Assessment of Fertilizer Distribution Systems and Opportunities for Developing Fertilizer Blends TANZANIA

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Executed by:

IFDC
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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

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
AS	ammonium sulfate
BMGF	Bill and Melinda Gates Foundation
BPS	bulk procurement system
CAN	calcium ammonium nitrate
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
DAP	di-ammonium phosphate
ETG	Export Trading Group
FAO	Food and Agriculture Organization of the United Nations
FTF	Feed The Future
Ha	hectare
IFDC	International Fertilizer Development Center
IITA	International Institute for Tropical Agriculture
IPNI	International Plant Nutrition Institute
ISFM	integrated soil fertility management
ISRIC	World Soil Information
MAP	ammonium phosphate
MT	metric ton
MVIWATA	Mtandao wa vikundi vya wakulima wa Tanzania
NAFAKA	Tanzania Staples Value Chain project
NGO	non governmental organization
NPK	nitrogen phosphorus potassium
OCP	Office Chérifien des Phosphates
PR	phosphate rock
SADC	Southern African Development Community
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SHF	smallholder farmer
SME	small and medium enterprise
SSA	sub-Saharan Africa
SSP	single superphosphate
SWOT	Strengths Weaknesses Opportunities Threats
TANADA	Tanzania Agro Dealers Association
TFC	Tanzania Fertilizer Company
TFRA	Tanzania Fertilizer Regulatory Authority
TSP	triple super phosphate
USAID	United States Agency for International Development

Assessment of Fertilizer Distribution and Opportunities for Developing Fertilizer Blends in Tanzania

Introduction

In preparation of this report, discussions were held with AFAP country staff, staff from SAGCOT, Britam, and the NAFAKA project, AFAP policy staff, and staff from Minjingu, ETG and Yara. We had discussions with members of TANADA. We also drew on the experience we gained during the company visits while compiling the AFAP Tanzanian Acidity report.

Available Soil Information

The main source of complete soil nutrient and soil acidity information will be the AfSIS assessment, due to be completed in September 2018. We reviewed maps made from information gathered by ISRIC from sparse data, but considered it to be rather imprecise due to the lack of samples utilized. Nevertheless, the data did indicate that soils in Tanzania are generally degraded, and many probably justify secondary and micronutrients added in the multi-nutrient compounds currently available in Tanzania from Yara and Minjingu. Some refined studies by AfSIS using data in the recent AFAP/AGRA/BMGF assessment entitled "Soil Acidity in Tanzania" identified 4.7 million hectares of cropped land in need of soil acidity correction (pH<5.6).

Inventories of Fertilizers Available in the Markets

Table 1 shows multi-nutrient compounds available from Yara and Minjingu, which currently represent the main multi-nutrient fertilizers to Tanzanian farmers. There are several combinations of basal and topdress fertilizers which can be used to meet soil-specifc requirements.

Table 2 shows the main fertilizers consumed in Tanzania by crop from 2014-2017, as estimated in the AFAP Fertilizer Use by Crop assessment (2018), which may not correspond exactly to other figures as it does not take into account fertilizers in storage. Maize has traditionally accounted for about half of all fertilizer consumption, followed by rice and pulses at about 10% each.

Table 1. Multi-nutrient fertilizers currently available in Tanzania.

Formulation	Trade brand	Main use
Yara compound fertilizers		
NPK 22-06-12 +2CaO, +1MgO,+3S, +0.2B +0.2Zn	Java	Coffee and tea
NPK 23-10-5 +2 MgO +3 S +0.3 Zn	Cereals	Cereals
NPK 15-9-20 +1.8 MgO +9.5 SO3 +0.015 B +0.02 Mn +0.02 Zn	Winner	Fruits and vegetables
NPK 12-24-12 + 5S +2MgO + 0.2Fe + 0.007Zn	Otesha	Rice
NPK 17-17-17		Coffee, maize, melon, rice, vegetables
NPK 10-18-24 +3CaO +0.5MgO +7S +0.012B	Tobacco	Tobacco
NPK 40-0-0 + 5.5S	Amidas	Topdress; cereals (rice, maize, barley)
NPK 24-0-0 +6S +7CaO	Sulfan	Topdress; all crops, particularly those
NPK 15.5-0-0 +26.3CaO	Calcium nitrate	Topdress; fruits and vegetables
NPK 15.4-0-0 +25.9CaO + 0.3B	Nitrabor	Topdress; vegetables and potatoes
NPK 5-7.5-5 +5S +5Zn +5B +0.1 Cu +0.1Fe +0.1Mn +0.1Mo	Tracel BZ	B and Zn foliar; multiple crops
NPK 0-44-7.5 +6.6MgO +4.6Zn	Cereal Boost	P and K foliar; cereal crops
Minjingu compound fertilizers		
NPK 10-20-0 +25CaO +1.5MgO +5S +0.5 Zn +0.1B	Minjingu Mazao	Maize; phosphate rock based
NPK 0-29-0 +38CaO +2.5MgO	Phosphate rock	Multiple crop and tree soil conditioner
NPK 9-16-6 +25CaO +2MgO +5S +0.5 Zn +0.1B	NAFAKA Plus	Rice, coffee, tobacco, and sugarcane;
NPK 26-10-0 +15CaO	Minjingu topdress	Topdress formulation (urea+PR)

Table 2. Main fertilizers consumed in Tanzania by crop from 2014-2017.

Crop	Types of Fertilizer Applied	Volumes of Fertilizer Applied (tons)			
		2014	2015	2016	2017
Maize	DAP	20,962	23,275	50,278	42,141
	23-21-0 +S , Mg, Zn	2,381	4,147	7,860	
	CAN	-	5,906	10,239	
	TSP	-	108	153	290
	Urea	90,937	58,662	93,552	88,057
	Ammonium sulfate	14,724	-	20,836	19,611
Rice	DAP	5,123	7,305	14,158	11,238
	23-21-0 +S , Mg, Zn	8,487	-	-	
	TSP	-	109	149	300
	Urea	12,957	16,072	24,493	24,125
Pulses (Beans, Cowpeas, etc)	DAP	-	-	2,815	
	SA	-	-	10,218	-
	Ammonium nitrate	23,096	17,004	3,334	900
	CAN	12,783	11,173	17,000	15,355
Tobacco	TSP	-	200	200	850
	Urea	550	350	200	2,413
	10-18-24 +S, Mg, B	13,833	10,020	8,875	42,310
	20-10-10	5,396	3,830	2,982	10,194
Sugar cane	DAP	4,531	5,943	3,539	2,809
	Urea	-	1,596	-	2,412
	Ammonium sulfate	14,919	11,811	13,248	19,611
Coffee	TSP	-	50	75	214
	CAN	1,065	3,970	16,704	19,780
	NPK (Others)	-	-	3,447	-
	17 -17-17	3,746	10,953	1,507	7,253
Roots & Tubers (potatoes and cassava)	TSP	-	1,450	721	6,046
	17 -17-17	5,923	5,929	5,393	2,412
	Ammonium sulfate	2,089	-	2,397	-
	CAN	7,456	7,002	6,435	14,314
Vegetables and Horticulture	Calcium nitrate	12,740	2,000	-	1,986
	MOP	326	3,000	966	1,585
	SOP	1,511	163	-	80
	MAP	3,497	153	108	135
	NPK (others)	11,793	18,535	2,321	2,941
	MRP Mazao	-	-	-	2,531
Other cereals (millets, sorghum, wheat and barley) & oil seeds	Calcium nitrate	6,593	512	725	830
	MOP	49	3,210	1,078	67
	SOP	457	-	54	127
	MAP	1,646	10	50	74
	NPK (others)	13,840	10,191	-	-
Tea	TSP	-	250	230	400
	25-5-5	4,710	4,500	4,540	6,100
Grand Total		**308,120**	**249,389**	**330,880**	**349,491**

Rationale for Why Fertilizer Blended Products Were Developed

In the case of Tanzania, there are no blended fertilizers available. However, both Yara and Minjingu have multi-nutrient compounds. The main rationale for these compounds is to target crop-specific requirements. There are multiple basal and topdress formulations available, such that some region-specific targeting is possible, and even field-specific targeting, given a quality analysis. Minjingu has two balanced basal fertilizers, and one topdress fertilizer containing N and P, in addition to its phosphate rock (PR) product. All Minjingu fertilizers are based on PR, and the PR from Minjingu mines is relatively soluble compared to most PR sources. It tends to do well in more acidic conditions, where both P and Ca are required, and is less subject to P fixation by iron and aluminum oxides. However, it has been reported to be less effective than soluble P sources common in other fertilizers under moderate to high pH conditions.

One challenge to compounds production is that they have a minimum batch production of perhaps 2,000 MT, compared to 5 MT or even less for blended fertilizers, so product diversification at a national level favors blends.

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

Table 3 shows fertilizer source and rate recommendations for AGRA priority crops in Tanzania from government and fertilizer companies, along with nutrients removed to achieve various yield targets, and nutrients applied in those recommendations.

Maize recommendations and their suitability

The government recommendation is 100 kg N and 40 kg P_2O_5/ha, derived from either DAP or TSP at basal application and either urea or ammonium sulfate (AS) at topdress. This recommendation meets the basic N and P demands of maize, which are in most circumstances the most limiting nutrients for maize growth. If AS is used as the topdress fertilizer, it will provide sufficient S. The N, P, and S provided are sufficient to sustain the 5 MT/ha yield target, but as demonstrations run by various public and private entities have demonstrated, yields are often less and constrained by secondary and micronutrients. It is the least expensive recommendation and requires the lowest volume of fertilizers. If DAP and urea are used as the N and P sources, only 87 kg DAP and 183 kg urea/ha are required.

The Minjingu recommendation is a general recommendation for smallholders, and provides sufficient P, Ca, S, Zn, and B, but is constrained by insufficient N. This can be remedied by applying an additional 125 kg of urea per ha (approximately 1 50-kg bag per acre). The P source is Minjingu phosphate rock, which has been reported to give lesser responses compared to soluble P sources such as DAP in moderate to high pH soils. However, in more acidic soils, it has been reported to increase sustained P ability, and the substantial Ca supplied helps reduce Al toxicity and Ca deficiency common in acid soils. With more specific soils information, the Minjingu recommendation can be adjusted per rate, and for low-K environments, Minjingu NAFAKA Plus can be used, however at a higher rate.

Table 3. Nutrients extracted for given yield targets and nutrients supplied in government and private company recommendations for AGRA priority crops

Crop	Yield target	N	P_2O_5	K_2O	CaO	MgO	S	Zn	B	Cu	Mn	Fe
	Mt/ha	----------Nutrients removed in crop and residue, kg ha^{-1}----------										
Maize	5	100	46	121	18	35	13	0.23	0.24	0.07	0.73	0.36
		----------Nutrients supplied in recommendation, kg ha^{-1}----------										
Government: TSP or DAP basal, urea or AS topdress		100	40	0	0	0	0	0	0	0	0	0
Minjingu Mazao (planting) + Minjingu topdress (125 kg/ha each)		45	38	0	50	2	6	0.63	0.13	0	0	0
Yara Mila Cereals 375 kg/ha (3 splits) + +YaraLiva Boost 3L/ha (foliar)		86	39	19	0	8	11	1.26	0	0	0	0.00
	Mt/ha	----------Nutrients removed in crop and residue, kg ha^{-1}----------										
Rice	7	150	46	217	42	50	7	0.28	0.21	0.20	4.73	1.05
		----------Nutrients supplied in recommendation, kg ha^{-1}----------										
Government: TSP or DAP basal, urea or AS topdress		100	20	0	0	0	0	0	0	0	0	0
Minjingu NAFAKA+ +Minjingu topdress (250 kg/ha each)		90	70	15	100	5	13	1.25	0.25	0	0	0
Yara Otesha 185 kg/ha +Yara Amidas 250 kg/ha (split) +YaraLiva Boost 3L/ha (foliar)		122	46	22	6	4	23	0.15	0	0	0	0.37
	Mt/ha	----------Nutrients removed in crop and residue, kg ha^{-1}----------										
Beans	3	144	41	120	132	37	10	0.15	0.15	0.02	0.23	0.11
		----------Nutrients supplied in recommendation, kg ha^{-1}----------										
Government: TSP 133 kg/ha		0	66	0	28	0	4	0	0	0	0	0
Minjingu Mazao (planting) + Minjingu topdress (125 kg/ha each)		45	38	0	50	2	6	0.63	0.13	0	0	0
YaraMila Winner 250 kg/ha +YaraBela Sulfan 150 kg/ha +YaraLiva Boost 3 kg/ha (foliar)		74	24	50	11	5	19	0.19	0.04	0	0.05	0

The Yara fertilizer recommendation is well-balanced for N, P, K, Mg, S, and Zn. It can be supplemented with Yara BZ (foliar) in low-B environments and may be replaced by other Yara fertilizers such as Otesha, depending on the soil environment. Recently, Yara has recommended a combination of Otesha and Amidas (similar to the rice recommendation) in parts of the SAGCOT region of Tanzania.

All recommendations can be adjusted according to soil analysis and farmer yield target.

Rice recommendations and their suitability

The government rice recommendation is similar to the maize recommendation, but with half the P. While much rice is grown in Tanzania, fertilizer use on rice is still low. Most smallholder rice is not under controlled irrigation and improving consistent water availability is a government priority. The lower yield potential due to poor water control may in part explain the lower P recommendation.

The Minjingu recommendation for rice has a small amount of K relative to rice requirements, and sufficient amounts of S, Zn, and B. Our experience with rice from Rwanda and Burundi indicates that rice is tolerant to moderate acidity, so it is not likely that the large quantities of Ca in the Minjingu recommendation are generally required for rice. Due to its PR base formulation, the application rate is high (250 kg/ha basal and 250 kg/ha topdress). Lower rates are advised by Minjingu for lower yield potential areas.

The Yara recommendation for rice has balanced quantities of N and P, the most K relative to other recommendations, and substantial amounts of S and Zn, but no B, which can be added as Yara BZ (foliar) if required. The topdress formulation (Amidas; 40%N, 5.5% S) has been found to be very effective on a number of crops relative to urea. Though relatively more expensive, it is usually justified in terms of return on investment.

Bean recommendations and their suitability

The government bean recommendation (TSP only) supplies sufficient P and Ca, both of which are important for beans. It is likely that a lower rate could be applied given the P requirements of beans. It obviously depends on N fixation by the bean crop to supply N, which will require inoculation in many areas.

The Minjingu recommendation is the same as their maize recommendation. A benefit is in its Ca supply; beans respond well to Ca when deficient (>pH 6). It also contains sufficient amounts of S, Zn, and B. Beans also respond well to K, so in some soils, Minjingu NAFAKA Plus might be a better choice, though it would require about twice the application rate.

The Yara bean recommendation employs its higher K fertilizer Winner, which is primarily used for vegetables. It employs a topdress fertilizer that is based on ammonium nitrate, which is probably more suitable for beans than urea. The recommendation, by supplying high amounts of N, obviously does not assume any N fixation, which is common unless beans are inoculated. It may not be required when beans are inoculated.

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

Both Yara and Minjingu have already demonstrated that multi-nutrient fertilizers can result in greater yields. Without more specific soils information, it is difficult to determine the appropriateness of the generalized recommendations. Tanzania has diverse soils and agro-ecologies that can benefit from a greater diversity in recommendations. Both Minjingu and Yara have their own rationale for their recommendations, and both adjust recommendations from fertilizers in their inventory when sufficient information is available to make such adjustments. Completion of the soil maps in Tanzania will aid these companies in better targeting and perhaps new formulation development.

The blending industry is not well-established in Tanzania, though interest exists. ETG and OCP have planned to blend, and in the past, Greenbelt blended in Dar es Salaam. The niche that blenders can potentially fill relates to fertilizer cost, volume, and product diversity. The compounds used in Tanzania are for the most part not highly concentrated; Minjingu fertilizers have large amounts of Ca that are generally not necessary in moderate to high pH soils, and Yara compounds, which are based on ammonium nitrate, are not as nutrient dense as formulations that supply similar nutrient quantities in lower fertilizer volumes, potentially resulting in lower costs for farmers. As well, since blenders can produce in smaller volume batches, greater product diversity is possible.

To support the likely entry of blenders into the market, blended fertilizer formulations first need to be developed and evaluated for one cropping season. Government, Minjingu, and

Yara recommendations provide good benchmarks for what blends will be expected to achieve.

Fertilizer Companies and/or SME Blenders Existing in the Country and the Geographies Targeted by AGRA

Minjingu Mines and Fertilizer (Arusha) mines phosphate rock and compounds fertilizers based thereon, with a capacity of 100,000 MT/hr. Life Support Systems (T) (Kibaha) has a 50 MT/hr line blender, currently not operational. OCP intends to open a 100 MT/hr line blender in Dar es Salaam in 2019.

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

1. AGRA can invest a small amount to finalize soil maps, combining data from the national system, AfSIS, and other sources. It should be born in mind that while AfSIS/ISRIC work together on these maps and have advanced capabilities relating to using mapping layers such as soil properties and underlying geology, they require some support in combining data from different analytical methods, and choosing mapping gradients relevant to low, medium, and high nutrient levels, which can be provided by IFDC or a professional soils laboratory such as Crop Nutrition Laboratories (Nairobi). This will require less than a month.
2. Support best-bet trials on AGRA priority crops using blended fertilizers, with Yara and Minjingu fertilizers serving as benchmarks. One major objective of these trials should be to demonstrate that equal or superior yields can be achieved at lower or equal fertilizer costs than are being realized with the current recommendations. This is highly likely for maize and rice; for groundnut and soybean, current recommendations are strong, but it may be possible to improve them with small additions of Zn and B. This should involve a coalition of future fertilizer blenders, national research and extension staff, and strong external support to assist in trial design and implementation.
3. Invest in national research capacity to implement balanced crop nutrition research through appropriate technical training of national soil scientists, agronomists, and private sector field staff. Agronomic and soil science training does not equate to expertise in fertilizer formulating and evaluation but forms a solid basis. National agronomic staff have much local knowledge regarding varieties, crops, soils, and market constraints, and have some track record in trial implementation. Advanced skills can be used to efficiently develop/validate new formulations and determine the agronomic effectiveness of different nutrients (omission trials). Solid partnerships with the private sector are required to share costs and maximize benefits to both sectors.

Bottlenecks in Fertilizer Distribution in Tanzania, and Interventions that AGRA and its Partners Can Implement to Improve Farmer Access

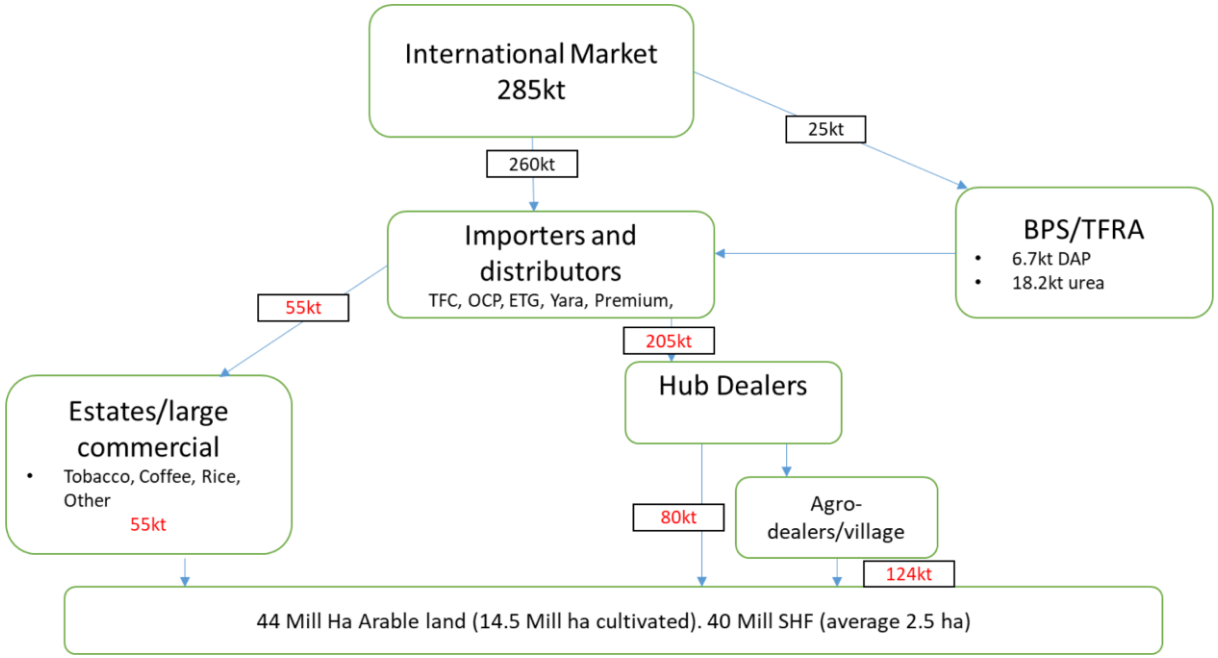
The Tanzania Fertilizer Distribution Structure and Value Chain SWOT analysis are presented in Figures 1 and 2, respectively.

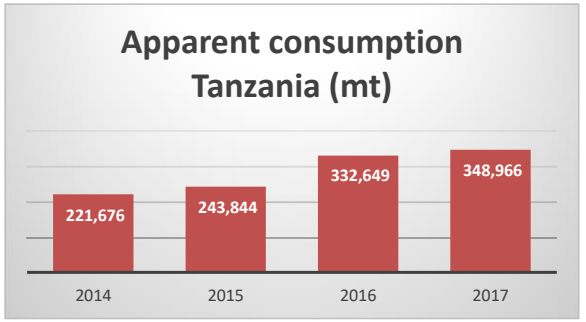
Key characteristics of the Tanzanian fertilizer market

The Tanzanian market has the following key characteristics:

- Introduction of the Bulk Procurement System (BPS). From mid-2017, Import of major commodities (DAP and urea) has been undertaken by TFRA tender arrangement.
    - Pricing of these major commodities is controlled at all points of the value chain.
    - This has impacted traditional market importers and distributors as these products made up 59% of the product imported. The distribution channel has been severely disrupted.
- Government-to-government agreement between Morocco (OCP) and Tanzania which sees support given to
    - soil testing and blend formulation research
    - joint project with Tanzania Fertilizer Company (TFC) to provide consignment stock and utilize TFC storage capacity.
    - a proposal to build a blending plant in 2019
- The market has predominantly used DAP and urea with limited numbers of compounds and no blends because of the registration requirements.
- Changes to regulations in 2017 that allowed a more market-responsive approach to blend formulations
    - No validation of blends required.
    - One season evaluation for new products.
- 4.7 million ha have pH <5.6. This is likely having a significant regional impact on productivity and fertilizer use efficiency.
- TFRA is the sole regulatory body responsible for all aspects pertaining to fertilizer, including management of the BPS.
- A number of importers and manufacturers have placed on hold development plans until a clear direction is understood with BPS.
- Increase in productivity (cereals) over the last 40 years (Figure 3) is marginal.
- Significant market disruptors and public sector controls over the SHF sector exist.
- Minjingu is seeking greater role in supply of domestically manufactured product into the BPS.

TANZANIA FERTILIZER DISTRIBUTION SYSTEM





	Fertilizer system	Volume (mt)	%
Estates	Bulk Plantation	55,000	19%
	Bulk Annchor		
BPS / TFRA	Bulk Government	25,000	9%
Private	Private	205,000	72%
		285,000	

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

VALUE CHAIN SWOT SUMMARY – TANZANIA

	Strengths	Weaknesses	Opportunities	Threats
Manufacturer	• Has gas availability—inability to allocate gas for fertilizer production • Has Phosphate resource—some production issues		• The proposed Fauiji/GoT urea plant has been cancelled—inability to reach agreement on Gas price. Is scale production an option? • .there is some discussion from GoT to revisit support for Minjingu manufacture for domestic needs	
Importer	• Historically development of different distribution channels—ETG to develop container shops, Yara to provide agro-dealer development. "wait and see • OCP have entered market with GoT to GoM support	• Lack of confidence in investment because of BPS and failure of Govt to pay for participation in subsidy programs from 4 years back • Lack of clear role for actors	• Develop competitive markets, supporting all players in an agreed development process. • Lever of the success of SAGCOT who has acted as a private/public platform. • Lever of catalytic capacity of private sector	• Fall back to rely on public sector capacity • BPS will limit many importers appetite to invest in development. GoT doesn't have the capacity to do this
Blender		• Requirement of public sector to make decisions on formulations • Limited understanding of public sector on crop and soil nutrient levels and ability to make formulations and commercial process. • Limited understanding of fertilizer types and technologies available • No blenders in Tz. OCP proposing to build one • Limited appetite to invest with current governance	• Develop a platform that allow domestic ownership, but builds understanding of technologies and processes needed to implement and deliver required outcomes	• Continued direction from inexperienced people • Unclear position with Minjingu
Distributor	• Dependant on BPS	• The role of both Hubs and agro-dealers have been impacted by decisions of the govt in payment of subsidy arrears and BPS.	• Better role for village and cooperative actors in distribution.	• BPS
Agro Dealer	• Variable role—from village promoter to cooperative seller—a village representation	• Role under BPS is unclear because of financial constraints	• They play a significant role in programs like NAFAKA, Farm To Markets, in providing follow up from Village demonstrations.	• BPS

Key Takeaways:

1. It is unclear what direction Tz importers will take. Many are on a "wait and see" until BPS direction is more clearly understood.
2. Building distribution channels under government fixed pricing models needs careful evaluation
3. There needs to be re- focus on farmer profitability, not just lowest cost.
4. Government institutions need support to define and implement programs that can develop "best bets" as a first step in adopting balanced nutrition and have the ability to work with a range of suppliers to supply.
5. Governments need support to work with private sector to catalyse this action.
6. Recognition of the key role SAGCOT has played in building productivity and private sector bridging in Tz
7. Need to support Tz actors with knowledge on new technologies

Figure 2. Value chain SWOT analysis for Tanzania

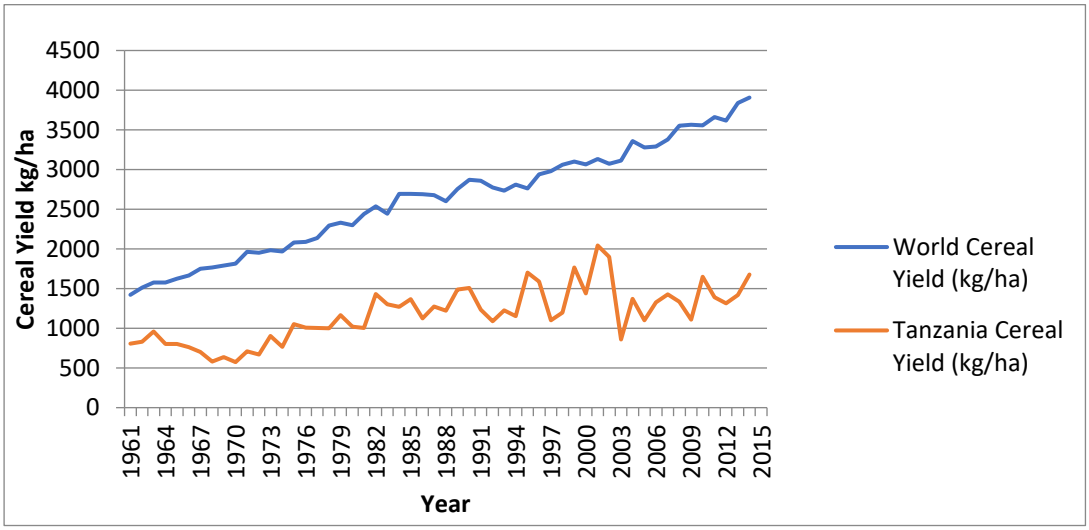


Figure 3. Tanzania and World cereal productivity, 1961-2015.

Supply issues

- Supply was disrupted in 2017 due to BPS related issues: timely supply and channel migration because of low margins and unpaid subsidy debt.
- Poor infrastructure exists in some areas: distribution Kigoma and Kagera, and poor roads in many areas.
- Border closure to maize trade impacts farmer cash flow.
- Compounds were substituted for DAP due to DAP unavailability.
- Importers are looking at bringing transit product for Rwanda through Mombasa.

Demand issues

- Poor access to cash availability at small holder farmer level. High input prices relative to outputs results from low prices from closed borders for maize, and ften poor linkages with output markets
- Low input credit
- Low knowledge of product use
- Limited knowledge of fertilizer technologies and marketing practices in the value chain

Partners

- Historically, SAGCOT has played an important role in bringing partners together in the Southern Highlands. This has included using companies like Yara to provide fertilizer training at the village level. Projects like Farm to Markets and NAFAKA have worked with both Yara and ETG, but it is unclear who will provide this role going forward.
- SAGCOT should play an important role in liming in the Southern Highlands.
- The proposed Fauji urea plant in Southern Tanzania has been cancelled.

A list of partners and key contacts in Tanzania is in Appendix I.

Policy Bottlenecks Affecting the Availability of Blended Fertilizers in Tanzania, and Interventions that AGRA and its Partners could Design and Advocate for Implementation

There are a number issues with political sensitivities surrounding BPS. It does not make sense to comment on the BPS but rather wait until the government clarifies the direction.

- It is likely OCP will continue with the construction of blending plant.
- It is unlikely other importer manufacturers will invest until the direction is clear.
- The incorporation of Minjingu products into the BPS is unclear.
- The full impact on the distribution channel is unclear at this point.

Currently the market is in a state of transition. There are no blenders established in Tanzania (there is steam granulation capacity at Minjingu). The role of Minjingu in providing fertilizer for BPS is unknown at this point.

The amended Fertilizer Regulations of 2017 ease the requirements to make blends, but will require significant strengthening of the capacity of public sector individuals involved in formulation approval. This needs to be a transparent process when TFRA is both the importer and the quality control institution.

Regarding acidity correction, AGRA/BMGF/AFAP have completed a scoping study identifying the severity of acidity in Tanzania. This has a significant impact on productivity in Tanzania and could be a catalytic program for Tanzania and AGRA. Soil acidity is a pan-African challenge and developing clear project management and implementation plans for Tanzania could be an important flagship activity that leads change in other countries. We recommend the development of a Road Map for acidity correction.

Appendix I.
Potential Partners and Key Country Contacts in Tanzania

Organization and contact details of key personnel	Regions of activities	Brief description of activities as related to AGRA priority crops
One Acre Fund: David Hylden, Tanzania country representative, Iringa david.hylden@oneacrefund.org	Iringa and Mbeya	Tanzania program supports farmers growing maize during one long season per year, and also offers solar lights on credit.
IITA: Dr. Victor Manyong, Hub director and country representative, Dar es Salaam +255 222 700 092 v.manyong@cgiar.org	Mara, Mwanza, Mtwara,Lindi. Biharamulo, Serengeti	IITA works on maize and beans. The projects include Aflasafe Technical Transfer and Commercialization (ATTC) and Putting Nitrogen Fixation to Work for Smallholder Farmers in Africa (N2Africa).
Africa Rising: Irmgard Hoeschle-Zeledon, Project coordinator East and Southern Africa i.zeledon@cgiar.org	Babati, Kongwa and Kiteto	Africa Rising works on maize and beans in an initiative called "mbili intercropping". Africa Rising links farmers to markets and develop better performing crop varieties.
IPNI: Dr. Shamie Zingore, Director Sub Saharan Africa programme, Nairobi +254 700 393 454 szingore@ipni.net	Babati, Arusha	IPNI in collaboration with CIMMYT and IITA is working on maize in Tanzania to optimize nutrient responses.
CIMMYT: Stephen Mugo, Principal scientist / Regional representative, Arusha +254 723 621 909 S.mugo@cgiar.org	Mbeya, Arusha, Shinyanga, Dodoma, Lindi, Mtwara, Kigoma Rukwa, Kagera and Mara	CIMMYT is working on a special type of biofortified maize known as provitamin A maize (PVA) and a stress tolerant maize for Africa (STMA) to diminish devastating environmental effects in maize production that occur simultaneously across many regions in Sub-Saharan Africa (SSA).
Selian Agricultural Research Institute (SARI): Rose Matiko Ubwe, Senior agriculture research officer Farming Systems Research & Socio-Economics (FSR/SE) Programme, Arusha +255 754 929689, +255 783 494173, +255 719 269188 roseubwe@yahoo.com, rosematiko@gmail.com	Northern zone of Tanzania	Research on all major grain crops grown in the zone.
CIAT: Jean-Claude Rubyogo, Seed systems specialist, Arusha +255 688 033 600 or +255 784 72 5470 j.c.rubyogo@cgiar.org	Babati, Lushoto	CIAT is researching vitamin A-rich yellow maize, and high-iron beans as a way of addressing human malnutrition.
Sokoine University of Agriculture (SUA) Minjingu project: Prof. Johnson M. Semoka, Project leader/Professor of Soil Fertility and Plant Nutrition, Morogoro +255 756 488 648 semoka@yahoo.com	Kilombero, Mvomero, Siha, Muheza, Korogwe, Mkinga and Morogoro	The project aims to demonstrate the benefit of balanced fertilizer technologies, incorporating Minjingu fertilizers on yields of major cereal and legume food crops.

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Mlingano Agricultural Research Institute: Dr Zaid Mkangwa, Director, Tanga +255 272 647 647 mlingano@iwayafrica.com	Throughout the country	Soil fertility research.
African Fertilizer and Agribusiness Partnership (AFAP): David Kijazi Tanzania country director, Dar es Salaam dkijazi@afap-partnership.org +255 717 500 917	Non specific	AFAP works to make fertilizer accessible and affordable for African smallholder farmers
Southern Agricultural Growth Corridor of Tanzania (SAGCOT): Geoffrey Kirenga, CEO, Dar es Salaam +255 222 601 024 a.peter@sagcot.co.tz	Morogoro, Iringa,Kilosa and Mvomero	This is an upcoming rice project that will commence in a few months' time. Rice is one of the multiple crops SAGCOT puts emphasis on by creating partnerships between smallholder farmers and agribusinesses.
Mtandao wa vikundi vya wakulima wa Tanzania (MVIWATA): Stephen Antigon Ruvuga, Executive director, Morogoro +255 232 932 026 info@mviwata.org	Throughout the country but strongly rooted in Dodoma, Iringa, Kilimanjaro, Mbeya, Morogoro, Tanga, Arumeru East, Arumeru West, Karatu, Longido, Mondul, Masasi, Mtwara and Rukwa	MVIWATA provides a platform for SHF to unite with a common voice with regard to economic, social, cultural and political interests.
ACDI/VOCA: Filbert Mzee, Seed input specialist, Arusha +255 754 438 288 mzeefn@gmail.com	Kilombero, Kiteto, Kongwa and Mvomero, Wanging'ombe, Mbozi, Momba, Mbarali, Mufindi, Iringa rural, Kilolo and Zanzibar (Pemba and Unguja)	They increase competitiveness of rice and maize value chain. This is done by effective fertilizer use among other management practices.
Farm Concern International: Wiston Mwombeki, Country team leader, Arusha +255 763 449 736 wiston.mwombeki@farmconcern.org	Same, Mwanga, Siha, Hai, Meru, Arusha, Simanjiro, Babati, Kiteto, Sengerema, Ukerewe, Buchosa, Nyang'wale, Geita, Misenyi, Muleba, Bukoba Rural and Karagwe and Monduli	FCI focuses on market linkages for maize and bean (among other crops) value chains. They are also working with other partners in the introduction of five early maturing rice varieties.
ABM Equipment Services Ltd: Ben Maimu, Managing director, Tanga +255 653 703 170 ben_abmfertilizers@yahoo.com		Agriculture supplies (Fertilizer and horticulture supplies).Products include calcium carbonate, magnesium carbonate, calcium sulphate and magnesium.
Minjingu Mines & Fertilizer Ltd: Anup Modha, General manager, Arusha +255 784 655 000 gm@minjingumies.com		Manufacturer of phosphate rock-based fertilizers

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Poli General Trading and Supplies Ltd:Paul Peter Akyoo, CEO, Tanga +255 714 888 334/ +255 272 646 260 akyooelisa@gmail.com	Tanzania	Manufacturer of lime products e.g hydrated lime, agricultural lime and quick lime fertilizers.
Export Trading Company Ltd: Manoj Shewkani, Head of fertilizers, Dar es Salaam +255 684 221 306 manoj.shewkani@etgworld.com		Intended to set up a processing plant by 2017 but this did not actualize.
Life Support Systems (T) Ltd: Dr. Edmond Matafu, Managing director, Kibaha +255 784 723 999 md@livesupport-systems.com		Have a blending plant, not currently operational.