



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

Developing Competitive Fertilizer Markets in Africa: Policy Lessons from FTF Country Assessments

November 2015



Acknowledgments

This is a summarized update of a background paper written for the African Union’s “2014 Africa Year of Agriculture and Food Security” CAADP Partnership Platform meeting held in Durban (IFDC, 2014). It draws material from USAID-funded fertilizer market assessments by IFDC in 12 Feed the Future (FTF) countries, an extensive review of literature on fertilizer markets in Africa, recommendations from the Technical Convening of Seed and Fertilizer Policy Experts in Addis Ababa, Ethiopia, organized by USAID and partner organizations (IFDC, 2013), and other sources including reports from the African Union and the New Partnership for Africa’s Development (NEPAD) Agency on the progress related to the 2006 *Abuja Declaration on Fertilizer*.

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Table of Contents

Executive Summary	v
1. Background	1
2. Key Agriculture Challenges in Sub-Saharan Africa	3
2.1 Consumption and Role of Fertilizers in SSA Agriculture.....	6
2.2 Fertilizer Requirements from 12 FTF Country Market Assessments	8
3. Challenges and Policies Constraining Fertilizer Markets in SSA.....	9
3.1 Import and Custom Procedures and Regulations Relating to Fertilizer Trade.....	10
3.2 Investment in Infrastructure Including Ports and Roads	13
3.3 The Nature and Challenges of Fertilizer Subsidies in Africa.....	15
3.3.1 Non-Targeted Subsidy with Government Importation and Distribution.....	16
3.3.2 Non-Targeted Subsidy with Private Sector Importation and Distribution.....	16
3.3.3 Targeted Subsidy with Importation and Distribution by Private Sector.....	16
3.3.4 Targeted Subsidy with Importation by Private Sector and Distribution by Government.....	17
3.4 Supply-Side Constraints	19
3.5 Demand-Side Constraints.....	20
3.6 Incorporating Women and Youth in Value Chains	21
3.7 Finance/Investment in Value Chain Activities.....	22
4. Conclusions and Recommendations.....	23
4.1 Status of Fertilizer Policy Frameworks and Recommended Actions for Some Countries	23
4.2 Road Map in Support of African Union.....	27
4.2.1 Policy Action Area 1: Allocate More of the National Budget to Agronomic Research and Extension	28
4.2.2 Policy Action Area 2: Develop and Harmonize Policy and Regulatory Frameworks	30
4.2.3 Policy Action Area 3: Allocate Budget to a Fund that Supports Innovative Fertilizer Financing Mechanisms	32
4.2.4 Policy Action Area 4: Public-Private Dialogue and Joint Action on Fertilizer Policy	33
References.....	36

Tables

Table 1.	Yield Potential with Fertilizer Use in Africa.....	7
Table 2.	Estimated Fertilizer to Meet FTF Country Agricultural Growth Targets.....	9
Table 3.	Summary of Key Challenges to Market Development in SSA	10
Table 4.	Summary of Tariff and Non-Tariff Barriers to Trade in Africa	12
Table 5.	Port and Inland Haulage Constraints in Africa.....	14
Table 6.	Fertilizer Subsidy and Public Agricultural Expenditures in Selected African Countries, 2008-2011	15
Table 7.	Four Categories of Subsidy Programs in Africa.....	16
Table 8.	Status of Fertilizer Policy Frameworks and Suggested Actions for Some Countries.....	24
Table 9.	Summary of Action Area 1: Goals and Actions to Establish Sustainable Research and Extension Systems.....	29
Table 10.	Area 2: Actions and Targets to Develop and Harmonize Policy and Regulatory Frameworks	31
Table 11.	Summary of Action Area 3: Goals and Actions to Establish a Fund to Support Innovative Financing Activities for the Fertilizer Value Chain	32
Table 12.	Summary of Action Area 4: Goals and Actions to Establish Public-Private Dialogue and Joint Action on Policy	34

Figures

Figure 1.	Trend in Undernourished for Africa Compared to All Developing Countries	3
Figure 2.	Fertilizer Nutrient Use by Regions (2012, kg/ha)	4
Figure 3.	World Cereal Yields (mt/ha)	5
Figure 4.	Intensification vs. Area Expansion (Asia and SSA).....	6
Figure 5.	Fertilizer Consumption (Nutrients, NPK kg/ha) for Some African Countries, 2012	8
Figure 6.	Schematic of Major Port Operations	13
Figure 7.	Average Vessel Dwell Time at Various Ports in Africa.....	14

Acronyms

AFAP	African Fertilizer and Agribusiness Partnership
AfDB	African Development Bank
AFFM	Africa Fertilizer Financing Mechanism
AGRA	Alliance for a Green Revolution in Africa
AU	African Union
AUC-DREA	African Union Commission's Department of Rural Economy and Agriculture
BFS	Bureau of Food Security, USAID
CAADP	Comprehensive Africa Agricultural Development Programme
COMESA	Common Market for Eastern and Southern Africa
DAP	Diammonium Phosphate
EAC	East African Community
ECOWAS	Economic Community of West African States
FAO	Food and Agriculture Organization of the United Nations
FTF	Feed the Future
G-20	Group of Twenty
GDP	Gross Domestic Product
ha	hectare
ICT	Information and Communications Technology
IFDC	International Fertilizer Development Center
IFPRI	International Food Policy Research Institute
JICA	Japan International Cooperation Agency
kg/ha	kilograms per hectare
MDG	Millennium Development Goal
ME&P	Markets, Economics and Policy
MFI	Microfinance Institutions
mt	metric ton
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NPK	Nitrogen-Phosphorus-Potassium
NPS	Nitrogen-Phosphorus-Sulfur
NTB	Non-Tariff Barrier
PPP	Public-Private Partnership
REC	Regional Economic Community
SADC	Southern African Development Community
SSA	Sub-Saharan Africa
UDP	Urea Deep Placement
UNECA	United Nations Economic Commission for Africa
USAID	United States Agency for International Development
VAT	Value-Added Tax
WAFP	West Africa Fertilizer Program
WFS	World Food Summit

Developing Competitive Fertilizer Markets in Africa: Policy Lessons from FTF Country Assessments

Executive Summary

The 2003 Maputo Declaration to raise agricultural investment and growth followed by the 2006 *Abuja Declaration on Fertilizer for an African Green Revolution*, and the implementation of the Comprehensive Africa Agriculture Development Programme (CAADP) have led to increased focus on strengthening fertilizer markets in SSA in order to raise productivity and incomes for smallholder farmers. African agriculture faces a number of challenges that require major policy reforms to deal with food insecurity, soil nutrient depletion, low agricultural productivity, declining arable land per capita and effects of increased global demand for food, feed, fiber and fuel resulting from population growth.

Based on extensive analysis of existing research and knowledge from various sources, including lessons learned from IFDC activities in SSA, this report provides a synopsis of the status of fertilizer markets, key challenges and potential opportunities and highlights key policy recommendations needed at the continental, regional and national levels to create competitive and sustainable fertilizer markets and increase farmers' access to fertilizers. A recent study commissioned by USAID and implemented by IFDC in 12 Feed the Future countries in SSA concludes that in order to meet the agricultural growth targets envisioned in the national strategic plans, these countries need to more than double their current fertilizer consumption levels¹. Therefore, strengthening fertilizer value chains by tackling existing challenges and putting in place policies that encourage increased private sector investments will be crucial in meeting these targets.

The following recommendations touch on four key areas selected for their potential to achieve significant and sustainable increases in fertilizer use and supply in SSA. It is important to stimulate farm-level demand for fertilizer by improving crop response through updating recommendations on fertilizer use and applications as well as strengthening extension and

¹ Some of these country fertilizer market assessments can be accessed at <http://ifdc.org/research-papers-and-studies/>

market information services. Developing and harmonizing fertilizer policy and regulatory frameworks (including trade policy to establish regional markets) is necessary to reduce costs and increase demand for fertilizers by expanding markets. Access to credit is a major constraint for fertilizer value chains, and it is recommended that innovative financing approaches be established to alleviate this challenge. Finally, public-private sector dialogue for joint action on fertilizer policy will accelerate policy responsiveness to market needs and encourage private investments.

1. Allocate budget for a sustainable research and extension program

Goal: Stimulate farm-level demand for fertilizer by improving crop response to fertilizer use

Issue	Recommendation (Country or Regional)
Inadequate agronomic research and extension programs	Develop national soil maps; establish soil testing facilities in order to generate fertilizer formulations that match with soil and crop requirements; including use of blending facilities.
Training and extension services for farmers	Increase number of trained agro-dealers and extension capacity, including farm demonstrations and trials on benefits of fertilizer
Fertilizer use efficiency (FUE) and the environment	Adopt an Integrated Soil Fertility Management (ISFM) approach. This will vary by location based on soil fertility conditions, type of crop, agro-climatic zones, availability of organic inputs, etc. Use fertilizer technologies that have less environmental footprint; Urea Deep Placement (UDP) is an ISFM package specific for lowland transplanted rice.
Market information	Establish a market information system for farmers

2. Develop and harmonize policy and regulatory frameworks

Goal: Develop and harmonize fertilizer policy and regulatory frameworks (including trade policy to establish regional markets)

Issue	Recommendation (Country or Regional)
Policy and Regulatory Framework	Develop, update and enact fertilizer frameworks at national and regional levels: Hire national and international experts with requisite experience
(Predictable, develop private sector)	Strengthen regulatory enforcement capacity: Human and analytical labs for quality assurance
Trade Policy	Reduce delays at border: 24-hour one-stop border posts and single electronic window; install ICT to link revenue authorities and border customs agents
(Establishing and promoting national and regional markets)	Eliminate non-tariff barriers (NTBs): Reduce number of road checks and weighbridges on routes; remove restrictions on business licensing and imports including price controls
	Eliminate all taxes and tariffs on fertilizers

3. Allocate budget to establish a fund to support innovative fertilizer financing mechanisms and operationalize the Africa Fertilizer Financing Mechanism (AFFM).

Goal: Establish a fund to support innovative finance activities for the fertilizer value chain

Issue	Recommendation (Country or Regional)
National fertilizer financing facilities for input suppliers	Dedicate part of CAADP agriculture budget commitment to establish national fertilizer financing fund to support imports, storage, distribution capacity, etc.
Operationalizing the AFFM at the AfDB	Countries contribute to support and make the AFFM operational

4. Public-private dialogue and joint action on fertilizer policy

Goal: Establish an inclusive policy environment and institutions to accelerate policy responsiveness to market needs and increase private investment

Issue	Recommendation (Country or Regional)
Conducive policy and institutional environment to stimulate and increase private investment	Support public-private sector platforms on fertilizer policy, with regular meetings to review challenges and provide solutions
Subsidy design and implementation: Limit subsidies to targeted or “smart” subsidies that are gender friendly	Joint government and private sector design and implementation of the subsidy program; Private sector imports and distributes the fertilizer; government regulates

These recommendations can be implemented in the short-, medium- or long-term depending on country or regional priorities and the available capacity. Section 5 provides more detailed recommendations in addition to a tabular summary of the status of fertilizer policies for some countries and recommendations for reforms.

Developing Competitive Fertilizer Markets in Africa: Policy Lessons from FTF Country Assessments

1. Background

Following the Maputo Declaration of 2003, the continental commitment to the agriculture sector intensified and important progress has been achieved – and lessons learned – in implementing the Comprehensive Africa Agriculture Development Programme (CAADP). In 2014, the African Union Commission (AUC) organized a series of meetings during the 10th Anniversary of CAADP highlighting the importance of agriculture in combating food security and also laying the strategic actions to raise productivity for the next decade.

Unlike developed countries, where manufacturing and service industries contribute significantly to their gross domestic product (GDP), the agriculture sector in SSA accounts for over one-third of GDP and export earnings and employs over 60 percent of the population. Therefore, a number of stakeholders including international organizations have focused on improving this sector in order to get these countries out of poverty. The G-20 has already committed \$20 billion for agricultural development and related efforts to reduce world hunger, the bulk of which is intended for SSA countries. The CAADP framework sets a target of 6 percent annual growth in agricultural productivity through the allocation of at least 10 percent of national budgets to the agriculture sector for those countries that sign onto the Compact.

The last decade has seen unprecedented and sustained economic growth in SSA, and a number of countries are currently enjoying some of the highest economic growth rates in the world. In recent years, Africa achieved a high growth rate of 5 percent, well above the world average (United Nations Economic Commission for Africa [UNECA], 2012). However, much of this growth has been fueled by a boom in the mineral and petroleum industries. The agriculture sectors have not grown commensurately due to a number of factors, including low use of improved inputs and technologies, high population growth rates and volatile international markets that impact profitability at the farm level. Accordingly, SSA is still experiencing high levels of poverty, food insecurity and malnutrition.

The low use of inputs, especially fertilizers, serves as a brake on agricultural growth. The continent meets just 10 percent of the world average application rate for fertilizers. More nutrients are being removed through crop harvesting than are added back to the soil through the use of fertilizers (Henao and Baanante, 1999). Since the 2006 *Abuja Declaration on Fertilizer for an African Green Revolution*, some modest progress has been made in policy to support market development to raise fertilizer consumption through concerted efforts of key stakeholders. There have been positive developments in the areas of policy and regulations, private sector provision and distribution of fertilizers, and government interventions to improve access to fertilizer by poor resource farmers. Nevertheless, current fertilizer policies in SSA are still not adequately conducive to the establishment of competitive, private sector-led fertilizer marketing systems to deliver to farmers the fertilizer quantities needed at the right time and place and at an affordable price. As a result, fertilizer use levels are still lower than the targets.

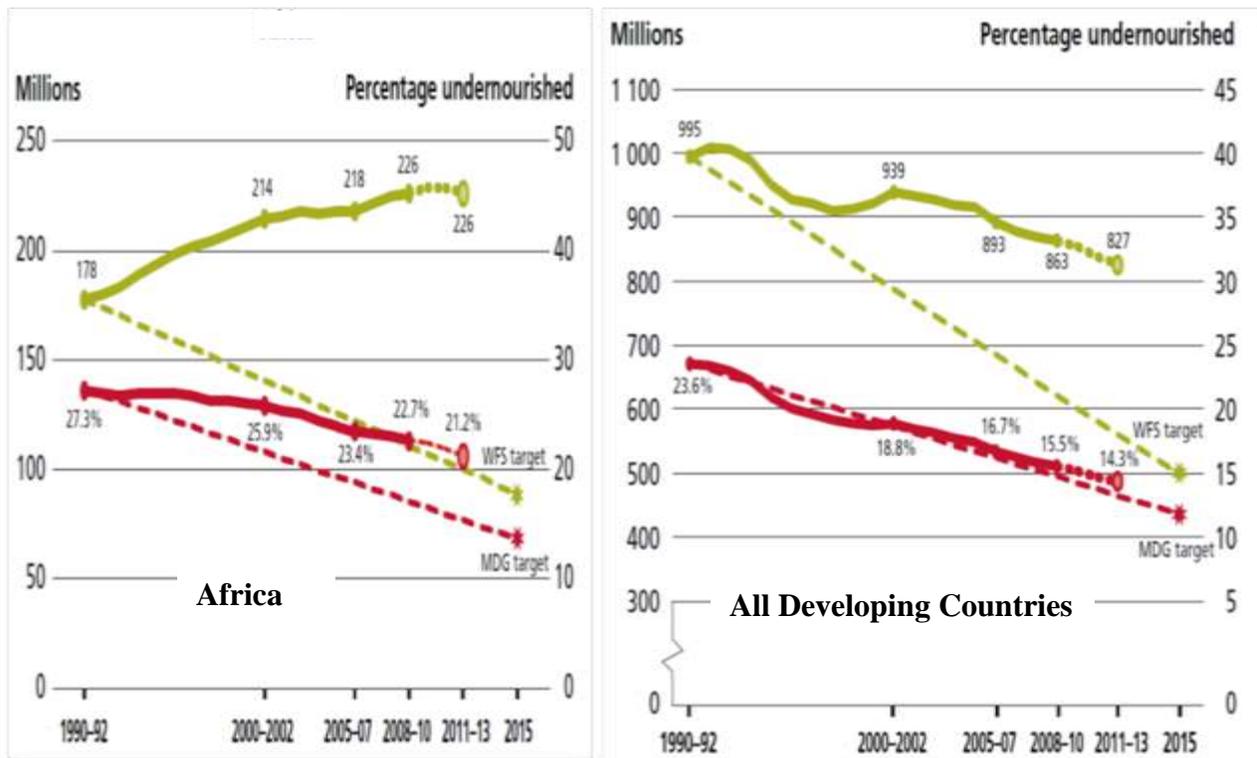
This paper reports on current policy status in FTF countries, offers lessons and experiences and provides recommendations to strengthen access to fertilizers by smallholder farmers. The experiences and lessons learned from policy design and implementation processes can provide the basis for future policy deliberations and reforms.

The remainder of this paper is organized as follows. Section 2 gives an overview of the challenges facing the agriculture sector in Africa, potential role of fertilizers in raising productivity, and the estimated amount of fertilizers required to meet the growth targets in the national agricultural plans for these countries. Section 3 provides insights into the nature of trade barriers, infrastructure constraints, and subsidy-related challenges and what is needed to improve access to fertilizer by smallholder farmers. Section 4 delves into specific supply and demand issues including cross-cutting constraints and policies needed to build sustainable fertilizer markets. Section 5 concludes with specific recommendations for particular Feed the Future countries and four policy areas with goals and suggested actions in support of the African Union agenda at country and regional level.

2. Key Agriculture Challenges in Sub-Saharan Africa

This section provides an overview of why many stakeholders are focused on agriculture and the potential role fertilizer can play to alleviate challenges facing the sector. The agriculture sector in sub-Saharan Africa (SSA) accounts for about a third of GDP and for many countries, 60-90 percent of employment, which implies relatively low labor productivity. Therefore, accelerating growth in agriculture is one way to reduce poverty and hunger including generating off-farm employment among other approaches.

Unlike the rest of the world where this is decreasing, the number of malnourished people in Africa is rising and the proportion of undernourished is increasing (FAO, 2013); therefore, World Food Summit (WFS) and Millennium Development Goals (MDG) targets have not been met thus far (Figure 1).



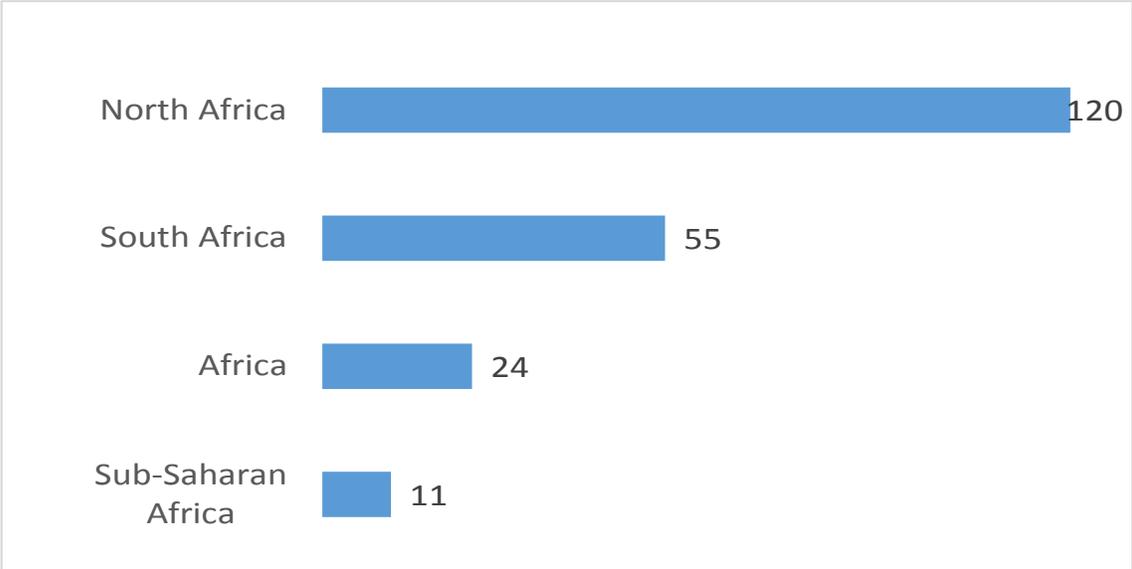
Source: FAO (2013).

Figure 1. Trend in Undernourished for Africa Compared to All Developing Countries

While most of the malnourished are located in Asia, the highest proportion of malnourished people (relative to total populations in these regions) is in African countries, with women and children constituting the most vulnerable groups.

Some of the key challenges facing the agriculture sector in Africa are discussed below: soil nutrient depletion, low agricultural productivity, increasing population and declining arable land per capita and climate change.

While average nutrient application rates in SSA are barely 11 kg/ha (Figure 2), soil nutrient depletion for some countries is higher than 50 kg/ha per annum, leading to soil degradation through leaching and erosion (Henao and Baanante, 1999). Fertilizer application rates per hectare in SSA are the lowest in the world at an equivalent of 3 percent of Asia's and 9 percent of North America's application rates. The average application rate in North Africa is 120 kg/ha, which is the highest in the African region.

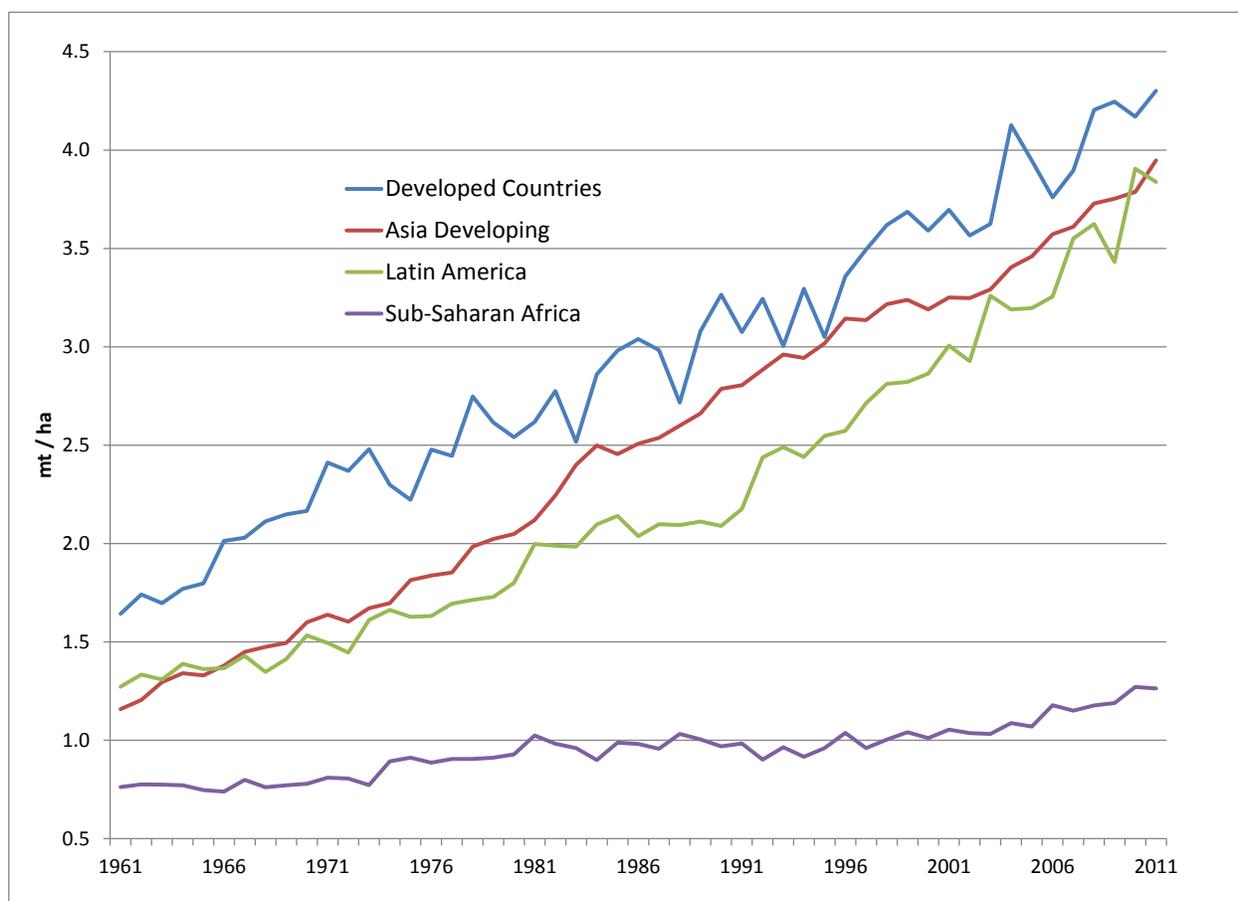


Source: Derived from FAO data.

Figure 2. Fertilizer Nutrient Use by Regions (2012, kg/ha)

Yields for cereal crops in Africa are a small fraction of those in Asia or developed countries and far less than their potential. Furthermore, these yields have not shown any significant increase

over time. Within the continent, there are differences in yields across sub-regions with SSA having lower and relatively stagnant yields than those for other regions in the world (Figure 3).



Source: IFDC, using available data from FAO.

Figure 3. World Cereal Yields (mt/ha)

The current low rates of fertilizer application and the corresponding poor yields for SSA act as a depressing force for future investments in improved technologies and methods, due to the insufficient returns to labor and land constrained by poor soil conditions, exacerbated by nutrient depletion.

Declining land per capita coupled with increasing population is posing a challenge to increasing production in some of these countries. In the past, increased agricultural production in SSA has partly been a result of expansion in cultivation of available arable land as opposed to increased yield (as has happened in Asia; Figure 4).

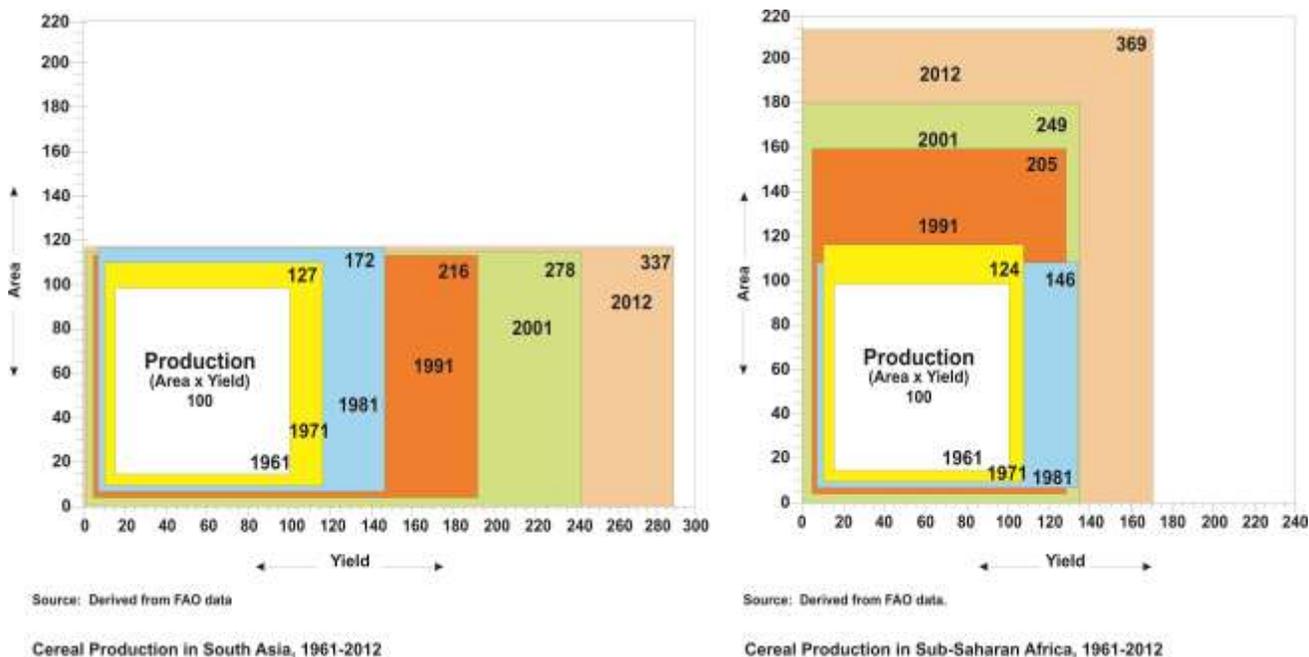


Figure 4. Intensification vs. Area Expansion (Asia and SSA)

But over time, agricultural extensification is becoming increasingly difficult, as farm sizes become smaller and arable land is limited, coupled with increasing population. This implies that the focus should be on land-augmenting technologies such as mechanization, irrigation and improved seeds and fertilizers coupled with best management practices. Without land reforms or a substantial decline in the share of labor engaged in agriculture, African countries will have difficulties initiating the process of agricultural and structural transformation.

2.1 Consumption and Role of Fertilizers in SSA Agriculture

Fertilizer played an equally important role as seed during the Green Revolution, contributing more than 30 percent of the yield growth in Asia (Hopper, 1993). Apart from raising land productivity, use of fertilizers can contribute to increased labor productivity, total farm production and smallholder incomes, which provide an opportunity to participate and earn off-farm income.

Table 1 illustrates the potential yields associated with fertilizer use on major food crops in various agro-ecological regions of Africa (Bationo and Egulu, 2010). Other studies agree with the

results in Table 1, indicating a significant gap in yields that can be filled by using the right inputs.

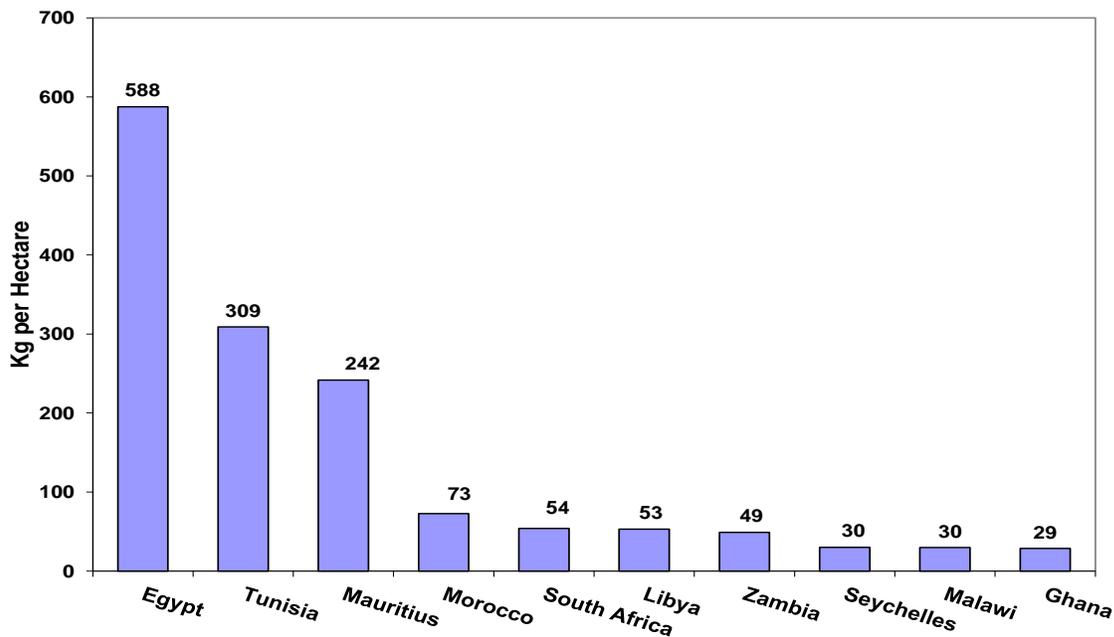
Table 1. Yield Potential with Fertilizer Use in Africa

Region	Crop	Yields (mt/ha)		
		Farm (Without Fertilizer)	Farm (With Fertilizer)	Experimental Station (With Fertilizer)
West Africa	Irrigated rice	3.0	6.0	8.0
	Upland rice	1.0	2.5	4.0
	Lowland rice	1.5	3.0	5.0
	Cassava	8.0	35.0	47.0
	Maize	0.8	3.5	6.0
	Sorghum	0.6	1.8	3.0
	Cowpea	0.3	1.0	2.0
South Africa	Maize	1.5	4.0	8.0
	Soybean	0.5	2.0	3.0
East Africa	Maize	1.5	7.0	8.0

Source: Bationo and Egulu (2010).

However, it is important to note that the effect of fertilizer depends on the levels of other limiting factors. For instance, some studies have shown that crop response to fertilizer depends significantly on availability of water and the condition of soils, declining or rising depending on the level of these factors (Marenja and Barrett, 2009).

In terms of total national fertilizer use, there have been some improvements for some countries in Africa. However, fertilizer application levels, particularly in SSA, are still much lower than the Abuja Declaration target of 50 kg/ha. Average fertilizer use per hectare in SSA has remained between 5 kg/ha and 10 kg/ha since 1990, which is less than 10 percent of the world average (Camara and Edeme, 2014). A comparison among African countries indicates a wide diversity in application rates, with some countries at levels that rival those in developed countries (Figure 5).



Source: FAO data.

Figure 5. Fertilizer Consumption (Nutrients, NPK kg/ha) for Some African Countries, 2012

The small size of national fertilizer markets in SSA pose a challenge raising unit costs as fertilizer moves through the supply chain eventually getting to farmers at twice the prices of the same products in the United States or elsewhere in the global market (Gregory and Bumb, 2006). Economies-of-scale are possible with the creation of regional markets. In addition, different tax regimes and non-tariff barriers (NTBs) in some countries hinder robust inter- and intra-country trade distorting prices and raising costs of business.

2.2 Fertilizer Requirements from 12 FTF Country Market Assessments

The IFDC fertilizer market assessment studies (on which this report is based) estimated the quantities² of fertilizer required to meet the agricultural production targets laid out in each country's agricultural strategic plans under the CAADP Compact. The table below shows the current levels against the estimated consumption based on the agricultural growth targets.

² These are based on the nutrient removal approach, which estimates the amount of nutrients required to achieve projected crop production levels in the country agricultural development plans. Detailed information on the approach used can be obtained from the specific country reports at <http://ifdc.org/research-papers-and-studies/>.

Table 2. Estimated Fertilizer to Meet FTF Country Agricultural Growth Targets

Country	Current Consumption (mt/yr)	Target Consumption (mt/yr)	Increase Factor
Ethiopia	550,500	1,200,000	2.2
Ghana	200,000	400,000	2.0
Kenya	488,800	910,000	1.9
Mozambique	51,600	225,000	4.4
Tanzania	263,000	528,000	2.0
Rwanda	35,000	144,000	4.1
Uganda	50,000	310,640	6.2
Malawi	297,000	600,000	2.0
Zambia	250,000	498,000	2.0
Liberia	3,000	28,000	9.3
Senegal	87,000	239,400	2.7
Mali	250,000	550,000	2.2

Note: Since these assessments were conducted between 2012 and 2015, the “current” consumption numbers may have changed. The above numbers are fertilizer product equivalents, not nutrients.

Source: IFDC Market Assessments conducted 2012-2015.

The results show that these countries need to more than double their current consumption levels in order to meet strategic growth targets for the agricultural sector. The following sections provide insights on how these targets (yield and fertilizer use) can be met by tackling the policy and regulatory frameworks to encourage investments and spur increased adoption of fertilizers.

3. Challenges and Policies Constraining Fertilizer Markets in SSA

This section looks at some challenges and policies that constrain fertilizer markets in SSA, mostly associated with public goods or government interventions in the form of taxes, tariffs, subsidy programs, and poor infrastructure. Demand- and supply-side constraints to market development are also analyzed, including cross-cutting issues touching on financing and gender. Section 4 concludes with an analysis of the current status of fertilizer policies in some Feed the Future countries in SSA and possible changes or actions for developing sustainable, inclusive and competitive fertilizer markets with the capacity to deliver the right type of fertilizers to smallholder farmers in order to fill the gaps identified in Tables 1 and 2.

Table 3 provides a summary of these challenges requiring specific interventions at the continental, regional and country level to encourage competitive and sustainable markets and

increase access to fertilizers for farmers. These are explained in more detail in the following sub-sections.

Table 3. Summary of Key Challenges to Market Development in SSA

Policy Challenges	
<p>Legal and Regulatory Framework**:</p> <ul style="list-style-type: none"> • Outdated regulations • Limited physical and human capacity for quality inspections • Inadequate enforcement of quality standards 	<p>Market Restrictions / Interventions:</p> <ul style="list-style-type: none"> • Barriers to entry <ul style="list-style-type: none"> ➢ Restrictions on imports ➢ Restrictions on domestic marketing • Allocation of market shares to enterprises at district/province level • State importation and distribution
<p>Trade Policy:</p> <ul style="list-style-type: none"> • Tariff (tax, duties on imports) • Non-tariff (police road checks, weighbridges, permits, delays at borders) • Different standards for fertilizer within region (EAC, COMESA, SADC) • Low cross-border trade activity 	<p>Price Controls:</p> <ul style="list-style-type: none"> • Pan-regional pricing • Price supports, subsidies
<p>Supply Side:</p> <ul style="list-style-type: none"> • Manufacturing and blending capacity in Africa • Agro-dealer training • Inadequate port handling facilities – delays and costs • Transportation bottlenecks – weighbridges, police checks, axle loads: in-transit costs 	<p>Demand Side:</p> <ul style="list-style-type: none"> • Small size of fertilizer markets (demand) leading to higher per unit costs • Underdeveloped output markets or poor linkages to output markets • Outdated fertilizer recommendations that reduce yield response • Distance traveled to purchase fertilizers
<p>Cross-Cutting:</p> <ul style="list-style-type: none"> • Finance • Women and Youth Challenges 	

Note: Topics with ** will be covered in Section 4 below and so will not be covered under this section.

3.1 Import and Custom Procedures and Regulations Relating to Fertilizer Trade

The Abuja resolution on trade aims at encouraging trade within Africa. With regards to inter- and intra-regional economic community (REC) trade, most fertilizer consumed in Africa is imported from outside the continent and almost all of the phosphate rock and fertilizers produced in Africa are exported out of the continent. In general trade among African countries accounts for only 10 percent of their total external trade (UNECA, 2012). With regard to inter-regional trade within Africa, countries such as Tanzania import fertilizers from manufacturers in Egypt, South Africa and Tunisia. Cameroon imports from Côte d’Ivoire and Tunisia. Regarding intra-regional trade, countries in southern Africa, such as Botswana, Lesotho, Namibia and Swaziland, import

fertilizers from South Africa; Uganda imports fertilizers from Kenya and South Africa. However, in many cases, intra-regional imports are from countries outside the continent. For instance, Burundi, Rwanda and Uganda import their fertilizers from overseas via the ports of Mombasa in Kenya and Dar es Salaam in Tanzania.

Approximately one-third of countries have import duties and half the countries levy some form of tax on fertilizers in SSA (Wanzala, 2011). In some countries the tax is on services, materials and incomes that might indirectly impact on fertilizer costs and hence prices. Kenya levies a refundable value-added tax (VAT) on services and materials used in relation to handling of fertilizers during importation. The problem is the time taken to refund this tax, which leads to additional finance costs to importers. For Uganda, importers are charged withholding tax, which can be deducted (or not deducted) from taxes when importers eventually do their tax returns and find that they were over (or under) charged. These two taxes may impact farm-gate prices since they are implemented at the point of importation and take time to get refunded, incurring costs in the process. At the time of conducting this assessment in 2012, Zambia had a foreign exchange policy that required all trade be conducted in Kwachas, the local currency, thus exposing importers to the risk of currency fluctuations. However, in 2014, facing a rapid devaluation of the Kwacha, the government scrapped exchange control regulations.

There are barriers to market entry in various countries including restrictions on fertilizer importation, restrictions on who can sell fertilizers in certain districts within a country and state involvement in importation and distributions. Trade policies discourage investment by raising the costs of business through tax and non-tariff regimes that inhibit enterprise development. These include differential quality standards across countries and regions and restrictions on prices through price controls or support. These actions restrain free trade domestically and internationally, which reduces the benefits accruing to smallholders.

The impact of NTBs on fertilizer use is difficult to estimate. There are many inspections or road stops for checks by police or customs officials along the transport routes from ports to hinterland destinations (for oceanfront as well as for landlocked countries). Weighbridges meant to implement axle-load regulations and weights often create logjams and further increase rent-

seeking costs. Such limitations have a significant impact on the number of additional days for trucks to deliver their cargo. Again, drawing from the recent IFDC studies, Table 4 illustrates tariff and NTBs in some African countries.

Table 4. Summary of Tariff and Non-Tariff Barriers to Trade in Africa

Nature of Intervention	Country
Tariff, levies and taxes	Mozambique, Kenya (refundable VAT), Ghana, Mali (shipper and council levies), Uganda (withholding tax)
Non-tariff restrictions (documentation requirements, border delays, currency restrictions, etc.)	Kenya, Uganda, Zambia, Tanzania, Malawi
Different quality standards	All countries

Source: Using information collected from IFDC Fertilizer Assessment Studies (2012-2015).

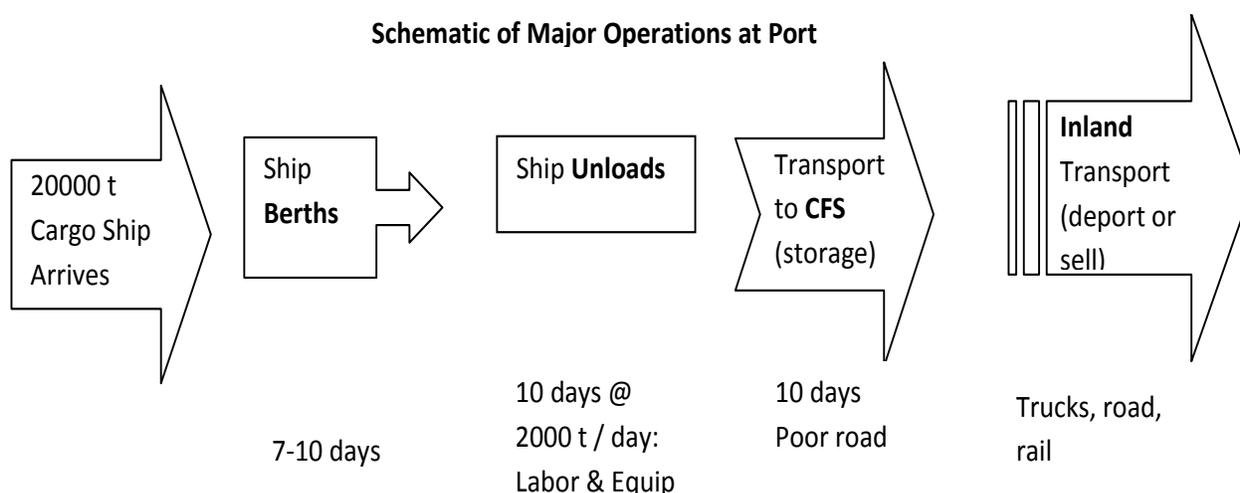
At the regional level, EAC has a common external tariff for all imported fertilizers, and fertilizer trade within the EAC attracts zero tariffs. In the ECOWAS region there are no taxes or tariffs on fertilizers being imported into the region, but importers pay related administrative fees. For COMESA, recommendations for zero external tariffs on fertilizer have been approved and the next step is domestication through the alignment of national legislation.

In 2014 there were a number of meetings by three EAC presidents to deal with the non-tariff barriers to trade. These meetings suggested actions to: (1) establish a one-stop window for documentation and payment; (2) reduce the number of road stops and weighbridges; and (3) reduce delays at inland borders.³ The number of road checks has been reduced substantially. There is an agreement to have only one weighbridge within Kenya and there is movement towards having an online one-stop window for filing of import documentations and making payments. At least two border entry points in EAC have implemented a one-stop window by combining customs clearance procedures for the two countries under one roof, so that traders do not have to undergo two separate clearing processes. These activities will contribute significantly to reducing travel times and costs.

³ The Kenyan, Ugandan and Rwandan presidents met three times in 2014 to find ways of accelerating port handling and transport constraints, https://www.standardmedia.co.ke/mobile/?articleID=2000096450&story_title=kenya-lauded-by-presidents-for-efficiency-at-the-port-of-mombasa.

3.2 Investment in Infrastructure Including Ports and Roads

There is inadequate port and transport infrastructure in SSA, which results in high freight rates and port charges. Limited port capacity results in the use of small vessels (15,000 mt). Ports are congested due to poorly maintained or an insufficient number of cranes, inefficient bagging equipment and limited warehousing capacity. The result is significant delays before berthing and low discharge rates, both of which generate high demurrage costs for importers (Figure 6). As a result, fertilizer prices ex-port are typically at least \$200 higher than the free-on-board prices on the world market (Wanzala and Groot, 2013).



Source: Extracted from IFDC’s Kenya Fertilizer Assessment (2012) study⁴.

Figure 6. Schematic of Major Port Operations

Inland haulage is expensive due to the poor condition of road and rail networks. Although rail transport is potentially 30 percent cheaper than moving fertilizers by road, it is unreliable due to railway lines that are not well maintained. The key challenges faced by ports are listed in Table 5 (but are not necessarily applicable to all ports). Consequently, importers and agro-dealers prefer to use trucks to transport their fertilizers, even though it is more costly due to long distances between ports and agricultural production areas, poor road conditions, frequent stops for inspection and inadequate competition among trucking companies.

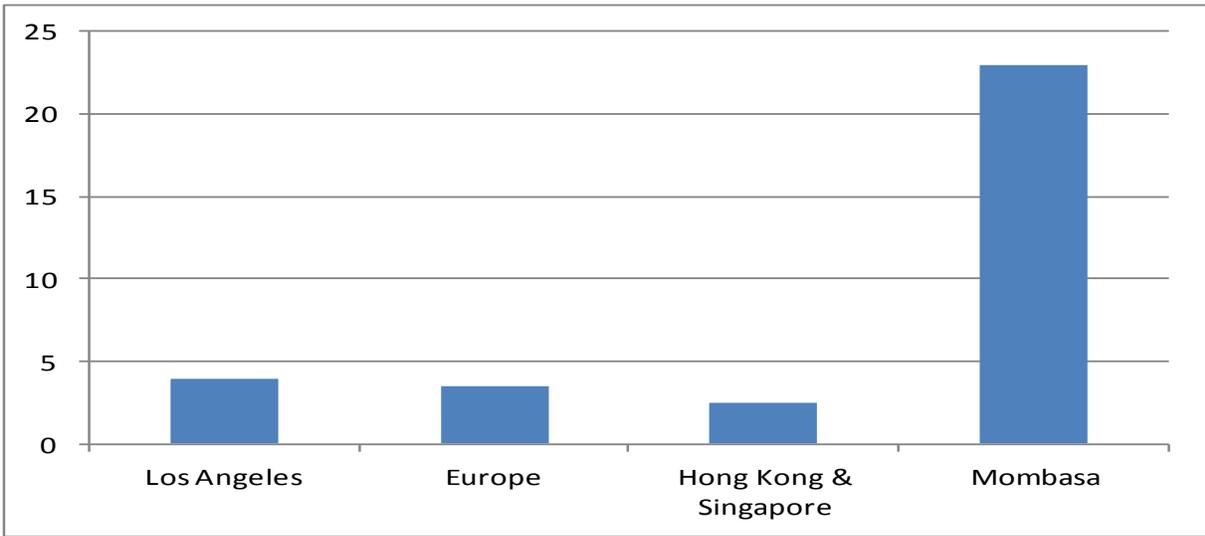
⁴ Since the time of the study, clearance at port of Mombasa has improved due to above efforts. This requires another study to gauge impact of recent efforts to reduce demurrage costs.

Table 5. Port and Inland Haulage Constraints in Africa

Ports	Inland Haulage
❖ Small, shallow, congested	❖ Poor rail and road networks
❖ Poor equipment	❖ Inadequate rail loading equipment
❖ Slow discharge of cargo	❖ Many road inspection stops and weighbridges
❖ Inadequate storage	❖ Inland border delays (NTBs)
❖ Poor management	

Source: Using information collected from IFDC FTF Fertilizer Assessment Studies.

Due to this forced reliance on roads, transportation from the time the ship docks until the goods reach warehouses in major locations in East Africa (i.e., Nairobi, Kigali and Kampala) can require more than 30 days. Figure 7 compares average times spent by vessels offloading their cargo and leaving port. A vessel through Mombasa requires an average of 23 days from its arrival to leaving port. Land transportation is the major post-port cost and is relatively more for landlocked countries.



Source: *The Research on the Cross-Border Transport Infrastructure: Phase 3*, Japan International Cooperation Agency (JICA) (2009).

Figure 7. Average Vessel Dwell Time at Various Ports in Africa

3.3 The Nature and Challenges of Fertilizer Subsidies in Africa

About two-thirds of the countries in SSA have fertilizer subsidy programs and approximately 40 percent of the fertilizer consumed is subsidized. Expenditure on subsidies runs into billions of dollars each year and, on average, subsidies account for 30 percent of national agriculture budgets (Gilbert, Jayne and Shively, 2011; Wanzala and Groot, 2013; Jayne and Rashid, 2013).

Table 6. Fertilizer Subsidy and Public Agricultural Expenditures in Selected African Countries, 2008-2011

Country	Year	Program Cost (millions U.S. \$)	[A] per MT of program fertilizer distributed (U.S. \$/MT)	Public expenditure on agriculture (million U.S. \$)	[A] as a percentage of [C]
		[A]	[B]	[C]	D
Mali	2011	38.6	890	213	18.1
Burkina Faso	2010	21.7	867	259	8.4
Ghana	2011	111.7	634	374	29.9
Senegal	2010	42.4	785	163	26.1
Nigeria	2010	190.0	719	729	26.0
Kenya	2011	61.1	1,072	318	25.7
Malawi	2011	179.2	1,200	308	58.3
Tanzania	2011	134.1	1,056	291	46.0
Zambia	2011	134.8	1,310	438	39.9
Ethiopia	2011	55.0	130	530	10.4

Source: Jayne and Rashid, 2013.

The motivation behind subsidies cited by governments takes different forms: introduction of improved technologies to farmers, who will then be incentivized by good returns to purchase their own fertilizers; provision of other inputs like improved seeds; and encouragement of fertilizer use in order to raise production nationally and end food insecurity.

These subsidies range from non-targeted/universal with complete government control of all aspects of the subsidy program to targeted programs with importation and distribution exclusively carried out by the private sector. Input vouchers are the most commonly used mechanism to deliver targeted fertilizer subsidies. Subsidy programs in Africa can be divided into four broad categories (Table 7).

Table 7. Four Categories of Subsidy Programs in Africa

	Government Distribution	Private Sector Distribution
Non-targeted subsidy	Government importation and distribution (e.g., Burkina Faso, Kenya)	Private sector importation and distribution (e.g., Senegal)
Targeted subsidy	Private sector importation, government distribution (Malawi, Zambia)	Private sector importation and distribution (Ghana, Kenya, Tanzania, Rwanda)

Source: Wanzala and Groot, 2013.⁵

3.3.1 Non-Targeted Subsidy with Government Importation and Distribution

The subsidy is not targeted to specific crops or types of beneficiaries and therefore all farmers (large, medium and small) willing to pay the subsidized price can access the fertilizer on a first-come, first-served basis. Importation of the fertilizer for the subsidy program is by the government or by the private sector on behalf of the government, based on the estimated national requirement and the available budget. The government or private sector delivers the fertilizer to warehouses in rural areas owned by the Ministry of Agriculture or a government parastatal.

3.3.2 Non-Targeted Subsidy with Private Sector Importation and Distribution

Private companies import the fertilizer for the subsidy program based on the government’s stated requirements and deliver through the market channels involving distributors and retailers at full market price. Farmers buy the fertilizer from retailers at the subsidized price, and retailers submit the requisite documentation to the government for reimbursement. No vouchers are necessary in this case but retailers or agro-dealers need to show documentation of sales volumes.

3.3.3 Targeted Subsidy with Importation and Distribution by Private Sector

Private companies import fertilizers based on their own market demand assessment including information from the government on the amount of fertilizer to be distributed to selected farmers based on vouchers issued to beneficiaries. Importers deliver the fertilizer to the regions and distributors and retailers purchase it at market price. Retailers sell fertilizer at the subsidized price to farmer beneficiaries with vouchers and keep these vouchers to submit to the importers or a participating bank for payment of the value of the voucher. The importer or bank submits an

⁵ This categorization of subsidy programs and accompanying narrative is taken from Wanzala and Groot (2013) and Wanzala, Fuentes and Mkumbwa (2013).

invoice for the value of the voucher to the government for reimbursement. These vouchers are distributed ahead of time by district officers and extension agents, based on a list of target beneficiaries generated at the district and village level.

3.3.4 Targeted Subsidy with Importation by Private Sector and Distribution by Government

The private sector imports the fertilizer on behalf of the government and sells it to the government at an agreed price. The government then distributes the fertilizer using its own networks, typically via the Ministry of Agriculture or a government parastatal. The fertilizer is sold at subsidized prices from the government rural warehouses to farmers in exchange for vouchers. The vouchers will have been previously printed by the Ministry of Agriculture and distributed to eligible beneficiaries who have been selected by using criteria developed by district officers, the local community and village committees.

Some countries have two types of subsidies running alongside each other. For example Kenya has two parallel subsidy programs, targeted and universal. The targeted subsidy is implemented through the private sector while the universal subsidy is implemented by a state agency using its distribution networks.

Though some subsidy programs have created an uncertain environment and displaced the private sector, there are examples of countries in Africa where a conducive policy environment has encouraged private investment and engagement in the fertilizer market.

Box 1. Case Study, Kenya: Privatization Leading to Lower Margins and Reduced Distance to Retailers

A combination of the liberalization of input and maize markets and public investments in support of smallholder agriculture led to tangible private investments in fertilizer retailing and maize marketing in Kenya during the period 1990-2007 (Ariga and Jayne, 2009). There was significant growth in fertilizer use and productivity resulting in a 34 percent increase in smallholder application per hectare of maize and 18 percent increase in maize yields. National consumption increased from 250,000 mt in 1990 to 400,000 mt of fertilizer products in 2007. The increased competition led to reduction in domestic marketing margins and distance travelled by farmers to agro-dealers to purchase fertilizer. Good public policy and provision of supportive services played a key role in this.

Aggregate data on fertilizer consumption trends in some countries have shown sharp declines following agriculture sector reforms leading to abrupt government withdrawal before the private sector was ready to take over the activities that were previously undertaken by state. No consistent effort was made to nurture the private sector through improved technical and business knowledge including access to finance.

There are disadvantages emanating from design of programs that create barriers to market entry. In Rwanda, the government recently replaced the system of government importation of fertilizers and distribution by the private sector with a new system in which the private sector imports and distributes fertilizers. In Rwanda, importers/distributors and the government negotiate and fix retail ceiling prices together.

Box 2. Case Study, Rwanda: A Step Toward Private Sector Importation and Distribution

Rwanda has made a lot of progress in the last five years toward private sector importation and distribution from a hitherto state-controlled subsidy system where the state imported and the private sector distributed under a bidding system that assigned distributors certain districts of the country. The state has now withdrawn and allowed a few private players to participate in both importation and distribution. However, there are joint public-private discussions to set the ceiling for retail prices. The impact of these changes remains to be seen considering that it has been difficult to get farmers to pay the subsidized price and the private sector faces financing challenges. But as the Kenya case study shows, it takes some time for impacts to be discernible as players figure their way to get cheaper financing and build networks and farmers recognize the benefits of using fertilizer and are willing to pay to access it.

The implementation of subsidy programs has faced many challenges including the disruption to private sector investments, which does not augur well for sustainable systems, as state funding for subsidies is not guaranteed. By their nature, non-targeted subsidies are available to farmers who would normally purchase fertilizers at market price, thus reducing the customer base for the private sector by reducing the amount of effective demand for commercial fertilizers. Subsidized fertilizer is often delivered late, whether via government channels or by the private sector, due to delays in budgetary approval and tendering. Consequently, farmers apply the fertilizer late, which reduces the yield benefits and discourages farmers from investing in fertilizers the next season, even at subsidized prices. In addition, the process of voucher redemption is too cumbersome. This is typically the case where farmers have to track down extension agents and

district officials to obtain vouchers. In addition to creating high transaction costs, this system also creates opportunities for rent-seeking. Further, retailers may refuse to accept the voucher if they will have difficulty redeeming it.

3.4 Supply-Side Constraints

On the supply side, the key areas constraining market development are: low manufacturing capacity on the continent which relies mostly on imports, poor capacity of agro-dealers to run a business and also to impart knowledge to farmers, easing of port operation delays to reduce costs and minimizing bottlenecks from port to the farm-gate, especially the number of road checks and weighbridges that provide opportunities for rent-seeking in addition to raising direct costs of transport; some of these have been discussed under Section 3.1 and 3.2 above.

The Abuja resolution on increasing fertilizer production has seen some progress in Africa over the past two decades. There are a number of investments in fertilizer production (manufacturing and blending) in Africa that are either in the pipeline or already underway. Fertilizer production in Africa increased from 4.9 million mt of nutrients in 1990 to 7.4 million mt in 2013, mostly in Egypt, Morocco, South Africa and Tunisia which account for over 90 percent of Africa's fertilizer production (Wanzala and Groot, 2013). There are feasibility studies being undertaken in several counties in SSA by international investors. Nigeria is currently the only urea producer in SSA. With regard to fertilizer blending, almost half of the 15 ECOWAS member states have fertilizer bulk blending plants (Camara and Edeme, 2014) and also in COMESA several states have bulk blending plants (Kenya, Malawi, Zambia, Zimbabwe). In Tanzania, the Minjingu Phosphate Fertilizer Manufacturing Company is now granulating nitrogen-phosphorus-sulfur (NPS) micronutrient-enriched formulation that can be used as a basal dressing and is cheaper than diammonium phosphate (DAP), and is aiming to serve the regional market. Ethiopia has also established a number of blending plants (Camara and Edeme, 2014). In Mozambique, international investors are keen on opportunities for urea production based on proven offshore gas reserves, and a Brazilian mining company has conducted a study to estimate phosphate

reserves. Other explorations for various fertilizer nutrient deposits are ongoing in a number of countries, including for potash in Ethiopia, Ghana and others.⁶

Agro-dealer training and recruitment has several benefits, including (1) increasing competition, which reduces prices, and (2) reducing the distance from farm to purchase point as a result of competition. Due to relatively low demand in most of these areas, competition is stifled and incentives for businesses to engage in the fertilizer sector are diminished. However, for the supply side to work effectively, the demand side has to be engaged, which requires a two-pronged approach.

3.5 Demand-Side Constraints

Effective demand by farmers can act as a magnet to attract increased supply. The small fertilizer markets in these rural markets are reflected in the high fertilizer prices, which deter further purchases. African smallholders consume relatively less fertilizer compared to other countries for a number of reasons: (1) poor linkages to output markets and therefore reduced demand for inputs because the farmers cannot sell their surplus output and receive the purchasing power to access improved inputs; (2) poor information on market prices for outputs and inputs; (3) long distances to purchasing points, which raises the transaction cost; (4) the poor state of rural feeder roads; (5) outdated fertilizer recommendations, which implies low productivity, low profits and hence low demand for fertilizers; (6) poor knowledge about correct fertilizer use due to non-existent or inadequate extension services; and (7) lack of information on the benefits accruing from using fertilizer.

Farmer access to fertilizers can be accelerated by farm demonstrations and fertilizer trials accompanied by radio and other media dissemination of relevant data on fertilizer use, prices, etc. There may be a need to provide funding to ministries to implement these activities including extension advice to raise awareness on the benefits of using fertilizer and market information. To complement awareness efforts, it is also important to link farmers to markets and provide finance services to the rural sector through microfinance institutions (MFIs).

⁶ A comprehensive assessment of fertilizer raw material resources in 12 FTF countries can be accessed in the IFDC report, *Fertilizer Country Assessment Studies for Sub-Saharan Africa: Fertilizer Raw Material Resource Assessment* (IFDC, 2014)

Though there are no definitive studies to validate this, targeted subsidies can increase demand from poor farmers who otherwise are excluded from the market since they do not have the purchasing power to buy fertilizer. Subsidies can also be used to demonstrate the benefits of fertilizer use to farmers who are unfamiliar with fertilizer and how to use it correctly to maximize their agronomic and economic returns.

Outdated recommendations are a problem due to lack of access to soil maps and tests. If an analysis was conducted on the losses accruing from using the wrong fertilizers on soils whose contents are unknown and crops whose nutrient needs are not aligned to the types of fertilizers used by smallholder farmers across Africa, losses would likely amount to billions of dollars. These losses are both from the investments in fertilizers themselves and the soil nutrient depletion that could have been prevented if the correct fertilizers were applied. Fertilizer recommendations should vary by location and crop, but currently fertilizer recommendations in SSA are sometimes uniform throughout the country or across different crops. Research is needed to identify differences in soils and the micronutrient requirements in each location. Similarly, the nutrient requirements of each crop are different and need to be taken into account in developing fertilizer recommendations. Ethiopia has tackled this problem by doing soil mapping accompanied by identification of nutrient deficiencies accompanied by investments in blending facilities to respond to the need for targeted products.

3.6 Incorporating Women and Youth in Value Chains

It is well documented that women are the majority of the breadwinners in most African smallholder farm households, accounting for more than 60 percent of the workforce. However, they have lower productivity (less yields) due to more limited access to resources (land, credit and other inputs) compared to their male counterparts (Anríquez, 2010). Clearly, addressing gender inequity and putting assets, inputs and other technologies into women's hands will have huge implications for food security, equity and poverty reduction. Key actions required to empower women in this regard are:

- **Improve access:** to services, markets and income for their produce, land and other income-generating assets.

- **Education is an important aspect of empowering women:** most women are disadvantaged in terms of education opportunities. Typically, some cultures educate boys over girls. A deliberate policy to target women and provide training to establish basic literacy and promote skills development can reduce this gap.
- There are **information gaps between men and women.** Extension services are usually received by men, since women are usually engaged in farm activities or are not actively requested to participate. Therefore, unless there is an appropriate location and time, women may not attend extension training. Where culture does not allow women and men to be trained together, women extension agents may be needed. Alternatively, there should be women-only meetings where male dominance may not have negative effects.
- **Family planning efforts** will give women the choice of balancing their family needs with other activities. High birth rates reduce the capacity of women to participate in productive ventures because of the demands on their time imposed by a large family. This is particularly important in rural areas where women tend to be less educated and informed compared to the urban population.

Putting women in positions of leadership can provide young women and girls with **role models**. However, their limited education can create a hurdle to the attainment of such positions. There should be policies to target qualified women for parliamentary seats and other key leadership positions. Rwanda has proactively allocated several parliamentary seats to women, an example that is being emulated by other countries, including Kenya.

Similarly, these strategies need to include activities that have a high likelihood of attracting youth back to the agriculture sector, by helping them experience farming as an enjoyable, lucrative way to make a living.

3.7 Finance/Investment in Value Chain Activities

Importers, distributors and retailers face financing challenges involving letters of credit, high interest rates, inadequate storage capacity, and stiff collateral requirements, which may act as a barrier to entry. There are well-documented risks associated with agriculture production (price, weather, policy) that constrain investments. Since the signing of the *Abuja Declaration*, some

governments and donors have launched initiatives to reduce the risk to financial institutions of lending to importers and agro-dealers. Risk-sharing arrangements can reduce the risk of a particular individual or organization bearing the full brunt of a bad outcome. These initiatives include the Alliance for a Green Revolution in Africa (AGRA)/Standard Bank credit guarantee scheme and the AFAP model, which provides credit guarantees or, in limited instances, matching investment grants and technical training. Currently, there are few such innovative approaches to deal with this challenge and improve availability of finance at every level of the fertilizer supply chain including at the farm level. It may be necessary to introduce legislation to improve access to foreign exchange and financing (including foreign direct investment) and introduce innovative financing along the value chain.

4. Conclusions and Recommendations

The overall policy environment in a number of SSA countries is not conducive for private sector investment as there are no clear and dependable strategies and the policy and regulatory frameworks are not up-to-date mostly due to inadequate capacity for designing and implementation coupled with lack of political goodwill in some cases. Sub-section 4.1 describes the current status of fertilizer policies in some SSA countries and recommends possible changes or actions for developing sustainable, inclusive and competitive fertilizer markets with the capacity to deliver the right type of fertilizers to smallholder farmers in order to meet the potential for crop yields and fertilizer use (Tables 1 and 2). Sub-section 4.2 takes a broader look at what key areas need more efforts to support countries and the Africa Union to develop and or improve fertilizer markets.

4.1 Status of Fertilizer Policy Frameworks and Recommended Actions for Some Countries

About one-third of African countries have formal fertilizer policy and regulatory frameworks to guide the fertilizer sector, while the rest govern their sectors by administrative decree. However, many of these formal policies and regulations are outdated (enacted in the 1970s and 1980s) and often are not specific to fertilizers but cover a wide range of inputs and foodstuffs under the same law. While some have been updated since 2006 (as is the case of Uganda, for example), they

have not yet been signed into law and even then they often lack some key elements needed to encourage increased investments in the fertilizer markets. Moreover, even with the current regulations, the capacity for enforcement is weak due to poor inspection capacity and inadequate laboratory equipment for testing and enforcement. Table 8 summarizes the status of fertilizer policy and regulatory frameworks for some countries in SSA and suggested actions to improve on the status quo.

Table 8. Status of Fertilizer Policy Frameworks and Suggested Actions for Some Countries

Country	Status of Policy Framework
Rwanda	<ul style="list-style-type: none"> Fertilizer policy drafted with support of agriculture stakeholder working group but not yet approved by parliament. Significant progress being made in privatizing fertilizer market. There is increased competition but retail price ceilings set by government and private sector. Subsidy: rate at 30% of retail price; planning to adopt nutrient-based approach. <p><i>Suggested Actions: Further reforms to increase private sector involvement. More policy analysis and advocacy required to support these efforts. Improve ministry's policy analysis capacity</i></p>
Kenya	<ul style="list-style-type: none"> Fertilizers and Animal Foodstuffs (Amendment) Act 2015 was signed or approved in October 2015 by President; labs and inspection capacity in place and soil map completed. Political system recently devolved from central to county government. Two parallel subsidy programs in place (targeted and general) with ad-hoc state intervention. There is a risk of intervening with county-specific subsidies that may crowd-out the private sector. <p><i>Suggested Actions: Fertilizer trade reforms needed to allow for quick registration of new products. Harmonization of fertilizer policies across COMESA and elimination of tariff and NTBs. Capacity building at county level on fertilizer policy.</i></p>
Mozambique	<ul style="list-style-type: none"> Draft fertilizer policy awaiting parliamentary approval; labs and inspection capacity inadequate. Small fertilizer market (low adoption, at 5%); most fertilizer imports through Mozambique are destined for neighboring countries. Fertilizer market is private sector-driven. Some subsidy vouchers program run by FAO-EU in some parts of country. <p><i>Suggested Actions: Sensitization of farmers on use of fertilizer and soil maps/tests to allow for scaling up use of fertilizers.</i></p>
Uganda	<ul style="list-style-type: none"> Draft policy awaiting parliamentary approval. Like Mozambique; nascent fertilizer use, low demand; labs and inspection capacity inadequate. Planning to introduce fertilizer subsidy for the first time. <p><i>Suggested Actions: Similar to Mozambique (above) plus assistance to design and implement "smart" subsidy based on best practices.</i></p>

Country	Status of Policy Framework
Malawi	<ul style="list-style-type: none"> • No specific “fertilizer” policy (some strategy in place); outdated quality regulations in place; ad-hoc public directives provide guidelines to fertilizer market; labs and inspection capacity inadequate. • State-run input and output agencies monopolize distribution of inputs and procurement of maize, deterring private investment. • Smallholder subsidy program constituted large part of national budget. • IFPRI and MSU involved in a number of research activities in Malawi. <p><i>Suggested Actions: There is room for partnerships across organizations (IFPRI, MSU, IFDC, FAO, others) to assist government develop sustainable agricultural policy and also assistance to design and implement “smart” subsidy based on best practices.</i></p>
Zambia	<ul style="list-style-type: none"> • No fertilizer policy, outdated and weak regulations in existence; labs and inspection capacity inadequate. • Ad-hoc government directives including on exchange rate regimes that raises risks to exporters/importers. • AGRA funding review of quality control, upgrading labs and training inspectors. <p><i>Suggested Actions: Partnerships to encourage dialogue with policymakers. Regional policy harmonization is crucial as Zambia, Malawi and others rely on fertilizer imports through Mozambique (and through SA and Tanzania, too).</i></p>
Tanzania	<ul style="list-style-type: none"> • The Fertilizer Act (2009) and Fertilizer Regulations (2010) are in place to govern fertilizer markets. These are not updated sufficiently to deal with quality issues in the country; labs and inspection capacity inadequate. • Active private sector in place. • Have subsidy program that is of concern due to budgetary pressures. • Soil testing services expensive and unreliable. <p><i>Suggested Actions: Need to reform import and quality control procedures as relates to new fertilizer products. Technical assistance in designing “smart” subsidy.</i></p>
Nigeria	<ul style="list-style-type: none"> • Dysfunctional laws and regulations, no clear roles for monitoring and regulations; outdated frameworks, frequent changes in management and directives at federal and state levels; labs and inspection capacity inadequate to deal with adulteration etc. • Nigeria has taken a different route from ECOWAS’s approved fertilizer quality regulations and set its own regulatory framework; a draft Fertilizer Bill (2014) has not yet passed into law by the National Assembly • The Growth Enhancement Support (GES) program (2012-2015), under which an aggressive subsidy agenda was introduced under the Agricultural Transformation Agenda has not been renewed under the new administration. Subsidy program piloted in some states under electronic TAP system. • Nigeria is also a producer of some fertilizers. • A number of institutions are supporting Nigeria’s fertilizer quality regulatory efforts including: AGRA, IFDC, USAID, ECOWAS <p><i>Suggested Actions: Technical support to i) implement regulatory framework once law is passed ii) assess the performance of the GES/TAP pilot subsidy program and iii) policy changes with ministry of agriculture.</i></p>

Country	Status of Policy Framework
Ghana	<ul style="list-style-type: none"> • Fertilizer policy in place. • The ECOWAS fertilizer regulation published in the national gazette. • Quality regulations drafted but labs and inspection capacity inadequate, adulteration of fertilizer occurring. • A multi-organizational mission provided technical support on soil fertility in 2015 (MSU/IFPRI/IFDC/IITA/USAID-APSP). • Current subsidy faces challenges-late payment to suppliers and late delivery of subsidy to farmers; State seeking to improve current subsidy model. <p><i>Suggested Actions: Technical support in implementation of quality regulations (WAFP, USAID-APSP), policy dialogue and design of “smart” fertilizer subsidy.</i></p>
Ethiopia	<ul style="list-style-type: none"> • Mostly government-driven fertilizer sector. • No private sector as government is involved in market and support services. • Soil maps completed, blending introduced in some regions. <p><i>Suggested Actions: Policy dialogue to encourage private investment (this is a long-term strategy) and technical support to improve efficiency in current market system.</i></p>
Burkina Faso, Mali, Côte d’Ivoire, Senegal, Benin, Liberia	<ul style="list-style-type: none"> • No formal fertilizer policy, just some strategies to promote fertilizers. • ECOWAS regulations published in national gazette but not yet adopted. • Some legal framework consistent with ECOWAS rules drafted for enactment. <p><i>Suggested Actions: Baseline assessment of fertilizer quality including sensitization and “domestication” of ECOWAS regulations and training of inspectors; assistance from WAFP and AGRA already in place.</i></p>

Source: IFDC Fertilizer Assessment Studies 2012-2015 and other sources.

The current country fertilizer markets in SSA are characterized by outdated policies and restrictive regulations. A consequence of this is the: (1) delays in validation and registration of new improved fertilizer products imported into some countries due to rigidities in existing regulations; (2) constriction of inter-country trade as neighboring countries have different quality standards that have not been harmonized; and therefore (3) limits the set of products available and also the extent of the market, which leads to higher fertilizer prices resulting from smaller costly markets.

To deal with these challenges, a number of regional blocks are working towards harmonizing policy frameworks across member states. In 2012 the Economic Community of West African States (ECOWAS) ratified harmonized fertilizer quality regulations for its members, thus eliminating quality restrictions to cross-border trade. However, most ECOWAS states do not have the requisite domestic capacity in terms of labs and inspection to quickly implement the regional regulations. ECOWAS and development partners including IFDC are working with the relevant stakeholders in the private and public sectors to identify solutions to domestication of the regional frameworks. There are efforts being made to develop regional frameworks for the

East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA).

4.2 Road Map in Support of African Union

This section concludes with the way forward on priority areas that require continued intervention from AU, national governments, development partners and other stakeholders. It provides clear implementable recommendations with specific goals, policy proposals and action plans that offer opportunities for these stakeholders to strengthen access to fertilizers by smallholders.

Implementing such recommendations will require political commitment and continued dialogue between technical experts and stakeholders, including policymakers.

This report has focused substantially on smallholders who make up the majority of SSA – farmers owning less than 2 hectares (ha) of land. However, it is crucial to keep reassessing approaches and experimenting with alternative models that support “medium” scale farmers who may have the capacity to make the big leap and pull the economy along. Also, closing the gender gap could increase agricultural output in the developing world and reduce the number of undernourished people (Anríquez, 2010).

Though there has been some progress with the Abuja resolutions, it is clear that there are policies and policy-related areas that require attention in order to improve the performance of fertilizer markets in Africa. These areas have been detailed in this report, including some case studies that show some progress through the adoption of good practices in policy design and implementation.

This section will zero in on four areas that need to be prioritized because of their potential to achieve significant and sustainable increases in fertilizer use and supply in Africa. For each area the following will be provided: an explanation for why this is a priority area; the major goals associated with it; and the key actions required to deliver these goals. Implementing these policies will require political commitment, expert technical and legal support, and strong communication to stakeholders in each country’s public and private sector.

The road map is comprised of four action areas.

4.2.1 Policy Action Area 1: Allocate More of the National Budget to Agronomic Research and Extension

The single most important constraint to increased agricultural productivity in Africa is the mismatch between the nutrient needs of the soils and crops and the fertilizers that are being used by the majority of farmers. This is an area that has been overlooked by researchers and policymakers but is probably the most important area for raising production significantly through increasing fertilizer use efficiency and response rates. The increase in productivity and profitability will stimulate increased demand by smallholders and at the same time raise national agricultural production.

Well-meaning governments are pushing for increased fertilizer use across the continent with insufficient knowledge of the soil conditions and crop nutrient requirements. This inherent contradiction has resulted in inefficiencies in the form of the high cost of using wrong or inappropriate fertilizers and the accompanying low response from crops. Identifying soil needs and gaps by agro-ecological zone and/or crop and the specific fertilizer recommendations and formulations to meet that gap and getting that information to private dealers, extension agents and farmers are important in raising profitability. Policy Action Area 1 consists of the following goals and actions (Table 9).

Goal: Stimulate farm-level demand for fertilizer S by improving crop response to fertilizer use.

Table 9. Summary of Action Area 1: Goals and Actions to Establish Sustainable Research and Extension Systems

Issue	Recommendations (Through Country or Regional Efforts)	Short Term 1-2 Years	Medium Term 3-5 Years	Long Term >5 Years
Inadequate agronomic research and extension programs	Develop national soil maps, recommendations by location, soils, and crop types	X	X	X
	Establish at least one soil testing facility	X	X	
	Establish blending facilities			
	Increase number of agro-dealers trained in technical and business knowledge	X	X	
	Increase number of trained extension officers	X	X	
Fertilizer use efficiency(FUE) and the environment	Increase number of fertilizer demonstrations and trials	X	X	
	Adopt an Integrated Soil Fertility Management (ISFM) approach. This will vary by location based on soil fertility conditions, type of crop, agro-climatic zones, availability of organic inputs, etc. Use fertilizer technologies that have less environmental footprint.	X	X	
Market Information	Establish an effective operational system providing information about input and output market conditions to farmers		X	

Fertilizer use efficiency (FUE) depends on other complementary inputs and services; availability of information on BMPs, extension services, organic inputs, water use efficiency (harvesting, efficient irrigation), soil structure, and improved planting materials. Other measures that should accompany efforts to improve soil fertility include addressing credit problems and land rights as well as improving and extending rural infrastructure, marketing and distribution networks.

4.2.2 Policy Action Area 2: Develop and Harmonize Policy and Regulatory Frameworks

Most governments in SSA govern the fertilizer sector either through formal legislation or by administrative decisions. However, the formal legislation is typically outdated and needs to be modernized. For those countries that have updated legislation, it still lacks elements that are important for encouragement of investment in the fertilizer industry and has weak enforcement capacity particularly at the point of sale where adulteration is most likely to take place. Countries tend to have a list of approved fertilizer products, which limits the set of fertilizer products available to farmers, and, moreover, the list of approved products differs across countries, so the introduction of new products into a country is delayed or can even be denied altogether.

A significant number of countries still have taxes and duties on fertilizers or on services/materials used with fertilizers (e.g., bags) and delayed refunds on VAT. Non-tariff barriers (road checks, weighbridges, border delays and currency restrictions) add to farm-gate prices. Easing these impediments will contribute to incentives for the private sector to invest in manufacturing and/or procuring for regional (as opposed to country) markets.

Countries need to develop modern, rationalized fertilizer policy and regulatory frameworks, and these need to be harmonized at the regional level. The approach should be that taken by ECOWAS, where the RECs develop a regional regulatory framework, which is then endorsed and adopted by member states to suit individual needs while conforming to regional requirements. This is more efficient than members developing individual frameworks, which then need to be harmonized.

Policy Action Area 2 consists of the following goal, actions and targets (Table 10).

Goal: Develop and harmonize fertilizer policy and regulatory frameworks (including trade policy to establish regional markets).

Table 10. Area 2: Actions and Targets to Develop and Harmonize Policy and Regulatory Frameworks

Issue	Recommendations (Through Country or Regional Efforts)	Short Term 1-2 Years	Medium Term 3-5 Years	Long Term >5 Years
Policy and Regulatory Framework (Predictable, reliable environment)	Develop, update and enact fertilizer policy and regulations at two levels:			
	National: Countries to develop/modernize fertilizer policy and supporting regulations and enact them into law; countries should adopt REC harmonized policy if present.	X	X	
	REC: Design regional regulatory architecture to which all members in RECs will adhere. The design of these regional frameworks should proceed irrespective and independent of national frameworks. Hire national and international experts with wide experience.	X	X	
	Strengthen regulatory enforcement capacity:			
	Human	X	X	
	Analytical labs		X	X
	Approve ingredients not the product (or blend)	X	X	
Trade Policy: (Establish and promote national and regional markets)	Reduce delays at border:			
	One-stop border posts (24-hr)	X	X	
	Single electronic windows (24-hr) and link revenue authority with customs		X	X
	Eliminate NTBs:			
	Reduce number of road checks and weighbridges on transit cargo	X	X	
	Remove restrictions on import participation		X	
	Ease licensing procedures for businesses and import tenders	X	X	
	No restricted entry to markets, pan-regional pricing and price controls	X	X	
	Eliminate tariffs and taxes:			
	Zero/eliminate all taxes and tariffs on fertilizer (e.g., ECOWAS signed 2012)	X	X	
Remove withholding, VAT, etc.	X			

Most importantly, governments must carefully balance their roles of facilitators and actors in market development. Governments have an important role to play in input quality control, input and output market information systems, tax reforms and regional cooperation where markets are too small to attract private investments. When these services are missing, the private sector cannot grow to its potential. However, it is sometimes difficult to design or reform public policy due to divergent interests or the political economy and therefore efforts need to be made to obtain consensus among key players.

4.2.3 Policy Action Area 3: Allocate Budget to a Fund that Supports Innovative Fertilizer Financing Mechanisms

The government should allocate part of the CAADP budget commitment to establish a fund that will finance activities aimed at: (1) increasing the availability of fertilizer supply all along the value chain and (2) providing a “pull factor” that will increase demand through output market incentives. It is important to include the private sector and donors in such financing arrangements not only to spread the risks but also build consensus on priority areas that need support.

Policy Action Area 3 consists of the following goals, actions and targets (Table 11).

Goal: Establish a fund to support innovative finance activities for the fertilizer value chain

Table 11. Summary of Action Area 3: Goals and Actions to Establish a Fund to Support Innovative Financing Activities for the Fertilizer Value Chain

Issue	Recommendations (Through Country or Regional Efforts)	Short Term 1-2 Years	Medium Term 3-5 Years	Long Term >5 Years
National fertilizer financing facilities for input suppliers and farmers	Dedicate part of CAADP budget commitment for agriculture to establish national fertilizer financing facilities for input suppliers.		X	X
	Learn from other models & partnerships: One Acre Fund in Rwanda, AGRA and Standard Bank “loan Guarantee fund” (Tanzania, Mozambique), AFAP Agribusiness Partnership Contracts (APCs)			
Operationalize the AFFM at the AfDB	Countries to contribute at least \$500,000 annually to the AFFM toward meeting the target of \$10 million	X	X	

4.2.4 Policy Action Area 4: Public-Private Dialogue and Joint Action on Fertilizer Policy

The facilitation of public-private engagement is critically important to a sound policy environment for the fertilizer market. The significance of PPPs and private-public dialogue has been emphasized throughout this paper and clearly stakeholder inclusiveness will be of critical importance for the success of these actions. There should be regular and structured public-private dialogue and consultations on policy reforms and new policy and implementation in order to draft regulatory language and to establish a joint understanding of appropriate public and private roles in the fertilizer sector. The outcome should be a policy environment where the role of the public sector is transparent and is designed to strengthen private sector investment and engagement where government involvement in the fertilizer space enhances rather than reduces competition.

The key guiding principle should be the following: government facilitates, private sector executes, development partners help catalyze. To make this a reality, it will be critical to strengthen the capacity of public and private sector vis-à-vis executing their own roles and responsibilities toward the development of competitive and sustainable fertilizer markets and understanding and appreciating the value addition from each party. A key area that will require attention in this regard is the design and implementation of subsidies. Subsidy programs should be designed and managed as PPPs. They should be implemented in a manner that manages government involvement in the fertilizer value chain so as to limit government competition with the private sector. All private sector actors should be free to participate in the programs. This would mean moving away from government tenders for importation and toward vouchers redeemable through any licensed dealer to maximize competition and private sector incentives that lower costs to the farmer.

Policy Action Area 4 consists of the following goals, actions and targets (Table 12).

Goal: Establish an inclusive policy environment and system of institutions that will accelerate policy responsiveness to market needs, stimulate and increase private investment

Table 12. Summary of Action Area 4: Goals and Actions to Establish Public-Private Dialogue and Joint Action on Policy

Issue	Recommendations (Through Country or Regional Efforts)	Short Term 1-2 Years	Medium Term 3-5 Years	Long Term >5 Years
Conducive policy and institutional environment to stimulate and increase private investment	Regular platform meetings, government and private sector to: Review and clarify current and intended changes in policy, government discuss with private sector and private sector share concerns on impact of policies on their activities	X	X	X
Subsidy design and implementation: Limit subsidies to targeted or “smart” subsidies that are gender friendly	Joint government and private sector design and implementation of the subsidy program Apply PPP approach to subsidy: Private sector imports and distributes the fertilizer; government regulates the sector; both disseminate information to farmers Subsidies to include the following: <ul style="list-style-type: none"> • Target resource-poor farmers who would not otherwise purchase fertilizer including women • Use vouchers redeemable from agro-dealers • Free entry to all importers; allow for private sector development – as part of government EXIT strategy • Conduct periodic Cost-Benefit Analysis of programs 	X	X	X

It has been demonstrated throughout the world that the use of improved technologies increases when the environment is conducive for the private sector to invest in markets. Dialogue among farmers' organizations, private sector associations and the public sector becomes an indispensable element for market development in situations where there is a transition from public to more private sector participation.

However, because of the market-distorting nature of subsidies, countries should also consider indirect support to farmers through increased access to and affordability of soil mapping and testing facilities. Where direct fertilizer subsidies seem indispensable (for example, to re-establish a country's agriculture after a war or natural disaster), they should be distributed through a voucher or electronic system that does not distort the market. Subsidies can also be useful tools in introducing farmers to fertilizer use in the early stages of agricultural development and for smallholders on marginal land. Subsidies need to be sustainable by including private sector participation, using a "smart" approach: allowing all private actors to participate, not just a few, and promoting input subsidy packages (fertilizer, seed, extension, finance), not just fertilizer alone. It is also necessary to take into account potential alternative uses of subsidy monies that are cognizant of other investment options.

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