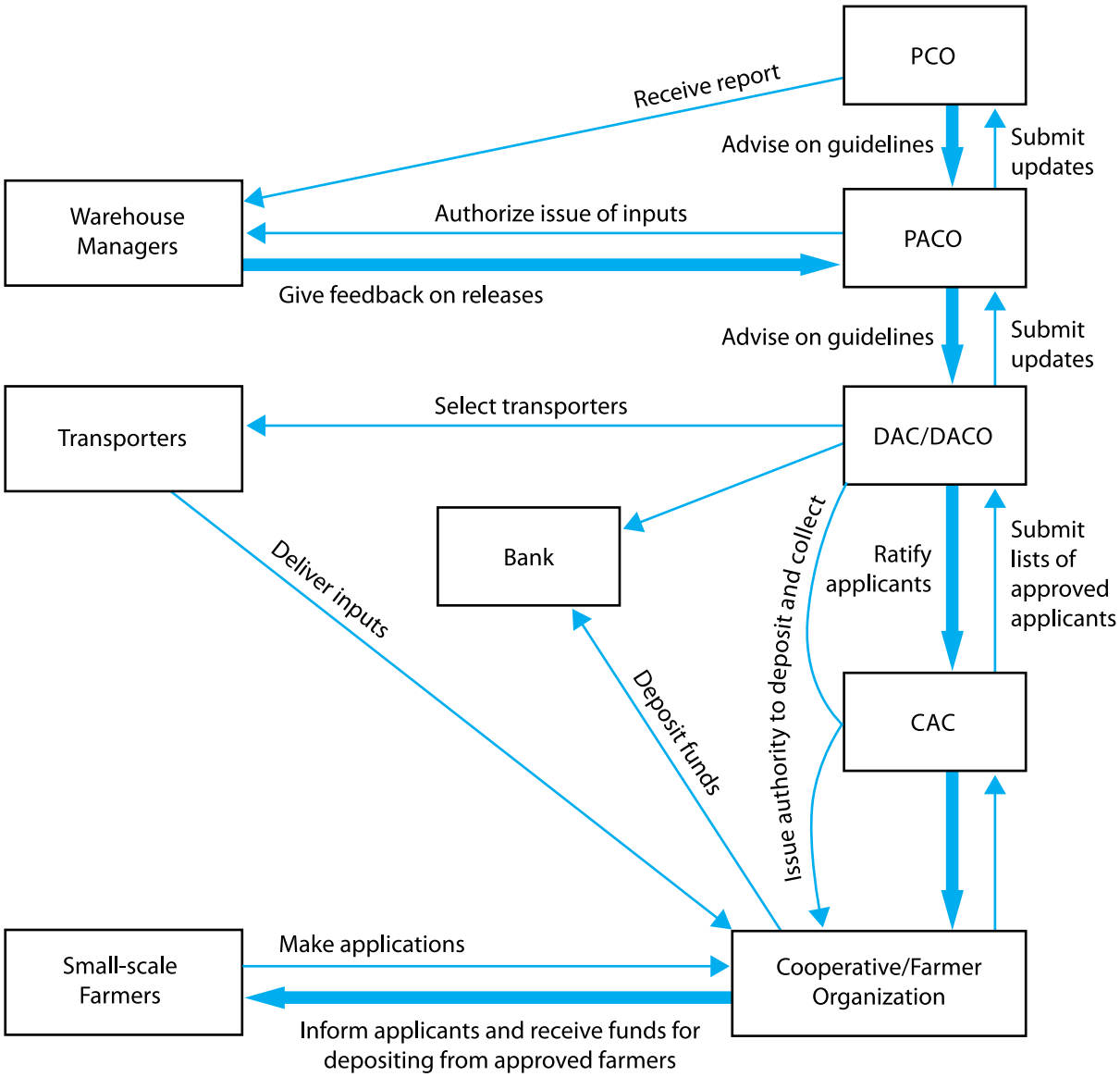
Between 1964 and 1992, subsidies were delivered to farmers though state-owned agricultural cooperatives. In 1992, subsidies were removed as part of wide-ranging agricultural sector reforms. However, in 2002, subsidies were reintroduced under the Farmer Input Support Program (FISP). The key objectives are the following: (a) to increase private sector participation in the supply of agricultural inputs to small-scale farmers, thereby reducing government involvement; (b) to improve access of small-scale farmers to agricultural inputs; (c) to serve as a risk-sharing mechanism for small-scale farmers to cover part of the costs for improving agricultural productivity; and (d) to facilitate the process of farmers' organization, dissemination of knowledge and creation of other rural institutions that will contribute to the development of the agricultural sector. The stated objectives do not include food security or increased agricultural production.

The first FISP (2002) targeted 125,000 smallholders with a fertilizer package composed of four 50-kg bags of D-compound and four 50-kg bags of urea (eight 50-kg bags of fertilizer in total). Farmers also received 20-kg bags of hybrid maize seed as part of the input pack. A pack is expected to cover 1.0 ha of maize cultivation. For FISP (2009/10), the input pack was reduced by half to consist of two 50-kg bags of D-compound and two 50-kg bags of urea, plus a 10-kg bag of maize seed, thereby helping to increase the number of targeted beneficiaries to 500,000. The proportion of subsidy increased from 50 percent in 2005 to 80 percent in 2008 before declining to 50 percent again in 2009.

The private sector is involved in the importation but not the sale of fertilizers for the FISP. The Ministry of Agriculture and Cooperatives (MACO) is the implementing and distribution agency of the FISP with an elaborate structure running from the headquarters in Lusaka (the capital city) to the village level. The importers of the subsidized fertilizers are selected through a national tender. The successful bidding companies import the fertilizer and sell it at the agreed price to the government. Before changes were made in 2009 regarding the calendar for the budget process, the procurement process started in April after the budget had been approved by Parliament. Before this, MACO could undertake some pre-tender preparations, but could not engage suppliers of inputs and transporters. MACO observed that starting the tender process after April imposed serious time constraints as inputs needed to reach farmers in October at the latest for planting in November. In 2009, changes were made to the calendar for the budget process; the budget for the year will now be presented in October of the previous year and approved by December. Therefore, the budget for 2010 was presented in October 2009, not in January 2010.

The FISP Program Coordinating Office (PCO) convenes a one-day Provincial FISP workshop in each of the nine provinces in Zambia every year prior to the start of input distribution to farmers. The purpose of the workshop is to provide the terms of reference to all stakeholders involved with FISP at all levels in the country to ensure that all the procedures and guidelines are adhered to during and after the FISP Program. The PCO provides all documentation such as the implementation manual, stock receipts, stock issues such as authority to collect inputs, goods issue vouchers and authority to deposit, goods received note, input release note, transporters' cost sheet and warehouse cost sheet. The Provincial Agricultural Coordinator (PACO) is responsible for ensuring the smooth implementation of the FISP in their respective provinces through regular monitoring or backstopping, and they submit regular updates to the PCO.

Figure 16. Schematic Structure for the Implementation of the Farmer Input Support Programmed in Zambia



Key:

CAC *Community Agricultural Committees*
DAC *District Agriculture Committee*
DACO *District Agricultural Coordinator*
PACO *Provincial Agricultural Coordinator*
PCO *Program Coordinator*

MACO selects the suppliers and transporters of the subsidized fertilizer through a national tender each year. The transporters deliver the inputs to designated districts at the main depots throughout the country. The MACO district officials are responsible for selecting and contracting the local input transporters in each district. The local transporters must meet the following criteria to bid for the tender: have physical presence in the district; have a credible track record in transportation; demonstrate that they have the financial capacity to provide the transportation service; and be registered with the Registrar of Companies and provincial and district tender committees. Local input transporters take subsidized inputs to designated areas in the district for release to cooperatives and farmer organizations. All inputs are distributed to, and all payments are made by representatives of the cooperatives and farmers' organizations – not by the individual farmers. The selected cooperatives and other farmers' organizations deposit the subsidy percentage given by the government for fertilizer and the maize seed in a particular bank or financial institution appointed by the government and then pays the matching cost of inputs to the agro-dealers.

The District Agriculture Committee (DAC) works with agriculture extension officers and Community Agricultural Committees (CAC) to disseminate FISP information to cooperatives and individual farmers on the application procedures and acquisition of FISP inputs. The CAC and agriculture extension officers update and maintain the farmers' register;

receive applications from cooperatives/farmers' organizations; identify and make recommendations to the DAC as to which farmers and cooperatives/farmers' organizations are eligible to benefit from the FISP;[27] receive a ratified list of applicants from DAC; inform the cooperatives/farmers' organizations regarding the outcome of their application; and monitor the distribution and utilization of inputs at the village level.[28] The selection criteria of beneficiary farmers specify that they must belong to a cooperative or some other recognized farmer organization. The cooperatives/farmers' organizations select the farmers who will participate using the following criteria: farmers should have the capacity to grow 1.0-5.0 ha of maize and to pay 40 percent of the cost of inputs, and should not be benefitting from other programs.[29]

Regarding the process for collection of the subsidized inputs by cooperatives and farmers' organizations, the DAC will inform the CAC about the selected cooperatives. The cooperative representative will then submit a list of approved individual small-scale farmers to the District Agricultural Coordinator (DACO), who will then issue authority for the cooperative (or farmers' organization) to deposit the unsubsidized amount of the price of fertilizer and maize seed in a particular bank or financial institution appointed by the government. The cooperative representative will return to the DACO with the authentic deposit slip as a proof of funds deposited. The DACO will issue an authority to collect (ATC) inputs form to the cooperative representative, which they use to collect inputs from the warehouse manager. The DACO will also provide the list of approved cooperative members to the warehouse manager. The ATC will specify the deposited amount, quantities and types of inputs to be collected and the collection point. The warehouse manager will give inputs to the assigned transporter to be delivered to the cooperative site. The warehouse manager will inform the DACO on the release of inputs through the input release note. The warehouse manager will also issue each local transporter with goods issue notes to accompany the inputs to ensure they are delivered to the correct recipients.

The original design of the FISP included the need for farmers to cycle out of the program, or graduate, after accessing subsidized inputs for three years. The government subsidy was to decline from 75 percent in Year 1 to 25 percent in Year 3. It was expected that farmers' eroded assets would have recovered sufficiency by the fourth year for them to be self-reliant. However, this graduation principle seems to have been set aside. MACO's claim now is that cooperatives are the ones who are supposed to wean off farmers who have benefited from the program for three years. This principle is ignored by cooperatives as evidenced by the fact that the ability to graduate from the program after three years is not a key aspect of their selection criteria.

Section 3. Analysis of the Performance of Country Fertilizer Subsidy Programs in Africa

3.1 Performance of Subsidy Program – Burkina Faso

3.1.1 Fertilizer Accessibility and Availability

Fertilizer Accessibility

- *Physical Accessibility*

In addition to the cost of transporting the fertilizer from the regional office to the provincial capital, farmers must bear the cost of transportation from the provincial capital to the home or farmstead. This additional cost of subsidized fertilizer from the regional office to the farmstead can be as much as 1,000 CFA, which increases the cost of subsidized fertilizer to the farmer (transport costs to the farm-gate are not taken into account when the subsidy rate is being set). Nevertheless, the fertilizer subsidy provides farmers with better access to chemical fertilizers than they had previously and permits those who already use it to increase their use.

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27 *For a cooperative or farmer organization to qualify, it should meet a number of good governance criteria. It should also not have any outstanding loans with the Food Reserve Agency and should be located in the area and be engaged in agriculture. A weakness is that some of the criteria are difficult to objectively verify, such as "demonstrable knowledge in cooperative and agribusiness management."*

28 *Cooperatives and farmers' organizations are recommended by the CAC in each district and selected by the DAC.*

29 *It has been observed that the eligibility criteria are too broad and do not sufficiently clarify who qualifies for subsidized inputs. Consequently, the majority of cooperatives ignore the criteria. It has been shown that one's membership in a cooperative and ability to pay for the FISP package are the dominant considerations by cooperatives in beneficiary selection.*

Regarding the distance that farmers must travel to gain access to the subsidized inputs, although the subsidized fertilizer is distributed by the MoA as far as the provincial capitals, these towns are typically at considerable distances from the farm-gates. Most farmers must travel at least 30 km (about 19 miles) to buy subsidized fertilizer. This long journey translates into additional costs for farmers (related to transport and food), increasing the price of the subsidized fertilizer by an average of 500 CFA per 50-kg bag. This fact discourages many farmers who would benefit from subsidized fertilizers from going to the provincial capitals to access the subsidized fertilizers.

Subsidy Rate

According to Table 2, the fertilizer operation program in Burkina Faso has been effective in increasing farmers' access to fertilizer by reducing the fertilizer price by an estimated average of 19 percent of the market price between 2008 and 2010. The market price is the one determined by the other importers selling fertilizer in the open market. The program makes urea more accessible than NPK formulations in terms of price reduction.

Table 2. *Fertilizer Prices in Burkina Faso: 2008-10 (US $)*

Fertilizer Products	Fertilizer Prices								
	National Average Market Price			Subsidy or Subsidized Price			Subsidy as Percentage of Market Price		
	2008	*2009*	*2010*	*2008*	*2009*	*2010*	*2008*	*2009*	*2010*
	(US $/50-kg bag)			(US $/50-kg bag)			(%)		
NPK	31.6	30.0	27.6	27.9	26.5	24.4	12	12	12
Urea	40.6	38.6	35.5	30.1	28.6	26.3	26	26	26
Average	**36.1**	**34.3**	**31.6**	**29.0**	**27.5**	**25.4**	**19**	**19**	**19**

Sources: Fertilizer prices and subsidies were estimated as reported by local consultants. Exchange rates used are the mean annual rates for each year as reported on the website http://www.exchangerate.com.

Voucher Availability

The subsidy program in Burkina Faso does not use input vouchers or other targeting instruments, even though it is intended to increase the accessibility to fertilizer by small farmers. The subsidized fertilizer is distributed through official channels from central to provincial governments. Consequently, commercial farmers who are closer to provincial capitals and larger towns are typically able to pay the market price for fertilizer and have easier access to the subsidized inputs than poor small farmers in rural areas who can only gain access to fertilizer when the price is subsidized.

Fertilizer Availability

National Fertilizer Availability

In Burkina Faso, the in-country consumption of fertilizer is estimated at 145,000 mtpy, while the fertilizer operation program intends to supply only a fraction of that amount. Table 3 shows that the program did not achieve the targets set forth for the years 2008 through 2010, which could be attributed to budgetary constraints and/or to the volatilization of prices in the fertilizer international market and other logistics cost increases. However, although the percentage and amount of supplied subsidized fertilizer is in decline relative to the intended amount, the fertilizer support program increases the overall availability of fertilizer in the domestic market.

Table 3. *Subsidized Fertilizer Consumption in Burkina Faso, 2008-10*

	2008	2009	2010
Intended amount of subsidized fertilizer (mt)	18,472.87	34,097.82	38,883.42
Actual amount of subsidized fertilizer supplied/consumed (mt)	15,169.67	29,062.27	25,013.92
Actual percent of intended subsidized fertilizer (%)	0.82	0.85	0.64

Source: Local consultant report.
Note: The intended and actual amount of subsidized fertilizer is for use in maize and other cereals.

Nevertheless, there is anecdotal evidence that the amount of available subsidized fertilizer is not sufficient to meet farmers' needs. It is estimated that more than half of the intended farmers have never benefited from the fertilizer subsidy program due to the low quantity supplied and high demand for subsidized fertilizer. The reasons follow. First, in determining the amount of fertilizer to be supplied under the subsidy program, the government does not take into consideration the actual needs of farmers. Instead, the government's decision is based on arbitrary estimates made by the district directors of agriculture. These arbitrary estimates result in the government meeting just a fraction of the actual needs, because the government does not have the means in terms of personnel and logistics to better estimate the actual needs of fertilizer in their provinces. In addition, the allocation of subsidized fertilizer to the different provinces is made according to the level of available public funds and budgetary considerations, at times resulting in misallocations of fertilizer among the different provinces. This causes problems not only with respect to availability in the deficit provinces, but it also increases the cost of the subsidized fertilizer, since farmers in the deficit provinces must incur additional costs for the transfer of fertilizer from surplus provinces. Moreover, the surplus provinces may not have enough products to fully meet the shortages in the deficit provinces; even if they do, such surplus may become available late in the season when the provinces realize their surpluses and shortages.

Secondly, there are problems with the misallocation of fertilizer among farmers. Farmers' fertilizer claims according to their crops and planted areas are not met most of the time, especially if they are unable to present proof to support their claims, since the regional agricultural officer in charge of the distribution does not have the means to corroborate such assertions. Consequently, farmers are typically assigned lower quantities than required. In a few cases, some farmers are assigned more than required and sell the additional fertilizer to other farmers at a profit, thus increasing the cost of the subsidized fertilizer for the resource-poor farmers who are the target population of the operation.

Another issue that affects availability is the quality of the fertilizer distributed under the subsidy program. There are allegations that the quality of subsidized fertilizer is low, since the observed yields are lower compared with yields using other fertilizers. Some farmers speculate that the subsidized fertilizer has been adulterated. However, most farmers believe that the problem is in the formulation. The fertilizer operation provides one single formulation of NPK and urea, and the NPK formulation typically recommended for rice production is also used on maize and other cereals. The provision of unsuitable fertilizers by the subsidy operation also discourages cereal farmers from using the subsidized fertilizer.

- *Timeliness of Delivery*

In terms of timelines, in addition to the issues of delays described above, there are also delays in the transfer of fertilizer from the MoA central offices to the regional and provincial offices. These delays in delivery have an effect on crop production and yields, because the fertilizer is not applied in a timely manner or possibly not applied at all.

3.1.2 Impact on the Private Sector

Expansion of Private Sector Distribution Network

Despite the existence of a domestic company for the production of fertilizer (CIPAM) in Burkina Faso, the government is involved in procurement, importation and distribution. The private sector has not been allowed to participate in the procurement and distribution of subsidized fertilizer. This is arguably due to their inability to supply and distribute the necessary quantity under the fertilizer support program; the private fertilizer marketing system is comprised of a thin network of importers, wholesalers and retailers who cater mainly to the large commercial farmers located in accessible production zones.

The MAHRH procures fertilizer directly from international traders or neighboring countries and distributes it via government channels using its own personnel and distribution network, rather than using the existing network and strengthening it through the subsidy program to better serve smallholder farmers. In the process, the government has chosen to eschew it altogether and create a parallel system. Therefore, the program's design and implementation modalities have both conspired to constrain the development, or even weaken the private distribution system. Although the fertilizer support program comprises a relatively small amount of the market (up to 28 percent in the three years considered in this report), the exclusion of the private sector from distribution of the subsidized fertilizer prevents the expansion of the distribution network closer to poor small farmers where the product is needed most.

Table 4 provides a summary of the performance of the subsidy program in Burkina Faso.

Table 4. Summary of Performance of the Subsidy Program in Burkina Faso

Burkina Faso		
Does it support private sector distribution development?		+ve Scores
Government is involved in distribution	-	0
Government does not issue a private tender for importation	-	
Market structure: There is a parallel market that potentially crowds out private sector importers and distributors	-	
Payment arrangements: Government self-finances its importation and distribution	-	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is clear and well-defined: 19 percent of market price	+	6
No voucher entitlement to poor/small farmers	-	
Complementary services: There are extension services Program does not have a complementary credit facility	 + -	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is restriction on the maximum quantity of fertilizer per farmer There is pre-registration/screening of beneficiaries	 + + +	
Reduces the distance from retailer to farm-gate	+	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	1
Product is not normally delivered on time to retailers: There is misallocation of fertilizer	-	
Does the program have an exit strategy?		
There is no written exit strategy	-	0
Total +ve Score		7

3.2 Performance of Subsidy Program – Ghana

3.2.1 Fertilizer Accessibility and Availability

Fertilizer Accessibility

- *Physical Accessibility*

Under the waybill receipt system, farmers buy the subsidized fertilizer from the nearest agro-dealer. The distance to this nearest distribution point is at a minimum since no agro-dealer is excluded from participating in the subsidy program. The main additional cost that the farmers incur (over the price of the subsidized fertilizer) is the transportation of fertilizer from the agro-dealer to the farm-gate. Nevertheless, farmers reported the following areas that could be addressed to improve accessibility: making fertilizer available in adequate quantities at the right time; monitoring distributors and retailers to ensure they are selling subsidized fertilizers at the correct price; and providing farmers with assistance to access output markets for their produce since they incur substantive post-harvest losses of surplus production due to the use of subsidized fertilizer.

- *Subsidy Rate*

In Ghana, the subsidy program has been effective in increasing farmers' accessibility to fertilizer by reducing the price by an average of 32.5 percent in 2008 and 40.5 percent in 2010 (Table 5), although these percentages were not the intended target reduction of 50 percent of the market price.

Table 5. Fertilizer Prices in Ghana: 2008-10 (US $)

Fertilizer Products	Fertilizer Prices								
	National Average Market			Subsidized Price			Subsidy as Percentage of Market Price		
	2008	*2009*	*2010*	*2008*	*2009*	*2010*	*2008*	*2009*	*2010*
	Price (US $/50-kg bag)[a]			Price (US $/50-kg bag)[b]			(%)		
NPK (15:15:15)	33.70	30.56	30.77	23.36	18.31	18.88	30.7	40.1	38.6
Other NPK	33.70	30.56	30.77	23.36	18.31	18.88	30.7	40.1	38.6
Urea	34.70	29.17	27.97	23.36	18.31	17.48	32.7	37.2	37.5
SoA	26.26	22.32	23.78	16.82	12.68	12.59	35.9	43.2	47.1
Average	**32.09**	**28.15**	**28.32**	**21.73**	**16.90**	**16.96**	**32.5**	**40.2**	**40.5**

Sources: a. MOFA (2010), Agriculture in Ghana: Facts and Figures 2009, SRID – MOFA, April, Accra.
b. Agricultural Extension Services Directorate, MOFA, Accra.
Note: Exchange rates used are the mean monthly rates – GHC 1.07/US $ for 2008, GHC 1.42/US $ for 2009 and GHC 1.43/US $ for 2010. The monthly exchange rates were obtained from BOG Statistical Bulletin, Table 25: Interbank Foreign Exchange Rates, http://www.bog.gov.gh/index1.

Voucher Availability

The current subsidy program in Ghana does not use vouchers; it uses a waybill receipt system, which does not discriminate between large/commercial farmers and small/subsistence farmers. Moreover, it does not provide a credit facility for small farmers. Therefore, it makes commercial fertilizer more accessible to large/commercial farmers who are more likely to be able to afford it and neglects the intended target-farmer population (the small/subsistence farmers), since they lack the funds and access to finance to pay for the non-subsidized portion of the fertilizer price.

Fertilizer Availability

National Fertilizer Availability

In Ghana, the amount of fertilizer demanded by small farmers, the intended beneficiaries of the subsidy program for the production of staple food crops, was originally estimated at 50 percent of the country's total fertilizer demand. Table 6 shows that when the subsidy program was introduced in 2008, it was intended to provide for more than the amount demanded. However, the program was not able to achieving the targeted amount (60 percent of total demand) to be provided under the subsidy – not even the estimated 50 percent of the total demanded by small farmers – which could be attributed to budgetary constraints and/or to the volatilization of prices in the fertilizer international market and other logistics cost increases. However, although the percentage and amount of supplied subsidized fertilizer has been decreasing relative to the intended amount, the fertilizer support program increases the overall availability of fertilizer in the domestic market.

Table 6. Subsidized Fertilizer Consumption, 2008-10

	2008	2009	2010
Estimated potential in-country total fertilizer demand (mt)	100,000	200,000	300,000
Intended amount of subsidized fertilizer (mt)	60,000	80,000	100,000
Actual amount of subsidized fertilizer supplied/consumed (mt)	43,200	73,000	88,000
Actual percentage of intended subsidized fertilizer (%)	72.0%	91.3%	88.0%
Percentage of actual subsidized fertilizer relative to total demand (%)	43.2%	36.5%	29.3%

Source: Agricultural Extension Services Directorate, MOFA, Accra.

This inability of the program to provide the proper amount of subsidized fertilizer for the intended farmer population has been made worse by the changes in the subsidy program delivery from vouchers to the waybill system, since the new delivery approach does not take targeting into consideration and makes subsidized fertilizer available to all farmers whether small or large, commercial, semi-commercial or subsistence. This puts small and subsistence farmers at a disadvantage considering their lack of financial resources and inaccessibility to credit in order to gain access to fertilizer, even if it is affordable and available. Consequently, although the new subsidy approach may be more cost-effective for the government, since it reduces the cost of delivery of the program and presumably augments the amount/availability of subsidized fertilizer (therefore increasing program management effectiveness and efficiency), it sacrifices efficiency in private sector operations and the effectiveness in providing subsidized fertilizer to the intended farmer population and crops.

3.2.2 Impact on the Private Sector

Expansion of Private Sector Distribution Network

The private sector has participated in the fertilizer subsidy program since its inception in 2008, and more so with the new waybill system which allows the participation of the majority of agro-dealers. Private importing companies import fertilizer for the program in response to government tenders and distribute the product via their wholesale-retail network.[30] There is anecdotal evidence that the subsidy program has boosted the sales of fertilizers by the private sector. Nevertheless, a number of stumbling blocks have had the effect of constraining the expansion of the private distribution network as follows:

- Since the subsidy program accounts for a substantive proportion of the market (50 percent), importers are discouraged from importing more than the subsidized amount of fertilizers or investing to expand their distribution networks to provide fertilizer to those farmers who are willing and able to buy at market price.
- Retailers are excluded from the importer-government discussions about the design of the subsidy program and price negotiations. This practice places them at a disadvantage, as they are not able to ensure that their costs are taken into account when retail margins are being set during the negotiations. The result is low retail margins, which reduces retailers' incentive and ability to extend their distribution network closer to farmers.
- The pool of retailers who can participate in the distribution of subsidized fertilizer is limited to those affiliated with the importer-wholesaler network, which participates in the price negotiations with the GoG. This exclusion of all other retailers increases market concentration in the distribution network for the supply of subsidized fertilizers.
- The new waybill receipt system requires a long trail of paperwork; a large proportion of this administrative burden has been transferred to the private sector. For example, wholesalers/distributors who sell directly to farmers and retailers bear the full risk of holding unsold subsidized fertilizer and incur the transaction costs of validating the correct documentation for submission to importers after the fertilizer has been sold to farmers. Distributors take delivery of fertilizer from importers' warehouses, pay full cost for the fertilizer and arrange their own transport to the districts. If the fertilizer is sold to retailers, it is sold at full market price; the risk is transferred to retailers. If the fertilizer is sold directly to farmers, it is sold at the subsidized price. At the end of the month, the distributor fills the relevant forms and has them signed at the district and regional levels (which allegedly requires multiple trips and bribing of government officials) and then submits them to the importer. The importer refunds the distributor an amount equivalent to the subsidy (40 percent of market price) plus a transport allowance and commission. (In contrast, under the previous voucher system, it was the importers who bore the risk; that is, wholesalers/distributors and retailers only paid for half the cost of the quantity of fertilizer purchased from importers. Once the fertilizers were sold, they would submit the vouchers to importers for redemption by the government.) These activities and their associated transaction costs can negate the wholesaler and retailer margins that were built into the subsidized price during the importer-government price negotiations.
- The cumbersome nature of the procedures for the refund of the subsidy (the number of forms to be filled out and offices to visit, unavailability of directors at all times for verification and signing of completed forms from retailers) places a huge burden on retailers and creates bottlenecks in the whole system. If a designated signatory of MOFA is not available, then the signing of the documents is also delayed at all subsequent levels.
- There are delays in government reimbursement of the subsidy to the private sector; it can take up to a year or more due to government bureaucracy and/or the lack of government funds. This places a large financial burden on the private

30 *The program was originally implemented using vouchers and intended to benefit small and subsistence farmers. The vouchers were targeted to the product and regions as a means for the government to corroborate payment to importers for the delivered subsidized fertilizer only, and to ensure broad coverage of the subsidy across the country. In theory, the vouchers were also targeted to the small-scale farmer, but this was not the case in practice.*

sector (it ties up their working capital and increases interest charges on borrowed capital) and discourages their future participation in the subsidy program. In Ghana, the fertilizer subsidy programs feature private sector importation and/or distribution. However, a major problem is the government's delays in payments to importers, which compromises the cash flow of these importers. Even though there is a designated financial institution to make subsidy payments on behalf of the government, there are still delays due to bureaucratic voucher corroboration at the MOFA offices and lengthy bank procedures. As a result, importers are frustrated by exposure to foreign exchange losses due to delays in payments, which are made in local currency. Although these potential losses are expected to have been factored into the price previously negotiated with the government, the introduction of these inefficiencies into the program can be problematic. This also increases the capital and product cost for importers and agro-dealers, while reducing the business's ability to finance the procurement of fertilizer for the next planting season. This issue must be addressed, as it will affect the willingness of the private sector to participate in fertilizer subsidy programs.

- The fertilizer subsidy program in Ghana has displaced the commercial/non-subsidized fertilizer market by making subsidized fertilizer accessible to farmers who otherwise can afford to purchase non-subsidized fertilizers; consequently, these wealthier farmers purchase the subsidized fertilizer, and the total amount of fertilizer sold by the private sector is reduced, which in turn contracts their distribution network. This indicates that the targeting and monitoring system is inadequate. Moreover, some MOFA staff do not fully understand the implementation of the subsidy program, and low literacy levels among some retailers reduce the speed of the documentation process.

Table 7 provides a summary of the performance of the subsidy program in Ghana.

Table 7. *Summary of Performance of the Subsidy Program in Ghana*

Ghana		
Does it support private sector distribution development?		+ve Scores
Government is not involved in importation and distribution	+	1
There is no tender process: Government-importer domestic price negotiation/determination with few importers	-	
Market structure: There is domestic market concentration	-	
Payment arrangements: Late subsidy payments to importers	-	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is clear and well-defined: 40 percent of market price	+	4
There is no voucher entitlement to poor/small farmers	-	
Complementary investment There are extension services Program is not linked to a complementary credit facility	 + -	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is no restriction on the maximum quantity of fertilizer per farmer There is pre-registration/screening of beneficiaries	 + - +	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	2
Increases the distance from retailer to farm-gate	-	
Product is normally delivered on time to retailers	+	
Does the program have an exit strategy?		
There is no written exit strategy	-	0
Total +ve Scores		7

3.3 Performance of Subsidy Program – Malawi

3.3.1 Fertilizer Accessibility and Availability

Fertilizer Accessibility

- *Subsidy Rate*

The subsidy program in Malawi has been effective in reducing the fertilizer market price; therefore, the program has made fertilizer more accessible to small farmers. In fact, fertilizer prices have been reduced by as much as 91 percent of the market price due to the subsidy (Table 8).

Table 8. AISP Principal Program Features (Malawi), 2005/06 to 2009/10 Seasons

Variable	2005/06	2006/07	2007/08	2008/09	2009/10
Total subsidy (mt)	131,388	174,688	216,553	202,278	161,495
Households receiving one or more fertilizer vouchers (%)	n/a	54	59	65	n/a
Voucher value (MK/50-kg bag)	1,750	2,480	3,299	7,951	3,841
Redemption price (MK/50-kg bag)	950	950	900	800	500
Subsidy rate (%)	64	72	79	91	88
Local market price of fertilizers (MK/50 kg)	2,700	3,430	4,199	8,751	4,341
International market price: DAP (US $/mt)	-	-	$344	$1,179	Δ=+242.7%
International market price: urea (US $/mt)	-	-	$298	$719	Δ=+141.3%
Total program cost (MK 'million)	7,200	12,729	16,346	39,847	17,140
Total program cost (% national budget)	No data	8.2	9.0	16.2	6.8

Adapted from Minde, Jayne, Crawford, Ariga and Govereh (2008) based on data from the World Bank (2008).

The AISP was able to cushion the poor Malawian farmers from the record high fertilizer prices experienced during the last five years by raising the voucher value while keeping the redemption (top-up) price the same, and at times even reducing it. This was most apparent between 2007/08 and 2009/10 when the international fertilizer market prices increased by 242.7 percent for DAP and 141.3 percent for urea. On the local market, the price of a 50-kg bag of fertilizer increased on average by 108.41 percent, while the Government of Malawi reduced the redemption price by 11.1 percent from MK 900 in 2007/08 to MK 800 in 2008/09.

- *Voucher Availability*

Due to budgetary constraints, the Malawi subsidy program (AISP) is only targeted at poor small farmers. The contentious question of how to define a poor farmer and a non-poor farmer is left to each community to decide, agree and select the beneficiaries. Each selected registered beneficiary receives three vouchers that entitle him or her to purchase the subsidized fertilizers and improved maize seeds from designated selling points. Vouchers are distributed via the extension system of the Ministry of Agriculture, and the fertilizers are distributed via a dense network of 920 ADMARC market outlets across the entire country. About 60 percent of smallholder farmers received at least one fertilizer voucher in the last five seasons (Table 9).

Over the years, the program has increased in size, as measured by the proportion of smallholder farmers able to access the subsidy vouchers; the percentage increased from 54 percent in 2007 to 65 percent in 2009.

Table 9. Accessibility of Vouchers for Subsidized Fertilizers in Malawi, 2005/06 to 2009/10

Variable	2005/06	2006/07	2007/08	2008/09	2009/10
Total subsidy (mt)	131,388	174,688	216,553	202,278	161,495
Households receiving one or more fertilizer vouchers (%)	n/a	54	59	65	n/a

Complementary Services

The Malawi subsidy program is comprised of fertilizer, improved seeds and extension services. These factors build the confidence of the poor small farmers to use fertilizer – and use it in a more effective and productive manner. The program, however, does not have a complementary credit facility to assist farmers to access loans for the top-up. This credit facility may not be very necessary because the subsidy rate is very high; in some years, the subsidy is more than 90 percent of the fertilizer price on the open market. The other complementary service lacking (currently being developed under the Green Belt Development Programme) is irrigation. In bad years, drought undercuts production and yields, thereby greatly reducing the benefit of the subsidy program to poor small farmers.

Direct and Indirect Restrictions to the Non-Poor Farmers

The program excludes the non-poor farmers directly during the process of beneficiary selection. By the open community vetting that determines who should and should not be included on the beneficiary list, the non-poor are screened out. Indirectly, the non-poor are further discouraged (publicly and privately) in accessing subsidized fertilizers because the program enforces the following:

- Limiting the subsidy to only one bag of 23:21:0 + 5S and one bag of urea.
- Restricting sales of subsidized fertilizers to ADMARC depots, where farmers must line up and have their names verified again by openly calling out names.

Fertilizer Availability

National Fertilizer Availability

Since the introduction of the AISP, the total amount of fertilizer used has increased steadily from year to year, driven by subsidized fertilizer (Table 10). Fertilizer consumption has increased in excess of 300,000 mt, which is perhaps an indication of the success of the AISP toward meeting the potential demand for fertilizers, although not in its entirety. Overall, the subsidy program has been effective in making subsidized fertilizer increasingly available to smallholder farmers (Table 10), in spite of the price volatility in the international market, which is putting a great deal of pressure on the Treasury and increasing the nation's fiscal deficit.

Table 10. Availability of Subsidized Fertilizer in Malawi, 2005/06 to 2009/10

Variable	2005/06	2006/07	2007/08	2008/09	2009/10
Estimated potential country total demand	547,000	547,000	547,000	547,000	547,000
Actual amount of subsidized fertilizer	131,388	174,688	216,553	202,278	161,495
Actual subsidized fertilizer as % of total demand	24.0	31.9	39.6	37.0	29.5

Timeliness of Delivery

The availability of subsidized fertilizer products is also determined by the timing of delivery of agro-inputs in the market and the issuing of vouchers to beneficiaries where applicable. This timing is critical for the effective use of fertilizer and seed at the start of the agricultural season. For fertilizer products, the timing of input availability depends upon: timing of the tendering of input purchases; supplier deliveries to depots; staffing and stocking of input markets; subsidy redemption contracts with retailers; and retailer stocking and staffing of input sales points for private sector sales. Overall, timeliness in the issue of vouchers and the delivery of fertilizer to beneficiaries has improved year over year in subsequent programs, with the first year not being very effective in this effort.

3.3.2 Impact on the Private Sector

During the early to mid-2000s, the private fertilizer industry in Malawi showed strong growth, with an estimated 1,000 private fertilizer retailers operating in the country by 2005 (IFDC, 2008). With the introduction of the AISP in the 2005/06 season, some displacement was reported on private retail fertilizer sales. Dorward et al. (2008) reports that commercial fertilizer sales by private retailers fell from an estimated 186,354 mt in 2003/04 to 117,719 mt in 2006/07. Estimates are difficult to acquire, but it is speculated that commercial fertilizer sales fell by around 20-30 percent in 2005/06 and by 30-40 percent for 2006/07.

It is, however, inevitable that such a large subsidy program will have some displacement effect on the private fertilizer retail market. As is the case for Burkina Faso and Ghana, the displacement effect in Malawi is both direct and indirect. The direct displacement relates to leakages where farmers who could otherwise afford to purchase the fertilizers at market prices from commercial sellers also benefited from the subsidy program. Another source of direct displacement comes from the shrinkage of the private distribution network due to the migration of small agro-dealers that were once linked to major importers, who are now supplying the more lucrative and hassle-free market: the subsidy program. Indirect displacement relates to the fact that much of the NGO fertilizer distribution activities in Malawi were scaled down after the introduction of AISP. This had a displacement effect because much of the fertilizer sold by the private sector was sponsored by various NGOs implementing food security programs in Malawi following recurrent food crises. On the other hand, private fertilizer importers clearly benefited from both the growing import volumes as a result of the subsidy program and their growing dominant share in the imports portfolios of the AISP (Table 11). Importers are selected on open tender process; some of the selected importers are supported by the government with access to loans and foreign currency to finance their import allotments.

Table 11. *Private Sector Involvement in Fertilizer Imports and Sales for AISP, Malawi, 2005/06 to 2008/09*

	2005/06	2006/07	2007/08	2008/09
Private sector fertilizer subsidy tender deliveries (mt)	70,000	99,386	97,845	162,784
Private sector fertilizer subsidy tender deliveries (%)	48	72	71	88
Private sector fertilizer retail (%)	0	28	24	0

Malawi country report (2011).

Exit Strategy

The Malawi subsidy program does not have an exit strategy, nor does it have a graduation program for farmers that benefit from the program. As such, the program risks creating a group of subsidy-dependent farmers and weakens the entrepreneurial growth among the small farmers. Table 12 provides a summary of performance of the subsidy program in Malawi.

Table 12. Summary of Performance of the Subsidy Program in Malawi

Malawi		
Does it support private sector distribution development?		+ve Scores
Government is involved in distribution	-	2
Government issues a private tender for importation	+	
Market structure: There is a parallel market that potentially crowds out private sector importers and distributors	-	
Payment arrangements: Government issues letters of credit to importers	+	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is clear and well-defined: more than 50 percent of market price	+	6
There is voucher entitlement to poor/small farmers	+	
Complementary investment: There are extension services Program is not linked to a complementary credit facility	 + -	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is restriction on the maximum quantity of fertilizer per farmer: 2 bags There is pre-registration/screening of beneficiaries	 + + +	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	2
Reduces the distance from retailer to farm-gate	+	
Product is not normally delivered on time to retailers	-	
Does the program have an exit strategy?		
There is no written exit strategy	-	0
Total +ve scores		10

3.4 Performance of Subsidy Program – Nigeria

3.4.1 Fertilizer Accessibility and Availability

Subsidy Rate

According to Table 13, the fertilizer subsidy program in Nigeria has been effective in increasing farmers' accessibility to fertilizer by reducing the price by 25-75 percent of the market price during the period 2007-09, dependent on the state. The actual market price is determined through the FGN negotiation with private importers under the subsidy program.

Table 13. Fertilizer Prices in Nigeria: 2007-2009 (US $)

Fertilizer Products	Fertilizer Prices								
	National Average Market Price			Subsidy or Subsidized Price			Subsidy as Percentage of Market Price		
	2007	*2008*	*2009*	*2007*	*2008*	*2009*	*2007*	*2008*	*2009*
	(US $/50-kg bag)			(US $/50-kg bag)			(%)		
NPK	18.50	33.88	34.00	13.87	25.35	25.50	25.0	25.0	25.0
Urea	20.50	29.60	24.90	15.37	22.20	18.70	25.0	25.0	25.0
Average	**19.50**	**31.74**	**29.50**	**14.60**	**23.77**	**22.10**	**25.0**	**25.0**	**25.0**

Sources: Fertilizer prices and subsidies were estimated based on previous assessments from IFDC and updated through personal communication with local experts. Exchange rates used are the mean annual rates as reported in the website http://www.exchangerate.com.

Voucher Availability

Until 2011, the Nigerian subsidy program did not have a voucher system of subsidy delivery to small poor farmers. As such, any farmer could buy the subsidized fertilizers, and there are reports that only 23 percent of the subsidized fertilizers reached the small poor farmers (IFDC, 2008). There was also no mechanism for entitlement to small poor farmers, such as vouchers or otherwise.

Complementary Services

There is an extension service through the Ministry of Agriculture to small poor farmers. This, in theory, should enable the farmers to use the fertilizer appropriately for maximum productivity gains. The program, however, does not have a complementary subsidy on improved seeds, a credit facility or an irrigation facility. Improved seeds respond well to additional fertilizers; access to credit addresses the financial liquidity constraints faced by the small poor farmers; and irrigation support insures production from the effects of drought. Thus, lacking support on most of these complementary services, subsidies on fertilizer alone may not be as effective at addressing some of the constraints that the program is designed to resolve.

Direct and Indirect Restriction on Access to Subsidized Fertilizer by Non-Poor Farmers

The program targets poor farmers more directly with the process of beneficiary selection. The program only sells fertilizers used for food production, a major preoccupation of small poor farmers. Both the selection of beneficiaries and the limitation of subsidized fertilizers to specific types used by poor small farmers impede, to some extent, access of the subsidized fertilizers to the non-poor farmers. However, the program does not restrict the quantity of fertilizers one farmer may purchase. This renders the program prone to access by the non-poor, as the non-poor can conspire with the poor to get fertilizers under their disguise.

Fertilizer Availability

National Fertilizer Availability

Availability in terms of quantity needs to be assessed in addition to cost accessibility to better determine the program effectiveness in delivering fertilizer. Table 14 presents the basis for assessing effectiveness with respect to availability of subsidized fertilizer. In Nigeria, the in-country estimated total amount of fertilizer demanded is more than 2 million mt, while the subsidy program intends to supply a fraction (about 10 percent) of such amount with the intention to benefit mainly small and subsistence farmers. Table 14 shows that the amount of subsidized fertilizer has been in decline and that the program has not been effective in achieving the targets set forth for the years 2007 through 2009. However, the actual amount supplied under the subsidy program has been approaching the intended amount as a result of the reduction of the intended supplied amount.

Table 14. *Subsidized Fertilizer Consumption in Nigeria, 2007-09*

	2007	2008	2009
Estimated potential in-country total fertilizer demand (mt)	2,004,000	2,124,000	2,520,000
Intended amount of subsidized fertilizer (mt)	211,200	260,000	160,000
Actual amount of subsidized fertilizer supplied/consumed (mt)	118,904	226,636	148,425
Actual percentage of intended subsidized fertilizer (%)	56	87	93
Percentage of actual subsidized fertilizer relative to total demand (%)	6	10	6

Source: Local consultant report.
Note: The intended and actual amount of subsidized fertilizer is for use in maize and other cereals.

In determining the amount of fertilizer to be supplied under the subsidy program in Nigeria, farmers' needs are not a primary consideration. Rather, it is the available budget that determines the quantity to be supplied under the program. Hence, the quantity that can be accommodated by the budget is that which is usually supplied under the government subsidy program. Still, the government has been unable to deliver 100 percent of these committed amounts of subsidized

fertilizer, covering 56, 87 and 93 percent of such commitments (or 6, 10 and 6 percent of the total estimated fertilizer demand) between 2007 and 2009. This implies that although the program has been effective in making fertilizer more affordable in terms of price, it has not been effective in ensuring that the targeted amount of subsidized fertilizer is available to farmers in terms of quantity, especially when considering that such an amount is not higher than 10 percent of the total estimated demand. Therefore, the lack of effectiveness in making subsidized fertilizer available to small farmers cancels out the effectiveness of accessibility to a large number of the intended farmer population. According to the in-country report, more than 80 percent of farmers received less than a 50-kg bag of government-subsidized fertilizer over the years identified. This quantity of fertilizer, as obtained by farmers under the present subsidy scheme, cannot have a significant impact on yield and production.

Furthermore, as the subsidized fertilizer is transferred from federal to local authorities, there are leakages of fertilizer out of the program into the black market where it is sold at a non-subsidized price in the domestic market and outside the country. This leakage reduces the amount of subsidized fertilizer available for the intended farming population. Consequently, some farmers may receive less than the optimal amount of fertilizer according to their planted area and crops, while others may not receive fertilizer at all. The subsidy program distribution process also offers a rent-seeking opportunity for government officials, which further constrains the amount of subsidized fertilizer available for the intended farming population.

- *Timeliness of Delivery*

There have been delays in the government disbursement to pay the private sector for the subsidy component, which has affected the timeliness of delivery. Delayed payment also places a financial constraint on importers and restricts their ability to procure fertilizer for the following cropping season. This therefore discourages importers from continuing to participate in the program.

3.4.2 Impact on the Private Sector

The FGN has allowed the involvement of the private sector in the subsidy program by procuring subsidized fertilizer through private importers, based on FGN-importer negotiations. However, this process is not transparent, nor does it allow the private distribution network to participate in the distribution of subsidized fertilizer. This has introduced some distortions in the market, which crowd out the private sector. With regard to the importation, negotiations with importers are not transparent and preference is given to certain importing companies based on their political influence with federal and state government officials. This reduces competition and discourages the participation of importers that may have the capability to participate in the subsidy program. With regard to the exclusion of the private sector from distribution of the subsidized fertilizer, the private sector is being crowded out by the sale of subsidized fertilizer on the black market, at prices that are typically below the market price and above the subsidized price. This has reduced fertilizer sales by the private sector. It also means that the intended beneficiaries of the subsidized fertilizers, small-scale subsistence farmers who can only afford fertilizer at the subsidized price, are not gaining access to the subsidized fertilizer. Instead, this fertilizer is being purchased by commercial farmers – a group who would be willing and able to pay the market price otherwise. A key reason for this distortion is that the subsidy program is not targeted. Hence, the private sector is being crowded out by the illicit sale of the subsidized fertilizer and is discouraged from investing in the expansion of the distribution network. The total amount of fertilizer that would otherwise be consumed in the country has also been reduced. Finally, the establishment of an elaborate federal- and state-sponsored distribution network to distribute the subsidized fertilizer further discourages investment by the private sector in a retail distribution network. The fact that the subsidy program accounts for 70 percent of the fertilizer market further discourages the expansion of the private distribution network.

Exit Strategy

The Nigerian subsidy program does not have an exit strategy nor does it have a graduation program for farmers that benefit from the subsidies. As such, the program risks creating a group of subsidy-dependent farmers and weakens the entrepreneurial growth among the small farmers.

Table 15. Summary of Performance of the Subsidy Program in Nigeria

Nigeria		
Does it support private sector distribution development?		+ve Scores
Local governments involved in distribution	-	1
Government issues a private tender for importation	+	
Market structure: There is a parallel market that potentially crowds out private sector distribution	-	
Payment arrangements: Government does not facilitate access to credit for importation and provides late payment to importers	-	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is defined: from 25 up to 75 percent of market price*	+	4
There is no voucher entitlement to poor/small farmers**	-	
Complementary investment There are extension services Program is not linked to a complementary credit facility	 + -	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is no restriction on the maximum quantity of fertilizer per farmer There is pre-registration/screening of beneficiaries	 + - +	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	2
Reduces the distance from retailer to farm-gate	+	
Product is normally not delivered on time to retailers due to late government payments to importers	-	
Does the program have an exit strategy?		
There is no written exit strategy	-	0
Total +ve scores		**7**

**Subsidy rate varies by states from 25 up to 75 percent.*
***Assessment is based on the 2010 subsidy program, previous to its current program.*

3.5 Performance of Subsidy Program – Rwanda

3.5.1 Fertilizer Accessibility and Availability

Fertilizer Accessibility

- *Physical Access*

There is evidence that the CIP has not been effective in reducing the distance traveled by farmers to access subsidized fertilizers. Despite indications to the contrary during the bidding process, none of the participating distributors had an agro-dealer network. As a result, when they distributed the fertilizer, they fell short of reaching the farm-gate due to their weak or non-existent agro-dealer networks. Instead, they delivered the fertilizer to their rural warehouses in the production zones, which are still considerable distances from the farm-gate. The responsibility of transporting the fertilizer to the farm-gate was left to the farmers.

- *Subsidy Rate*

In Rwanda, the CIP program has been effective in improving the accessibility of fertilizers to farmers by reducing the price by 72 percent in 2006 and 50 percent in 2007, 2008 and 2009. This good performance is due to the design of the subsidy program, whereby the government fixes the price on a cost-plus basis, offering a maximum margin over the government reserve price.

Voucher Availability

The Government of Rwanda has in place a precise electronic-based voucher system for targeting fertilizer to the intended farmer population. The process of voucher redemption is simple and relatively transparent, which reduces transaction costs and the opportunity for rent-seeking. Once the farmer redeems the voucher with an agro-dealer, the agro-dealer simply submits it for payment at the designated bank. There are no regional or district committees or signatures required. The process is centralized under the control of RADA (an autonomous body within MINAGRI) who has contracted out many of the services to independent service providers. This introduces an element of professionalism and objectivity to the process, which reduces delays and the incidence of bribery. Unfortunately, the system has not been implemented successfully, affecting the effectiveness in terms of timely delivery of vouchers to farmers. This was due to a number of issues with the voucher system – printing the vouchers was time-consuming (printing 500 vouchers could take 42 hours, which created long waiting lines for farmers), and some rural areas lacked sufficient electricity and information and communication technology (ICT) equipment.[31]

Complementary Services

A key reason for this good performance was the condition of the CIP 2007-09 that fertilizer vouchers were to be used in combination with improved seed. In addition, a public relations extension team was part of the implementation of the voucher program with the responsibility of promoting awareness of the program and ensuring proper use of fertilizers and other inputs.

Furthermore, the CIP linked farmers to nine microfinance institutions. As a result, some farmer beneficiaries have access to credit to help pay the remaining 50 percent of the market price required to gain access to the subsidized fertilizers. However, there are indications that some farmers have difficulty repaying credit as a result of crop failures due to weather-related problems, and since there are no risk management financial instruments to hedge against this risk, there is a high level of defaults on loans. Another characteristic of the design of the CIP program is that the fertilizer subsidy program is implemented as part of a comprehensive technical package which combines the use of improved seeds, fertilizers and the provision of extension services to ensure the use of correct farming techniques, and incorporates economic incentives (linkages with private sector providers) to induce farmers to adopt the input packages.

Fertilizer Availability

National Fertilizer Availability

Table 16. *Availability of Subsidized Fertilizer in Rwanda, 2007-09*

	2007	2008	2009
Intended amount of subsidized (vouchered) fertilizer (mt)	7,132	6,200	13,500
Actual amount of subsidized (vouchered) fertilizer (mt)	7,077	6,189	13,442
Actual amount as percent of intended amount of subsidized fertilizer (%)	99.2	99.8	99.6

Source: Rwanda country report, Table 5, Page 23.
However, the amount of subsidized fertilizer available for distribution through the program does not reflect the amount that was actually sold at auction. For example, in CIP 2009A, 14,324 mt of subsidized fertilizer was available for distribution through the program (Morris et al., 2009). Of this amount, 7,404 mt were sold at auction and 1,063 mt were sold via supplementary contracts, leaving a balance of 6,000 mt in stock at the end of December 2009.[32]

The data in Table 16 indicate that every year since the subsidy program was launched in 2007, the actual amount of fertilizer imported for distribution under the voucher system has increased, and is slightly below the planned amount for an average of 99.5 percent of the intended amount. In 2007, the actual amount of subsidized fertilizer provided by the voucher program was 7,077 mt; the intended amount was 7,132 mt, and the program reached an estimated 67,400 farm households. In 2008, the actual amount of fertilizer provided for the voucher program was 6,189 mt; the intended amount was 6,200 mt, and the program reached an estimated 58,943 farm households. In 2009, the actual amount of fertilizer provided by the voucher program was 13,442 mt; the intended amount was 13,500 mt, and the program reached

31 *Crop Intensification Program Evaluation Report, IFDC CATALIST Project, March 2010.*

32 *It is not clear why there is a discrepancy between figures reported for CIP 2009A by Morris et al. (2009) and the Rwanda country report.*

an estimated 128,019 farm households.[33] This increase in the total amount of subsidized fertilizer provided by the voucher program (2007 and 2009) reveals an improvement in the overall ability of the subsidy program to increase the availability of subsidized fertilizers for the voucher program and in the Rwanda market.

In terms of the number of beneficiaries, under the CIP 2008/09, 29,261 vouchers were distributed, representing nearly 4,500 mt of fertilizers. The number of farmer beneficiaries was 87,000 maize and wheat growers, less than the 100,000 targeted farmers, according to the CIP 2008-09 Evaluation Report (IFDC, March 2010); this indicates that in spite of the program being highly effective at providing the targeted amount of subsidized fertilizer, and therefore increasing availability in the domestic market, it has not been as effective at reaching the targeted population.

3.5.2 Impact on the Private Sector

The main objective of the CIP auction is to support the development of a private sector-led fertilizer marketing and distribution network. Nevertheless, some early experiences indicate that the program was not contributing to this objective. The primary reason was that none of the distributors who participated in the program had a network of agro-dealers. In addition, the successful bidders included a combination of business people with different types of expertise (producer cooperatives, fertilizer dealers, entrepreneurs). These business people were all experienced in fertilizer importation, but had little to no experience in fertilizer distribution. As a result, many of them underestimated their distribution costs, overbid in the auction and incurred losses. Table 17 provides a summary of the performance of the subsidy program in Rwanda.

Table 17. *Summary of Performance of the Subsidy Program in Rwanda*

Rwanda		
Does it support private sector distribution development?		+ve Scores
Government is involved in importation	-	3
Government issues a private tender for distribution	+	
Market structure: Open distribution/retail domestic market	+	
Payment arrangements: Government self-finances importation and also finances distributors	+	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is clear and well-defined: 50 percent of market price	+	7
There is voucher entitlement to poor/small farmers*	+	
Complementary investment There are extension services Program is linked to a complementary credit facility	 + +	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is restriction on the maximum quantity of fertilizer per farmer There is pre-registration/screening of beneficiaries	 + + +	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	2
Not effective at reducing the distance from retailer to farm-gate	-	
Product is normally delivered on time to retailers	+	
Does the program have an exit strategy?		
There is a not a written exit strategy**	-	0
Total +ve scores		**12**

**Because of voucher delays, farmers have delayed access to vouchers and fertilizer.*
***Government is yet to elaborate on an exit strategy.*

33 *These estimates are taken from the Rwanda country report; the computation is based on a subsidy rate of 75 kg/0.5 ha and average land holding of 0.7 ha per farm household.*

3.6 Performance of Subsidy Program – Senegal

3.6.1 Fertilizer Accessibility and Availability

Subsidy Rate

According to Table 18, the Senegalese fertilizer subsidy program has been effective in increasing the farmers' accessibility to fertilizer by reducing the price by the intended target of 50 percent of the market price between 2008 and 2010. In this case, the market price is the one determined by the government's tender bid process under the subsidy program.

Table 18. Fertilizer Prices in Senegal: 2008-10 (US $)

Fertilizer Products	Fertilizer Prices								
	National Average Market Price			Subsidy or Subsidized Price			Subsidy as Percentage of Market Price		
	2008	*2009*	*2010*	*2008*	*2009*	*2010*	*2008*	*2009*	*2010*
	Price (US $/50-kg bag)			Price (US $/50-kg bag)			(%)		
NPK (15:15:15)	44.20	36.00	36.45	21.20	18.00	18.23	48.0	50.0	50.0
Other NPK	31.25	30.82	31.18	15.62	15.36	15.59	50.0	49.8	50.0
Urea	31.25	27.54	27.87	15.63	13.77	13.93	50.0	50.0	50.0
Average	**35.57**	**31.45**	**31.83**	**17.48**	**15.71**	**15.91**	**49.3**	**49.8**	**50.0**

Sources: Fertilizer prices and subsidies were estimated based on previous assessments from IFDC and updated through personal communication with local experts. Exchange rates used are the mean annual rates as reported on the website http://www.exchangerate.com.

Voucher Availability

The Senegal subsidy program does not have a targeting mechanism either to the intended beneficiary farming population or to the fertilizer products. As previously described, all farmers are to visit the local distribution committee once the fertilizer has been delivered to the regional warehouses and claim the amount of fertilizer needed, according to the type of crops and cropping areas. Although the committee is expected to give priority to small farmers, this process may not work properly given that the committee members may lack full knowledge of the farmer population they serve, resulting in misallocation of fertilizer and consequently contributing to the ineffectiveness of the subsidy delivery.

■ *Complementary Services*

There is extension service provided by the Ministry of Agriculture to small poor farmers. The program also has a complementary credit facility. The extension service provides training and skills to farmers in the better use of fertilizer for maximum productivity gains. Additionally, access to credit addresses the financial liquidity constraints faced by the small poor farmers in procuring fertilizers. The program, however, does not have a complementary subsidy on improved seeds or an irrigation facility. Improved seeds respond well to additional fertilizers, and irrigation support insures production from the effects of drought. Thus, without support on these two complementary services, subsidies on fertilizer alone may not be as effective at addressing some of the constraints the program is designed to overcome.

■ *Direct and Indirect Restriction on Access to Subsidized Fertilizers by the Non-Poor Farmers*

The program targets poor farmers more directly through the process of selection of beneficiaries. The program only sells fertilizers used for food production, a major pre-occupation of small poor farmers. Both the selection of beneficiaries and the limitation of subsidized fertilizers to specific types used by poor small farmers impede, to some extent, access of the subsidized fertilizers to the non-poor farmers. However, the program does not restrict the quantity of fertilizers one farmer may purchase. This renders the program prone to access by the non-poor, as the non-poor can conspire with the poor to get fertilizers under their disguise.

Fertilizer Availability

National Fertilizer Availability

In Senegal, the in-country amount of fertilizer demanded by small farmers (the intended beneficiaries) originally was estimated at 120,000 mt. Table 19 shows that the subsidy program, intended to provide at least 50 percent of the small farmers' demand, was not effective at achieving such targets between 2008 and 2010. Although the intended amounts of subsidized fertilizer to be provided increased from 50 to 58 percent of total small farmers' demand between 2008 and 2010, the program has been unable to deliver 100 percent of these commitments, covering 97, 72 and 78 percent of such commitments (or 48, 42 and 45 percent of the total small farmers' fertilizer demand) in the years 2008, 2009 and 2010, respectively. This implies that although the program has been effective at making fertilizer more affordable in terms of price, it has not been effective in ensuring that the right amount of subsidized fertilizer is available to them in terms of quantity. Therefore, the lack of effectiveness to make subsidized fertilizer available to small farmers negates the effectiveness of accessibility, at least to a certain number of the intended farmer population. Furthermore, given the delays in the government disbursement of payments to the private sector for the subsidy component, this affects the timeliness of delivery, since such delays place a financial constraint on the importer; this also delays the acquisition and delivery of fertilizer during the following cropping season. Consequently, there is an effect on yield and production, since fertilizer is not applied in a timely manner or not applied at all.

Table 19. *Subsidized Fertilizer Consumption in Senegal, 2008-10*

	2008	2009	2010
Estimated in-country total fertilizer demand (mt)	**120,000**	**120,000**	**120,000**
Intended amount of subsidized fertilizer (mt)	**60,000**	**69,000**	**69,000**
Actual amount of subsidized fertilizer supplied/consumed (mt)	**58,000**	**50,000**	**54,000**
Actual percent of intended subsidized fertilizer (%)	**97.0**	**72.3**	**78.3**
Percent of actual subsidized fertilizer relative to total demand (%)	**48.3**	**41.6**	**45.0**

Source: Previous assessment by IFDC and personal communication for updates.

Availability and Timeliness of Delivery

Furthermore, the local distribution committee is to assign fertilizer to farmers in the most equitable manner on a first-come, first-served basis, while also considering the amount of land being cropped by an individual farmer (facts that the committee does not have the means to corroborate). This implies that some farmers may receive more fertilizer than necessary according to their cropped area, others may receive less and still others may be left without fertilizer completely (especially considering that the amount of subsidized fertilizer imported typically covers less than 50 percent of the expressed demand by small farmers). To make matters worse, this distribution process offers the opportunity for officials to obtain excess subsidized fertilizer by overstating the amount needed at a particular farm. The excess fertilizer is eventually sold on the black market at a profit, finding its way outside the country, mainly to neighboring countries; the process further limits the amount of fertilizer available to the intended farmer population, in spite of the program improving its accessibility in terms of cost.

3.6.2. Impact on the Private Sector

The private sector in Senegal is allowed to participate in the importation of fertilizers for the subsidy program based on a tender-bid process. However, distribution is via official government channels and private sector participation is not allowed. This arrangement has introduced a number of distortions in the market that have discouraged the expansion of the private distribution network. First, the tender-bid process is not transparent. Typically, the bids are not evaluated in an objective manner, but instead the evaluation process and decision-making are subject to political influence, whereby preference is given to private importers that have political clout with the government. Companies that are representatives of international fertilizer manufacturers or suppliers are not allowed to participate. This arrangement reduces competition at the importer level and creates ample opportunity for rent-seeking. Moreover, participating importers are frustrated by the numerous administrative steps required to obtain authorization for treasury payment and the delays in payment by the government for the subsidized fertilizer. Secondly, since the subsidy accounts for 80 percent of the fertilizer market, this leaves a limited

share of the market for the private sector; hence, the importers have little incentive to invest in the development of a retail distribution network. This lack of incentive is exacerbated by a third factor that further constrains the development of the retail sector in rural areas: the distribution of the subsidized fertilizer via local committees and representatives of the different local officials and the use of public warehouses for storage and disbursement to farmers. Finally, the subsidy is not targeted using a voucher or any other targeting mechanism. Instead, selection is on a first-come, first-served basis and guided by eligibility criteria set by the local committees – a process which is open to rent-seeking and allocation of subsidized fertilizers to those who may not benefit the most from them. Table 20 provides a summary of the performance of the subsidy program in Senegal.

Table 20. Summary of Performance of the Subsidy Program in Senegal

Senegal		
Does it support private sector distribution development?		+ve Scores
Local governments involved in distribution	-	2
Government issues a private tender for importation	+	
Market structure: There is a parallel market that potentially crowds out private sector distribution	-	
Payment arrangements: Government facilitates access to credit for importation	+	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rates are clear and well-defined: 50 percent of market price	+	5
There is no voucher entitlement to poor/small farmers	-	
Complementary investment: There are extension services Program is linked to a complementary credit facility	 + +	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is no restriction on the maximum quantity of fertilizer per farmer There is pre-registration/screening of beneficiaries	 + - +	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	3
Reduces the distance from retailer to farm-gate	+	
Product is normally delivered on time to retailers	+	
Does the program have an exit strategy?		
There is no written exit strategy	-	0
Total +ve scores		**10**

3.7 Performance of Subsidy Program – Tanzania

3.7.1 Fertilizer Accessibility and Availability

The goal of the fertilizer subsidy program in Tanzania can be summarized as: developing the private sector input supply system; reducing poverty; and attaining household and national food security. The Ministry of Agriculture complemented the subsidy program with fertilizer demonstration plots for farmers to learn about the use of fertilizer and other inputs. Nearly 1,200 demonstration plots were planted throughout Tanzania as part of the program in 2009/10.

Fertilizer Accessibility

- *Physical Access*

The distance farmers traveled to access fertilizers declined from an average of 40 km before 2008/09 to an average of 5.0 km in 2009/10. This was due to the fertilizer subsidy program's deliberate strategy to inform registered agro-dealers about the voucher program and encourage them to strategically place the inputs to make them more accessible to farmers.

Subsidy Rate

The fertilizer subsidy program has increased farmers' accessibility to fertilizers by reducing the price by 50 percent between the years of 2008/09 and 2009/10. In fact, this has been the case since the subsidy program was introduced in 2007/08; that is, while the design of the fertilizer subsidy program in Tanzania has changed, the amount of the subsidy has always been 50 percent of the market price of fertilizers. However, farmer beneficiaries are expected to pay the remaining 50 percent of the market price to gain access to the subsidized fertilizers, and the subsidy program does not include credit facilities to farmers. Therefore, the increase in accessibility, in terms of price reduction introduced by the program, is only beneficial to farmers who already have their own funds or access to finance to invest in farming. Consequently, although the subsidy program has increased the price accessibility of fertilizers to farmers, these benefits may not accrue to all of the intended beneficiaries (not all of the targeted beneficiaries may be able to pay 50 percent of the market price); those who are able to pay the 50 percent to access the fertilizer may not reap the full economic benefits of fertilizer use.

Voucher Availability

The National Voucher Steering Committee (NVSC) provides guidelines and oversees the implementation of the fertilizer subsidy program. The committee is chaired by the Permanent Secretary of Agriculture and includes representatives from the Ministry of Finance, Ministry of Agriculture, national farmers' organizations, fertilizer producers and importers and civil society organizations (CSOs). The Agricultural Input Section in the Ministry of Agriculture serves as the NVSC Secretariat. The Secretariat coordinates project activities and facilitates implementation. With regard to distribution of vouchers to beneficiaries, it is based on regions (Southern and Northern regions and Western Region) and focuses on maize and rice farmers. Targeting at the household level uses the following criteria: the farmer should be living in the village and be a full-time farmer growing maize and rice; the farmer should not own more than 1 ha of land; the farmer should be willing to use the provided inputs on these crops and undertake the recommended agricultural practices; and the farmer should be willing and able to pay for 50 percent of the market price of the fertilizers. Priority is given to female-headed households and households that have not used any or have used very little fertilizer and improved seeds to grow these crops over the last five years.

The voucher program is implemented as follows. First, the national demand for agricultural inputs (fertilizers and seeds) based on historical input use is estimated by the Regional Voucher Secretariat (RVS) and transmitted to the NVSC. The RVS also informs districts about their allocation and initiates the process of further allocation of vouchers to wards and villages by the local government authorities. At the district level, the District Voucher Committee (DVC), which is comprised of representatives of farmer groups, agro-dealers and CSOs, collaborates with the NAIVS district forum to allocate vouchers to wards and villages. At the village level, the Village Voucher Committee (VVC) is responsible for selecting beneficiary farmers and, upon endorsement by the village council, issues the vouchers to the beneficiaries. The VVC also monitors the use of the inputs by beneficiaries and provides regular reports to the village council and government, which then report up the channel through to the NVSC.

Complementary Services

Agro-dealers were trained by the Tanzania Agro-Dealer Strengthening Program (TASP) and also receive financial support to purchase inputs; 2,702 agro-dealers were trained in 2009/10 and participated in the program. Therefore, the subsidy program was effective in increasing the availability and accessibility of fertilizers and contributed to the expansion of the distribution network closer to farmers.

Fertilizer Availability

National Fertilizer Availability

In 2008/09, the national demand for fertilizers in Tanzania was estimated to be 385,000 mt. The estimated demand of the targeted farmer beneficiaries was 130,000 mt (that is, the intended amount of fertilizer to be provided by the fertilizer subsidy program), but the actual amount of 141,050 mt exceeded this target. In 2009/10, the actual amount of fertilizer provided by the subsidy program (151,000 mt) was 76 percent of the intended amount (200,000 mt), and the program reached 80 percent (1,199,596) of farmer households against a target of 1.5 million intended beneficiaries. The increase in the total amount of subsidized fertilizer provided under the program between 2008/09 (141,050 mt) and 2009/10 (151,000 mt) indicates an improvement in the overall ability of the subsidy program to meet the target population's demand for subsidized fertilizers. Overall, the subsidy program has effectively increased the amount of subsidized fertilizer available to smallholder farmers and to the market. However, whereas the actual amount of subsidized fertilizers in 2008/09 exceeded the set target, the actual amount of subsidized fertilizers provided in 2009/10 was less than the intended amount. This

decline may be due to the rapid expansion of the program between 2008/09 and 2009/10 from 11 to 20 regions (Table 21), to budget constraints and to fertilizer price volatility in the international market.

Table 21. *Availability of Subsidized Fertilizer in Tanzania, 2008/09 and 2009/10*

	2008/09	2009/10
Estimated total demand (mt)	385,000	385,000
Intended amount of subsidized fertilizer (mt)	130,000	200,000
Actual amount of subsidized fertilizer (mt)	141,050	151,000
Actual amount as a percentage of the intended amount of subsidized fertilizer (%)	108	76
Actual subsidized fertilizer as a percentage of total demand (%)	37	39

Timeliness of Delivery

Although the subsidy program increased accessibility and availability of subsidized fertilizers to farmers, it was not successful in terms of timely delivery as a result of late voucher delivery. Specifically, late delivery of vouchers to farmers and inadequate knowledge or lack of knowledge and understanding about the voucher program by stakeholders were problems. These factors contributed to the discrepancy between the intended and actual amount of subsidized fertilizers. Furthermore, there is anecdotal evidence of inadequate monitoring, coordination and management of the program at regional, district, ward and village levels. Members of the Village Management Committees did not apply themselves seriously or did not uphold their responsibility to select beneficiaries who met the criteria and to monitor them. The results are unreliable records of the number of beneficiaries and little data on the area fertilized (number of hectares) and yields. Members of the district-level committees did not pay sufficient attention to the coordination, monitoring and evaluation of voucher committees, which allowed for the selection of dishonest agro-dealers.

3.7.2 Impact on the Private Sector

The market-friendly characteristics of the NAIVS subsidy program have had a positive impact on the private distribution network. In 2005/06, there were just over 500 agro-dealers in Tanzania. In 2008/09, 1,684 agro-dealers were trained and involved in the distribution of subsidized fertilizers. By 2009/10, 2,702 agro-dealers received training in the handling and marketing of agricultural inputs, and 2,345 agro-dealers were involved in distribution of the inputs. As a result, the fertilizer subsidy program in Tanzania has contributed to the expansion of the private distribution network closer to the farmer. This impressive result can be attributed to the exclusive use of the private sector to import and distribute the fertilizer for the subsidy program and the complementary investments in agro-dealers (training and access to finance). The Ministry of Agriculture is responsible for implementation, but the most involved and time-consuming activity is the selection of farmer beneficiaries. Once the vouchers have been issued to selected farmers, the process of farmer redemption of the voucher and payment to the agro-dealers is a simple one-step process. No additional signatures or trips to various officials are required.

The two main private sector bodies supporting this process are agro-dealers and the National Microfinance Bank (NMB). Agro-dealers are informed of the government's intention to issue vouchers to farmers and are encouraged to place the inputs in strategic locations where the farmers will be able to access them without much difficulty. In 2009/10, 3,000 registered agro-dealers were selected to participate in the provision of inputs to farmers with vouchers. The government then partnered with an ongoing project, TASP, which is being implemented by CNFA, with funding from the Alliance for a Green Revolution in Africa (AGRA), to provide training and financial support to the registered agro-dealers. The agro-dealers receive training on their role in the implementation of the voucher system vis-à-vis their linkages with farmers on one hand and the participating commercial bank on the other (in this case, the NMB). The registered agro-dealers also receive support to address their short-term working capital needs through a Credit Guarantee program being implemented by AGRA through NMB. Thus, training agro-dealers, facilitating the adequate supply of inputs to reach the farmers and addressing the short-term working capital needs of the agro-dealers are areas that the project is addressing directly or in collaboration with other partners such as AGRA. Table 22 provides a summary of the performance of the subsidy program in Tanzania.

Table 22. Summary of Performance of the Subsidy Program in Tanzania

Tanzania		
Does it support private sector distribution development?		+ve Scores
Government is not involved in importation and distribution	+	4
Government issues a private tender for importation	+	
Market structure: There is an open market	+	
Payment arrangements: Registered agro-dealers have access to finance facilities	+	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is clear and well-defined: 50 percent of market price	+	6
There is voucher entitlement to poor/small farmers	+	
Complementary investment: There are extension services Program does not have a complementary credit facility	 + -	
Indirect restrictions to non-poor farmers: There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers There is restriction on the maximum quantity of fertilizer per farmer There is pre-registration/screening of beneficiaries	 + + +	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	3
Reduces the distance from retailer to farm-gate	+	
Product is normally delivered on time to retailers	+	
Does the program have an exit strategy?		
There is a written exit strategy	+	1
Total +ve scores		**14**

3.8 Performance of Subsidy Program – Zambia

3.8.1 Fertilizer Accessibility and Availability

Fertilizer Accessibility

- *Subsidy Rate*

The fertilizer subsidy program has increased farmers' accessibility to fertilizers by reducing the price of fertilizer by a minimum of 50 percent between 2002/03 and 2009/10. In fact, the subsidy rate increased to 60 percent in seasons 2006/07 and 2007/08, then to 80 percent in season 2008/09 before it settled back at 50 percent in the season 2009/10 (Table 23). However, farmer beneficiaries are expected to pay the remaining 50 percent of the market price to gain access to the subsidized fertilizers, and the subsidy program does not extend credit facilities to farmers.

Voucher Availability

The Zambian subsidy is not targeted at the poor, but rather at those farmers with productive capacity to use the subsidies best. As such, any farmer can buy the subsidized fertilizers.

Table 23. Subsidy Rate in Zambia, 2002/03 to 2009/10

Crop Season	Subsidy Rate (%)
2002/03	50
2003/04	50
2004/05	-
2005/06	50
2006/07	60
2007/08	60
2008/09	80
2009/10	50

Sources: MACO, FISP Implementation Manual, various.

Complementary Services

There is extension service offered by the Ministry of Agriculture to small poor farmers. The program also has a complementary subsidy on improved seeds and is linked to a credit facility via farmers' cooperatives. Access to improved seeds and extension services enhance the efficiency and effectiveness of fertilizer utilization for maximum productivity gains. Additionally, access to credit addresses the financial liquidity constraints faced by the small poor farmers in procuring fertilizers. The program, however, does not have a complementary subsidy on irrigation facility. Irrigation support insures production from the effects of drought. Thus, without such support, anticipated production gains from subsidies on fertilizer alone may be seriously undercut by a drought in this drought-prone region of Africa.

Fertilizer Availability

National Fertilizer Availability

Overall, the subsidy program is effective in providing an adequate supply of fertilizer to smallholder farmers. Compared with the 1991-2001 period, subsidized fertilizer supplied by the Government of Zambia increased by more than 50 percent, from an annual average of 42,505 mt to 66,345 mt during the 2002-10 period. The quantity of fertilizer procured under the program has increased from 48,000 mt in 2002/03 to 100,000 mt in 2009/10. The FISP now covers about 50 percent of small-scale farmers in the country. Two conditions enabled the Zambian government to scale-up the subsidies without major challenges: (a) the transition of the World Bank and other donors from conditional agreements to direct budget support; and (b) debt cancellation under Highly Indebted Poor Countries (HIPC) meant more financial resources for the Zambian government.

Timeliness of Delivery

Although the FISP has been effective in providing an adequate amount of fertilizer to small-scale farmers, timeliness of delivery is a large problem. The World Bank evaluation of the 2007/08 FSP reports that most farmers received the inputs late – after the rainy season had started. In fact, 63 percent of FSP beneficiaries received the inputs in November, 31 percent received their inputs in December and two percent received the inputs as late as January. This is contrary to MACO's intention to have all the subsidized inputs reach the district level by the end of September.

3.8.2 Impact on the Private Sector

The private sector imports 100 percent of the fertilizer requirement for Zambia's subsidy program in response to government requests for tenders. Private transporters transport the fertilizer on behalf of the government to the rural areas and deliver the inputs to the selected farmer cooperatives and organizations. The private distribution network is not involved in distribution. Since the fertilizer subsidy program accounts for 50 percent of the fertilizer market, the distribution of such a large quantity of subsidized fertilizer via official government channels has resulted in reluctance on the part of the private sector to expand its distribution network; they are unwilling to risk being saddled with unsold stock in the event that farmers choose to wait for the subsidized fertilizer. This fear has been validated by the impact of the subsidy program at the retail level. Xu et al. (October 2008) reports a 75 percent crowding-out effect among larger farming operations in accessible areas with large numbers of private retailers, whereby farmers who are able to buy fertilizer at market price opt instead to purchase the cheaper subsidized fertilizer. So, in addition to crowding out the private sector, the fertilizer subsidy program is not reaching subsistence farmers who cannot afford to purchase fertilizer at market price. However, the authors also found that in remote areas sparsely served by the private sector, distribution of subsidized fertilizer tended to boost demand for commercial fertilizer, and consequently increased or 'crowded in' private sector activity. With respect to whether the program has helped build capacity, the Zambia country study reported that only two companies have been awarded contracts to supply urea fertilizer since the inception of FISP, and only the parastatal Nitrogen Chemicals of Zambia Limited has supplied D-Compound fertilizer after the first two years of the program. Table 24 provides a summary of the performance of the subsidy program in Zambia.

Table 24. *Summary of Performance of the Subsidy Program in Zambia*

Zambia		
Does it support private sector distribution development?		+ve Score
Government is involved in distribution	-	1
Government issues a private tender for importation	+	
Market structure: There is a parallel market that potentially crowds out private sector importers and distributors	-	
Payment arrangements: Private sector self-finances	-	
Does it increase accessibility of fertilizer to small/poor farmers?		
Subsidy rate is clear and well defined: 60 percent of market price	-	6
There is no voucher entitlement to poor/small farmers	-	
Complementary investment		
There are extension services	+	
Program is linked to a complementary credit facility	+	
Indirect restrictions to non-poor farmers:		
There is a restriction on the type of fertilizer subsidized to those used by small/poor farmers	+	
There is restriction on the maximum quantity of fertilizer per farmer: 4 bags	+	
There is pre-registration/screening of beneficiaries	+	
Does it increase availability of subsidized fertilizer to small/poor farmers?		
Increases quantity of subsidized fertilizer	+	3
Reduces the distance from retailer to farm-gate	+	
Product is normally delivered on time to retailers	+	
Does the program have an exit strategy?		
No clear exit strategy*	-	0
Total +ve scores		**10**

** Although the program was designed for three years, it still continues.*

Table 25. *Summary of Performance Analysis of the Eight Country Fertilizer Subsidy Programs*

Country	Role of Government	Role of Private Sector	Input Voucher (Yes/No)	Other Attributes	Year Subsidy Introduced	Scores
Burkina Faso	Purchase from importers Warehousing Retailing	Transport	No	Extension service No credit support No quantity limit Pre-season registration	2008/09	7
Ghana	Negotiates price Pay importers based on waybills	Importation Wholesaling Transport Warehousing Retailing	No	No quantity limit per beneficiary Pre-season registration Extension service No credit	2009	7
Malawi	Purchase from importers Warehousing Retailing Distributes coupons	Importation Transport	Yes	Improved seed subsidy Extension service No credit support Quantity limit Pre-season registration	1997/98	10
Nigeria	Purchase from importers Warehousing Retailing	Importation Transport	No	Extension service No credit support No quantity limit Pre-season registration	2002	7
Rwanda	Importation Wholesaling	Transport Warehousing Retailing	Yes	Improved seed subsidy Extension service Credit support Quantity limit Pre-season registration	2007	12
Senegal	Purchase from importers Warehousing Retailing	Importation Transport	No	Extension service Credit support No quantity limit Pre-season registration	2005	10
Tanzania	Pay importers based on coupons Distributes coupons	Importation Wholesaling Transport Warehousing Retailing	Yes	Improved seed subsidy Extension service Credit support Quantity limit Pre-season registration	2008	14
Zambia	Purchase from importers Warehousing Retailing	Importation Transport	No	Improved seed subsidy Extension service Credit support Quantity limit Pre-season registration	2003	10

Section 4. Comparative Analysis of the Performance of 'More Market-Friendly' and 'Less Market-Friendly' Fertilizer Subsidy Programs in Africa

The previous section provided the first level analysis of the eight country subsidy programs in this study. It concluded with a scored list of programs with respect to their market friendliness. From the list, the Rwanda and Tanzania subsidy programs were, due to their designs, more market-friendly than the other subsidy programs, while the Burkina Faso, Ghana and Nigeria subsidy programs were the least market-friendly. Malawi, Senegal and Zambia had mixed results, but their scores and design characteristics were closer to those of the least market-friendly subsidy programs. Accordingly, the study divided the subsidy programs into two groups: more market-friendly subsidy programs (Rwanda and Tanzania) and less market-friendly subsidy programs (Burkina Faso, Ghana, Malawi, Nigeria, Senegal and Zambia). This section will do a comparative analysis of the performance based on qualitative information on the two groups of subsidy programs in order to identify some of the best practices and lessons learned for improved management and implementation of subsidy programs.

The approach used is as follows. First, the section develops a set of hypotheses drawing from the analysis of the individual country subsidy programs regarding the relationship between design characteristics and implementation modalities on one hand and performance on the other in terms of: potential expansion of the private sector; increased availability and accessibility of fertilizer; and the existence of a timeframe and exit strategy. It then compares the key design characteristics and implementation modalities of the more *market-friendly* programs with those of the *less market-friendly* programs, and their respective effects on the performance indicators, vis-à-vis the hypotheses. The expectation is that, in the majority of cases, the findings for the more market-friendly subsidy programs will support the hypotheses because of their primary design characteristics. However, analyzing whether more market-friendly subsidy programs perform better than the less market-friendly subsidy programs because they have better design characteristics and implementation modalities is not the purpose of the comparative analysis. This may prove difficult in any case, because some of the subsidy programs in the two groups often have similar design characteristics and/or implementation modalities. Rather, the two groups of subsidy programs have been created to provide a basis for comparison upon which to draw out key differences and similarities in design, implementation and, hence, performance, and thus obtain key lessons and best practices that can improve the implementation of subsidy programs in SSA.

4.1 Potential Expansion of the Private Fertilizer Market

In this sub-section, we highlight the key features of the more *market-friendly* programs compared with *less market-friendly* programs and their related effects on the ability to support the development of the private fertilizer supply market.

The decision of whether to have government or private sector importation and distribution of subsidized fertilizer and the procurement arrangements for obtaining the subsidized fertilizers are two design features that have an impact on market development. It is hypothesized that private sector importation and distribution of the subsidized fertilizer and the use of an open and transparent government tender for the private importation and distribution of the fertilizer will result in the expansion of the private fertilizer market. The comparative analysis of the findings from more market-friendly subsidy programs (which feature private sector importation and distribution and a tender) with less-market-friendly subsidy programs supports this hypothesis.

■ *Private Sector Versus Government Importation and Distribution of Subsidized Fertilizer*

With regard to the more market-friendly subsidy programs, in Tanzania, importation and distribution of the subsidized fertilizer by the private sector has had a positive impact on the private distribution network; the number of agro-dealers in Tanzania increased from 500 in 2005/06 to over 2,000 in 2009/10. This result may also be due to the investment in complementary measures (training of agro-dealers, access to finance) that accompanied the implementation of the subsidy program. The situation in Rwanda is more complicated; the government is investing in developing and expanding the private distribution network (through training of agro-dealers and linkages to financial institutions), but these efforts have yet to result in the development of a private distribution network, particularly beyond the main towns and cities. Therefore, the government directly imports and then issues distribution rights to selected private retailers, and augments this distribution using the Ministry of Agriculture's distribution network. In comparison, with the exception of Ghana, less market-friendly subsidy programs do not allow private sector involvement in fertilizer importation and distribution at all (e.g., Burkina Faso), or they only allow it for importation (Nigeria, Malawi, Senegal, Zambia). This practice crowds out the private sector in these countries, as it cannot compete with subsidized fertilizers, and negatively impacts private sector

sales.[34] Therefore, private importation and distribution of subsidized fertilizer – a key design characteristic of market-friendly subsidy programs – is an important design feature to include, in order to improve the performance of subsidy programs.

Nevertheless, there are issues with regard to the implementation of this design feature that undercut its beneficial effects, and which must be addressed to improve the performance of subsidy programs. In the cases where the private sector self-finances importation (and this is the case for both more market-friendly and less market-friendly subsidy programs), there are reported delays in government payments to the private sector for deliveries; this places a heavy financial burden on the private sector and discourages their participation in the subsidy program in subsequent seasons. Secondly, although this design feature does not allow for restrictions by the government on who can participate in the market, importers may still exclude some portion of the private sector. This is the case in Ghana where importers exclude agro-dealers from the price-setting negotiations with the government. This practice places agro-dealers at a disadvantage, as they are unable to ensure that their margins will be protected; hence, this practice weakens the retail network. Private agro-dealers are also discouraged from participating due to rules that make it difficult to participate even if they are willing to (for example, the requirement that they must be affiliated with an importer). The result is increased market concentration at the retail level, since only affiliated retailers are allowed to participate in the subsidy program. Therefore, there are important lessons to be taken into consideration to improve the design of market-friendly subsidy programs: (a) this design characteristic (use of the private sector) should include a mechanism that will address the delays in payments to importers and agro-dealers; and (b) representatives of the private sector from all levels of the fertilizer supply chain should be included in any discussions with the government related to the design and implementation of the subsidy program.

One potential best practice with regard to a mechanism that can address the issue of late payments comes from Tanzania and Malawi. In order to alleviate the liquidity constraints (including foreign currency) faced by private importers for the expeditious importation of fertilizers, the governments of Tanzania and Malawi offer letters of credit to local importers through their central banks. This is a preferred model to the one in Ghana where the private importers must use their own international networks to source the working capital to finance the importation of fertilizer for the subsidy program, and later experience delayed payment by the government. Two issues are important to highlight here. First, lack of support to local importers without international networks technically excludes them from supplying the subsidy program. Secondly, the delay in payment by the government for the supply of fertilizers to the subsidy program ties up the working capital for the private importers. This lowers their liquidity position for further importation or other business at the same time, a factor that increases the cost of borrowing (time value of money), and consequently the cost of the subsidized fertilizer, since importers tend to factor in this additional costs in future subsidy operations and price negotiations.

Procurement Arrangements for Subsidized Fertilizer

The use of an open and transparent tender in sourcing the services of the private sector in the fertilizer subsidy program is hypothesized to have a positive impact on private market development, because it includes rather than excludes potential private importers from importation of subsidized fertilizer, and it has the potential to enhance price competitiveness among the private importers. Both of the more market-friendly subsidy programs and nearly all of the less market-friendly subsidy programs, except Ghana and Burkina Faso, feature this type of procurement arrangement (a government tender for the supply of fertilizers). However, the actual findings from the comparative analysis do not support the hypothesis; the findings show that for both the more market-friendly subsidy programs and the less market-friendly subsidy programs, the use of a tender for the procurement of subsidized fertilizer has a negative impact on the development of the private sector. For both groups of subsidy programs, the reasons are as follows: first, the permission to bid on the government tender is not transparent or objective, rather it is restricted to selected importing companies, and political patronage plays a major role in determining who is or is not allowed to participate in the tender. This practice creates risk and uncertainty about which companies will win the tender from one year to the next, and hence, reduces the incentive to invest in the distribution network. Secondly, the exclusion of certain importing companies from participation reduces competition in the importing and distribution system and encourages concentration and collusion, since there is a tendency for the market to concentrate around those that are awarded the tenders and their linked wholesalers and retailers. As a result, most importers, wholesalers and retailers who do not have access to the subsidized fertilizers are forced out of the market, resulting in market concentration. Finally, the tender system results in late delivery of fertilizers to farmers due to bureaucratic processes that result in late confirmation of the tender recipients and delays in subsequent payments. Importers that are awarded the tender wait until they receive confirmation from the government before they place their orders and import the fertilizer.

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34 This finding holds in the exception for the market-friendly subsidy program in Malawi where the government imports the total consignment of subsidized fertilizer via the private sector and distributes it via the state-owned enterprises ADMARC and SFFRFM thereby undercutting the private distribution network. The subsidy program in Malawi is categorized as market-friendly because it uses input vouchers to target farmers. There is evidence that the exclusion of the private sector from distribution of subsidized fertilizer at the retail level reduces sales.

This creates delays in the acquisition of fertilizers, which ripples downward to the farm-gate. Therefore, the overall impact of this procurement arrangement on the development of the private fertilizer market in SSA has been negative.

This situation is neither uncommon nor specific to SSA. Tenders for public procurement are used regularly by governments worldwide; ideally, the process should feature open bidding, competitiveness and transparency, with no exclusion or favoritism due to political patronage. However, as is the case with fertilizer tenders in SSA, the use of tenders for public procurements worldwide is often reported to be marred with abuses. Given that a certain mode of using the tender system is so entrenched in the administration of fertilizer subsidy programs in SSA, it may be advisable to improve on the current system rather than introduce a new alternative. Therefore, the recommendation would be that good practice and fair play in the use of tenders for fertilizer should be intentionally incorporated and applied by governments in SSA. Alternatively, if possible, governments should consider completely disengaging from the direct procurement of fertilizers for their subsidy program. They could leave this effort to the private sector and focus their resources and energies on providing purchasing power to farmers, while creating conducive environments for increased private sector investment in their sectors.

A possible best practice in this regard comes from Tanzania, where the government does not purchase the fertilizers directly from the importers, but instead empowers the poor farmers with vouchers with which they can purchase the fertilizers from the open market that is supplied by the private sector system. On the other hand, a rather similar arrangement in Ghana requires some modifications. In Ghana, there is no tender for the provision of subsidized fertilizer. Instead, the government makes an annual budgetary allocation to subsidize fertilizer based on historical fertilizer consumption by smallholder producers of staple food crops; this determines the subsidized amount of fertilizer to be imported. The government and importers engage in negotiations to determine the domestic price of fertilizer and the subsidy (price-setting for the subsidized fertilizer), taking into account margins and a reasonable profit for importers. Importers then make their decisions about how much of the subsidized fertilizer they will import. However, this procurement arrangement has fallen prey to the same problem of exclusion as under the tender system; only a select few importers are involved in the price-setting/negotiation (selection is by the government), making the rest of the companies' price-takers (collusion). This flaw would need to be addressed before this approach can be adopted as a best practice.

4.2 Fertilizer Availability and Accessibility by the Poor Farmers

In this sub-section, we highlight the key features of the *more market-friendly* programs compared with *less market-friendly* programs and their related effects on making fertilizer available and accessible to the poor farmers.

■ *Subsidy Rate*

The hypothesis is that the subsidy rate can be an instrument for promoting fertilizer use if it is consistent and predictable, as this can enhance farmers' ability to save the top-up amount and purchase the fertilizer. It can also be used as part of an exit strategy to graduate farmers out of the subsidy program through the gradual reduction in the amount of the subsidy. For example, gradual adjustment of the subsidy rate can innovatively be used, as in Tanzania, to gradually wean off fertilizer subsidy beneficiaries. In that case, farmers may receive a subsidy rate of say, 50 percent in the first year, 25 percent in the second year and 10 percent in the third year with the planned intention of completely weaning them off in the fourth year onward. The findings from the comparative analysis with regard to this hypothesis are mixed. Both more market-friendly and less market-friendly subsidy programs reduce the price of fertilizer using either a fixed or variable subsidy rate, although at different proportions or rates, while increasing the amount of fertilizer available in the market, and more than anything, to small farmers whom otherwise would not have access to it. In Tanzania and Rwanda (the more market-friendly programs), the subsidy rate is fixed and availability of subsidized fertilizer to the intended beneficiaries is high, with the programs reaching over 80 percent of the targeted farmers in these countries. On the other hand, in Senegal (a less market-friendly subsidy program), the subsidy rate is also fixed, but the findings suggest that the program was not successful in reaching the majority of targeted beneficiaries. In Malawi and Zambia (less market-friendly subsidy programs), the subsidy rate has hovered above 60 percent, with some years as high as 90 percent in the case of Malawi, and the percentage of targeted beneficiaries reached is over 50 percent in both countries. Therefore, the findings are mixed, but overall, they do not appear to support the hypothesis. Additional research is required to substantiate whether the subsidy rate is an important design feature for the improved performance of subsidy programs.

■ *Use of Input Vouchers to Entitle Selected Beneficiaries (Poor Small Farmers)*

Regarding the use of a targeting mechanism (input vouchers or coupons), the hypothesis is that the use of input vouchers to entitle poor farmers will have a positive impact on enhancing accessibility by poor farmers to subsidized fertilizers. Vouchers entitle individual beneficiaries to a price discount that is a saving equivalent to the face value of the voucher, and even more importantly, it provides better access to the subsidized product by the intended beneficiary. By distributing vouchers, a

subsidy program increases the likelihood that the targeted beneficiaries will access the subsidized fertilizers. Furthermore, redeemed vouchers can be used to account for the subsidized fertilizers that have been distributed, since the vouchers also limit the number of bags of fertilizer one farmer can purchase. The comparative analysis of the more market-friendly and less market-friendly subsidy programs shows that the findings support the hypothesis. The less market-friendly subsidy programs which do not use input vouchers experience the problem of crowding out the private sector, as subsidized fertilizer was being made available to farmers who could otherwise afford to pay the market price (leakages). Nevertheless, the more market-friendly subsidy programs also experienced problems in the use of input vouchers. First, there is a problem of counterfeit vouchers, as was the case in some years in Malawi, Ghana and Tanzania due to weak security features. In order to counteract this problem, the Government of Tanzania invested more money to improve the security features of the coupons, while the Government of Ghana completely overhauled the voucher system for the current waybill system. In Malawi, the security features were also enhanced; the government also engaged in mass education and used the police to handle the problems associated with counterfeit vouchers. Secondly, the system for the delivery and administration of vouchers is too cumbersome and bureaucratic. It involves too many people and has numerous steps, which introduces ample opportunities for rent-seeking. Third, the implementation of the voucher system in some countries creates a burden to recipients of the subsidy since it requires multi-step procedures for farmers to acquire, validate and redeem the vouchers from numerous actors (agricultural district and regional officers, extension workers and retailers). Fourth, the voucher system also creates a burden on the private sector, which is required to file a long trail of paperwork and implement several steps in order to validate and then redeem the vouchers from the government (for example, in Malawi and Tanzania). This process is cumbersome and delays the payment for the subsidy to the final recipient, thus adding to the cost of participating in the program. This, in turn, creates transaction costs and threatens margins, but none of the programs include reimbursement for these costs. In some cases, the administrative burden of implementing the voucher system has been transferred solely to the private sector without compensation, as in the case of Ghana. Fifth, even if the voucher program is properly implemented (distributed), there is insufficient availability of the subsidized product. In other words, there is no congruency between the number of vouchers and the amount of fertilizer product available in the market to honor those vouchers. This was the case in Ghana during the first couple of years of the program, where the number of vouchers distributed exceeded the amount of available subsidized product; the result was that some vouchers went unclaimed (IFPRI/Banful report, 2010).

Clearly, there is a need to simplify the distribution of vouchers and the subsidized product to make it more objective and transparent. Some best practices in this regard come from Rwanda and Tanzania. The key lesson here is that the use of input vouchers are an important design feature for subsidy programs as they improve their ability to target the intended beneficiaries. However, if the input voucher system is not implemented well, it can compromise the performance of the subsidy program.

Complementary Services

Regarding the provision of complementary services for farmers, the hypothesis is that provisions of complementary services will have a positive impact on enhancing accessibility by poor farmers to subsidized fertilizers. By providing farmers with the means to pay the unsubsidized portion of the fertilizer price, the subsidy program increases accessibility for poor farmers. Similarly, by providing extension services to farmers, the subsidy program creates awareness of the availability of fertilizers and improves farmer knowledge of the benefits of fertilizer and correct use of the input. This increases the likelihood that poor farmers will use fertilizer since it has become more accessible (in the sense that it is more user-friendly). Overall, the findings from the comparative analysis are supportive of the hypothesis. Both Rwanda and Tanzania (the more market-friendly subsidy programs) provide credit facilities to help farmers pay for the unsubsidized portion of the input vouchers, and they have high levels of accessibility (the subsidized fertilizer reaches more than 80 percent of targeted farmers in these countries). Among the less market-friendly subsidy programs, only Senegal provides a credit facility for farmers, while in Zambia, access to credit is only via the farmer cooperatives. However, while there is no information that suggests that the program in Senegal was successful in reaching a high percentage of targeted beneficiaries, over 50 percent of the targeted beneficiaries were reached in Zambia. These results imply that including a credit facility as a component of a subsidy program does improve accessibility.

The main source of extension services in both the more market-friendly and less market-friendly subsidy programs is the staff of the Ministry of Agriculture. Even where extension services are part of the subsidy package, they are provided by the Ministry of Agriculture. The exception is Rwanda, where the provider of extension services is a separate entity from the Ministry within, and paid for by, the subsidy program. Consequently, the coverage and quality of extension services provided for the subsidy programs varied according to the pre-existing level of delivery. In some countries where extension services are basically non-functional in rural areas, the subsidy programs actually improved the situation by providing extension messages by, for example in Burkina Faso, the provision of leaflets to beneficiaries explaining how to use the fertilizers. However, in the cases where the extension system was already functioning and was expected to supplement

the subsidy program, such as Malawi and Zambia, delivery of extension services reportedly suffered. This is because the Ministry of Agriculture extension staff were also given the responsibility of implementing the subsidy programs. Since the subsidy program tends to be given priority, extension staff diverted their energies to activities related to subsidy management and the logistical needs of the program, and other extension services suffered as a result. Therefore, although the findings from Rwanda indicate that the extension services component played an important role in increasing yields and productivity, overall, there is insufficient information to reach a conclusion about the importance of including extension services as a component of subsidy programs.

Rigorous Government Planning for the Fertilizer Requirement

With regard to increased availability of subsidized fertilizer for poor farmers, the hypothesis is that rigorous government planning regarding the fertilizer requirement will increase availability of the subsidized fertilizer to poor farmers. The quantity of subsidized product may not be as planned (i.e., actual subsidized fertilizer may be less than the targeted amount) due to constraints out of the control of the program, but better planning will result in reduced leakages and less misallocation among regions (i.e., between surplus and deficit areas). Rigorous planning entails the annual estimation of the fertilizer requirement, taking into account the number of targeted beneficiaries, area planted and crop mix, rather than simply increasing annual estimates by a set percentage.

The findings support the hypothesis. More market-friendly subsidy programs where the government engaged in rigorous planning increased the availability of subsidized fertilizer and there was less misallocation between surplus and deficit regions. The more market-friendly subsidy programs of Rwanda and Tanzania, which involved to various degrees the determination of the number of targeted farmers, estimation of their seed and fertilizer requirement, beneficiary selection according to set criteria and generation of a list of eligible target beneficiaries, yielded good results in terms of increased availability of fertilizers to poor farmers; for example, in Rwanda, rigorous government planning resulted in 87 percent of targeted farmers receiving fertilizer.

The less market-friendly subsidy programs, where the government planning was not systematic and rigorous, resulted in poorer results, such as the amount of subsidized fertilizer being much less than the actual needs of targeted farmers and misallocation of subsidized fertilizers to different regions. For example, in Burkina Faso, the government does not take into consideration the actual needs of the farmers in terms of their planted area and crops in determining the amount of subsidized fertilizer. Instead, this estimate is based on arbitrary estimates made at the district level, the level of available public funding and budgetary considerations. As a result, the subsidy program only meets a fraction of the actual needs, and more than half of the intended farmers in Burkina Faso have never benefited from the fertilizer subsidy program due to the low quantity supplied compared with the demand for subsidized fertilizer. Similarly, in Nigeria, more than 80 percent of farmers had received less than the equivalent of a 50-kg bag of subsidized fertilizers over the years. Other findings from Burkina Faso are the misallocation of subsidized fertilizer to the different provinces because the actual needs in those provinces based on hectarage to be planted and crop mix are not taken into consideration in the estimation of the fertilizer requirement per region. The exception among the less market-friendly subsidy programs is Malawi, where government planning and implementation of the subsidy program was rigorous. This yielded similar results to those for the more market-friendly subsidy programs; about 60 percent of smallholder farmers in Malawi received at least one input voucher for fertilizer between 2005/06 and 2009/10, and during this time, the number of households receiving one or more fertilizer vouchers increased from 54 percent in 2007 to 65 percent in 2009. Therefore, the findings indicate that proactive and rigorous government planning regarding the fertilizer requirement is an important design feature to include in order to improve the performance of subsidy programs.

However, there is an important lesson with regard to the considerable cost involved in rigorously planning and administering these market-friendly programs. A cost-benefit analysis is required to assess whether the benefits in terms of increased output outweigh the costs of administration. It is also necessary to analyze whether the total costs of the subsidy program are less than the cost of importing the amount of food produced by the program.

Indirect Restrictions on the Participation of Non-Poor Farmers

These restrictions on the participation of non-poor farmers entail: pre-screening and registration of beneficiaries; restrictions on the type of subsidized fertilizers to those used by poor small farmers and for staple food production; and restrictions on the maximum quantity of fertilizer per farmer.

With regard to pre-screening and registration of beneficiaries, the hypothesis is that pre-screening and vetting of the eligible beneficiaries and the generation of a list will effectively exclude non-poor farmers. This is particularly the case if it is done at the community level, as non-poor farmers will find it socially expensive to participate and, hence, are likely to self-exclude

from the programs. With regard to the imposition of restrictions on the type of fertilizer to be subsidized to those used by poor farmers, the hypothesis is that by restricting the fertilizer types it includes, the subsidy program will be encouraging large farmers who grow cash crops (and therefore use different types of fertilizers) to self-exclude from the program, thereby reducing leakages of the subsidy to the non-poor and increasing accessibility for poor small farmers. Regarding restrictions on the maximum quantity of fertilizer per farmer, the hypothesis is that restricting the maximum quantity a farmer can purchase will have a positive impact on accessibility by poor farmers to subsidized fertilizers. For example, if the maximum quantity a farmer can purchase under the subsidy program is two 50-kg bags, this will discourage large farmers from participating in the program, since they are interested in purchasing larger quantities than offered or permissible by the subsidy program. If this restriction is not imposed, there is a risk that non-poor farmers can either directly buy a large quantity for themselves or they can use small farmers to go and purchase larger amounts on their behalf. This may potentially reduce quantities actually available to the poor farmers.

Overall, the findings support the hypothesis, although there is not a significant difference in these findings between the more market-friendly and the less market-friendly programs. Both the more market-friendly programs (e.g., Rwanda and Tanzania) and less market-friendly subsidy programs (e.g., Malawi, Senegal and Zambia) generated lists of beneficiaries, or farmers' registers, and placed restrictions on fertilizer type and quantity; these programs reported better accessibility than programs which did not. Nevertheless, the more market-friendly programs had relatively fewer reported problems with accessibility and leakages than the less market-friendly subsidy programs. On the other hand, the programs that do not have restrictions on the quantity of subsidized fertilizer that one farmer can buy do report these problems (most notably the less market-friendly programs of Ghana and Nigeria). The findings from Ghana are that some retailers withhold stocks of subsidized fertilizers and sell them later in the season at market prices to the same farmers or other traders who then smuggle the fertilizer across the border into Burkina Faso. Similarly, in Nigeria, there are reports of unscrupulous farmers buying subsidized fertilizer and selling it at a price that is higher than subsidized price but lower than market price.

Therefore, the results indicate that restricting the quantity of fertilizer one beneficiary farmer can buy per season, as practiced in Malawi, Tanzania and Zambia, does limit leakages and enhances equitable sharing of subsidized fertilizers among the poor, while curtailing tendencies of unscrupulous behavior in the fertilizer market. However, given the similar findings for market-friendly and less market-friendly subsidy programs, these findings also imply that indirect restrictions alone are insufficient to curtail access by non-poor farmers to subsidized fertilizers; these measures must be complemented with other instruments such as vouchers to reduce leakages. Additional research is required to reach a conclusion about the extent of leakages vis-à-vis the cost of controlling the leakage and the type of institutional arrangements that should be in place to effectively reduce the leakages.

■ *Physical Access to Subsidized Fertilizer – Distance To Subsidized Fertilizer/Distribution Points*

In addition to timely receipt of the right type of fertilizer at the right time, the distance that farmers travel to obtain the subsidized fertilizer is an important determinant of the accessibility of poor farmers to the product. The hypothesis is that distribution of the subsidized fertilizer by private agro-dealers reduces the distance farmers must travel to obtain the product. The findings support this hypothesis; the more market-friendly subsidy programs used the agro-dealer network to distribute the subsidized fertilizer, whereas the less market-friendly programs typically used the Ministry of Agriculture or other public agencies' distribution networks to sell the subsidized fertilizers. Since agro-dealer networks penetrate deeper into rural areas than the public networks, the more market-friendly subsidy programs improved accessibility to farmers (5-10 km), whereas with the less market-friendly subsidy programs' farmers still had to walk longer distances (20-30 km) to the offices of the Ministry of Agriculture in district/provincial capitals to source the fertilizer. The exceptions among the less market-friendly subsidy programs are Malawi and Zambia. In the case of Malawi, the government uses a state-owned enterprise, ADMARC, which has an extensive network in rural areas that rivals, and in some cases surpasses, that of the private sector. In Zambia, the government hires transporters (as part of the design of the subsidy program) to deliver fertilizer to farmers and farmer cooperatives. Nevertheless, the results indicate that improved physical accessibility to subsidized fertilizer is facilitated by the use of the private agro-dealer network rather than government distribution channels.

4.3 Timeframe

A specific timeframe for the subsidy program entails either a specific date for completion of the program or graduation of a group of beneficiaries after participation in the program for a specified period of time. It also implies an exit strategy. The hypothesis is that having a timeframe and exit strategy will improve the overall performance of the subsidy program, because this will encourage governments to set goals and targets that are to be met within a specific time. It will also reduce the potential for entrenching a dependency syndrome among the beneficiaries and undermining their entrepreneurial abilities. It is hypothesized that market-friendly programs are more likely to have a timeframe and exit strategy for the following

reason: by including the private sector in its subsidy program, the government is implicitly recognizing that the program will eventually be phased out, so it has to ensure the private sector is not weakened by excluding it from the program (this ensures there will still be a system in place to distribute fertilizer once the government ends the subsidy program).

Only the two market-friendly subsidy programs (Tanzania and Rwanda) give indications of a timeframe and exit strategy. In Tanzania, smallholder farmers are only allowed to participate in the program for three years after which time they have to "graduate". The expectation is that they will have benefited sufficiently from participation in the program to be able to continue to purchase fertilizers at the market price and use them correctly. The strategy in Rwanda is to stimulate competition among private distributors and provide training and support until they are mature and can procure and distribute fertilizers independently, thus providing an exit strategy for government. Therefore, no exit strategy been elaborated. None of the less market-friendly subsidy programs have a timeframe or exit strategy. However, countries are reviewing their programs, for example in Malawi, Nigeria and Rwanda, and moving toward designing three- to five-year programs, to allow for evaluation and potential for changes. This is opposed to open-ended designs. Based on this anecdotal evidence, the study concludes that inclusion of a timeframe and elaboration of an exit strategy are desirable components to include in subsidy programs

Therefore, the results of the comparative analysis reveal some similarities and differences between market- and less market-friendly subsidy programs with regard to their impact on performance, which in turn yield some useful lessons and enable the identification of best practices.

Section 5. Recommendations and the Way Forward

The previous section presented the key findings regarding the performance of eight fertilizer subsidy programs in SSA and identified the associated lessons learned and best practices in the design and implementation of subsidy programs in SSA. This section will provide a set of recommendations for a well-implemented fertilizer subsidy program, which can be used as a reference and provide guidance to government officials as they design and implement their subsidy programs in a way that will contribute to sustainable market development in the medium- to long-term.

5.1 General Findings

Overall, the fertilizer subsidy programs have been beneficial by increasing fertilizer availability in the market and its use in the countries considered in this assessment. Depending on the design and implementation, more market-friendly programs have been able to increase fertilizer availability and accessibility for small poor farmers and support the development of the private sector fertilizer supply market more than the less market-friendly programs. Nevertheless, for both the more market-friendly and less market-friendly subsidy programs, their full potential to increase availability and accessibility and develop private fertilizer markets has not been realized due to some shortfalls in program design and/or implementation.

In spite of the potential benefits of targeting instruments, they do not always serve the purpose of aiming the subsidy to a specific population, nor are they supportive of private sector distribution of the subsidized product, if program and targeting instruments are ill-designed and not well-managed. For example, in Ghana, under the old subsidy program that used an input voucher, the subsidy program was not designed to target the subsidy to the intended farmer population. Instead, it was designed to target and ensure/corroborate delivery of the subsidized product to specific regions by distributors and for payment verification to the importers. In addition, the voucher program did not contribute to the development of an already existing extensive retail network, which excluded many retailers from the handling of the vouchers, especially those not affiliated with the importer-distributor network participating in the program. Furthermore, even if vouchers were available, farmers were unable to redeem them given the non-availability of products or the inability of non-participating retailers to redeem the voucher.

The findings suggest that governments' direct involvement in importation and distribution of the subsidized fertilizer generated market distortions that led to rent-seeking opportunities with political patronage, in most cases to the benefit of the least needy and neglecting the intended target population.

Most programs do not have an exit strategy, or if they do, they are not being enforced. This includes programs that were implemented as an emergency measure in response to the high international prices resulting from the 2007-08 oil and food crisis. Although they had an implicit timeframe (i.e., once the prices improved or went back to the pre-crisis levels), they have continued indefinitely, thus creating dependency on the part of the farmer population and uncertainty for the private sector.

There is a common problem with delays in the implementation process that emanates from delays by governments in approving national budgets for funding of the programs. As a result, the fertilizer suppliers (importers, wholesalers and retailers) to the programs are paid late, and this negatively affects their business operations. Delayed funding also leads to delays in the delivery of the vouchers (if any), but more importantly in the delivery of the subsidized fertilizer, a situation that counteracts the intention of the subsidy programs to increase or avoiding a reduction of the use of fertilizer, due to unavailability at the right time and/or place.

Neither of the two types of programs has been effective in making the fertilizer available to the farmer population in remote areas of the country, in spite of some specific attempts to do so. An example is the voucher program in Ghana, which was targeted to the subsidized fertilizer and to some remote regions of the country in an attempt to ensure the supply of subsidized fertilizer to such areas. The key reasons include the lack of infrastructure and other services which result in higher cost of input distribution; these higher costs are passed on to the farmers and reduce the demand, and therefore the supply, in such areas.

A well-managed targeted subsidy is preferable in order to ensure accessibility to subsidized fertilizer to the intended population and reduce the leakages of subsidized product into the open market. Nevertheless, availability is not guaranteed. That is, even where the distribution of the subsidized fertilizer is relatively effective and farmers have access to cash or credit to pay for the unsubsidized portion of the fertilizer, most subsidy programs were likely to experience shortages due to the gap between the intended and targeted amount of subsidized fertilizer.

Nearly all of the subsidy programs that were studied are implemented by existing Ministry of Agriculture staff. Without additional staff, subsidy programs put considerable strain on the MoA staff, hence compromising their overall delivery. With the exception of Rwanda and Tanzania, the Ministries of Agriculture and committees at various levels (regional, district and village) spend a considerable amount of time and cost implementing the subsidy programs, specifically: time and costs related to meetings at regional, district and village levels; time spent by extension workers to mobilize farmers to understand and participate in the program; time spent at the village level compiling lists and selecting farmers. Often, this additional work is performed without compensation, which leads to rent-seeking, and compromises the quality of implementation.

5.2 Conclusions

The eight fertilizer subsidy programs in this study were implemented either as part of an overall agricultural development strategy or as part of an emergency response to avoid a rapid decrease in input usage (and therefore in agriculture production) as a result of the 2007-08 food and oil crisis; the crisis caused a dramatic increase in the price of inputs in the international market. Whether these subsidy programs were implemented as part of an overall agricultural development strategy or in response to the food and oil price emergency, they have serious political, social and economic implications. Therefore, it is safe to assume that efficiency and effectiveness of the subsidy program, efficiency on the use of the subsidized product and overall sustainability were not of primary concern in the design and implementation of the subsidy programs. Consequently, effectiveness, efficiency and sustainability should not be used to assess the performance of these programs. However, if governments are committed to the continued implementation of these programs, the concepts of efficiency and effectiveness must be introduced in the programs design and implementation for long-term sustainability.

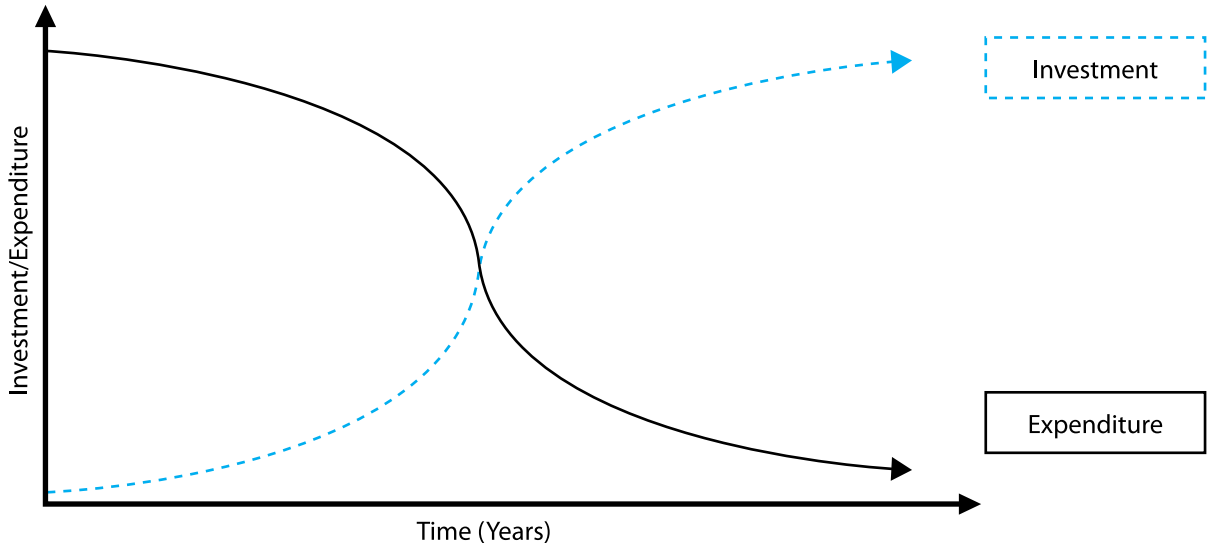
Market-friendly toward SMART subsidies have the potential to increase efficiency, effectiveness and the sustainability of subsidy programs. Clearly, some governments have made an attempt to implement market-friendly subsidies by introducing at least some of the basic attributes of SMART subsidies. However, in spite of some programs having SMART attributes and being market-friendly, the findings of this study reveal that the results have not been as promising as expected. The reasons could be attributed to the fact that most countries in Africa, and especially those where there have been attempts to implement SMART subsidies, do not have suitable macro- and micro-economic conditions in place to allow for competitive market development in order to make the delivery of the subsidy programs efficient and effective and therefore contribute to the development of the input and output markets. Due to these ill conditions, it is unlikely that program outcomes will be sustainable in the long term and continue after program termination.

5.3 Recommendations

Governments tend to view fertilizer subsidies as a necessary recurring expenditure. However, there is a need for a paradigm shift when it comes to how subsidy programs are viewed. Rather than viewing them as expenditures, governments should think of subsidy programs as an investment in the agriculture sector, which contributes toward making the agricultural sector self-sustaining. If the government accepts that subsidies are going to be part of the government budget for the foreseeable future, it should aim to make this expenditure as productive as possible. Therefore, subsidy programs should be intentionally designed to increase efficiency and effectiveness and therefore the profitability of fertilizer use to grow maize and other staple crops, thus enhancing the sustainability of these programs.

First and foremost, subsidy programs must be designed as temporary measures with a phase-out strategy and a mixture of investment and expenditures. Expenditures, in this context, refer to setting up and implementing the subsidy program itself, while investments refer to measures that enhance the effectiveness of the subsidy program over the long term (as opposed to subsidies with measures that are expected to have a relatively short- to medium-term effect). During the initial years of the program, expenditures are expected to be higher than investments; however, in the later stages of the program, there should be a reversal to higher investments and lower expenditures, eventually approaching zero. The expenditures should be focused on setting up an effective subsidy program during the initial stage and providing the subsidy itself, as well as providing the proper political and policy environment that facilitates agriculture and fertilizer market growth. As the program progresses through the years, expenditures are expected to be reduced to almost zero, that is, to a level of maintenance of the subsidy program by providing a subsidy to the few farmers that are late adopters of fertilizer or are resource-poor and hence require longer-term support. On the other hand, investment should be oriented at setting up the right conditions (physically) for the private sector to reduce transaction costs, develop their business and expand the fertilizer market closer to the farmers, and for farmers to make better use of the subsidized product. As the program is implemented through the years, the level of investment increases and should stabilize at a point required to maintain the investments (i.e., road infrastructure investment and maintenance, continuous extension and research personnel development, agro-dealers' and farmers' training, etc.). This concept is illustrated in Figure 17.

Figure 17. *Expenditure and Investment Trends*



The above scenario would be created by implementing at least some aspects of the following recommendations:

- ***Overall recommendation: Governments should withdraw from direct involvement in the importation and distribution of fertilizers. Instead, the governments should provide purchasing power support to poor farmers and enter multi-year mutually beneficial contracts with the private sector for the importation and distribution of fertilizers for the subsidy program.***

Governments should withdraw from direct involvement in the importation and distribution of fertilizers. Instead, governments should allow for open competition in the importation and distribution of fertilizers with minimum government regulation and focus on providing the financial and economic incentives for market development. That is, the governments should provide farmers with the necessary purchasing power support to gain access to fertilizer while allowing private sector importation and distribution businesses to develop and expand their markets according to government regulations. The governments should decide on the level of support to provide to smallholder farmers and allocate the necessary funds for the subsidy. Once the amounts of funds are decided, governments should negotiate the price of the subsidy with the fertilizer suppliers to avoid a situation where the traders hike the fertilizer prices to take advantage of the subsidy program. Once this is agreed, the government should also target the subsidy through the use of vouchers to reach the largest number of farmer beneficiaries.

It is important for governments to have good knowledge of the costs along the supply chain in order to properly negotiate a price ceiling with the import and distribution private sector, and take this price into consideration when deciding on the

level of subsidy given the allocated funds. This implies that the government should invest in researching the potential cost of delivery along the supply chain in order to engage in better and more educated negotiation while allowing the private sector to maintain a reasonable profit margin.

Governments should enter into multi-year contracts with importers with flexible price negotiations – to be adjusted according to changes in the international market – to provide certain allotments per importing company and ensure the provision of fertilizers to certain regions or provinces, with an open and wide participation of the domestic distribution and retail sector. These multi-year contracts would have the following advantages: (a) allow the contracted private sector firms to plan well in advance; (b) contracted firms will feel much more secure, serving as an incentive to support the expansion and investment in the distribution and retail network; (c) these contracts would reduce the costs incurred annually by the government in administering the procurement process and free the much-needed human resources for other Ministry of Agriculture operations; and (d) government efforts would concentrate on better management and implementation of the voucher program.

Furthermore, the contract should be a 'two way street' where the government commits to implement subsidy effectiveness-enhancement policy measures such as: investing in infrastructure to increase the supply of fertilizer; provision of complementary services such as extension to increase yields (productivity) and agriculture production and credit guarantees to improve access to credit for farmers and agro-dealers; and technical assistance to agro-dealers and farmers to incentivize the supply and demand of fertilizers, in order for the contractor be encouraged to supply even those regions where it was not profitable to distribute fertilizer before the effectiveness enhancement measures were implemented. Otherwise, they will not distribute the subsidized product in those regions and will fail to fulfill the terms of the contract.

Specific Supporting Recommendations

- *Subsidy programs should include subsidy complementary services.*

The subsidy program should include complementary services to make subsidized fertilizer accessible and its use more effective. That implies complementary measures addressing the supply- and the demand-side of agro-inputs and outputs. The effectiveness of the targeting mechanism will depend on whether the subsidy program is complemented by measures to enable poor farmers to pay the unsubsidized portion of the fertilizer price and even then will only be effective if the private sector has the capacity to deliver fertilizer where and when it is needed. The case of Zambia revealed that wealthier small-scale farmers have been more likely to benefit from the subsidy program, not because the subsidy scheme goes out of its way to target the more resourceful farmers, but because even when the subsidy is at 50 percent or higher (80 percent in 2008), the high levels of poverty in rural areas prevent most farmers from purchasing the subsidized inputs. Therefore, the subsidy program should be complemented by some type of government-backed credit program (credit guarantee, crop insurance, etc.) for farmers; or as an alternative, it should include a "subsidy for public works" program that enables farmers to 'top-up' the voucher and further gain access to fertilizer. Under these programs, the intention is to target poor households by offering vouchers to buy fertilizer in the market up to a limited quantity (large enough to be of interest and use by smallholder farmers in exchange for labor on public works programs, but small enough to not interest wealthier large farmers). Furthermore, given that fertilizer is a capital-intensive business, private fertilizer companies at all levels of the supply chain often have their activities stymied by low working capital due to high interest rates and stiff collateral requirements imposed by banks. Therefore, fertilizer subsidy programs that involve private sector importation and distribution should incorporate a feature that will improve access to finance for importers, wholesalers and retailers so they will be able to provide the fertilizer for the subsidy program in a timely manner.

In addition, subsidy programs should incorporate and invest in research and extension services. The subsidy program should take into account the fact that fertilizer use is only one tool for raising crop productivity and that substantive productivity increases can only be achieved through comprehensive technical packages, which create conducive conditions for high responsiveness of each constituent of the package. The combined use of improved seed varieties and fertilizer and the provision of extension services enhance effectiveness by creating favorable conditions for achieving physical and genetic yield potentials. As is the case with the CIP in Rwanda, the program should take into consideration the fact that the institutional arrangement of extending agricultural technical packages to farmers matters as much as economic incentives to induce farmers to adopt the fertilizer packages. Hence, it is critical to reinforce national extension services with contracted private service providers to bring extension closer to farmers.

Furthermore, investing in market access, including post-harvest facilities and marketing infrastructure, is necessary. A major source of ineffectiveness in fertilizer subsidy programs is lacking/inadequate investments in post-harvest facilities and marketing infrastructures. This is typically the case with many agricultural programs in Africa that involve promoting the use of productivity-enhancing inputs. As marketable surpluses increase (as a result of enhanced productivity), inadequacies

in complementary support facilities and services will begin to emerge. This can cause frustrations and disincentives in the use of the productivity-enhancing technology. Reportedly, this is already the case in Rwanda, where discussions with key informants revealed some of the problems that are frustrating the efforts of the fertilizer subsidy program, such as: the lack of appropriate grain threshing, drying facilities and on-farm storage infrastructures; poor access to processing and value-adding technologies; poor access to marketing; and heavy post-harvest losses through spoilage and insect infestation. The lack of appropriate threshing and drying facilities limits the production of clean grains; farmers complained that they were receiving lower prices because of soiled grains. In some areas of Malawi where farmers reportedly line up for more than two days, the problem was not the late arrival of fertilizer, but lack of storage space in certain areas where depot capacity is low. Consequently, SFFRFM was forced to renovate/expand buildings in remote areas to store the fertilizer.

Lastly, the subsidy should work in a way that benefits farmers, primarily while allowing the private sector to do and develop business 'as usual' without negative government interference. This implies that the subsidy must be implemented on behalf of the farmers, not the private sector, but still allow the private sector to do business as usual. Therefore, in addition, governments should focus on creating the necessary supporting policies and regulatory environment to facilitate the expansion of private sector importation and distribution. These actions will make subsidized fertilizer accessible and available to the targeted farmers where and when needed, while allowing the private distribution and retail sectors to have reasonable profit margins. This will introduce sustainability in the market and act as an incentive for the private sector to continue operating and expanding its operations closer to farmers.

- *Integrate the subsidy program into the existing private fertilizer market.*

Countries that presently have a separate and differentiated supply chain for the government fertilizer subsidy program should integrate that chain into the traditional private sector-led supply chain. The private sector should have the sole responsibility to import and distribute fertilizers, whether it is subsidized or not; therefore, they should have the ability to sell fertilizer in the market with and without subsidy. The role of the government should be to provide purchasing power support directly to farmers using input vouchers. Where a country has a weak distribution network (as is the case with Burkina Faso), governments should support the traders by: (a) acting as a credit guarantee or issuing letters of credit for the importation of fertilizers (as is the case in Malawi); (b) encouraging importers to sell their fertilizers at auction to retailers, as opposed to secretive selection; (c) build up the private import and distribution network by supporting and investing in training, exposure and credit facilities (this is the Rwanda model); (d) more importantly, the government should invest in improving the conditions for the fertilizer private sector to expand and supply fertilizer when and where it is needed; and (e) training programs should include training a cadre of importers and linking them with international traders and financial institutions.

- *Engage adequately represented farmers' organizations and fertilizer traders' associations from the design to implementation.*

The subsidy program should be designed in a way that allows for the involvement of farmers, importers and agro-dealers in the design and implementation of the subsidy programs. The design should include capacity building for the private sector, mainly: (a) business management training to improve access to finance and obtain better credit terms; and (b) technical training to agro-dealers so they can serve as de facto extension agents and provide farmers with advice on the correct inputs to use and how to apply them. These negotiations should be transparent and should also include the relevant banks/financial institutions.

- *Subsidy programs should include a targeting mechanism (input vouchers).*

The use of targeting instruments (vouchers) is preferable to not using them, because the subsidy otherwise is unlikely to reach the targeted population of the subsidy programs: smallholder and subsistence farmers. It is also preferable to avoid displacement of commercial fertilizer in the market by making subsidized fertilizer available and more accessible to commercial farmers who can afford to pay the market price. Although there are high costs associated with implementation of a targeted fertilizer subsidy program, the inclusion of a targeting mechanism in the subsidy program is key in order to avoid two of the main pitfalls of subsidy programs: (a) crowding out of the private sector; and (b) the provision of subsidized fertilizers to farmers who can afford to purchase fertilizer at market price at the expense of resource-poor farmers who would gain the most from the subsidy program and need it most from an efficiency and equity perspective. However, targeting mechanisms will be successful only if targeted to the intended farmer population as a means of purchase support rather than targeting the product and/or a given region. In addition, the distribution of vouchers should be open and transparent in an effort to reach the largest percentage of the beneficiary population.

Introducing a voucher system where none exists will have the advantage of reducing the burden of the grand logistical operation on the government by sharing some of these responsibilities with the private sector. The government should assign

the management and implementation of the whole subsidy program, including the voucher program, to an autonomous (but not independent) unit within the Ministry of Agriculture, as is done in Rwanda (RADA) and Tanzania (NVSC), to increase the chances of program effectiveness. In this way, the subsidy program reduces interference with the regular work of ministry staff.

To implement the subsidy program and the voucher issue and distribution, the government should establish an autonomous body (using a transparent procedure) that is responsible for selecting beneficiaries, issuing vouchers to farmers and administering the voucher system. This body will be autonomous, but not independent of the Ministry of Agriculture. This autonomous unit should design and implement a program of sensitization of all stakeholders, which is maintained throughout program implementation. Stakeholders should be sensitized through initial meetings to ensure that they are aware of the subsidy program and how it works, and beneficiaries should be included in the planning process to the extent possible. After the initial consultations, stakeholders should be kept informed about the status of implementation of the subsidy program through radio broadcasts, brochures, etc.

Beneficiary selection should not be done on the basis of politically sensitive documentation such as voter registration numbers, as this opens the process to political patronage and exclusion and places an unnecessary burden on the registering teams. It is preferable that a government establishes a decentralized demographic statistical department; although it is initially cumbersome to compile lists of families in each district, once compiled properly, the list would simply need to be updated each year. Assigning responsibility for management and implementation of the subsidy program to an autonomous unit within the Ministry of Agriculture would be expected to improve transparency of the program, and hence trust in the program and support for it. Stakeholders will develop a sense of ownership and appreciation of the contribution of the program to national food security, which will increase their willingness to safeguard the program against leakages and other forms of corruption, as there will be a national vested interest to make the program successful.

- *Introduce measures to address the bottleneck created by slow government payment of the subsidized portion of the fertilizer price.*

The typical reason for late payment by the government is that the budget is not approved in time due to lack of public funds; since fiscal revenues are typically lower than expenditures, governments must rely on loans or donations to finance the subsidy programs. This situation makes most subsidy programs unsustainable from the financial and fiscal perspective. If fiscal constraints were not an issue, one possible solution, introduced by the Government of Zambia, is to change the calendar for the budget process so that the budget for any given year is presented and approved by December of the previous year. This change has reportedly improved timeliness in the delivery of inputs in the subsequent years of the implementation of the subsidy program in Zambia. However, if this is not a viable option, the government should identify an alternative source of payment to maintain cash flow and keep the supply of fertilizer moving. For example, the government could take a bank loan that is guaranteed by a development partner (or other institution that is acceptable to the bank) to bridge this financial gap; this would reduce the financial risks and costs to private sector actors participating in the subsidy program. The government would repay the loan as soon as the budget is approved and the funds are released. However, this process should be well managed to avoid an over-escalation of the internal public debt, which could crowd out private investment at the expense of the subsidy program.

- *Introduce a universal graduation/exit strategy element into the subsidy programs in support of sustainability.*

The subsidy program should deliberately enforce the entrepreneurial capacities of beneficiaries by enrolling beneficiaries for a pre-designed time period, after which they should be assessed and graduated, either as small commercial farmers or referred to other social protection/welfare programs. This will ensure that farmers use their beneficiary rights and privileges effectively; the strategy will avoid creating a dependency syndrome among farmers, avoid a fiscal imbalance and ensure sustainability of the program outcomes.

5.4 The Way Forward

Following the 2006 *Abuja Declaration on Fertilizer for an African Green Revolution,* a political commitment by African leaders to arrest land degradation and improve crop productivity by increasing fertilizer use to at least 50 kg/ha of arable land, with further impetus provided by the 2007/08 soaring food, fuel and fertilizer prices, several SSA countries re-introduced fertilizer subsidies as a way to boost food production. While prices for fuel and fertilizers have since declined, those of food have only stabilized and stand at higher levels than pre-2007. Despite this, it is likely that African governments will continue to subsidize fertilizer use by small and subsistence farmers for the foreseeable future. However, some analysts fear that the recent resurgence of fertilizer subsidies will erode past efforts and achievements in private sector fertilizer supply market development in SSA. In order to objectively intervene and support countries in SSA regarding the successful design and implementation of their fertilizer subsidy policies and programs, the AU-NEPAD Coordinating Agency (NPCA), with support from FAO, IFDC and AGRA, commissioned a study: *Implementation of Fertilizer Subsidy Programs in Sub-Saharan Africa: Practices and Policy Options.*

Therefore, this study does not address whether or not subsidies should be implemented. The focus is on identifying lessons learned and best practices regarding the design, implementation modalities and management of these programs in order to delineate a package of the key features of well-implemented fertilizer subsidy programs. These findings can be used as a reference and provide guidance to government officials as they design and implement their programs in a way that contributes to a sustainable market development in the medium to long run. The addressed key issues are: (a) effectiveness in terms of availability and accessibility of subsidized fertilizer; (b) impact on the private distribution network; and (c) existence of an exit strategy. Accordingly, the study has: (a) analyzed the key design characteristics and implementation modalities of eight subsidy programs in SSA and the factors influencing the same; (b) analyzed the effects of these design/implementation characteristics on the performance ('market-friendliness') of the subsidy programs in terms of (i) availability and accessibility to fertilizer by poor smallholder farmers and (ii) domestic private sector fertilizer supply market development. The key outputs are: (a) a set of lessons learned and best practices on program design and implementation with respect to improved access to, and availability of subsidized fertilizer by poor farmers and support for the development of the private fertilizer market; and (b) recommendations to improve the implementation of fertilizer subsidy programs in SSA.

Upon finalization of the study, the technical team will present the document to NPCA management with recommendations for the next steps for dissemination and use of the findings and recommendations. It is expected that NPCA will disseminate the document to its supporters: FAO, IFDC and AGRA with its intended follow-up actions.

Regarding recommendations from the technical team for the next steps, the team proposes to convene an expert consultation meeting of NEPAD, IFDC, FAO and AGRA, the experts from the team of reviewers and the key national stakeholders in the fertilizer subsidy programs in the respective countries to discuss the following (but not limited to) action points:

1. How do we best get the lessons and recommendations to the countries?
2. How do we address outstanding issues that require further investigation, particularly: (a) impact of the subsidy programs at the farm level (impact yields, production and farm incomes); and (b) the macro-economic cost-benefit analysis of the subsidy programs?
3. Promotion of peer review and cross-country learning by policymakers, the private sector and farmers' organizations.

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Appendix 1

Table A1. *Fertilizer Subsidy Programs in Eight African Countries: Key Characteristics*

Characteristics by Country			
Government Justification for the Subsidy Program	*Number Farmers/ Farm Households (hh) Targeted*	*Fertilizer Subsidy Package*	*Crops Targeted (Food and Cash Crops)*
Burkina Faso			
• Provide financial support to the three cotton companies to purchase fertilizers • Boost the production of staple foods, mainly maize and rice by 17%	468,630 hh	• Not applicable	• Maize, rice, beans, cotton
Ghana			
• Facilitate access and encourage fertilizer use by small-scale farmers to increase food production	956,241 hh	• Not applicable	• Staple foods (maize, rice) – all crops are expected to receive, on average, a 40% subsidy on the price of a 50-kg fertilizer bag
Malawi			
• Safeguard food security for poor households (i.e., enable poor farmers to produce larger share of own food requirements) • Reduce food import bill	1,600,000	• 50 kg basal and 50 kg topdressing • 2 kg hybrid seed or 4 kg OPV	• Maize (fertilizer and seed vouchers) • Tobacco, coffee, tea (fertilizer vouchers) • Legume and cotton seed (flexible vouchers)
Nigeria			
• Make fertilizer accessible to small farmers at reasonable price and increase food production	Not applicable	• 25% of the price on a 50-kg bag is subsidized and paid for by the FGN. In addition, the state and local governments can add at their discretion an additional subsidy for a maximum subsidy that oscillates between 75% and 85% on a 50-kg bag of fertilizer.	• Mainly staple food crops and other cash crops grown by small farmers
Rwanda			
• Phase out government involvement in retail fertilizer distribution and increase private sector involvement • Shield farmers from high global fertilizer prices	128,019 hh	• 100 kg basal and 50 kg topdressing • Government distributed 30 kg maize seed (hybrid or OPV) or 100 kg wheat seed to participating farmers without seed	• Wheat, maize (additional 50% off ceiling price subsidized by fertilizer auction) • Rice and potatoes (ceiling price subsidized by fertilizer auction)
Senegal			
• To reactivate the agriculture sector to supply domestically the food demanded by the increasing urbanized population • Increase fertilizer use and food security	Not applicable		• Most staple food crops and cash crops grown by small farmers are expected to receive a 50% subsidy, on average, on every 50-kg bag
Tanzania			
• To develop the private input supply system, reduce poverty and attain national or household food security	1,499,596 farmers	• 50 kg urea • 50 kg DAP • Improved maize or rice seed	• Maize, rice
Zambia			
• Improve access to and use of fertilizer among smallholder farmers to increase production and national food supply	500,000	• 50 kg basal fertilizer • 50 kg urea • 5 kg hybrid maize seed	• Hybrid maize

Table A2. *Fertilizer Subsidy Programs in Eight African Countries: Modalities of Implementation*

Modalities of Implementation by Country			
Procurement	*Distribution*	*Targeted Beneficiaries (Input Vouchers) or Universal Subsidy*	
Burkina Faso			
• Direct procurement by the government	• Exclusive distribution by the government	• No targeted beneficiaries • Universal subsidy paid at source	
Ghana			
• Government procurement through private sector importers with a pre-negotiated price • No tender issued	• Distribution by private sector distribution network (registered agents and independent retailers)	• Self-selection, i.e., if farmer can raise 60% of market price of fertilizer • As long as stocks last • No targeted beneficiaries • Universal subsidy paid at source	
Malawi			
• Government procurement via private sector tender	• State-owned enterprises (SFFRFM, ADMARC)	• Input vouchers distributed by government to designated households	
Nigeria			
• Procurement by government under contracts with private sector, based on a tender-bid to supply lots of subsidized fertilizer	• Distributed through public outlets at the state and local levels	• Not targeted	
Rwanda			
• Bulk procurement by government	• Auction to qualified private sector bidding companies by MINAGRI	• Input vouchers distributed by government to selected farmers	
Senegal			
• Procurement by government under contracts with private sector, based on a tender-bid to supply lots of subsidized fertilizer	• Distributed by local committees at community level, who assign fertilizer to farmers in a most equitable way and on a first-come, first-served basis	• Vouchers assigned by local community committees with quantity (number of bags assigned) per farmer, to be purchased at a subsidized price at a local warehouse	
Tanzania			
• Procurement through private sector importers	• Distribution by private distribution network (registered and trained agro-dealers)	• Input vouchers distributed by government to selected farmers	
Zambia			
• Procurement by government under contracts with private sector, based on a tender-bid to supply lots of subsidized fertilizer	• Cooperatives and farmer associations	• Smallholder farmers	

	Beneficiary Selection Criteria	*Fertilizer Subsidy (% of Market Price for 50-kg Bag of Fertilizer)*
	• Smallholder farmers growing rice, maize, beans and cotton who cannot afford to pay the unsubsidized portion of the cost of a 50-kg bag of fertilizer	26%
	• All categories of farmers who use compound fertilizers, urea and AS to grow staple food and cash crops • Another subsidy on cocoa is targeted exclusively to cocoa producers under a different scheme from the waybill • Chosen by local authorities	Estimated at 40% of the price, on average, for a 50-kg bag of fertilizer
	• Members of poor households who would otherwise not purchase fertilizer • Chosen by local authorities	92%
	• Not targeted to any farmer segment of the population; however, the government has been testing vouchers in different states and may start implementing a voucher program nationwide in 2012 to target fertilizer to small farmers	25% subsidy from FGN and 40%-60% additional and optional from state and local authorities, for a potential max subsidy of 85% on the price of a 50-kg bag of fertilizer
	• Smallholder farmers of wheat and maize • Farmers possessing improved seed to use with the subsidized fertilizer • Farmers with vouchers entitled to a further 50% off the ceiling price subsidized by fertilizer auction	Voucher provided 50% discount on 50-kg urea and 100-kg DAP (enough for 1 ha)
	• Criteria include equity according to estimated expected beneficiaries at a local community level, availability of fertilizer at local warehouses and on a first-come, first-served basis • Targeting mechanism is done by local committees who assign fertilizer to farmers on a first-come, first-served basis, considering the estimated number of farmers per locality in an equitable way and given the amount of fertilizer available	Coupon is expected to cover up to 50% of the price of a 50-kg fertilizer bag, for the number of bags assigned to a farmer
	• Farmer should be a full-time farmer growing maize and rice and living in the village • Farmer should not own more than 1 ha of land • Farmer should be willing to use the provided inputs on these crops and follow the recommended agricultural practices • Farmer should be willing and able to pay the unsubsidized portion of the market price for fertilizers • Priority is given to female-headed households and households which have not used any/have used very little fertilizer and improved seeds to grow these crops over the last five years	50%
	• Access to complementary inputs, mainly land	50%

Abbreviations and Acronyms

General

AGMARK	Agricultural Market Development Trust (a CNFA Program in Kenya)
AGRA	Alliance for a Green Revolution in Africa
AU	African Union
CATALIST	Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability
CFA	Communauté Financière Africaine
CNC	Certificate of Conformity
CNFA	Citizens Network for Foreign Affairs
CONACE	National Commission for the Control of Fertilizers
CSO	civil society organizations
DAP	diammonium phosphate
DC	district commissioner
FA	field assistant
FAFS	Framework for African Food Security
FAO	Food and Agriculture Organization of the United Nations
FOB	free on board
FSP	Fertilizer Subsidy Program
GDP	gross domestic product
ha	hectare
HIPC	Highly Indebted Poor Countries
HSGIC	Heads of State and Government Implementation Committee
ICT	information and communication technology
IFDC	International Fertilizer Development Center
IFPRI	International Food Policy Research Institute
kg	kilogram
LU	Logistics Unit
MK	Malawi Kwacha
MSU	Michigan State University
mt	metric ton
NEPAD	New Partnership for Africa's Development
NGOs	non-governmental organizations
NPCA	Planning and Coordinating Agency (NEPAD)
NPK	nitrogen, phosphorus and potassium
OPV	open-pollinated variety
ReSAKSS	Regional Strategic Analysis and Knowledge Support System
SG2000	Sasakawa-Global 2000 Programme
SMART	Specific, Measurable, Achievable, Results Oriented, Timely (subsidy)
SOAS	School of Oriental and African Studies
SSA	Sub-Saharan Africa
TA	traditional authorities

Burkina Faso

CIPAM	Industrial Company of Agricultural and Tradable Productions
MAHRH	Ministry of Agriculture, Hydraulics and Fisheries
PDA	Provincial Director of Agriculture (MAHRH)
SOCOMA	Societe Cotonniere du Gourma
SOFITEX	Société des Fibres Textiles

Ghana

COCOBOD	Ghana's Cocoa Board
GHC	Ghana Cedi (currency)
MOFA	Ministry of Food and Agriculture
SRID	Statistics, Research and Information Division (MOFA)

Malawi

ADD	Agricultural Development Divisions (ADMARC)
ADMARC	Agricultural Development and Marketing Corporation
AISP	Agricultural Input Subsidy Program
DADO	District Agricultural Development Officers (ADMARC)
MK	Malawian Kwacha
MoAFS	Ministry of Agriculture and Food Security
NASFAM	National Small Farmer Association of Malawi
SFFRFM	Smallholder Farmers Fertilizer Revolving Fund of Malawi
VDC	Village Development Committees

Nigeria

FCT	Federal Capital Territory
FGN	Federal Government of Nigeria
LGAs	Local Government Authorities
NAFCON	National Fertilizer Company of Nigeria

Rwanda

CIP	Crop Intensification Program
MINAGRI	Ministry of Agriculture and Animal Resources
RADA	Rwanda Agricultural Development Authority (MINAGRI)

Senegal

ICS	Industries Chimiques du Senegal
MoA	Ministry of Agriculture
NAP	National Agricultural Policy
SENCHIM	Société de Commercialisation des Productions des Industries Chimiques du Sénégal

Tanzania

DVC . . . . . District Voucher Committee
NAIVS . . . . . National Agricultural Inputs Voucher Scheme
NMB . . . . . National Microfinance Bank
NVSC . . . . . National Voucher Steering Committee
RVS . . . . . Regional Voucher Secretariat
TASP . . . . . Tanzania Agro-Dealer Strengthening Program
VVC . . . . . Village Voucher Committee

Zambia

ATC . . . . . Authority to Collect
CAC . . . . . Community Agricultural Committees
CSO . . . . . Central Statistical Office (MACO)
DAC . . . . . District Agriculture Committee
DACO . . . . . District Agricultural Coordinator
FISP . . . . . Farmer Input Support Program
FSRP . . . . . Food Security Research Project (MSU)
MACO . . . . . Ministry of Agriculture and Cooperatives
NCZ . . . . . Nitrogen Chemicals of Zambia
PCO . . . . . Program Coordinating Office
PACO . . . . . Provincial Agricultural Coordinator

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