



# Assessment of Fertilizer Distribution Systems and Opportunities for Developing Fertilizer Blends BURKINA FASO

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Executed by:



This assessment was conducted by the International Fertilizer Development Center (IFDC) and the African Fertilizer and Agribusiness Partnership (AFAP) for the Alliance for a Green Revolution in Africa (AGRA) as part of a consultancy for Assessment of Fertilizer Distribution Systems and Opportunities for Developing Fertilizer Blends. The views, information, and opinions expressed in this assessment are those of IFDC and AFAP and do not necessarily reflect the official policy or position of AGRA.

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## Acronyms & Abbreviations

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2SCALE	Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship
ACDI/VOCA	Agricultural Cooperative Development International / Volunteers in Overseas Cooperative Assistance
AFAP	African Fertilizer and Agribusiness Partnership
AfSIS	African Soil Information Service
AGRA	Alliance for a Green Revolution in Africa
AGRODIA	Association des Grossistes et des Détaillants d'Intrants Agricoles
AS	ammonium sulfate
B	boron
BUNASOLS	Bureau National des Sols
CAN	calcium ammonium nitrate
CCA	Canadian Co-operative Association
CIAT	International Center for Tropical Agriculture
CIDA	Canadian International Development Agency
CILSS	Comité inter Etats de lutte contre la sécheresse au Sahel
CIPAM	Société de Commercialisation et de Production Agricole et Marchande
CONACE	National Committee for Fertilizer Control
COVEMI	Compagnie Villageoise d'Exploitation Minière
DAP	di-ammonium phosphate
DGESS	Direction Générale des Etudes et des Statistiques Sectorielles
DGPV	Direction Générale de la Production Végétale
DPA	Doucouré Partenaire Agricole
DSS	Demographic Surveillance System
ECOWAS	Economic Community of West African States
ETG	Export Trading Group
FAO	Food and Agriculture Organization of the United Nations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
Ha	hectare
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDB	Islamic Development Bank
IFDC	International Fertilizer Development Center
IFPRI	International Food Policy Research Institute
IITA	International Institute for Tropical Agriculture
INERA	National Institute for Environment and Agricultural Research
ISFM	Integrated Soil Fertility Management
MAAH	Ministère de l'Agriculture et des Aménagements Hydrauliques
Mt	metric ton
NGO	non governmental organization
NPK	nitrogen phosphorus potassium
NPS	nitrogen phosphorus sulfur
OCP	Office Chérifien des Phosphates
OFRA	Optimizing Fertilizer Recommendations in Africa
SAPEP	Programme d'Amélioration de la Productivité Agricole des Petits Exploitants
SATREPS	Science and Technology Research Partnership for Sustainable Development

SHF	smallholder farmer
SOGEFERT	Société Générale des Fertilisants
SSA	sub-Saharan Africa
SSP	single superphosphate
SWOT	Strengths, Weaknesses, Opportunities, Threats
TSP	triple super phosphate
UEMOA	Union Economique et Monétaire Ouest Africaine
USAID	United States Agency for International Development
WDI	World Development Indicators

# Assessment of Fertilizer Distribution and Opportunities for Developing Fertilizer Blends in Burkina Faso

## Introduction

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In execution of this assessment, structured interviews were conducted with key institutions in the public and private sectors of the fertilizer value chain in Burkina Faso. The main importers and fertilizer producers in Burkina were interviewed, including SOLEVO (Ex. LDC), TROPIC AGRO CHEM and CIPAM, as well as a dozen fertilizer distributors, the most important of which were also interviewed following an introductory meeting with the agro-dealer organization AGRODIA. Wholesale distributors and retailers interviewed were selected in main cities including Bobo-Dioulasso, Banfora, Dédougou, Koudougou and Ouagadougou, using IFDC's directory of agricultural input distributors in Burkina. In addition to these actors, public services involved in the field of extension and research were approached. These are the DGPV, the DGESS, BUNASOLS of the Ministry of Agriculture, and INERA of the Ministry of Research. Finally, some sectoral projects targeting large-scale interventions in the field of production and/or promotion of adapted fertilizer use by crop and by site were also encountered, such as SATREPS, SAPEP and OCP. These various interviews were supplemented by the exploitation of secondary data on policies and regulations related to the fertilizer sector, drawn from sources of regional institutions (ECOWAS, UEMOA) and international institutions (World Bank, FAO, IFDC).

## Available Soil Information

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No substantial body of full soil analysis currently exists for Burkina Faso. A few site characterizations exist within the framework of these research, but they are limited in scope and spatial coverage. An OCP mobile laboratory in partnership with BUNASOLS employing spectral analyses began operation in May 2018, and was anticipated to take some 1300 soil samples in Hauts Bassins, Cascades, Sud-Ouest, and Bucle du Mouhoun over the coming months (see Table 1). Our understanding is that this information will be made public. The National Soil Institute (BUNASOLS) has data available related to soil morphology and classification, and spans the regions of Hauts Bassins, Cascades, Nouhoum, Centre-Ouest and Centre Est. Mapping under AfSIS is proposed to be carried out under a pending proposal supported by the Islamic Development Bank.

**Table 1. Soil mapping plans and locations**

Région	Area (ha)	Number of samples	Number of sites	Cropping system
Hauts bassins	35,000	550	23	Cotton, sorghum, maize, rice
Cascades	20,000	200	12	Cotton, groundnut, maize, sesame, sorghum, rice, cowpea
Sud-Ouest	10,000	100	6	Yam, maize, sorghum, rice
Boucle du Mouhoun	35,000	450	21	Cotton, maize, sesame, sorghum, rice, cowpea, tomato, onion
Total	100,000	1300	62	-

## Inventories of Fertilizers Available in the Markets

Tables 2 and 3 show fertilizer consumption by crop in Burkina Faso (2017 data). Cotton and maize account for about 85% of the fertilizer consumed.

## Rationale for Why Fertilizer Blended Products Were Developed

The main rationale for blends development as it relates to fertilizers for AGRA priority crops in Burkina Faso appears to be to meet crop-specific demands, with minor regional differentiation (explained more in the section below). There is likely some brand recognition in the formulation 14-23-14, which is the base for several maize, sorghum, and cowpea formulations. The formula 14-23-14 +6S +1B may have been meant to preserve that brand recognition.

**Table 2. Apparent fertilizer consumption (MT) by crop in 2017.**

Crop	NPK (undifferentiated)	Urea	Burkina Phosphate	Total
Cotton	99,259	43,534	686	143,479
Maize	85,778	43,179	365	129,321
White Sorghum	12,046	1,900	175	14,120
Millet	7,732	1,288	151	9,171
Rice (Lowland)	4,699	3,117	272	8,088
Red Sorghum	1,848	639	53	2,540
Cowpea	1,740	439	15	2,193
Rice (Upland)	1,686	1,241	18	2,945
Peanut	1,249	902	26	2,177
Sesame	749	323	10	1,082
Potato	405	118	-	523
Okra	237	60	6	303
Local Aubergine	172	103	-	275
Yam	133	85	-	218

**Table 3. Main fertilizers consumed in Burkina Faso by crop.**

Crop	Fertilizer formulation	Distributor / Manufacturer
Cotton	NPK 14-18-18 +6S+0.1B	CIPAM
	NPK 14-18-18	
	NPK 13-17-17 +5S +0.1B +3.5MgO	Tropic Agro Chem
	KCl 0-0-60	
	NPK 15-20-15 +6S +0.1B Urea 46-0-0	
Maize	NPK 14-23-14 or 14-23-14 +6S +0.1B	SOLEVO (Ex. LDC), CIPAM, Tropic Agro Chem, YARA
	NPK 23-10-5 +3S +2MgO +0.3Zn (Yara Avtyva)	
	DAP 18-46-0 Urea 46-0-0	
Rice	NPK 14-23-14	
	NPK 15-15-15	
	NPK 15-15-15 +5S +0.1B	
Sorghum	NPK 14-23-14 or 14-23-14 +6S +0.1B	
Vegetable products	NPK 14-23-14 or 14-23-14 +6S +0.1B	CIPAM
	NPK 15-15-15 or 15-15-15 +13SO <sub>3</sub> +8CaO	
	N30+3MgO+8S+0,3Zn+0,2B	
	NPK 12-22-22 +2SO <sub>3</sub> + 1MgO +5CaO	SOLEVO (Ex. LDC)
	NPK 8-8-8 ; used with 14-23-14 in the basal fertilizer Urea 46-0-0	
Banana	NPK 11-11-33 +3S	SOLEVO (Ex. LDC)
	NPK 11-11-33	
	NPK 10-18-18	CIPAM
Sugar cane	DAP 18-46-0	Tropic Agro Chem ; CIPAM
	MAP 11-52-0	
	KCL 0-0-60	
	TSP 0-45-0 + 21CaO	

## Types of Fertilizer Recommendations Available, and their Suitability for Crops and Agro-Ecological Zones that are Targeted by AGRA

Table 4 shows the fertilizer source and rate for AGRA priority crops in Burkina Faso, along with total nutrients applied and extracted for specified yield targets.

### Maize, sorghum and rice recommendations and their suitability

Without soils information or detailed experimental data, it is difficult to know if maize, sorghum and rice fertilizers contained an optimized balance of nutrients. OFRA reports indicate that the addition of Mg, S, Zn, and B increased maize, sorghum, and rice yields significantly (between 20 and 25%, depending on crop), but it is not possible to know which of these nutrients contributed, or if the results can be broadly extended beyond the few trial sites. OFRA data also did not support the addition of K to maize, sorghum, or rice, but again there are limitations on whether these results can be extended beyond trial sites. It nevertheless suggests that omitting K from formulations should be the subject of investigation for some cereals.

**Table 4. Fertilizer recommendations for AGRA priority crops in Burkina Faso, including nutrients applied and nutrients extracted for specified yield targets.**

Crop	Yield Target	Appl. Rate		N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	CaO	MgO	S	Zn	B	Cu	Mn	Fe
		Basal	Top dress											
<b>Maize</b>	Mt ha <sup>-1</sup> 5	-----kg ha <sup>-1</sup> -----		-----Nutrients removed in crop and residue, kg ha <sup>-1</sup> ----- -----Nutrients supplied in recommendation, kg ha <sup>-1</sup> -----										
General maize cascades, Hauts Bassins 14:23:14 basal, urea topdress		300	100	88	69	42	0	0	0	0	0	0	0	0
General All agroecologies 14:23:14 +6S +1B basal, urea topdress		150	100	67	35	21	0	0	9	0	1.5	0	0	0
INERA South Sudan Savanna DAP + urea (OFRA)		40	130	67	18	0	0	0	0	0	0	0	0	0
<b>Sorghum</b>	Mt ha <sup>-1</sup> 2	-----kg ha <sup>-1</sup> -----		-----Nutrients removed in crop and residue, kg ha <sup>-1</sup> ----- -----Nutrients supplied in recommendation, kg ha <sup>-1</sup> -----										
General straight DAP		100	0	18	46	0	0	0	0	0	0	0	0	0
Microdosing Sudano-Sahelian and northern: 14:23:14+6S+1B		62.5	0	9	14	9	0	0	4	0	1	0	0	0
General INERA all agroecologies 14:23:14+6S+1B basal + urea topdress		100	50	37	23	14	0	0	6	0	1	0	0	0
<b>Rice</b>	Mt ha <sup>-1</sup> 7	-----kg ha <sup>-1</sup> -----		-----Nutrients removed in crop and residue, kg ha <sup>-1</sup> ----- -----Nutrients supplied in recommendation, kg ha <sup>-1</sup> -----										
Central East Wet season, 14:23:14 basal, and urea topdress		200	200	120	46	28	0	0	0	0	0	0	0	0
Central East Dry season, 14:23:14 basal, and urea topdress		200	250	143	46	28	0	0	0	0	0	0	0	0
General 14:23:14 basal, urea topdress		150	100	67	35	21	0	0	0	0	0	0	0	0
<b>Cowpea</b>	Mt ha <sup>-1</sup> 2	-----kg ha <sup>-1</sup> -----		-----Nutrients removed in crop and residue, kg ha <sup>-1</sup> ----- -----Nutrients supplied in recommendation, kg ha <sup>-1</sup> -----										
General 14:23:14+6S basal		100		14	23	14	0	0	6	0	1	0	0	0

Some efforts have been made with regards to maize and in matching fertilizer rates with N and P requirements, differentiated according to the agro-ecology. None of the available fertilizers contain Zn, and we could find no information from Burkina Faso to indicate its sufficiency or deficiency. The quantities of S and B in the fertilizers that have them are appropriate for granular forms (though B may be higher than necessary). Some savings and rate reduction could be realized by coating B onto the granular fertilizers, which most blenders can achieve, or by using an NPS formulation in place of DAP and AS as is done currently.

### Cowpea recommendations and their suitability

Respecting the same caveats given for maize, sorghum, and rice, in OFRA evaluations, cowpea showed a 15% average response to the addition of Mg, S, Zn, and B, and as well showed profitable response to K. Legumes are often K-responsive. We found references in the literature (not related to Burkina Faso) to cowpea response to K, S, and B, all of which are in the cowpea formulation (the same formulation as used in cereals). What is mainly lacking is soils information to determine if the formulation can be broadly applicable, and investigation of whether Zn might induce response.

## Gaps that Need to be Addressed to Come Up with Area and Crop Specific Blends

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Some progress has been made in Burkina Faso, despite the lack of soils information. Though only a single multi-nutrient fertilizer is available for all 4 AGRA priority crops, it does contain S and B, and OFRA trials give an indication that significant responses to secondary and micronutrients can be obtained. The Burkina Faso recommendations also show some variation according to agro-ecological zones, most likely dictated by water limitations. Some best-bet trials would help resolve questions surrounding the need for Zn and K in relation to cereals. It is likely that funding for soil analysis and mapping will be realized in the near future through the Islamic Development Bank (IDB).

## Recommendations and Interventions that AGRA Could Implement to Address the Availability of Quality Fertilizers

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With likely funding for a more thorough soil analysis and mapping exercise on the horizon, we suggest that AGRA may want to proceed with support for best-bet trials on AGRA priority crops. One major objective of these trials should be to demonstrate that superior yields can be achieved at lower or equal fertilizer costs than are being realized with the current recommendations. These trials, if properly designed, can serve as best-bet trials and validation trials, and should be conducted in a collaboration between INERA and blending companies/suppliers. Some support from IFDC will be required to ensure that rates are sufficient to be responsive, and that a variety of options that yield useful information from their comparisons are developed. We only identified one Yara product in the market, but we have observed that Yara has other more concentrated products, particularly in West Africa, that might be appropriate to addressing deficiencies in Burkina Faso. As well, OCP is investing in soil analysis in Burkina Faso, with an apparent intention to enter the market, and should be considered as a partner for best bet and validation activities.

Invest in national capacity to implement balanced crop nutrition research through appropriate technical training of national soil scientists, agronomists, and private sector blenders and field staff. Advanced skills can be used to efficiently develop/validate new formulations and determine the agronomic effectiveness of different nutrients (omission trials). These skills include how to calculate and mix fertilizers, trial designs to detect sometimes small treatment differences, and statistical analysis methods appropriate to omission trials.

If sufficient evidence already exists to support the multi-nutrient fertilizers already being used (those containing S and B), scaling these fertilizers through demonstrations is advised.

Given the lack of soils information in Burkina Faso, some small investments in their analytical capacity might be advised. Expensive equipment such as ICPs are not required. We find a general lack of skills and knowledge in analyzing B and S in particular in many countries, though this can be accomplished in most government laboratories.

## The Burkina Fertilizer Market

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The Fertilizer Distribution Structure and Value Chain SWOT analysis are presented in Figures 1 and 2, respectively.

### Demand

Farmers are generally organized around main crops produced. There are farmer organizations for cotton, rice and maize / millet / sorghum. Some of the crops have grassroots, provincial and federal levels of organizations.

Apparent consumption of fertilizers has seen some increase in the last 2 years mostly because of flows of subsidized fertilizers from Ghana – there was a significant increase in the subsidies in Ghana in 2016 and 2017. Of the total fertilizer volumes consumed in 2016 (280,000 MT), 73% are subsidized (of which 66% are directly for cotton) leaving only about 75,000 MT private (Figure 4).

A significant proportion of the private volumes are likely to also end up around the subsidized areas - the farmers are likely to be more appreciative of fertilizers and can probably better afford than the others – cotton support (subsidies, credit and cash payout). Moreover, given the influence of subsidy on distribution, private fertilizers are likely to be more available in the subsidized areas.

In Burkina Faso, as well as in a lot of other Sub-Saharan African countries, direct subsidies were introduced in response to the 2008 world food crisis. Before then however, cotton, which is the most important cash crop in Burkina Faso, was subsidized. For direct subsidies, the fertilizers target vulnerable farmers who produce rice, maize, sorghum and cowpea.

The subsidies in Burkina Faso, are mainly driven by cotton production which has been improving since 2000. The total area cultivated in cereals during the 2016/2017 cropping year is estimated at 4,017,586 ha of which 700,000 ha was under cotton. For 17% of the cereal land, cotton producers consumed 66% of total fertilizer distributed in the country, and between 15% and 25% of the fertilizer consumed by cotton farmers was used for other cereals, principally maize. The increase in cereal production in Burkina Faso exceeds the growth in fertilizer consumption (Figures 3 and 4).

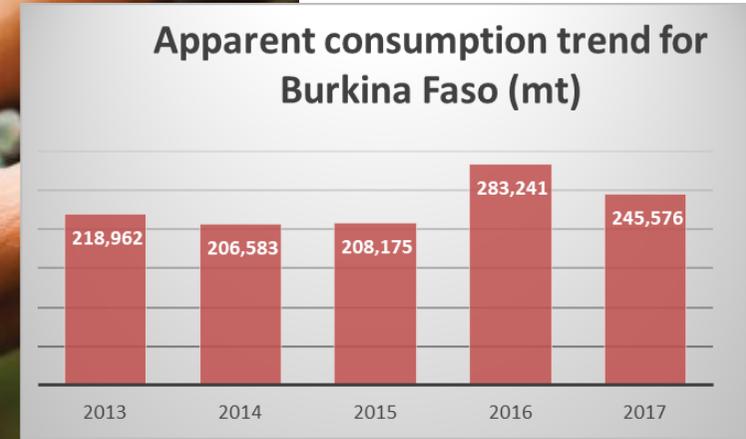
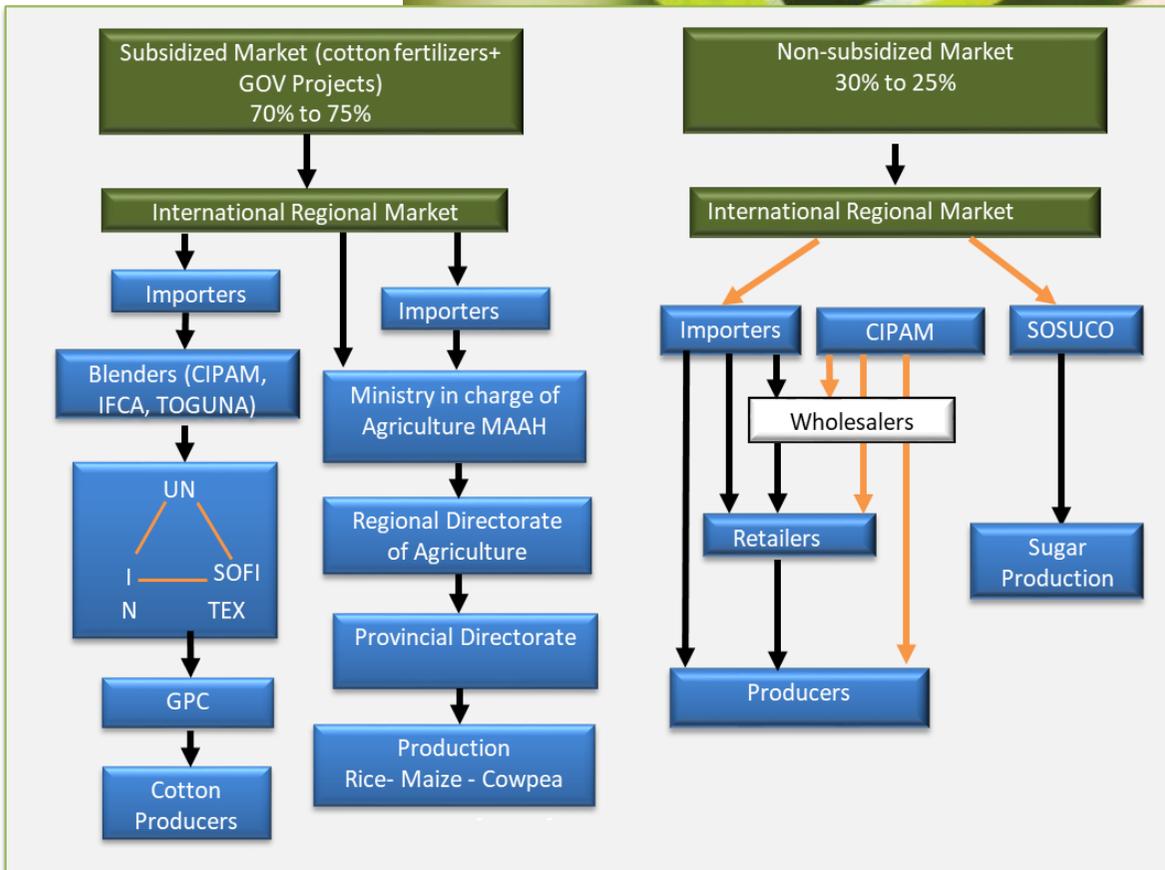
In fact, at about 12 kg/ha<sup>1</sup> of arable land, Burkina Faso remains an exceedingly poor user of fertilizer but shows significant potential for fertilizer consumption as about 67% of farmers<sup>2</sup> appear to understand the importance of fertilization. Moreover, the growth in production in the country has been as a result of increased land cultivation and not productivity (Figure 3) as yields have been stagnant.

Though government's income has been given a boost by the exploitation of gold, it is unlikely that the growth in fertilizer consumption will come from subsidies; only the development of the private system can drive a broader and deeper consumption of fertilizers in the country.

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<sup>1</sup> WDI – World Bank. 2014 value

<sup>2</sup> Ministry of Agriculture and Water management report on the impact of the subsidies programs, 2016



	Fertilizer System	Volume (mt)	%
Cotton	Bulk Anchor	184,847	66%
Direct Subsidy	Bulk Government	20,476	7%
Others	Private	74,677	27%
		280,000	

**\*205,323 mt (73%) of Fertilizers were subsidized by the Government in 2016**

Source : WAEMU CRAE study report 2017

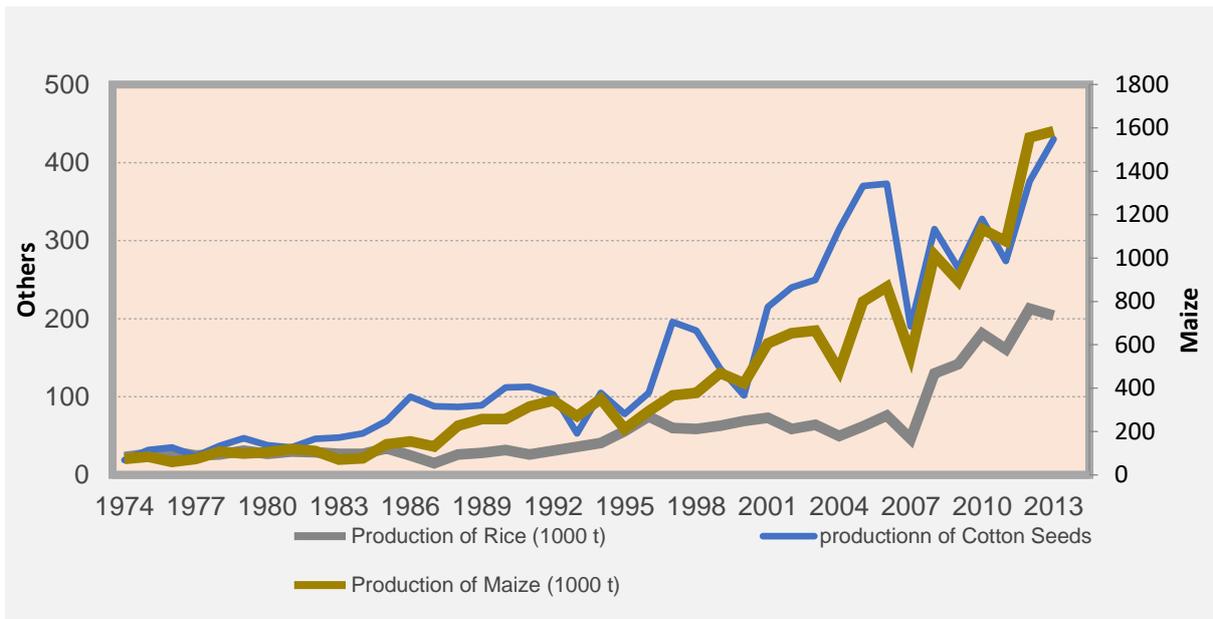
**Figure 1. Burkina Faso fertilizer market distribution structure, apparent consumption, and volumes distributed via various distribution systems**

	Strengths	Weaknesses	Opportunities	Threats
<b>Manufacturer</b>			<ul style="list-style-type: none"> <li>Granulate and export into the sub-region</li> </ul>	
<b>Importer</b>	<ul style="list-style-type: none"> <li>Access to finance</li> <li>Decent supplier network</li> <li>Network within Government</li> <li>Relationship with wholesalers</li> </ul>	<ul style="list-style-type: none"> <li>Focused strictly on the cotton business</li> <li>No interest in or connection to the farmer</li> </ul>	<ul style="list-style-type: none"> <li>Partnerships with manufacturers from the sub-Region                             <ul style="list-style-type: none"> <li>Granular urea from Nigeria</li> <li>Phosphate products from Senegal / Togo / OCP</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Entry of manufacturers into the market</li> </ul>
<b>Blender</b>	<ul style="list-style-type: none"> <li>Blending capacity</li> <li>Access to finance</li> </ul>	<ul style="list-style-type: none"> <li>Lack of management and technical competence</li> <li>Focused on the cotton tender</li> </ul>	<ul style="list-style-type: none"> <li>Specialty blends to improve productivity with the introduction of micro-nutrients</li> <li>Partnerships with manufacturers from the sub-Region                             <ul style="list-style-type: none"> <li>Granular urea from Nigeria</li> <li>Phosphate products from Senegal / Togo / OCP</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Stronger quality regulations as process might not be capable of</li> </ul>
<b>Distributor</b>	<ul style="list-style-type: none"> <li>Relationship with retailer</li> <li>Relationship with importers</li> </ul>	<ul style="list-style-type: none"> <li>Lack of management and technical competence</li> <li>Trader mentality – only interested in buying low and selling</li> <li>Fixated on the subsidy program</li> <li>Inadequate working capital</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in subsidy and increase in private fertiliser systems</li> <li>Opening up / seeking and building profitable last mile outlets / relationships</li> <li>Development of redistribution</li> </ul>	<ul style="list-style-type: none"> <li>Reduction or removal of subsidy creating normal competition</li> </ul>
<b>Agro Dealer</b>	<ul style="list-style-type: none"> <li>Wholesaler relationship</li> <li>Farmer interaction / relationships</li> </ul>	<ul style="list-style-type: none"> <li>Lack of working capital</li> <li>Dependent on wholesaler</li> <li>Lack of management and technical competence</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in subsidy and increase in private fertiliser systems</li> <li>Development of a professional association</li> </ul>	<ul style="list-style-type: none"> <li>Inability to compete normally – overdependence on the wholesaler relationship</li> </ul>
<b>Processor</b>	<ul style="list-style-type: none"> <li>Organised and controlled supply chain of feedstock</li> </ul>	<ul style="list-style-type: none"> <li>A monopolistic culture and incumbent inertia</li> </ul>	<ul style="list-style-type: none"> <li>Development of value added activities which will improve farmer income and company earnings</li> </ul>	<ul style="list-style-type: none"> <li>Weak farmer profitability.</li> </ul>

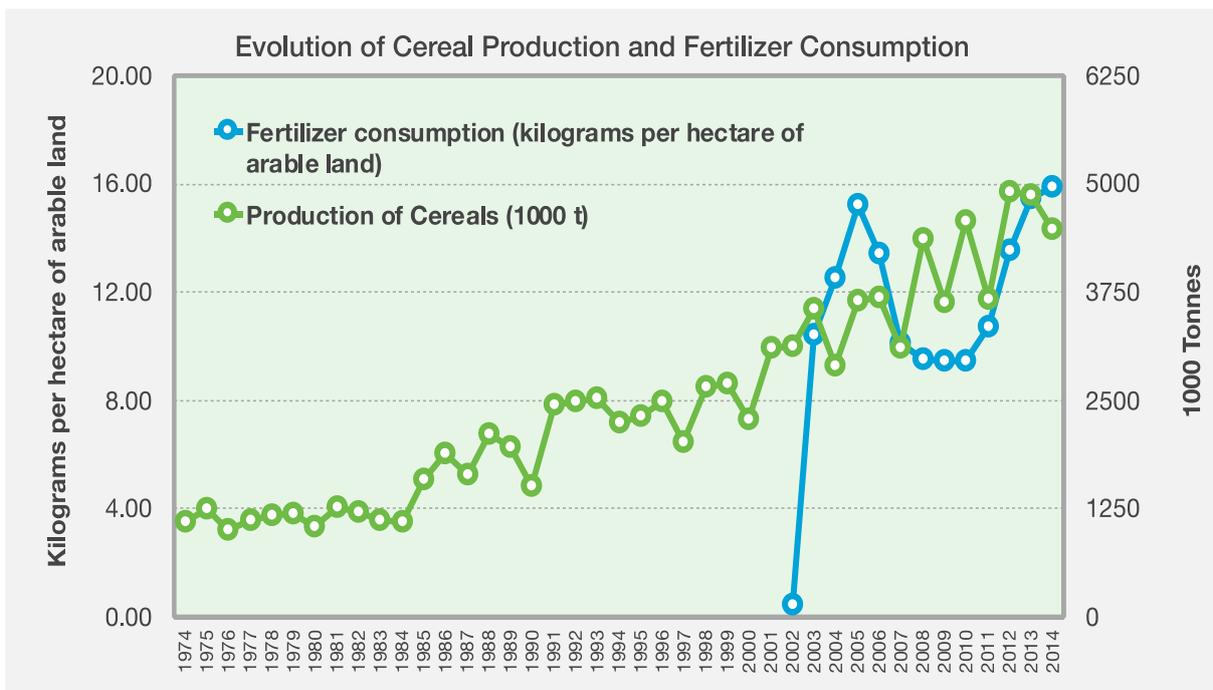
**Key Takeaways:**

1. Only the cotton farmer is seriously served – products, credit, extension
2. But the cotton farmer is trapped in the world of the processor (little value addition) monopoly
3. Blenders were focused on the cotton tenders and did not build relationships with distribution
4. The distributors consider the fertilizer business opportunistic
5. Fertilizer systems are unconnected to Sub-Regional manufacturing capacity
6. Trade (and therefore coordination) with neighbours is very poor given strengths and similarities

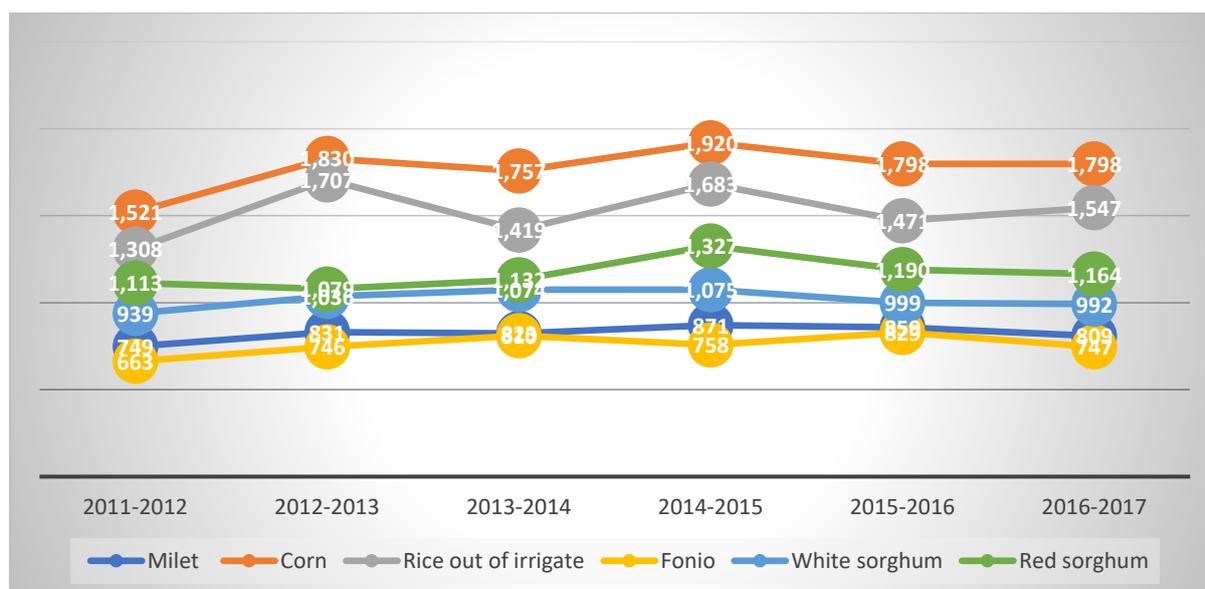
**Figure 2. Value chain SWOT analysis for Burkina Faso.**



**Figure 3. Production trends of major crops in Burkina Faso**



**Figure 4. Fertilizer consumption and cereal production in Burkina Faso**



**Figure 5. Evolution of cereal crop yields, 2011 to 2016**

Source: DSS/DGESS/MAAH, 2017

Effectively, Burkina Faso has seen a significant rise in the demand for fertilizers. The Government, through subsidies, has satisfied a part (a very little part)<sup>3</sup> of the latent demand, while constraining the exploitation of the rest for the following reasons:

- The fertilizer systems in Burkina Faso leave the farmer with very little agency – the cotton industry dominates and the cotton system controls all the value chain.
- Products likely to be more available around cotton and Government structures than other areas – the effect of bulk procurement.
- Farmer dependent on Government budget and the decision of the cotton organisations
- Farmer groups exist, especially to support cotton production, but appear to focus more on distributing the subsidized fertilizers than improving consumption.
- There is no demand generating activity in the market beyond decisions on subsidy volumes.
- A significant part of private sector volumes into the market are based on profit maximizing opportunities that the dealers see between subsidies in Ghana and supply gaps in Burkina Faso; there is no consideration for match between blends and crops.
- The dominance of the cotton industry in Burkina Faso is a major constraint to fertilizer consumption. The industry represents the market and the industry is dependent on government budget and the price of cotton in the international market, which has been quite stable.

## Supply

La Société d'Exploitation des Phosphates du Burkina supplies about 2,300 tons of natural phosphates per year (Ministry of Agriculture, 2015) and COVEMI (Compagnie Villageoise

<sup>3</sup> The latent demand (if we assume the Abuja target of 50kg/ha) will be 4X current demand. The Government's current trend subsidizes between 7% and 9% of this demand.

d'Exploitation Minière), based in Bobo-Dioulasso, produces dolomite and filler product for blended fertilizers. Other products are imported.

The majority of the imports are through eight importers and most of the imports are from blending units in the sub-region: Côte d'Ivoire (Yara Côte d'Ivoire, LDC, Agro-West); in Mali (Toguna, SOGEFERT, DPA, PROFEBBA); Ghana (Yara Ghana, Weinko); and Togo (CIAT).

There are two blenders in Burkina Faso – CIPAM and IFCA – and both were set up to supply the cotton industry's bulk purchase program. CIPAM was set up in 2003 to supply the cotton industry. As the only blender in sector for a long time, CIPAM dominated fertilizer purchases by both the cotton producers and Government. For the private systems, CIPAM was available to produce for wholesalers too. CIPAM is also currently thinking about investing in the granulation of dolomite.

IFCA is a 150,000 MT plant that started activity in 2016 with the cotton industry as the target. Like CIPAM, they import a number of products and primary materials to produce blends for the cotton industry.

Importers and blenders are focused on the bulk procurement systems and have no interest of connection to either farms or farmers. They have a strong network with farmer / producer organizations and also with Government. They have logistics assets – warehouses and trucks – and they maintain some relationship with wholesalers. They have access to finance.

Both blenders, due to competition for the cotton business, especially from the Malian blenders, are beginning to think about developing distribution channels to get to farmers beyond cotton – they are starting to invest in a commercial team. Blenders are weak technically and commercially, having always been in a monopolistic market with no competitive demands on them.

There are more than 2000 agrodealers in Burkina Faso, 5% of which can be described as wholesalers (able to purchase more than 8000 and linked to retailers). Agrodealers usually depend on either subsidies (from Ghana mostly) or on trade from Government subsidy program.

With the majority of the fertilizer flows beyond them, agrodealers are left with the completion for the rest of the industry, mostly subsidy flows from Ghana, sometimes Mali and some private importation. The agrodealers develop a strong trading mentality, seeking price arbitrage opportunities within the country and amongst the neighbours. Given that no private fertilizer is branded, and that farmers are typically ignorant about fertilizers, the agrodealer is able to supply any quality of fertilizer to the farmer, playing strictly with price. The agrodealer thus actively promotes the understanding of fertilizer as a product and not specific blends or compounds or nutrients.

Given that a significant part of the product within the agrodealer network is informal, the agrodealer's credit worthiness becomes more difficult to assess and credit is either not offered to the network at all, or offered at a high price to very few.

## Policy Contribution and Outcomes

Burkina Faso's fertilizer system is dominated by cotton. Cotton is about 14% of total export and only about 1% of cotton produced is processed. The government is a key player in the cotton value system. It is a majority share owner in the country's largest cotton company. The price of cotton seeds are regulated and cotton producers are paid annual stipends.

The food crisis of 2007, triggered a renewed interest in funding crop production (food and cash) with an emphasis on both improving the use of inputs and increasing arable land under production. This policy was combined with restrictions on import of rice and wheat.

**Table 5: Evolution of Areas used for Cereal Crops**

Year	Millet	Maize*	Rice*	Fonio	White Sorghum	Red Sorghum	Together
2011-2012	1 143 410	701 196	135 479	21 691	1 274 953	406 928	3 683 656
2012-2013	1 272 901	846 488	136 864	26 833	1 394 750	393 945	4 071 782
2013-2014	1 327 078	913 630	138 852	24 567	1 399 660	406 869	4 210 656
2014/2015	1 192 006	749 935	144 261	11 400	1 230 138	318 266	3 646 007
2015/2016	1 160 718	820 117	142 715	15 743	1 134 286	310 651	3 584 231
Average	1 219 223	806 273	139 634	20 047	1 286 757	367 332	3 839 267
2016/2017	1 187 397	911 728	170 158	14 133	1 320 442	413 728	4 017 586
Variation 2016/2015	2,30%	11,17%	19,23%	-10,23%	16,41%	33,18%	12,09%
Average five-year variation	-2,61%	13,08%	21,86%	-29,50%	2,62%	12,63%	4,64%

Source : DSS/DGESS/MAAH, 2017 ; AFAP baseline study

**Table 6: Synthesis of Cereal Productions (in tons)**

Year	Millet	Maize*	Rice*	Fonio	White Sorghum	Red Sorghum	Together
2011-2012	828, 741	1, 076, 754	240, 865	14, 502	1, 051, 923	453, 620	3, 666, 405
2012-2013	1, 078, 374	1, 556, 316	319, 390	20, 659	1, 481, 072	442, 733	4, 898, 544
2013-2014	1, 078, 570	1, 585, 418	305, 382	19, 887	1, 427, 747	452, 718	4, 869, 723
2014-2015	972, 539	1, 433, 085	347, 501	8, 562	1, 280, 529	427, 084	4, 469, 300
2015-2016	946, 184	1, 469, 612	325, 138	13, 091	1, 073, 095	362, 545	4, 189, 665
Average	980, 881	1, 424, 237	307, 655	15, 340	1, 262, 873	427, 740	4, 418, 727
2016/2017	905, 071	1, 602, 525	384, 690	10, 936	1, 177, 442	486, 402	4, 567, 066
Variation 2016/2015	-4.35%	9.04%	18.32%	-16.46%	9.72%	34.16%	9.01%
Average five-year variation	-7.73%	12.52%	25.04%	-28.71%	-6.76%	13.71%	3.36%

Source : DSS/DGESS/MAAH, 2017 ; AFAP baseline study

The net effect, shown earlier in Figure 4 and Tables 5 and 6 is the improvement in cereal production. The principal driver of this growth appears to be the increase in land under

cultivation and not productivity. This outcome is not surprising because the elements to drive productivity increases are still missing from Burkina Faso's agriculture.

Since 2017, fertilizer control regulations have been passed into law. These regulations apply to importing, exporting and manufacturing of fertilizers in the country. These regulations are in compliance with the fertilizer quality control regulations of ECOWAS.

To execute the regulations, the Government set up the National Committee for Fertilizer Control (CONACE) which manages fertilizer inspectors. CONACE is supported by the laboratories of the National Soil Bureau (BUNASOL) for testing and the National Institute for Environment and Agricultural Research (INERA) for fertilizer recommendations.

Executing the defined quality control structure has been a problem. There was a problem of the adequacy of the equipment at BUNASOL but this is being fixed by a \$5M investment. There is however still a problem of inspection procedures, manning and supervision. Moreover, the regulations do not appear to cover fertilizer distribution.

Effectively despite Government's policies, fertilizer use, as shown earlier, has not increased to match the increase in land under cultivation, primarily because cotton is the main driver of fertilizer use; fertilizers used are not adapted to crops; availability of inputs and good quality inputs is a problem.

### **Ongoing efforts or investments that are promoting the availability of appropriate blended fertilizers that AGRA can leverage in the target countries**

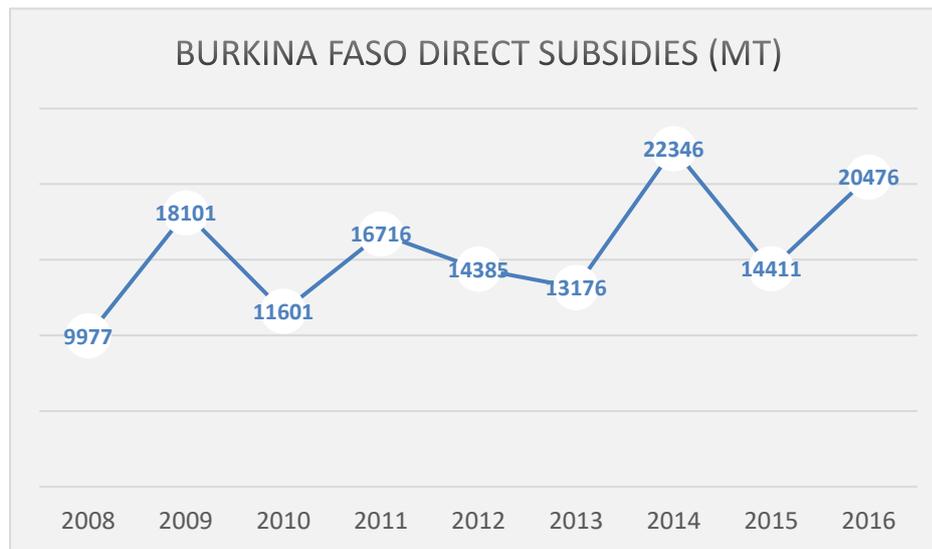
- OCP has partnered with INERA and BUNASOL to develop a soil map for 11 regions in the country. This soil map should improve fertilizer recommendations.
- The AGRA project "Optimizing Fertilizer Recommendations in Africa" was implemented in Burkina Faso in partnership with INERA. The objective of the project was to optimize the use of fertilizers by determining the appropriate dose from the response rate of crops.
- BUNASOL has received funding of up to \$6M (partly from AGRA) to install a new and modern laboratory and to purchase a mobile laboratory.
- CIPAM are investing in investment in dolomite granulation to improve the quality of the blends (reduce segregation and increase absorption) with dolomite

### **Policy and Regulatory Bottlenecks that Affect or May Affect the Availability of Blended Fertilizers, and Interventions that AGRA and its Partners could Design and Advocate for Implementation**

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#### **Policy constraints**

The Burkina Faso fertiliser systems have developed around bulk procurement of fertilizers, of the cotton industry and of Government subsidies. Both have government participation through subsidies, and the largest cotton company is partly owned by the Government.



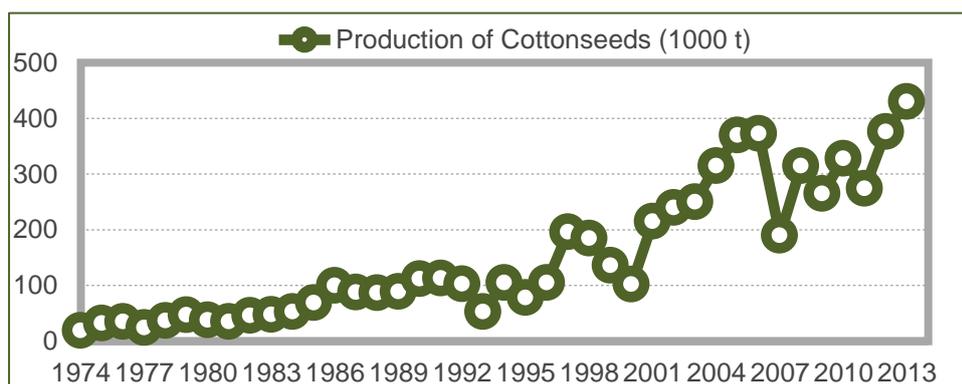
**Figure 6. Direct fertilizer subsidies**

Currently about 70% of the fertilizers in the country are for the cotton sector and about 10% are subsidized directly.

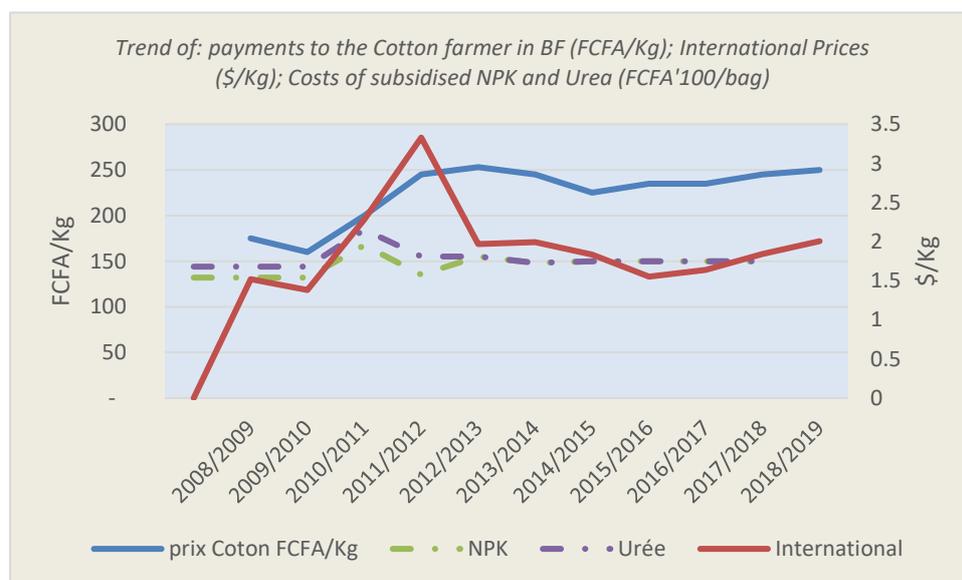
The policies of Government regarding the cotton industry in Burkina Faso have created the biggest constraint to the availability of blender fertilizers.

1. Cotton takes priority in the Government budget – a reduction in the subsidy budget will affect, first the direct subsidy before cotton. The subsequent fluctuation in subsidy volumes (Figure 6) creates within the system, the mindset of treating the volumes as opportunistic. Since the volumes are opportunistic, supply chain participants will not invest behind the volumes and will seek to maximize margins selfishly.
2. Supply chain investments are targeted at cotton companies. The cotton companies become the clients of the manufacturers, blenders and importers. The actors in the supply chain cannot be innovative with products; they have to supply exactly what has been defined.
3. The cotton sector avoids the private distribution structure. With direct distribution, the wholesalers and retailers are circumvented and, without a steady anchor, must depend on Government subsidies and the opportunity created by inflows of subsidized products from neighboring countries. They become very opportunistic.
4. The cotton companies subsume the agency of the farmers. The organization of the cotton sector is such that the farmer is treated as a worker and paid a salary – he is not an entrepreneur; she takes what she is given and does what she is told. As a part of the farmer's benefits is the additional fertilizer volumes (not exceeding 25% of cotton fertilizer assigned) allocated for maize. The cost of this allocation is withdrawn from the farmer's output. The system has been managed in a monopolistic manner – farmer income and input costs are maintained flat (Figure 7) while production increased. The Government and the farmer effectively subsidize the other shareholders of the cotton company.

5. There are likely to be leakages within the cotton system. The cotton farmers are also likely to have the most reliable cashflows of the farming communities. Moreover, the cotton farmers are likely to be the most progressive regarding input use. These three elements combine to create a higher density of retailers around the cotton community.
6. With the cotton industry the preoccupation of the government, and since the industry was controlled, the regulatory structures were not a priority of the Government – they are weak and underfunded. For example, though there is excessive manufacturing capacity for granular urea at proximity to Burkina Faso, the practice, supported by regulation, within the country is still to purchase more expensive prilled urea from Europe.



**Figure 7. Production of cottonseeds**



**Figure 8. Trends of cotton farmer payments, cotton prices and costs of subsidized fertilizers**

### Supply chain constraints

The fertilizer systems in Burkina Faso are the product of bulk purchases by cotton companies and Government. The primary clients of distribution systems are therefore the cotton companies and not the farmer: the farmer is simply the end of a delivery system. From buying organizations down the distribution systems flowed products and credit, creating a

pyramid of power that puts the farmer right at the bottom. The outcome is fertilizer systems that are constrained from being efficient by the following:

- There is no incentive to develop new products – when there is a decision to develop, usually prompted by development organizations, there is no hurry to commercialize.
- Delivery systems developed to seek arbitrage opportunities created by subsidies in Burkina Faso and from neighboring countries. The activities of the actors are therefore not transparent – management information systems are either weak or non-existent. Moreover, the actors push products for their profitability and not suitability. The immediate gratification tendency and the lack of a market vision stunts the professional growth of the distributor.
- The blenders lack blending management expertise; they also do not understand distribution and have not built any farmer relationship.
- With only 27% of fertilizer being private, the retail network is made up of small fragmented agro dealers with a significant majority illiterate and very traditional.
- An inconsistent supply and an inefficient (and greedy) distribution network results in products being expensive to the farmer.
- Products are not adapted to crops and they are also not optimized.
- Research institutions have not been active in the development of the sector.

### Summary of constraints to achieving efficient fertilizer systems

The Burkina Faso fertilizer sector is characterized by service to the cotton farmer only – products, credit, extension. Though served however, the cotton farmer is trapped in the world of the processor (little value addition) monopoly, and has been turned into a mere “plantation worker”, paid a stipend for his effort.

Distributors consider the fertilizer business opportunistic and blenders were focused on the cotton tenders, excluding and avoiding distributors and distribution.

Though there is excess urea production capacity in the Sub-Region, of better (granular urea) products and at a cheaper price, the Burkinabe importers still prefer to source from Europe.

Trade and coordination with neighbors is very poor given the similarities and complementarities of the Sub-Region.

## AGRA Intervention Options

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Given the current culture within the fertilizer sector, sustainable production and distribution of appropriate blends in Burkina Faso will depend on: 1) the improvement of the existing institutional structure – regulatory system, fertilizer competence in the country, and soil mapping; 2) strengthening of the implementation capacities of AGRA partners; 3) investing in best-bet trials and commercialization of optimized products within the AGRA geographies.

### Development of an institutional structure

#### Regulatory System

Fertilizer quality control is carried out by the fertilizer inspectors who are members of the National Commission for Fertilizer Control (CONACE), at borders and in the stores and input shops.

There has been some effort put into the definition of the fertilizer regulatory system in Burkina Faso. The system is however not complete – the distribution partners have been avoided – and it has been difficult to execute. The execution difficulty is no doubt aggravated by the culture of participants in the delivery system, especially the focus on subsidies rather than the development of a sustainable farmer-centric business.

To transform the regulatory structure, it will be necessary to create an active platform of stakeholders to work with the CONACE to:

- Understand the current unregulated landscape and its negative impact on value addition
- Develop a joint vision that is farmer-centric
- Through a scrupulous appraisal of the current system, understand the constraints to realizing vision within the fertilizer systems
- Agree on the key roles of the different actors
- Develop a roadmap that takes into consideration the level of preparedness of, and the need for self-regulation by, the different actors
- Include in the roadmap, the review of the current regulations to include distribution
- Institute a review mechanism

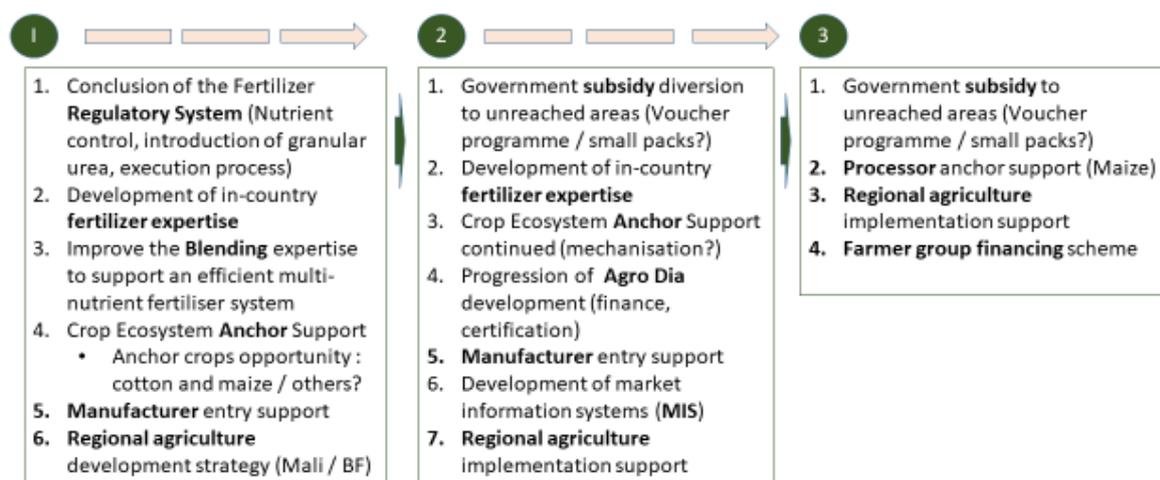
The development of the platform – convening, facilitating and funding – will require an external organization and will require the participation of technical resources that Burkina Faso does not have in-country. The constitution of the platform should take into consideration the need for a transformation of the regulatory system and therefore recruit members that are genuinely interested in the sector and are mavericks within their trade.

## AGRA Strategic Planning

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Getting good quality blends sustainably to the small holder farmer will probably require a 3-phase approach that has some immediate actions, complementary actions after the initial have gained traction and there is a structural effect, and the transition into maturity. The duration from starting to maturity is estimated to be 5 years (Figure 9).

Each phase has a blend of the intervention options and is dependent on the geography but the principles can be applied to multiple locations at the same time.



[www.afap-partnership.org](http://www.afap-partnership.org)

**Figure 9. Strategy approach for fertilizer development in Burkina Faso**

The first phase of proposed AGRA options has two parts:

1. Development of a more effective regulatory system. This phase, described above will entail two key parts:
  - a. urgent need to create efficiency within the current system from improved products – blends and granular urea. The focus of the new products can be maize and soya beans. Maize to take advantage of the cotton fertilizer distribution structure, replacing cotton blends with maize blends for the additional maize farms; soya beans could be the target for government subsidies and in low fertilizer-utilization areas. The subsidy program for soyabeans could be with small packs bundled with seeds. The objective is to introduce the private sector to farmers and the farmers to good quality products. The intervention should not exceed 2 years. The subsidy program could work with GPCs who will provide the communication / training of the participating agrodealers and who will also be trained to provide quality control of the agrodealers in the program.
  - b. the gradual building of the institutional base for the sustainability of the sector through the development of a vibrant technical and professional environment within the system.
2. The encouragement of substantial investments into the Burkinabe agricultural sector. These investments can come from fertilizer manufacturers as well as processors and the investments are to improve the competitiveness<sup>4</sup> of the agricultural landscape which has been dominated by the cotton monopoly.

The **first phase** is to improve immediately the quality of products (blends and urea) while building the foundation for transparency and regulation<sup>5</sup> of the fertilizer sector, leading to

<sup>4</sup> A 10% increase in competition could increase fertilizer use by 13–19% and rural incomes by 1–2% in regions like sub-Saharan Africa (Maximo Torero, 2013)

<sup>5</sup> The actions required for regulatory improvement were defined earlier

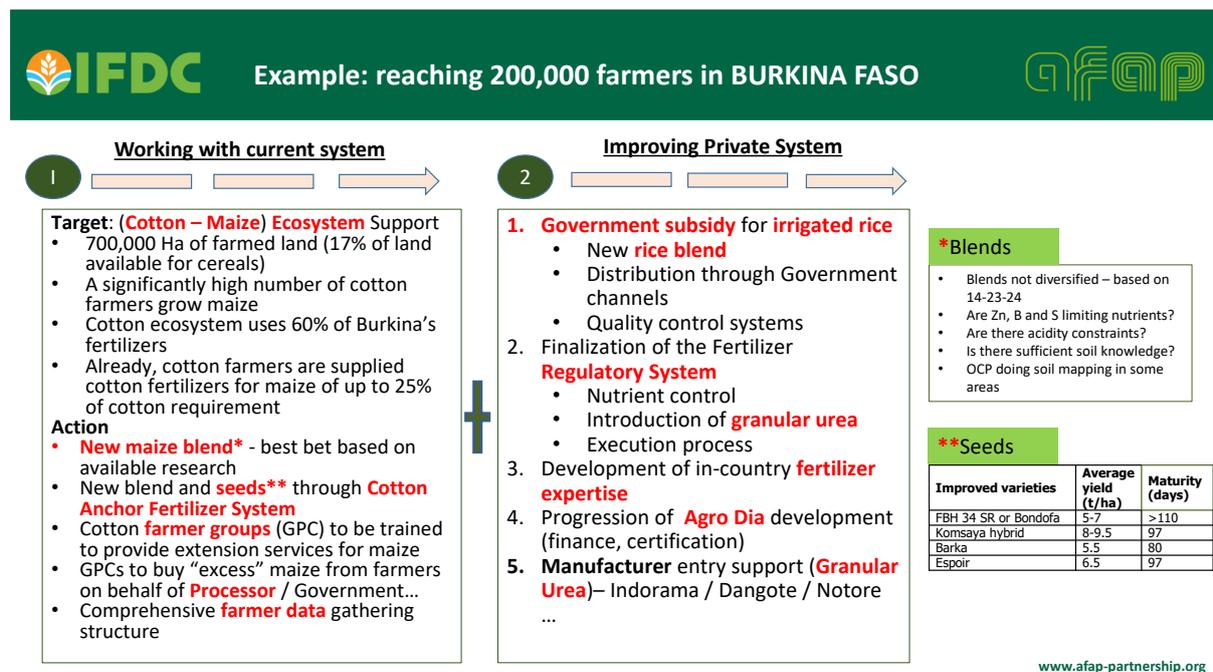
better distribution discipline and improved farmer yields. These institutional actions are then complemented with the improvement – with technical support and mentoring - of blending management and the distribution associations. An important final part of the first phase is the development of a regional strategy that involves the investment of large manufacturers with brand consciousness in to the Burkinabe market. These manufacturers could be new entrants or they could be existing but expanding (a biscuit manufacturer, for example).

In addition to continuing the programs begun in the first phase, the second phase starts to demand changes of the principal supply chain actors and Government. In this phase, for example, the case will be made for better quality products within the various subsidy regimes. AGRA could also incorporate Seed programs (or programming) into this phase.

In the second phase, given that the institutional landscape would have shifted, it will be necessary to take AGRO DIA, the network of agrodealers in Burkina Faso, to the next level where it actively adds value to the members (marketing, finance etc) and is then also able to self-regulate and introduce information systems to make distribution more transparent and efficient.

Most activities would be maturing, and the landscape significantly modified by the 3rd phase of AGRA’s options. Fertilizer systems will be significantly more transparent from the importer/manufacturer to the farmer. Farmer yields would have shown significant increases and the value chain would have benefitted from the increase. The anticipation is also that Government subsidies would have reduced significantly as not to be of any serious consequence to the sector. With increased productivity and credit support both upstream and downstream, the farmer is motivated to want to grow his business. The most important activity AGRA can therefore focus on then will be farmer financing.

Figure 10 is an example of the actions possible within the first phase of the AGRA strategy.



**Figure 10. Proposed implementation plan**

## Appendix I. Potential Partners and Key Country Contacts in Burkina Faso

Counties or Provinces of activities	Organization and contact details of key personnel	Organization type	Brief description of activities as related to AGRA priority crops
Est, Centre Est, Centre-Ouest, Centre	SATREPS/ INERA Dr. Emmanuel Compaoré National Coordinator Tel: 0022670319230 ecompaoreg@yahoo.fr	IARC	Le projet SATREPS débuté en Juin 2017 pour une durée de 05 ans, assurera la fabrication d'engrais complexe à base du Burkina Phosphate adapté aux zones agro-écologiques, la vulgarisation des fiches techniques et l'équipement du laboratoire d'analyse du sol de l'INERA/ (Kamboinsé)
	SAPEP/MESRI Dr Jean Baptiste Taonda National Coordinator Tel:+ 226 70 26 22 44 Email: staonda2@yahoo.fr	Government	Le projet SAPEP va renforcer l'équipement des laboratoires d'analyses de sols de l'INERA, soutenir un projet sur la formulation de nouvelles recommandations d'engrais dans des zones d'intervention de AGRA, et renforcer le réseau de distributeurs d'engrais pour rendre disponible de l'engrais de qualité au producteur
Ouest et Zone agro-écologique de la zone de production de maïs	OCP Africa Eric Ouedraogo Agronome OCP Africa	development value chain	OCP Africa formule des recommandations de bonnes pratiques agricoles individualisées adressées aux producteurs de maïs sur la base d'analyse de leurs pratiques et celle des sols et planifie formuler et disponibiliser des nouvelles recommandations d'engrais pour les cultures de Coton, de maïs et de riz à l'issue de la validation des protocoles testés avec la recherche et les sociétés cotonnières.
Boucle du Mouhoun, Cascades et Hauts-Bassins	International Fund for Agricultural Development (IFAD) Ludovic Pascal Contitamde Country Programme Officer West and Central Africa Division Tel: +22670265528 Email: l.conditamde@ifad.org	development value chain	PAPFA/ IFAD intervient dans quatre filières agricoles dont le riz et le niébé et s'investira à la restructuration des filières ciblées à travers le renforcement des acteurs dont les fournisseurs d'intrants, les transporteurs et le financement des infrastructures de stockage aux normes.
National	Bureau National des Sols Dr SEGDA Zacharie 70270400 / 78781692	Lab services	En partenariat avec le Ministère de l'Agriculture et OCP, le BUNASOL va développer une Carte de fertilité des sols à l'échelle nationale à l'usage des producteurs, des agents de vulgarisations et des différents acteurs couplée à une caravane d'analyse des sols pour la sensibilisation des producteurs
National	UE/DANIDA/AFD	development value chain	Le Projet de développement de la Valeur ajoutée des filières agricoles (VAFA) va soutenir l'entreprenariat agricole et la transformation des produits agro-industrielles

	Organization	Title	Specialty	Telephone	Email
<b>PROMINENT NATIONAL AGRONOMISTS</b>					
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Dr BAZIE Francois	Universités de Bobo-	Maitre de conférence			
KISSOU Roger					<a href="mailto:kissouroger@yahoo.fr">kissouroger@yahoo.fr</a>
BASIE Bernard	Universités de Bobo-	Maitre assistant			<a href="mailto:bbacve@gmail.com">bbacve@gmail.com</a>
TRAORE Mamadou Traoré	Universités de Bobo-	Maitre de conférence			<a href="mailto:iribatraore@yahoo.com">iribatraore@yahoo.com</a>