



Strategic Priorities for Improving Fertilizer Subsidy Programmes in Africa

Policy Brief # 2

June, 2024



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Strategic Priorities for Improving Fertilizer Subsidy Programmes in Africa¹



Summary

In 2016/17, AGRA undertook an assessment of marketing and distribution systems of farm inputs (mainly fertilizer) in 11 selected countries (Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Rwanda, Tanzania, and Uganda) resulting in country-specific recommendations for improving fertilizer subsidy programmes (FSPs). The uptake of AGRA's recommendations has been incomplete, leaving several critical gaps and challenges in FSP design and delivery and FSP policy and regulatory frameworks toward improved soil health and sustainable agricultural productivity and income growth.

Available evidence indicates that FSPs in Africa have generated several positive impacts, notably by bolstering agricultural productivity, augmenting farmers' incomes, and fortifying food security. These impacts have come at high cost and would appear to be fiscally unsustainable. They also crowd out investment in other areas critical to agricultural development (e.g., agricultural research and extension). These fiscal challenges alongside the unanticipated consequences stemming from a lack of adherence to the principles of "smart" subsidy design underscore the imperative for recalibration. Among these unintended outcomes are disruptions in commercial sales, logistical inefficiencies in distribution, market distortions, and increases in public debt – all of which necessitate a strategic shift in approach. To effectively address these challenges, "smart" fertilizer subsidy programs must not only stimulate new demand for fertilizers but also nurture existing supply chains to promote sustainability and market viability.

In most countries, there would appear to be significant potential for expanding and deepening fertilizer systems while reducing or repurposing fertilizer subsidies. Successful innovations center on: **(i)** leveraging input vouchers for enhanced access to financing and credit to acquire fertilizer and other improved inputs (as in Ethiopia); and **(ii)** financial and trading incentives that boost local production, blending, and distribution of fertilizer, thereby stabilizing supply and reducing cost (as in Nigeria). Realizing such potential requires strong and transparent public sector leadership alongside sustained engagement and support to the private sector and research and extension systems, aiming to overcome structural and regulatory impediments to scaled private investment in fertilizer systems.

¹ This report is a companion document to three AGRA policy briefs that address FSP design and delivery, scale and impacts, and policies and regulations. The report synthesizes material included in the three briefs and includes a full listing of the sources that informed the briefs.

Short-Term Priorities

Short-term actions (within 1-2 years) to improve FSP design and delivery include:

1. Ensure timely distribution of subsidized fertilizers before planting seasons
2. Increase the quality and rigor of beneficiary targeting, registration, and management systems, leveraging digital platforms and mobile applications in gender-sensitive approaches
3. Strengthen graduation and exit strategy design and execution based on clear criteria derived from objectively verifiable levels and thresholds of farm and food system performance
4. Integrate fertilizer subsidies with complementary inputs and interventions for soil health improvement including agronomic advice and agroforestry innovations
5. Enhance and expand e-voucher systems, streamlining administrative processes and reducing bureaucratic hurdles
6. Promote the use of digital financial services in subsidy delivery systems including mobile payment solutions
7. Enhance transparency and efficiency in fertilizer importation, prioritizing enhanced supply chain management in competitive processes
8. Avoid crowding out of the private sector (especially agrodealers) in FSPs, ceasing direct delivery of fertilizer by public agencies

Short term actions (within 1-2 years) to improve FSP policy and regulatory frameworks include:

1. Establish a single organization responsible for overseeing and implementing fertilizer industry policies, laws, and regulations
2. Sustain and increase investments in road and rail infrastructure and local production and blending facilities
3. Ensure coherence between agricultural output trade policies and fertilizer price and subsidy policies
4. Reform fertilizer import tendering rules and procedures in FSPs to boost transparency and competition
5. Streamline bureaucratic processes that delay payments to importers and distributors

Medium-Term Priorities

Medium-term actions (within 3-5 years) to improve FSP design and delivery include:

1. Terminate all universal FSPs and replace them with targeted ones
2. Invest in infrastructure and capacity building to scale up soil testing, allowing flexibility in input choice
3. Scale up domestic fertilizer manufacturing and blending capacity including technology transfer in public-private partnerships
4. Strengthen quality control measures for subsidized fertilizers through strict regulations and strong sanctions against distribution of counterfeit and substandard products
5. Establish accreditation mechanisms for input retailers
6. Increase the quality, rigor, and coverage of M&E systems, deploying digital tools in regular assessments
7. Combat elite capture, corruption, and politicization through transparent procurement processes and robust oversight



Medium term actions (within 3–5 years) to improve FSP policy and regulatory frameworks include:

1. Harmonize regional standards and policies to enable bulk fertilizer procurements and reduce transaction and transportation costs across borders
2. Invest in physical, technical, and organizational capacity for fertilizer quality control and monitoring beyond ports to ensure consistency and safety in fertilizer products.
3. Consolidate all testing and quality control of fertilizers under one authority to centralize oversight and ensure uniformity in standards
4. Enhance financial incentives for private importers, distributors, and agrodealers handling subsidized fertilizer by tackling payment delays, negotiating trade guarantee agreements, and developing flexible financial packages
5. Modernize equipment and procedures for bulk handling and distribution of fertilizer
6. Relax trade regulations that require all fertilizer blends to be tested and approved before use, while maintaining safety standards
7. Sustain commitment to regional integration by prioritizing regional infrastructure projects, trade corridors, and adoption of common fertilizer standards and regulation

Background

African agriculture is largely rainfed and seasonal, with wide variability in growing conditions from year to year. Most land holdings are small and dispersed, often with low quality soils. Rural infrastructure is generally poor, leading to high transportation costs, major information asymmetries, and uncompetitive input and output markets. These conditions negatively impact fertilizer costs, crop-yield response to fertilizers, and fertilizer use profitability (Holden, 2018). Average fertilizer application rates in Africa range between 13 and 20 kg per hectare – well below the global average of 80 kg per hectare (FAOSTAT) and the 2006 Abuja Declaration target of 50 kg per hectare. Fertilizer subsidies are a common response to this situation. “Smart” fertilizer subsidy programmes (FSPs) were conceived in the mid-2000s to promote fertilizer access and increase sustainable use without distorting nascent fertilizer markets (Holden, 2018; Jayne et al., 2018).

FSPs seek to overcome flaws in food systems that limit fertilizer availability and access and thereby damage soil health and blunt food system performance. By reducing costs, boosting yields, and increasing fertilizer use efficiency, FSPs promote innovations in food systems that raise farmer incomes, enhance livelihoods, and increase food security. Managed properly, FSPs can incentivize farmers to adopt sustainable practices that improve soil health in the long run by enhancing soil structure, fertility, and microbial activity (Holden, 2018).

In 2016/17, recognizing these opportunities and imperatives in Africa’s fertilizer industries, AGRA undertook an assessment of marketing and distribution systems of fertilizer and farm inputs in 11 selected countries (Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Rwanda, Tanzania, and Uganda) resulting in several recommendations for improving the enabling environment for implementation of FSPs (Mbonigaba et al., (2016). Drawing from that assessment and other relevant studies, this report: **(i)** outlines the major features of fertilizer industries of the 11 focus countries; **(ii)** examines the scales and impacts of FSPs in these countries; **(iii)** considers the extent of uptake of AGRA’s 2016/17 recommendations; **(iv)** identifies major gaps and challenges in FSP design and delivery and policy and regulatory frameworks; and **(v)** draws implications for policy and investment.

Main Features of Fertilizer Industries

Figures 1-3 describe current conditions in the fertilizer industries in the 11 countries based on national consumption of fertilizer, sub-national consumption of fertilizer, agrodealer concentration, fertilizer subsidy levels and types, domestic production and blending of fertilizers, and stakeholder roles (focusing on the roles of governments and the private sector). In summary:

- National consumption of fertilizer averaged 553,000 MT in 2020, with a high of 1,418,000 MT (Nigeria) and a low of 61,000 MT (Uganda) (Figure 1, panel A). These aggregate levels of fertilizer consumption appear to be linked to country size and agricultural GDP (Figure 1, panel B).
- Sub-national consumption of fertilizer averaged 34 kg/ha of arable land in 2020, with a high of 107 kg/ha (Ghana) and a low of 2 kg/ha (Uganda) (Figure 2, panel A). This metric is not equivalent to the fertilizer application rate, which is a farm-level measure of actual use of fertilizer. Rather, this measure captures the overall intensity of fertilizer consumption for the agricultural sector as a whole.

Agrodealer coverage averaged 7,800 farmers/agrodealer in 2022, with a high of 29,7000 farmers/agrodealer (Mozambique) and a low of 270 farmers/agrodealer (Mali) (Figure 2, panel B). These investments seek to make fertilizers available to numerous farm households at affordable prices, in suitable bag sizes, and at sales points as close as possible to farm-gates. Ethiopia, Mozambique, Nigeria, and Uganda are lagging far behind the other countries.

Fertilizer subsidies averaged 57 percent in 2020, with a high of 77 percent (Mali) and a low of 40 percent (Tanzania) (Figure 3, panel A). Between 2017 and 2022, the average expenditures on FSPs was \$35 million, with a high of \$72 million/year (Kenya) to \$2.5 million/year (Mozambique) (Figure 3, panel B). Four FSPs were universal (Burkina Faso, Kenya, Mali, and Tanzania); five were targeted/smart (Ghana, Malawi, Mozambique, Rwanda, Uganda). Degrees of universality and “smartness” varies across countries, with wide differences in objectives, eligibility criteria, coverage, monitoring and evaluation, and exit strategies. Products covered in FSP packages typically include seeds alongside fertilizers, with wide differences in size, value, and range of packages. In several countries, the level and composition of subsidized packages varies over product and time (e.g., Tanzania and Uganda).²

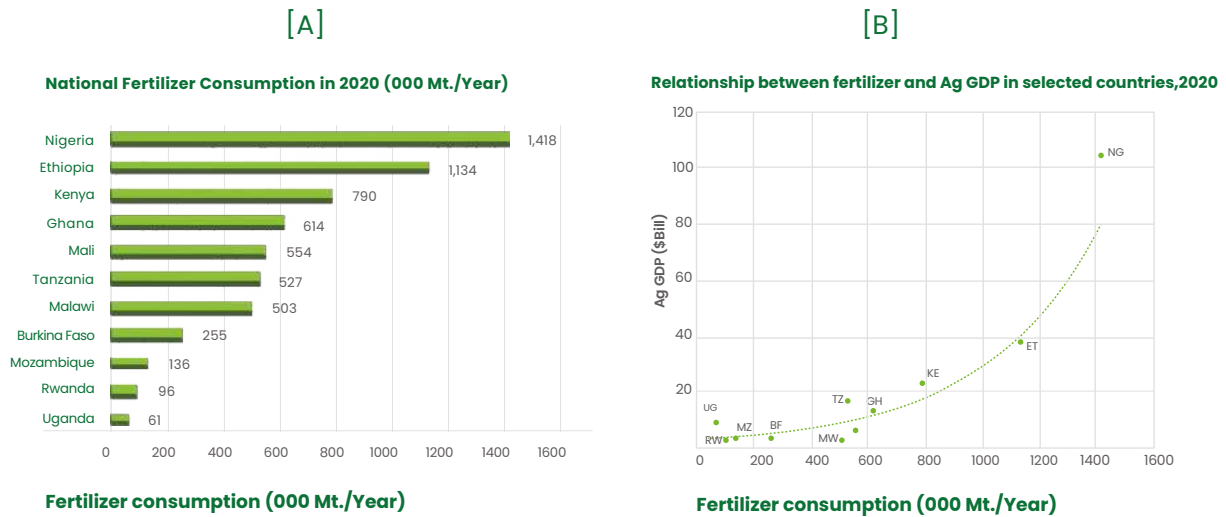
Five countries have invested in domestic production of fertilizers (Ethiopia, Kenya, Mali, Nigeria, Tanzania); ten have installed blending capacity (only Rwanda has not done so). These investments are growing steadily in number and size, seeking to lower cost and adapt fertilizer use recommendations and subsidy packages to local soil conditions in various agroecologies, thereby maintaining soil health, improving crop response, and increasing profitability of fertilizer use.

Stakeholder roles have been shaped by the liberalization and privatization of fertilizer industries in the 1990s that conferred stronger roles to the private sector in key functions, with governments urged to concentrate on creating an enabling environment for the private sector. But governments continue to play important roles in Ethiopia (government monopoly on importing), Malawi (state-dominated importing and distribution), Mali (state-run importing, processing, and distribution and pricing system), Rwanda (public procurement of subsidized fertilizer), and Tanzania (public bulk procurement of fertilizers).



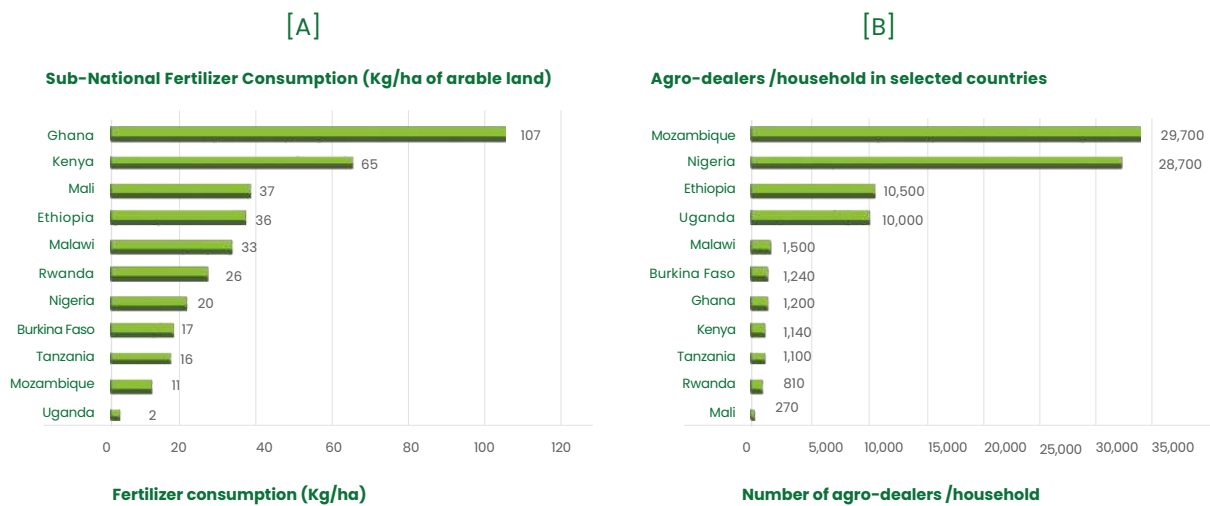


Figure 1: National fertilizer consumption [A] and the relationship between national fertilizer consumption and agricultural GDP [B] in selected countries, 2020



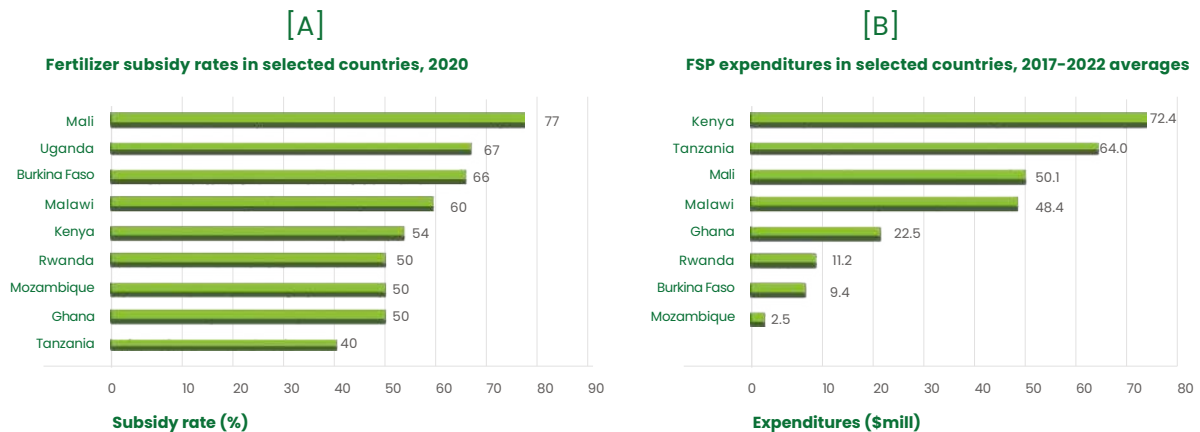
Source: A = AFAP: <https://afap-partnership.org/africa-fertilizer-map-2020/> ; B = World Development Indicators: <https://data.worldbank.org/indicator/AG.CON.FERT.ZS>

Figure 2: Sub-national fertilizer consumption in selected countries in 2020 [A] and number of agrodealers per household in selected countries in 2023 [B]



Sources: A = World Bank indicators: <https://data.worldbank.org/indicator/AG.CON.FERT.ZS>; B = African Seed Access Index <https://www.tasai.org/en/dashboard/cross-country-dashboard/>

Figure 3: Fertilizer subsidy rates in 2020 [A] and FSP expenditures levels in 2017-2022 [B] in selected countries, 2020



Note: Ethiopia and Nigeria do not operate FSPs; data for Uganda are not available. Sources: Authors based on stakeholder consultations

FSP Scales

It is instructive to consider the scale of FSPs before and after AGRA's 2016/17 review – i.e., from 2007 to 2016 and from 2017 to 2022. The scale of FSPs varied widely across 8 AGRA focus countries with such programmes in place, and for which data are available (Table 1).³

Table 1: Average annual FSP volumes (mt) – 2007–2016 vs 2017–2022

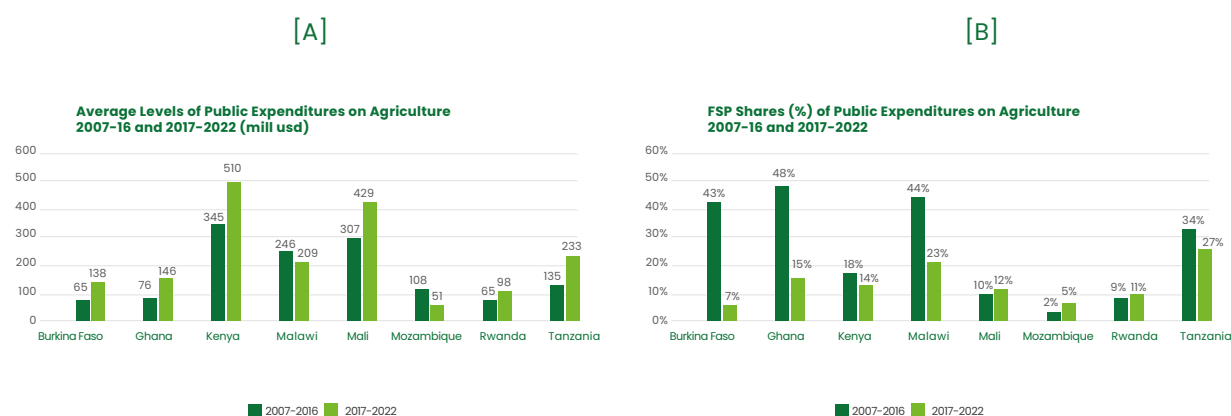
Period	Burkina Faso	Ghana	Kenya	Malawi	Mali	Mozambique	Rwanda	Tanzania	Average
2007–2016	31	123	80	187	181	0.6	27	113	93
2017–2022	21	108	194	--	361	0.9	54	--	123
Change	-11	-15	115	--	180	0.3	26	--	49

Note: Volume data for 2017–2022 are not available for Malawi and Tanzania. Sources: Authors, AGRA-HAPA, 2022; Jayne et al, 2018

Between 2007 and 2016, the average annual scale of FSPs across the 8 countries stood at 93,000 MT with an average value of \$40 million. Malawi's FSP averaging 187,000 MT/year valued at \$109 million/year was the largest; Mozambique's FSP averaged 600 MT/year valued at \$2 million/year was the smallest. Between 2017 and 2022, the average annual scale of FSPs rose to 123,000 MT, but with a lower average annual value of \$35 million. Mali's FSP had the largest average annual volume at 361,000 MT/year, but Kenya's FSP averaging 194,000 MT/year had the highest annual average value of \$72 million/year. Mozambique's FSP averaged 900 MT/year valued at \$2.5 million/year was the smallest. Between the two periods, the average annual values of FSPs in Kenya, Mali, Mozambique, Rwanda, and Tanzania grew; those in Burkina Faso, Ghana, and Mali fell. Distributed volumes increased in all countries except Burkina Faso and Ghana.

The scale of FSPs also varied significantly before and after AGRA's 2016 review (Figure 1, panel A). On average, public expenditure on agriculture in the 8 countries increased by 35 percent between 2007–2016 and 2017–2022, falling only in Malawi and Mozambique (Figure 4, panel A). Average spending on FSPs fell by 12 percent between the two periods, increasing only in Mali, Mozambique, and Rwanda (Figure 4, panel B).

Figure 4: Average annual public expenditures on agriculture [A] and average annual FSP expenditures levels [B] in selected countries in 2007–2016 and 2017–2022



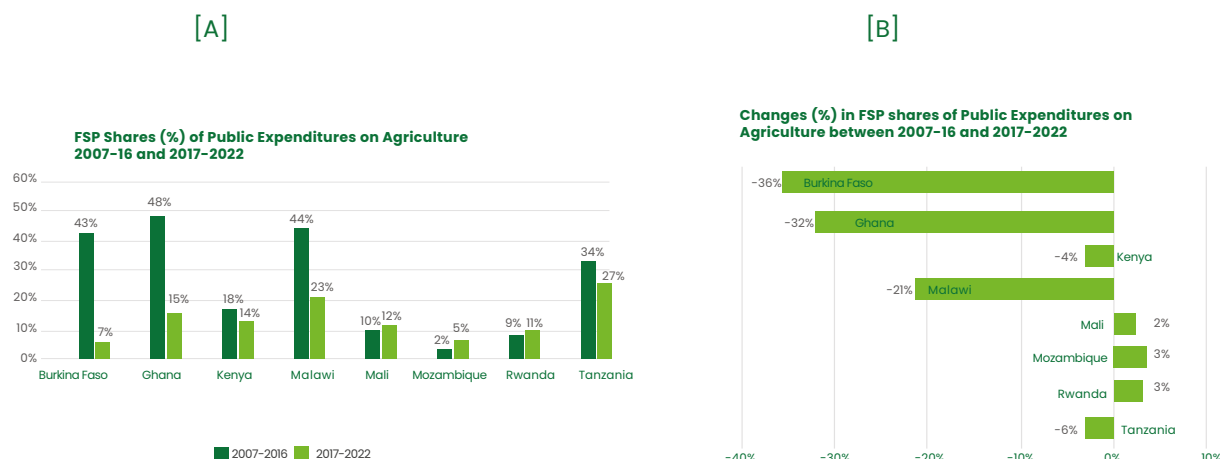
Sources: Authors; AGRA-HAPA, 2022; Jayne et al, 2018; FAOSTAT

3 Ethiopia and Nigeria did not have FSPs in place during the bulk of the 2007–2022 period. Relevant data for Uganda are not available.



Spending on FSPs averaged 26 percent of public expenditure on agriculture in 2007–2016 and 14 percent in 2017–2022, with a high of 48 percent in Ghana in 2007–2016 and 27 percent in Tanzania in 2017–2022 (Figure 5, panel A). Across the two periods, FSP shares fell in all countries except for Mali, Mozambique, and Rwanda (Figure 5, panel B). These averages mask the fact that in given countries, FSP shares varied significantly from year to year, sometimes absorbing significant shares of agriculture sector spending. For instance, in 2020, fertilizer subsidies constituted 85 percent of Ghana’s Programme for Food and Jobs (PFJ), the government’s flagship agricultural development initiative. In 2022, FSP-related expenditures stood at 60 percent of Malawi’s total public spending on the agricultural sector.

Figure 5: Levels [A] and changes [B] of FSP shares of public expenditures on in selected countries in 2007–2016 and 2017–2022



Sources: Authors; AGRA–HAPA, 2022; Jayne et al, 2018; FAOSTAT

Two countries – Ethiopia and Nigeria – represent special cases. In Ethiopia, while there is no official subsidy program, fertilizer promotion has involved large fiscal costs. Ethiopia’s input voucher programme is not a subsidy program but rather a farm input credit program, where farmers leverage vouchers to access credit from microfinance institutions and cooperative unions for purchases fertilizers, seeds and agrochemicals based on recommendations drawn from a comprehensive detailed soil map providing up-to-date soil fertility data. Between 2007 and 2016, Ethiopia’s expenditure on an annual average of 558,000 MT of fertilizers averaged \$53 million/year. In Nigeria, there has been no direct subsidy of fertilizer use since 2015. Rather, using subsidized locally sourced urea and limestone granules, the program aims to enhance availability and affordability of fertilizers through financial and trading incentives that boost local production of various blends of NPK fertilizer at a reduced cost. Fiscal costs have been significant. Between 2007 and 2016, Nigeria’s annual expenditure toward production and distribution of an average of 258,000 MT of fertilizers averaged \$89 million/year.



FSP Impacts

The economic efficiency of fertilizer use should be the overarching goal of FSPs and other fertilizer promotion initiatives, but objectives such as poverty reduction or food security may be relevant where fertilizer subsidies cost-effectively address these problems. Stated FSP objectives in AGRA's 11 focus countries fall into 6 broad categories: **(i)** increasing farmer capacity by boosting productivity, incomes, and livelihoods; **(ii)** enhancing food security and food self-sufficiency (and reducing import dependence); **(iii)** expanding access to fertilizer and enhancing fertilizer system efficiency; **(iv)** improving output market performance (including lowering prices); **(v)** consolidating land; and **(vi)** contributing to social safety nets. The bulk of available empirical evidence relates to three of these objectives: boosting farmer productivity, incomes, and livelihoods; enhancing food security; and enhancing fertilizer system efficiency.

Given their scale, FSPs have the potential to significantly impact the agricultural sector and wider macroeconomic conditions, including aggregate income growth, employment, exports and imports, and public debt and finances. The scale of most FSPs generates considerable political interest, raising important political economy issues and challenges. Impacts of FSPs on these two issues are therefore also considered.

FSP implementation contexts differ significantly across the 11 countries. Nevertheless, important patterns emerge. Identified impacts of FSPs (and other fertilizer promotion initiatives in Ethiopia and Nigeria) fall into three groups: **(i)** intended positive impacts (Table 2); **(ii)** unintended negative impacts (Table 3); and **(iii)** unexpected limited, absent, or mixed impacts (Table 4).⁴

Intended positive impacts of FSPs

Increased farmer productivity, incomes, and livelihoods

- Increased yields of targeted crops, especially cereals, and especially maize
- Higher household incomes
- Higher agricultural wages
- Impacts on productivity were greatest when seeds were also provided

Improved fertilizer system efficiency

- Increased fertilizer consumption

Greater food security

- Higher household-level food security from higher food availability within households and from higher food purchases due to higher incomes
- Higher child weight-for-height
- Lower food prices

Higher national food production

- Higher national output of cereals, especially maize
- Improved agricultural sector and macroeconomic performance
- Higher total factor productivity
- Higher GDP growth
- Faster growth in agricultural value added
- Lower unemployment
- Agricultural exports
- Lower national poverty headcount
- Lower national poverty rate
- Each dollar spent on fertilizer subsidies generated US\$1.62 dollars in national welfare improvements



Table 2: Intended positive impacts of FSPs

Country	Objectives	Impacts	Sources
Burkina Faso	Productivity, incomes, livelihoods	<p>Fertilizer consumption (kg/ha) increased by 27 percent between 2012 and 2020</p> <p>Yields (kg/ha) of maize, rice, millet and red sorghum increased by 42 percent, 30 percent, 21 percent and 14 percent, respectively, between 2014 and 2017</p> <p>Cereal production increased by 281,000 MTs in the 2016-17 season</p>	AGRA (2018a)
Ethiopia*	Productivity, incomes, livelihoods	<p>Fertilizer consumption (kg/ha) increased by 18 percent between 2012 and 2020</p> <p>Yield (kg/ha) of wheat and teff increased by 100 percent and 35 percent, respectively, between 2010 and 2020</p> <p>Yield of maize increased by 750 kg/ha (21 percent)</p> <p>69.1 percent of maize plots in Northwestern Ethiopia apply fertilizer</p>	AfricaFertilizer (2022); FAO (2020); Minten, et al. (2013)
	Food security	10 percent more calories available to participants	Gilligan et al. (2009)
Ghana	Productivity, incomes, livelihoods	<p>Fertilizer consumption (kg/ha) increased by 90 percent between 2012 and 2020</p> <p>Maize yield increased by 714 kg/ha for those farmers receiving subsidy compared to those who did not during the 2018 production season</p> <p>Overall cereal yield increased by 24.5 percent between 2012/12 and 2016/17</p> <p>Adoption of sustainable intensification practices increased by 62 percent</p>	Andani et al. (2020); Tsiboe et al. (2021)
	Macroeconomic conditions	<p>0.16 percent/year increase in GDP growth</p> <p>2.8-3.5 percent increase in government deficit</p> <p>Decline in rural unemployment rate</p>	Iddrisu et al. (2020)
Kenya	Productivity, incomes, livelihoods	<p>Fertilizer consumption (kg/ha) increased by 38 percent between 2012 and 2020</p> <p>Subsidy significantly increased maize production by an average of 201-471kg/acre between 2006/07 and 2009/10</p> <p>Proportion of farmers earning above US\$300 from their farms from 40 percent to 90 percent</p>	Mason et al. (2017); Mavuthu (2017)
	Food security	Number of households reporting no hunger months throughout the year increased from 38 percent to 55 percent	Mavuthu, 2017

Country	Objectives	Impacts	Sources
Malawi	Productivity, incomes, livelihoods	Fertilizer consumption (kg/ha) increased by 332 percent between 2012 and 2020 Maize production increased by 165 to 261 kg per 100 kg of fertilizer Beneficiaries realized an increased per capita income of 8.2 percent Average farm wages increased by up to 8 percent	Ricker-Gilbert and Jayne (2012); Arndt et al. (2016); Chirwa (2010); Dorward and Chirwa (2013)
	National food production	National maize production increased by 9 to 23 percent	
	Macroeconomic conditions	The national poverty headcount rate fell by up to 2.7 percent Each dollar spent on fertilizer subsidies generated US\$1.62 dollars in national welfare improvements	Arndt et al. (2016)
	Food security	Child weight-for-height increased by 2.1 standard deviations overall, and 3.1 (1.5) for male (female) children, on average Up to 4 percent reduction in retail food prices	Ricker-Gilbert et al. (2013)
Mali	Productivity, incomes, livelihoods	Fertilizer consumption (kg/ha) increased by 27 percent between 2012 and 2020 Maize yield increased by 38 percent from 1.97 to 2.73 mt/ha (2008/09 to 2016/17) and rice yield by 58.3 percent from 2.10 to 3.33Mt/ha (2010/2011 - 2016/17)	AGRA (2018b); Assima et al. (2022)
	Food security	Additional income from target crops enabled increased purchases of nutritious food and improved food nutrition security for women	Assima et al. (2022)
Mozambique	Productivity, incomes, livelihoods	Fertilizer consumption (kg/ha) increased by 100 percent between 2012 and 2020 Average maize yield increased from 0.82 t/ha to an average of 2.6 t/ha Farmers receiving the subsidy produced 21.6 percent more output than non-recipient farmers Household daily income increased by 14.7 percent Household per capita expenditure increased by 10 percent	Carter et al. (2016) De Oliveira (2018)
Nigeria*	Productivity, incomes, livelihoods	Crop yields increased by 38 percent Crop output increased by 47 percent Fertilizer purchases increased by 16 percent Fertilizer consumption (kg/ha) increased by 126 percent between 2012 and 2020 Poverty headcount in intervention areas reduced by 17.7 percent	Wossen et al. (2017)
Rwanda	Productivity, incomes, livelihoods	Fertilizer consumption (kg/ha) increased by 411 percent between 2012 and 2020 Total factor productivity increased by up to 29 percent between 2005 and 2015 Subsidy beneficiaries increased maize yields from 0.73 MT/ha in 2007 to 2.76 MT/ha in 2012, and wheat from 1.30 MT/ha to 2.17 MT/ha	MINAGRI (2019)
Tanzania	Productivity, incomes, livelihoods	Fertilizer consumption (kg/ha) increased by 89 percent between 2012 and 2020 Maize output increased by up to 12bags/ha and rice by up to 20bgs/Ha between 2009/2010 and 2011/2012 Maize yield increased from 0.9 to 2.5 mt/ha; and rice from 2 to 3 mt/ha between 2009/2010 and 2011/2012	ACB (2018)

* Ethiopia: Input voucher programme, rather than direct fertilizer subsidies; Nigeria: Subsidized local blending and production, rather than direct fertilizer subsidies



Unintended negative impacts of FSPs

Lower farmer productivity, incomes, and livelihoods

- Lower household purchasing power due to a lower maize-to-fertilizer price ration from reductions in food prices and increases in wages
- Reduced fertilizer system efficiency
- Crowding-out of demand for commercial fertilizer, especially from SME agrodealers
- Lower food security
- Lower food security due to lower dietary diversity linked to reduced crop diversity from mono-cropping
- Compromised nutrition security by reducing cultivation of other crops such as legumes and vegetables

Reduced agricultural sector and macroeconomic performance

- FSP domination of public agricultural budgets
- Unplanned overspending on FSPs
- Distorted political economy
- Rampant diversion and leakage of subsidized fertilizer
- Significant and widespread elite capture of fertilizer distribution
- Frequent political manipulation of fertilizer distribution

Table 3: Unintended negative impacts of FSPs

Country	Objectives	Impact	Sources
Burkina Faso	Food security	Reduced nutrition security of women and children due to reduced crop diversity	Ahmad et al. (2022)
Ethiopia	Food security	Participation associated with 0.4 fewer months of food security over 2 years	Gilligan et al. (2009)
Ghana	Fertilizer system efficiency	Political manipulation: programme distorted by presidential election campaigning	Banful (2011)
	Macroeconomic conditions	FSP domination of public agricultural budgets – 85 percent in 2020	Aloryto (2023)
		Unplanned overspending on FSP – between 148 and 2019 percent	
Kenya	Food security	Compromised nutrition security by reducing cultivation of other crops like cabbage, beans, groundnuts, soybeans and potatoes.	Mavuthu (2017); Mather and Jayne (2015); Jayne et al. (2013)
	Fertilizer system efficiency	<p>Crowding out: Additional 100 kg of subsidized fertilizer crowded out 42–51 kg of commercial fertilizer</p> <p>Crowding out: 77 percent and 88 percent decline in volumes handles by distributors and agrodealers, respectively</p> <p>Political manipulation: programme distorted by presidential election campaigning</p> <p>Elite capture: communities with resident elected leaders or close to leaders' hometowns received more subsidized fertilizer on average</p>	Mather and Jayne (2015); Sibande et al. (2017)

Country	Objectives	Impact	Sources
Malawi	Fertilizer system efficiency	<p>Crowding out: an additional 100 kg of subsidized fertilizer crowded out 18 kg of commercial fertilizer</p> <p>Diversion and leakage: one third of fertilizer intended for FSPs was reported to be diverted before reaching intended beneficiaries and resold as commercial fertilizer at or near commercial prices</p>	Takeshima et al (2012); Jayne et al. (2013); Jayne et al. (2016); Mason and Jayne (2013)
	Productivity, incomes, livelihoods	Purchasing power: decrease in the maize-to-wage price ratio due to both reductions in maize prices and increases in wages	Dorward and Chirwa (2011)
	Macroeconomic conditions	<p>FSP domination of public agricultural budgets 71 percent in 2021</p> <p>Unplanned overspending on FSP – 28-60 percent in 2022</p>	Nafsam/Oxfam/ActionAid/Cisanet (2023)
Mali	Food security	Reduced nutrition security due to reduced crop diversity	Assima et al. (2022)
Nigeria	Fertilizer system efficiency	<p>Crowding out: an additional 100 kg of subsidized fertilizer crowded out 19-35 kg of commercial fertilizer</p> <p>Elite capture: communities with resident elected leaders or close to leaders' hometowns received more subsidized fertilizer on average</p>	Takeshima et al. (2012); Takeshima and Liverpool-Tasie (2015)
Tanzania	Food security	Negative impacts on nutrition security due to mono-cropping, reduced crop diversity (dietary diversity) and inability to sell extra output	ACB (2016)
	Fertilizer system efficiency	<p>Elite capture: 60 percent of households receiving input vouchers included a village official.</p> <p>Elite capture: households with elected officials and voucher committee members were four times more likely to receive input vouchers than others</p>	Pan and Christiaensen (2012)

Unexpected limited, absent, or mixed impacts of FSPs include:

- No clear increase in cropped areas since subsidies promote intensification which may be accompanied by reductions in land devoted to food crops
- No impact on natural resource management
- No significant effects on farmgate food prices
- No significant effects on labor market participation
- No clear impacts on food imports



Table 4: Unexpected limited, absent, or mixed impacts of FSPs

Country	Objectives	Impact	Sources
Ethiopia	Productivity, incomes, livelihoods	Labor market participation: no effect	Gilligan et al. (2009)
Kenya	Productivity, incomes, livelihoods	Cropped area: no effect Farm income: negligible impacts on net crop income overall but increased net crop income among the poor	Mason et al. (2015); Ricker-Gilbert and Jayne (2011)
Malawi	Productivity, incomes, livelihoods	Rural labor demand: negligible increases Cropped area: subsidy incentivizes maize intensification and a reduction in the maize share of total area planted Maize harvest size: little correlation with program fiscal costs	Karamba (2013); Ricker-Gilbert (2014)
Nigeria	Productivity, incomes, livelihoods	Crop prices: no statistically significant effect on local maize and rice prices	Takeshima and Liverpool-Tasie (2015)
Multiple	Productivity, incomes, livelihoods	Natural resource management. No statistically significant increase in improved soil fertility management practices or broader natural resource management practices	Jayne et al. (2018)

While most FSPs in Africa have explicit durations and ending dates, many expiring programmes continue in new initiatives that extend well beyond the original ending dates. Further, there is little evidence of investments to ensure sustainability of outcomes beyond the ending dates. Objectively verifiable indicators to inform readiness for graduation or exit are seldom specified or applied. The sequence of severe economic disruptions between 2020 and 2022 due to COVID-19 and the war in Ukraine thus led to national crisis response strategies featuring enhanced reliance on FSPs but without adequate attention to graduation and exit, further accentuating financial burdens on governments. Where FSPs have been deliberately cut or phased out (typically due to fiscal constraints), large shares of former beneficiaries have discontinued fertilizer purchases, suggesting failures to adequately prepare them to transition to full market exposure.



Uptake of AGRA Recommendations to Strengthen FSPs

AGRA Recommendations for Improving FSP Design

Smart design of FSPs should: **(i)** stimulate new demand and promote growth of existing supply chains for fertilizer without displacing existing commercial sales; **(ii)** encourage competition in fertilizer distribution channels and thereby promote efficiency in fertilizer use; and **(iii)** be temporary with clear exit strategies.

AGRA's 2016/17 recommendations to improve FSP design had short-term and long-term aims. In the short term, AGRA sought to help the countries improve the effectiveness of the programmes by clarifying the objectives, eligibility criteria, targeting, exit strategies, and M&E systems. Over the long-term, AGRA sought to encourage countries to replace input subsidies with other forms of support. Specific recommendations fell into three clusters:

1. Enhancing clarity in programme objectives and associated beneficiary eligibility criteria, improving graduation and exit strategies, and strengthening monitoring and evaluation frameworks and systems;
2. Linking FSPs to soil health by scaling soil testing and nutrient deficiency mapping toward soil-specific and crop-specific input packages, and by establishing or boosting local production and blending capacity; and
3. Designing FSPs in congruence with other long-term agricultural and rural development investments (e.g., in agricultural R&D, extension services, and infrastructure).

Cluster 1 aimed at improving the precision, efficiency, and effectiveness of FSPs. **Clusters 2** and **3** stemmed from the need to sustain FSP outcomes and impacts beyond the durations of given programmes.

Uptake and implementation of the recommendations is incomplete, with Mozambique and Uganda showing greatest implementation progress across most of the recommendations. At the other extreme, Burkina Faso, Kenya, Mali, and Tanzania exhibit limited uptake. Ghana, Malawi, and Rwanda lie in between the two extremes, with moderate to strong implementation.

AGRA Recommendations for Improving FSP Delivery

Smart delivery of fertilizer in FSPs hinges on: **(i)** clarity in targeting criteria and alignment of these criteria with clearly defined programme objectives, aiming to avoid errors of exclusion and inclusion, and to minimize diversion and misuse; **(ii)** clarity in the roles assigned to key public, private, and actors and stakeholders, backed by adequate administrative and implementation capacity; **(iii)** relevance, effectiveness, and sustainability of resource transfer modalities, including in-kind, cash, digital cash, physical vouchers, and electronic vouchers (e-vouchers); **(iv)** relevance, effectiveness, and sustainability of systems for distributing and accessing the transferred resources; and **(v)** timeliness and adequacy of delivered and acquired quantities of fertilizer, aiming to avoid crowding out of the private sector.

1. AGRA's 2016/17 recommendations to improve FSP delivery had short-term and long-term objectives. In the short term, AGRA sought to help countries improve effectiveness of programmes by supporting the use of private sector delivery models, applying digital systems for transparency, and implementing enhanced M&E systems to monitor the effectiveness of the programme. Over the long-term, AGRA sought to encourage countries to replace input subsidies with other forms of support. Specific recommendations fell into four clusters:
2. Promoting the use of modern information and communication technology (ICT) tools in fertilizer delivery, including development of databases of eligible farmers by location and crop;
3. Strengthening the capacity of agrodealers to take a leading role in the procurement and distribution of inputs;



4. Scaling up innovative financing mechanisms for fertilizer distribution; and
5. Establishing and operationalizing fertilizer regulatory frameworks and systems.

Alignment with the recommendations is incomplete. Greatest progress has been made in deployment of ICT in monitoring input distribution and subsidy management, with systems having been rolled out in 6 of the 11 examined countries. Uptake has been lowest in scaling up innovative financing mechanisms for fertilizer distribution, with significant progress made in only 2 of the 11 countries (Ethiopia and Nigeria, neither of which implemented fertilizer subsidies over this period) and small-scale piloting in another two (Malawi and Mozambique).

AGRA Recommendations for Improving FSP Policy and Regulatory Frameworks

Fertilizer industries are shaped and governed by policies, acts and laws, and regulations. Fertilizer *policies* establish broad guidelines for the industry and establish related initiatives, such as capacity building programmes and subsidies. Fertilizer *acts and laws* prescribe a legally binding framework with rights and obligations concerning manufacturing, importation, distribution, marketing, storage, labelling, trade, and use of fertilizers. Acts and laws also stipulate regulatory and governance structures and create enforcement measures with penalties for failure to comply with provisions. Units or departments with administrative authority may be created under the acts or laws. Fertilizer *regulations* articulate how the general rights and obligations embodied in acts and laws are to be applied in practice, encompassing guidelines for registration of products and businesses, standard setting, product packaging and labelling, warehousing, quality inspection and monitoring procedures, and penalties and enforcement (Ariga et al., 2018; New Markets Lab, 2017).

AGRA's 2016/17 recommendations were that countries should: **(i)** develop policy and legal statutes (fertilizer policies and laws) frameworks on agricultural inputs; **(ii)** outline regulations and/or standards on fertilizer production, importation, transportation, storage, distribution, use and health hazards; and **(iii)** unify all fertilizer-specific policies, laws, and regulations under one organization (Mbonigaba et al., 2016). Full implementation has been achieved in Ethiopia, Mozambique, and Tanzania; limited implementation has occurred in Malawi, Nigeria and Rwanda. Burkina Faso, Ghana, Kenya, Mali, and Uganda show varying degrees of partial implementation.

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All countries (except Kenya and Malawi) have developed and operationalized fertilizer policies. A few (Ethiopia, Mali, Malawi, Mozambique and Tanzania) have stand-alone fertilizer acts/laws. Ghana, Kenya and Rwanda have fertilizer laws combined with other products (like seeds, agrochemicals or animal feeds) in single acts, while Nigeria has a variety of fertilizer regulations operationalized by different organizations. Nigeria and Uganda are developing fertilizer laws. Malawi's recently developed fertilizer law has yet to be supported by operational infrastructures. Only Malawi, Nigeria and Uganda are yet to develop fertilizer regulations.

Fertilizer standards are central in regulatory systems and are managed differently across countries. In Ghana, Kenya, Nigeria and Rwanda, fertilizer standards are prescribed in the Standards Acts. In Ethiopia and Tanzania, they are contained in the fertilizer legislation. The status in Burkina Faso, Mal and Malawi. Uganda is in the process of developing standards as part of its new fertilizer policy.

Special Cases: Ethiopia and Nigeria

AGRA's 2016/17 recommendations applied only partially to Ethiopia and Nigeria. Ethiopia's input voucher programme is not a subsidy programme but rather a farm input credit programme, where farmers leverage vouchers to access credit from microfinance institutions and cooperative unions for purchases fertilizers, seeds and agrochemicals based on recommendations drawn from a comprehensive detailed soil map providing up-to-date soil fertility data. In 2022, 8.3 million farmers accessed 1.5 million MT of fertilizer through the programme. In 2022, with the sharp increase in fertilizer

prices due to the war in Ukraine, the Government introduced a subsidy of 37.5 percent of the value of the ETB 40 billion input voucher programme to cushion targeted farmers from the price surge. Nevertheless, the central market-driven features of the initiative remain intact. In Nigeria, there has been no direct subsidy of fertilizer use since 2016. Rather, using subsidized locally sourced urea and limestone granules, the programme aims to enhance availability and affordability of fertilizers through financial and trading incentives that boost local production of various blends of NPK fertilizer at a reduced cost. The number of fertilizer manufacturing and blending facilities in Nigeria increased from 7 in 2015 to 48 in 2022, leading to a significant reduction in fertilizer imports.

The approaches taken by these two countries suggest significant potential for expanding and deepening fertilizer systems while reducing or repurposing fertilizer subsidies. Successful innovations center on: (i) leveraging input vouchers for enhanced access to financing and credit to acquire fertilizer and other improved inputs (as in Ethiopia); and (ii) financial and trading incentives that boost local production, blending, and distribution of fertilizer, thereby stabilizing supply and reducing cost (as in Nigeria). Realizing such potential requires strong and transparent public sector leadership alongside sustained engagement and support to the private sector and to research and extension systems, aiming to overcome structural and regulatory impediments to scaled private investment in fertilizer systems.

Major Challenges and Gaps in FSPs

This wide-ranging body of evidence from multiple contexts indicates that FSPs in Africa have generated several positive impacts, notably by bolstering agricultural productivity, augmenting farmers' incomes, and fortifying food security. However, several unanticipated consequences stemming from a lack of adherence to key principles of "smart" subsidy design underscore the imperative for recalibration.⁵ Among these unintended outcomes are disruptions in commercial sales, logistical inefficiencies in distribution, market distortions, and increased in public debt – all of which necessitate a strategic shift in approach. To effectively address these difficulties, national authorities must take urgent actions over the short-term and medium-term covering both FSP design and delivery and FSP policy and regulatory frameworks.

⁵ See the companion brief on improving design and delivery of FSPs.





Challenges and Gaps in FSP Design and Delivery

Continued lack of holistic integrated approaches aligned with broader agricultural sector goals and investments

While most FSPs entail subsidizing fertilizers alongside improved seeds, there is little evidence of scaled support for such farmer needs as irrigation technologies, improved agronomic practices, and market infrastructure that are critical to realization of the yield and income gains intended when subsidizing fertilizers (AGRA, 2018a and 2018b; Holden, 2018; Smale and Theriault, 2019).

Poor Programme Timing and Inadequate Stakeholder Sensitization

Poorly timed FSPs featuring limited stakeholder consultation and sensitization are common across Africa. These poorly timed fertilizer subsidy programmes have resulted in delays in the distribution of subsidized inputs to farmers, leading to missed planting windows and missed opportunities for optimal fertilizer application during critical stages of crop growth (GOK, 2023; Jayne et al., 2018; Njagi et al., 2023).

Poorly Designed and Implemented Graduation and Exit Strategies

While most FSPs in Africa have explicit durations and ending dates, many expiring programmes continue in new initiatives that extend well beyond the original ending dates. Further, there is little evidence of investments to ensure sustainability of outcomes beyond the ending dates. Objectively verifiable indicators to inform readiness for graduation or exit are seldom specified or applied. The sequence of severe economic disruptions between 2020 and 2022 due to COVID-19 and the war in Ukraine thus led to national crisis response strategies featuring enhanced reliance on FSPs within without adequate attention to graduation and exit, accentuating financial burdens on governments. Where FSPs have been deliberately cut or phased out (typically due to fiscal constraints), large shares of former beneficiaries have discontinued fertilizer purchases, pointing to failures to prepare them to transition to full market exposure (AfDB 2020; AGRA, 2017; Aloryito, 2023; Chadza and Duchoslav, 2022; Nyanda, 2022; Pernechele et al., 2021).

Limited Soil Testing

Soil testing capacity is limited in most African countries, and such capacity that exists is not adequately integrated into FSP design and implementation. Absent accurate soil information, most farmers supported under FSPs are applying fertilizers based on generic recommendations, leading to inefficient use of resources (Abate et al., 2020; Holden, 2018; Stewart et al., 2020).

Inadequate Fertilizer Quality Control and Inspection

In most countries, capacity for effective fertilizer quality control and inspection is weak, with responsibility for key functions such as pre-shipment inspection and sampling and testing at ports dispersed across multiple institutions. Many countries have established testing laboratories to support these functions, but most are not internationally accredited. This undermines the credibility of test results and limits the power of regulatory authorities to enforce penalties on firms that are trading in non-compliant products, including counterfeit and substandard items that disrupt and distort markets. In addition, once fertilizers leave ports, enforcement of regulations is left in the hands of Ministries of Agriculture, or of dedicated departments of fertilizer or quasi-governmental institutions that have extremely low numbers of inspectors and resources, rendering inspection random or absent altogether. The overlapping roles and responsibilities of multiple institutions in the fertilizer sector leads to delays in clearances of fertilizer cargo at ports and high demurrage costs. Multiple fees and charges also result, adding to costs that ultimately are transmitted to farmers (Ariga et al., 2019; Digana et al., 2018; Sanabria et al., 2018).

Flawed Beneficiary Targeting, Registration, and Management

The most common targeting approaches in the 11 AGRA focus countries are: **(i)** community-based targeting approaches (e.g., village committees); **(ii)** targeting by government employees (e.g., extension officers); **(iii)** hybrid approaches featuring community-based targeting with government involvement (e.g., stakeholder forums of public officials and community members; and farmer lists developed by combinations of local committees, local authorities, representatives of farmer organizations, and extension services officers); and self-registration (e.g., where farmers with an identification document and registered mobile phone number were required to complete a registration form at registration centres). Each of the targeting methods seeks to correctly select the intended programme beneficiaries in the population, based on eligibility criteria. No single approach is perfect and universally appropriate, with several context-specific challenges emerging.

Where beneficiaries are selected through open stakeholder forums involving both community members and government representatives, there is evidence that households with more land are less likely to receive FSP inputs. Similar outcomes are reported where open meetings were used to select beneficiaries. Where community-based approaches are used, the process either favored large land size holders outright, or include large and small farmers in equal measure. Self-registration (Nigeria) yields a similar equal selection of large and smallholder farms. The ineffectiveness of community-based selection approaches is attributed to “elite capture” whereby committees favor relatives of committee members, friends and locally influential persons. While decentralized targeting reduces costs by leveraging local knowledge, it was vulnerable to conditions and relationships in local political systems and does not necessarily improve the distribution of recipients. Where support to women is an explicit eligibility criterion, targeting and selection approaches can fail to favor female-headed households, or even discriminated against women (ACB, 2018; Houssou et al., 2019; Jayne et al., 2018; Sibande et al., 2017; Woosen et al., 2017).

Significant progress has been made in deployment of digital innovations in monitoring input distribution and subsidy management, with systems having been rolled out in several countries. But exploitation of digital tools remains limited for real-time access to information on beneficiary registration, eligibility criteria, and subsidy disbursements. Opportunities to promote transparency and enhance tracking and monitoring of program implementation, including early detection of trends and irregularities remain largely unseized, as do those to integrate FSP data with existing agricultural databases (e.g., land records, crop surveys, and extension services) (Abate et al., 2023; Onyekwena et al., 2018).

Poorly Implemented Transfer Mechanisms

Paper vouchers and e-vouchers are the two transfer modalities under implementation in the 11 AGRA focus countries. Paper vouchers have been vulnerable to counterfeiting (Malawi), late distribution and delivery of fertilizer (Ghana and Tanzania), and cumbersome bureaucratic processes with high administrative and implementation costs in their preparation and delivery (Ghana and Rwanda). Paper vouchers also involve often multi-step procedures in their acquisition, validation and redemption, imposing high costs and burdens on the private sector. While e-vouchers have led to cost savings in many contexts, they have been characterized by several challenges including: large inclusion errors and barriers to participation (Nigeria), leakage and fraudulent diversions of fertilizer for re-sale (Malawi and Nigeria), farmer illiteracy (Burkina Faso), inappropriate choice of digital technology (Mali), capacity gaps among agrodealers, and data fraud (Nigeria) (Alabi and Adams, 2020; Holden, 2018; MAAIA, 2021; Mbonigaba et al., 2016; World Bank/AFDB/AGRA, 2021).

Some challenges have affected both paper and e-vouchers. Both modalities have been beset by insufficient availability of the subsidized products. Private importation and distribution of subsidized fertilizer has suffered from delays in payments by the government to importers and distributors, placing a heavy financial burden on the private sector. Permission to participate in government tenders has been restricted to selected importing companies, creating risk and uncertainty that reduced private incentives to invest in distribution networks. Limited competition in the importing and distribution system has encouraged concentration and collusion, late delivery of fertilizers to



farmers due to bureaucratic processes, late confirmation of the tender recipients, and delays in subsequent reimbursements to agrodealers. Delays in acquisition of fertilizers have been common. In some countries (e.g., Nigeria, Zambia, and Zimbabwe), e-voucher mechanisms have been negatively impacted by the same set of challenges that affected traditional input subsidy delivery mechanisms, leading some countries (e.g., Mali and Niger) to revert to traditional input subsidy delivery (Alabi and Adams, 2020; World Bank/AFDB/AGRA, 2021)

Crowding Out of the Private Sector, Especially Agrodealers

In many countries, the private sector is being crowded out of fertilizer subsidy programmes when: **(i)** government agencies directly distribute subsidized fertilizers to farmers; **(ii)** subsidized fertilizer prices set by governments distort market prices and undercut private sector suppliers; **(iii)** single government entities or a few large companies dominate the subsidized fertilizer market; **(iv)** complex eligibility criteria, bureaucratic procedures, and administrative barriers deter private sector suppliers from participating in FSPs; **(v)** payment mechanisms for private sector suppliers are delayed or unreliable; **(vi)** subsidy programme implementation and procurement processes lack transparency; and **(vii)** market information and forecasting mechanisms are inadequate (Njagi et al., 2024; Opiyo et al., 2023; Smale and Theriault, 2019).

Agrodealers are especially vulnerable to crowding out, greatly deterring their input procurement, distribution, and marketing activities. Agrodealers face barriers in accessing subsidized fertilizers from government-approved suppliers or distribution channels. Exclusive procurement contracts, licensing requirements, or administrative hurdles restrict agrodealer participation in subsidized input markets, limiting their ability to offer subsidized products to farmers. Administrative burdens associated with programme compliance, documentation, and verification processes lead to delayed payments that strain agrodealer cash flows, liquidity, and working capital, affecting their ability to procure, stock, and distribute fertilizers to farmers (Mather and Jayne, 2018; Nyanda, 2022; Opiyo et al., 2023; Smale and Theriault, 2019).

Inadequate Monitoring and Evaluation Systems

Information on M&E systems is not readily available in the 11 AGRA focus countries. Where such information is available, the picture that emerges points to lacking or incomplete M&E systems. Among the 11 countries, only in Malawi and Tanzania is there evidence of fully developed systems from the outset of FSPs. Other M&E systems are patchy in either or both design and implementation. Ghana's M&E system was launched but not fully implemented. Mali, Burkina Faso and Kenya's programmes lack dedicated and functioning M&E systems. In the absence of timely and accurate monitoring data, authorities struggle to make informed decisions on resource allocations, hindering scope to refine programme design and implementation over time, including possibilities for graduation and exit (Holden, 2018; Pauw, 2022; Smale and Theriault, 2019).

Elite Capture, Corruption, and Politicization

Elite capture, corruption, and politicization are rampant across Africa's FSPs due to inadequate governance structures, weak regulatory oversight, lack of transparency, accountability loopholes, and weak monitoring mechanisms and regulatory enforcement. In many countries, weak civil society organizations, media inhibitions, and frail citizen empowerment mechanisms constrain public scrutiny and accountability for elite-driven corruption in FSPs. Perceptions of nepotism, favoritism, and injustice in subsidy allocation breed cynicism, alienation, and disillusionment among citizens, weakening social trust and democratic governance. Diversion of resources, unequal distribution of subsidies, and political interference compromise programme impact, hindering progress towards sustainable development goals (Holden, 2018; Houssou et al., 2017; Mason et al., 2017; Walls et al., 2023).

Challenges and Gaps in FSP Policy and Regulatory Frameworks

Dispersion, Duplication, and Incoherence

Because most countries have not unified responsibility for oversight and implementation of their formal fertilizer policies, acts/laws, and regulations in single organizations, several bodies regulate the manufacture, distribution and use of fertilizer. The resulting overlapping and conflicting roles of multiple institutions in fertilizer industries leads to high transaction costs of fertilizer imports, delays in clearances of fertilizer cargo at ports, high demurrage costs, and multiple fees and charges that are eventually transmitted to farmers. For purely bureaucratic reasons, traders are compelled to renew their import and trade permits frequently, increasing operating costs that are eventually passed on to farmers. Similarly, new fertilizer products must be registered through processes that include trials of up to three years in duration. Any new fertilizer product must be registered, even if it is a globally traded product. Any alteration in fertilizer composition, formulation, type, quantity, or quality triggers a new registration process. Even a small change in the formulation of a registered fertilizer requires a completely new registration. Blends are heavily penalized since all are considered new (Mbonigaba et al., 2016).⁶

High Transport and Handling Costs

Regional and national transport costs account for much of the end-user retail price of fertilizer in Africa. For instance, in Kenya, domestic transport costs for DAP and urea fertilizers account for 33 per cent of the total cost of transporting fertilizer from Mombasa Port to Nairobi (IFDC, 2012). In Rwanda, it costs approximately \$160 to transport one ton of fertilizer from Mombasa or Dar es Salaam to Kigali, Rwanda (Gisselquist, 2013), and this adds 45 per cent to the final retail price charged for that fertilizer (IFDC, 2014). In Mozambique, domestic transport costs account for over 45 percent of the total cost of moving fertilizer from Beira Port to Sofala (IFDC, 2012). Overall, transport costs alone account for between 64 and 80 per cent of price differentials between landed costs and farm gate prices for fertilizer in Ethiopia (Rashid et al., 2013).

Output Trade Restrictions

The demand for fertilizers is derived from returns generated by their use in production. Some countries impose periodic bans on exports of agricultural staples. This leads to lower output prices, reduces demand for fertilizer, and blunts or erases the intended impacts of fertilizer price subsidies.

Poor Quality Control

In most countries, capacity for effective fertilizer quality control and inspection is weak, with responsibility for key functions such as pre-shipment inspection and sampling and testing at ports dispersed across multiple institutions. Many countries have established testing laboratories to support these functions, but most are not internationally accredited. This undermines the credibility of test results and limits the power of regulatory authorities to enforce penalties on firms that are trading in non-compliant products. In addition, once fertilizers leave ports, enforcement of regulations is left in the hands of Ministries of Agriculture, or of dedicated departments of fertilizer or quasi-governmental institutions that have extremely low numbers of inspectors and resources, rendering inspection random or absent altogether. The overlapping roles and responsibilities of multiple institutions in the fertilizer sector leads to delays in clearances of fertilizer cargo at ports and high demurrage costs. Multiple fees and charges also result, adding to cost that ultimately are transmitted to farmers (Sanabria et al., 2013; White, 2014).⁷

Small Market Size, Limited Competition, and Low Transparency

6 Tanzania is a notable exception. With support from AGRA, the government revised regulations by centralizing regulatory functions within the Tanzania Fertilizer Regulatory Authority (TFRA), leading to an easing of the conditions for registering customized and specialist blends of fertilizer. The new regulations have resolved the conflicting and overlapping regulatory mandates by centralizing regulatory function under TFRA. Time delays and charges involved in processing consignments of fertilizer imports have been greatly reduced.

7 Again, Tanzania is a notable exception. With support from AGRA, the TFRA has streamlined quality control, leading to enhanced transparency and reduced costs.



The fertilizer industry is growing across Africa, but it remains relatively small and high cost. A small number of large firms have come to dominate imports in many countries. Some of these companies have integrated vertically into transport, storage and even blending, thereby acquiring enormous market power. Permission to participate in government tenders is often restricted to selected importing companies, creating risk and uncertainty that reduces private incentives to invest in distribution networks. Limited competition in the importing and distribution system encourages concentration and collusion, leading to late delivery of fertilizers to farmers due to bureaucratic processes, late confirmation of the tender recipients, delays in subsequent payments, and delays in acquisition of fertilizers (Alabi and Adams, 2020; Wanzala-Mlobela et al., 2013; World Bank/AFDB/AGRA, 2021).

Limited Trader and Agrodealer Finance

Investments by AGRA, AFAP and other organizations to increase the density of agrodealers have increased access to fertilizer and lowered prices for farmers across the continent. In the 11 countries, from 2012 to 2020, average farm-level consumption of fertilizer grew from 19.3 kg/ha to 33.8 kg/ha (World Bank, 2022). But with an average coverage of 7,800 farmers/agrodealer in the 11 selected countries, gaps are still significant. Fertilizer trading is capital intensive. Access to finance is a first-order determinant of traders' and agrodealers' abilities to conduct business. Constraints on financing have led to delays in development and completion of local production and blending facilities (Huang et al., 2017). Many commercial banks are risk-averse because they have lost large sums of money in agricultural lending in the past. Poor loan recovery and the lack of mechanisms for contract enforcement in rural areas discourage banks from lending to fertilizer traders and agrodealers (UNECA, 2018; Ochieng et al., 2016). Private importation and distribution of subsidized fertilizer suffers from delays in payments by the government to importers and distributors, further adding to the financial burden on the private sector.

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Investments by AGRA, AFAP and other organizations to increase the density of agrodealers have increased access to fertilizer and lowered prices for farmers across the continent. In the 11 countries, from 2012 to 2020, average sub-national consumption of fertilizer grew from 19.3 to 33.8 kg/ha of arable land (World Bank, 2022). But with an average coverage of 7,800 farmers/agrodealer in the 11 selected countries, access is still constrained, especially for smallholder farmers. Fertilizer trading is capital intensive. Access to finance is a first-order determinant of traders' and agrodealers' abilities to conduct business. Constraints on financing have led to delays in development and completion of local production and blending facilities (IFDC and FAI, 2017). Many commercial banks are risk-averse because they have lost large sums of money in agricultural lending in the past. Poor loan recovery and the lack of mechanisms for contract enforcement in rural areas discourage banks from lending to fertilizer traders and agrodealers (UNECA, 2018; Ochieng et al., 2016). Private importation and distribution of subsidized fertilizer suffers from delays in payments by the government to importers and distributors, further adding to the financial burden on the private sector. AGRA and other stakeholders have supported successful initiatives to expand finance to agrodealers and other value chain actors in several countries. These initiatives have focused on de-risking schemes that include a range of instruments including partial credit guarantees, agricultural insurance, direct financing, digital finance-based solutions, and technical assistance and capacity building (e.g., the Ghana Incentive-based Risk Sharing System for Agricultural Lending (GIRSAL), the Nigeria Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL), the Programme for Rural Outreach of Financial Innovations and Technologies (PROFIT) in Kenya, and the Africa Fertilizer Financing Mechanism (AFFM) in Tanzania) (Szebini et al., 2021). But major constraints persist.

High Barriers to Regional Trade

Inefficient port logistics, the poor state of roads, numerous weighbridges and police roadblocks and lengthy delays at border crossings affect land-locked countries impede domestic and international trade in fertilizers, distort prices and raise the cost of doing business. Although ECOWAS has adopted regulations on fertilizer use and transport, other regional economic communities in Africa are still in planning stages towards development of such regulations. All countries continue to retain their own unique fertilizer brands and formulations, which continues to hinder the cross-border fertilizer trade (UNECA, 2018).

Recommendations for Policy and Investment

To overcome these gaps and challenges, national authorities must take urgent actions over the short-term and medium-term covering both FSP design and delivery and FSP policy and regulatory frameworks.

Short-Term Priorities

Short-term actions (within 1-2 years) to strengthen **FSP design and delivery** include:

- 1. Ensure timely distribution of subsidized fertilizers before planting seasons** to align with farmers' cropping calendars and maximize the impact on crop yields. Coordinate with input suppliers and logistics providers to optimize supply chain management and minimize delays in subsidy delivery.
- 2. Increase the quality and rigor of beneficiary targeting, registration, and management systems** through: **(i)** greater use of objective criteria such as income levels, land size, household size, gender, and farming practices; **(ii)** greater use of digital platforms for beneficiary targeting, registration, and management by leveraging data analysis and geographic information systems (GIS), online registration portals, and mobile applications; and **(iii)** integration of FSP data with other agricultural databases to improve data interoperability, reduce duplication of efforts.
- 3. Strengthen graduation and exit strategy design and execution in FSPs** based on criteria derived from objectively verifiable indicators of farm and food system performance such as: crop yields, household income and assets, farmer adoption of sustainable production practices, farmer participation in training, and farmer market integration, and levels and stability of market prices of key farm inputs and outputs.
- 4. Integrate fertilizer subsidies in space and time with complementary soil health-enhancing inputs and interventions** such as improved seeds, extension services (especially agronomic advice), agricultural training, agroforestry innovations, access to credit, and market linkages delivered within broader agricultural sector investments.
- 5. Prioritize the enhancement and expansion of e-voucher systems in FSPs**, emphasizing user-friendly platforms, reliable rural connectivity, adequate training, and sustained support and sensitization of users. Additionally, streamline administrative processes to reduce bureaucratic hurdles and ensure efficient program implementation.
- 6. Promote the use of digital financial services in subsidy delivery systems** to facilitate secure and convenient transactions between farmers and input suppliers. Invest in mobile payment solutions and digital platforms to enhance efficiency and transparency in subsidy delivery.
- 7. Enhance transparency and efficiency in fertilizer importation for FSPs** by implementing robust procurement procedures, strengthening supply chain management, promoting competitive bidding processes, ensuring stakeholder involvement in decision-making, and establishing transparent monitoring mechanisms to track importation, distribution, and subsidy disbursements.
- 8. Avoid crowding out the private sector (especially agrodealers) in FSPs** by ceasing direct delivery of fertilizer by government agencies and promoting transparent procurement processes, timely payments to suppliers, and partnerships with agrodealers to utilize their local expertise and infrastructure for efficient input distribution.

Short Term actions (within 1-2 years) to strengthen **FSP policy and regulatory frameworks** include:

- 1. Establish a single organization responsible for overseeing and implementing fertilizer industry policies, laws, and regulations** to streamline decision-making and enforcement processes.
- 2. Sustain and increase investments in road and rail infrastructure** to facilitate the efficient transportation of fertilizers, as well as in local production and blending facilities to enhance domestic supply.
- 3. Ensure coherence between agricultural output trade policies and fertilizer price and subsidy policies** to support agricultural productivity and ensure farmers' access to affordable inputs.
- 4. Reform fertilizer import tendering rules and procedures for FSPs** to boost transparency and competition, reduce barriers to entry for new suppliers, and ensure fair pricing.
- 5. Streamline bureaucratic processes** that delay payments to importers and distributors, ensuring timely transactions and reducing financial burdens on stakeholders.



Medium-Term Priorities

Medium-term actions (within 3–5 years) to strengthen **FSP design and delivery** include:

1. **Terminate all universal FSPs** and replace them with targeted ones.
2. **Prioritize the improvement and scaling up of soil testing in FSPs** and allow flexibility in input choice by allowing farmers to choose from a range of fertilizers suitable for their specific crops and soil conditions, including organic fertilizers and agroforestry innovations. Invest in infrastructure, capacity building, and public awareness campaigns to promote soil testing among farmers. Integrate soil testing data into subsidy distribution mechanisms to tailor fertilizer recommendations and optimize nutrient management for sustainable agricultural productivity.
3. **Scale up local production and blending of fertilizer in Africa** through sustained investments in infrastructure, technology transfer, research, innovation, public–private partnerships, and policy support to strengthen domestic fertilizer manufacturing and blending capacity.
4. **Ensure the quality of subsidized fertilizers through rigorous and transparent regulatory standards and quality control measures**, including investing in laboratory testing facilities, certification processes, capacity building initiatives, and monitoring systems along the supply chain. Deploy strict quality assurance safeguards against counterfeit or substandard products, ensuring farmers receive effective and safe products.
5. **Establish accreditation mechanisms for input retailers** to ensure that only qualified and reputable dealers participate in subsidy programmes. Accredited retailers should meet specific quality standards, adhere to pricing regulations, maintain adequate stock levels, and provide reliable extension services to farmers.
6. **Increase the quality, rigor, and coverage of monitoring and evaluation systems leveraging digital tools and platforms** to track the implementation and impact of FSPs. Ensure regular assessments to identify challenges, measure progress towards goals, and inform adaptive management strategies for continuous improvement.
7. **Combat elite capture, corruption, and politicization in FSPs** through transparent procurement processes, robust oversight mechanisms, stakeholder engagement, and enforcement of anti-corruption measures. Prioritize accountability, transparency, and equitable distribution to ensure subsidies reach intended beneficiaries and contribute to agricultural development.

Medium term actions (within 3–5 years) to strengthen **FSP policy and regulatory frameworks** include:

1. **Harmonize regional standards and policies to enable bulk fertilizer procurements** and reduce transaction and transportation costs across borders.
2. **Invest in physical, technical, and organizational capacity for fertilizer quality control and monitoring beyond ports** to ensure consistency and safety in fertilizer products.
3. **Consolidate all testing and quality control of fertilizers under one authority** to centralize oversight and ensure uniformity in standards.
4. **Enhance financial incentives for private importers, distributors, and agrodealers handling subsidized fertilizer** by tackling payment delays, negotiating trade guarantee agreements, and developing flexible financial packages.
5. **Modernize equipment and procedures for bulk handling and distribution of fertilizer** to improve efficiency and reduce operational costs.
6. **Relax trade regulations that require all fertilizer blends to be tested and approved before use**, while maintaining safety standards, to streamline the importation process and expedite distribution.
7. **Sustain commitment to regional integration** by prioritizing regional infrastructure projects, trade corridors, and adoption of common fertilizer standards and regulations to facilitate cost-effective bulk imports and distribution.

Conclusions

This examination of design, delivery, scales, impacts, and policy and regulatory frameworks for FSPs in Africa underscores both challenges and opportunities. While acknowledging the complexities and implementation hurdles faced by these initiatives, it is evident that with strategic adjustments, transparent governance, and stakeholder collaboration, FSPs hold considerable potential for catalyzing agricultural transformation across the continent. Integrating robust monitoring mechanisms, fostering innovation in delivery methods, and aligning policies with local contexts are imperative, focusing on practical solutions and local adaptability. African nations must navigate these challenges diligently, recognizing the importance of prudent resource allocation and commitment to systemic improvement.

The cultivation of greater competition within distribution channels can engender innovation, enhance cost-effectiveness, and amplify benefits for both farmers and the broader agricultural sector. Central to the required recalibration of FSPs is precise targeting of beneficiaries, ensuring equitable access to subsidized inputs while mitigating the risk of diversion or misuse. An emphasis on cost-efficiency and transparency, underpinned by stringent monitoring mechanisms, is paramount to safeguarding against financial improprieties and optimizing resource allocation. The overarching goal is to foster a transition toward farmer self-reliance and market-led agricultural development, wherein subsidy programs serve as catalysts for progress rather than long-term dependencies. Through steadfast adherence to these principles, FSPs can not only realize their intended objectives but also propel sustainable growth, resilience, and prosperity across Africa's agricultural landscape.



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