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Assessment of the fertilizer market and bulk procurement system in the United Republic of Tanzania

POLICY REPORT

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This assessment was conducted and finalized in February and March 2017 and was submitted to the Ministry of Agriculture's Department of Policy and Planning on 20 March 2017. It presents therefore the issues prevailing and options available at the time.

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Abbreviations and acronyms

AGRA	Alliance for the Green Revolution in Africa
AT	assessment team
BPS	bulk procurement system
CAN	Calcium Ammonium Nitrate
CIF	cost, insurance and freight
DAP	Di-ammonium Phosphate
DCG	DSM Corridor Group
DMC	domestic marketing cost
DPP	Department of Policy and Planning
FAO	Food and Agriculture Organization of the United Nations
FAPDA	Food and Agriculture Policy Decision Analysis
FISP	Farmer Input Support Program
FMMIS	Fertilizer Market Monitoring and Information System
FOB	Free on Board
FSP	Fertilizer Support Program
IFDC	International Fertilizer Development Center
MAFAP	Monitoring and Analysing Food and Agricultural Policies
MALF	Ministry of Agriculture, Livestock, and Fisheries
MISA	Management Information System for Agriculture
MOP	Muriate of Potash
NAIVS	National Agricultural Input Voucher Scheme
NPK	Nitrogen, Phosphorus and Potassium
NBS	nutrient-based subsidy
NMB	National Microfinance Bank
OMC	Oil Marketing Company
PBPA	Petroleum Bulk Procurement Authority
SAGCOT	Southern Agricultural Growth Corridor of Tanzania
SFFRFM	Smallholder Farmers Fertilizer Revolving Fund of Malawi
SOE	state-owned enterprises
SUMATRA	Surface and Marine Transport Regulatory Authority
TAEC	Tanzania Atomic Energy Commission
TAFSIP	Tanzania Agricultural and Food Security Investment Plan
TAZARA	Tanzania-Zambia Railway Authority
TBS	Tanzania Bureau of Standards

TFRA	Tanzania Fertilizer Regulatory Authority
TPA	Tanzania Port Authority
TRA	Tanzania Revenue Authority
TRC	Tanzania Railway Corporation
TSP	Triple Superphosphate
WMA	Weights and Measures Agency

Executive summary

For nearly a decade, the Government of the United Republic of Tanzania has supported smallholder farmers to acquire seeds and fertilizers at reduced cost through various programmes including transport subsidy (2003-08) and the National Agricultural Input Voucher Scheme (NAIVS) from 2009 onward. However, due to funding constraints, the allocation for NAIVS was drastically reduced in the 2016/17 budget and indications are that funding will cease altogether in the future. In order to ensure that access to agricultural inputs for smallholder farmers is sufficiently guaranteed, the government now seeks to implement policy reforms that will reduce the cost of fertilizers through improvements in procurement and delivery efficiency and cost-saving regulatory reforms.

In March 2016, the Ministry of Agriculture, Livestock and Fisheries (MALF) of the United Republic of Tanzania requested the Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme of the Food and Agriculture Organization (FAO) to review relevant evidence-based policy options for the government to consider that would enable smallholder farmers to continue to access fertilizer at reasonable prices in the absence of subsidies. An assessment by Ngowi and Mwajande (2015) made two recommendations: (i) to streamline and reduce taxation; and (ii) improve the efficiency of procurement. However, MAFAP suggested that the particular approach to implementing new procurement modalities requires additional analysis and consultation.

With the same objective of reducing fertilizer prices for smallholder farmers, the Ministry of Agriculture, Livestock, and Fisheries (MALF) requested MAFAP to undertake a study on the assessment of the fertilizer market in the United Republic of Tanzania, with a special focus on the potential costs and benefits of a bulk procurement system (BPS). This report responds to that request. The assessment was conducted by a team of professionals from FAO/MAFAP, the International Fertilizer Development Center (IFDC), and the MALF Department of Policy and Planning (DPP). The team met with over one hundred stakeholders from both public and private sectors and the farming community from 6 February to 5 March 2017 and conducted field visits to Arusha and Mbeya. Debriefings were held by the MALF DPP and the Tanzania Fertilizer Regulatory Authority (TFRA). The field work was preceded by the Policy Roundtable on Bulk Procurement, Distribution, and Pricing in the United Republic of Tanzania on 29 November 2016 in Dar es Salaam, where the terms of reference for the study were refined based on stakeholder feedback.

As a background for the assessment, an overview of recent developments in the fertilizer market in the United Republic of Tanzania and an analysis of the impact of size of contract or shipment on the negotiated price in the global fertilizer markets are discussed. A cross-country literature/policy review was also carried out to identify examples of government-led private procurement of fertilizer in other countries to inform the development of the regulations. However, the study team could not find any similar examples of the proposed system. Therefore, we have included a more general cross-country review of the impact of certain government interventions in the fertilizer market. Thereafter, the assessment of BPS is discussed in detail and recommendations aimed at improving the efficiency of the fertilizer sector are presented.

The fertilizer market in the United Republic of Tanzania

The Government of the United Republic of Tanzania has made important investments in the fertilizer sector through various programmes aimed at developing domestic production, import, and agro-dealer networks, and generally creating an enabling environment for the private sector. Thus, the United Republic of Tanzania has witnessed significant progress toward the development of a reliable and competitive fertilizer supply chain. The size of the fertilizer market has grown rapidly, with overall fertilizer use increasing from less than 100 000 tonnes¹ during the 1990s to more than 300 000 tonnes in 2015/16. The growth has allowed the private sector to import and benefit from economies of scale in procurement and shipping and to develop strong linkages with global suppliers. Over 40 percent of all fertilizer cargoes discharged at the Port of Dar es Salaam weigh more than 10 000 tonnes. For urea, more than one-half of the total quantity imported was in cargoes of 10 000 tonnes or more. Key fertilizer companies in the United Republic of Tanzania have also developed a regional presence in neighbouring countries, which allows them to aggregate orders and benefit from economies of scale and scope since they are able to stagger discharges in different ports, such as Mombasa, Dar es Salaam, and Beira or Durban.

¹ All tonnes are metric tonnes.

There have been significant improvements in port operations as well: the discharge rate has increased from 1 000–1 500 tonnes/day in 2004 to the current 3 000–5 000 tonnes/day. This helps to reduce port-related costs.

Cross-country review

The United Republic of Tanzania is not alone in seeking solutions to low productivity and fertilizer use by farmers. However, attempts by governments toward this aim have had adverse effects on farmers in the long run by reducing market efficiency. Although the researcher team did not find any system similar to bulk procurement elsewhere in the review of international literature and policy documents, lessons can still be drawn from the common features that tend to arise from government intervention in the fertilizer market.

The United Republic of Tanzania may learn from the experiences of such countries as India, Kenya, Malawi and Zambia, where evidence suggests that the government interventions in the market are often not conducive to creating well-functioning (efficient and effective) fertilizer markets. In both Malawi and Zambia, the government tendering system reduced the number of importers and agro-dealers in the market, leading to oligopolistic behaviour and creating market uncertainty, thereby reducing the competition that keeps prices low; Kenya, although a successful example of fertilizer reforms leading to increased distribution and use, an untimely intervention in 2009 caused significant importer losses and the government faced challenges to regain the trust and investment of the private sector thereafter; in India, NPK ratios were distorted through indicative pricing and soil health was adversely affected, and actually led to higher prices in the long run.

The cross-country review therefore suggests that the optimal role of the government is to create a stable and supportive policy environment, in addition to improving infrastructural facilities for the market. These are the surest ways to sustainably reduce fertilizer prices for farmers.

The global fertilizer market

Because of economies of scale in production and procurement, there is an inverse relation between the price and the size of the contract (or shipment). As the quantity purchased increases, the price is reduced. However, for more than 30 000 tonnes, savings in the negotiated price is small – approximately USD 4–6/tonne. Such savings could be eclipsed by demurrage charges if the large ship cannot be unloaded by the stipulated time because of limited berthing capacity at the Port of Dar es Salaam. Only 22 percent of the 207 urea contracts traded in the Arabian Gulf in 2016 were more than 30 000 tonnes in size. If buying in volumes over 30 000 tonnes were lucrative, we would expect to see more consignments of this size and larger in the international market.

The bulk procurement system (BPS)

MALF has embarked on initial steps to implement a government-directed BPS for fertilizer by signing new regulations for bulk procurement of fertilizer on 10 February 2017. These regulations were published in the Government Gazette (GN 49) on 17 February 2017. The ultimate objective of the BPS is to reduce the cost of fertilizer at the farm level by reducing the negotiated price (FOB) of fertilizer products bought in the global market. The BPS is inspired by the model used for procurement of petroleum products (the “Petro Model”) established in the 2011 Petroleum Bulk Procurement Regulations. TFRA will be responsible for implementing the BPS.

TFRA has developed the guidelines for implementing the provisions of the regulations. Under the proposed BPS, potential importers will be prequalified, and one will be selected through the TFRA’s tender committee to import the pooled demand on behalf of all fertilizer importers and dealers for a given fertilizer product. Other importers will act as distributors. Public funds will not be used for procurement under the BPS; financing is expected to come from the private sector.

Indicative prices for fertilizer

The Fertilizer Regulation stipulates the publication of “indicative prices” based on the tender price, port clearance charges, and transportation cost plus mark-up. This system of indicative prices is to be implemented jointly with the BPS. Any agro-dealer or distributor who sells fertilizer products at a price higher than the indicative price could face a penalty, including the loss of his or her trading license. To set an accurate indicative price that is both timely and geographically

relevant requires vast data collection and processing capacity. It could be much more effective and less costly to set up a market information system that would enable farmers to negotiate fair prices with retailers and make informed decisions when purchasing inputs.

The main concern with enforcing maximum prices with punitive measures is that fertilizer could become an unprofitable business, forcing agro-dealers from the market, thereby making the already thin market thinner. After Kenya removed maximum selling prices in the 1990s, many new traders entered the market – especially rural retailers, increasing competition and access and reducing marketing costs, ultimately reducing fertilizer prices substantially (Sheahan *et al.*, 2016). The United Republic of Tanzania stands to benefit from a much wider and more competitive network of agro-dealers, which would also reduce the distance travelled by farmers to access fertilizers.

Relevance of the petro model to the fertilizer market

Under the Petro Model, potential importers are pre-selected by the Petroleum Bulk Procurement Authority (PBPA), and then one is awarded a tender to import the total quantity requested by all oil marketing companies (OMCs). Every OMC is required to pay in advance for the ordered quantity. Under this system, foreign exchange is allocated at a discount to the importer and petroleum ships are discharged on a “priority basis.” Moreover, unloading the petroleum ship is relatively easy, as it can be unloaded through a pipe into tankers, and these tankers can travel directly to wholesale or retail destinations.

Fertilizer, on the other hand, has to be unloaded from the ship onto trucks, which transport fertilizer to a storage facility, where it is bagged. Thereafter, trucks move it to the wholesale and retail outlets. Major savings with the Petro Model are a result of significant reductions in demurrage charges, as petroleum ships are granted priority berthing and discharging by the Tanzania Port Authority (TPA). PBPA reported that demurrage charges decreased from USD 40–45/tonne to USD 2–3/tonne under the priority system. It is possible that considerable savings could be achieved if fertilizer ships are given “priority” in unloading, even under the existing competitive marketing system. If the government wishes to encourage bulk procurement to reduce costs, ships carrying 25 000 tonnes or more of fertilizer products should receive priority discharge. This may not only generate savings in procurement, shipping, and port handling charges, it will also reduce congestion in the port. This will strengthen the functioning of the fertilizer market.

Applicability of the petro model

The inspiration for the fertilizer BPS is the model that has been employed in the petroleum sector. However, we find that the Petro Model is not directly applicable to the fertilizer market for the following reasons:

- Fertilizer demand fluctuates over time, follows a seasonal pattern, and tends to be commodity- and area-specific in terms of fertilizer types demanded. By contrast, petroleum products are fairly homogenous and demand can be easily forecast since it is stable throughout the year.
- Unlike the petroleum industry, limited access to finance by agro-dealers and distributors can constrain pre-payment to the tendered importer, and therefore, quantity of imported fertilizer could be compromised, unless the government provides a guarantee to the importer.
- Since fertilizer products are not homogenous (as in the case of petroleum), basing the winning tender strictly on the lowest price may create the wrong incentive environment, severely jeopardizing the quality of imported fertilizers or the appropriateness of imported fertilizer to local agronomic conditions.

Assessment of the bulk procurement system

We argue in this report that the proposed fertilizer BPS is unlikely to achieve the intended effect of significant fertilizer price reductions for farmers; in fact, the distortions created may actually reduce competition, which could cause prices to rise. Therefore, the authors of this report advise that the implementation of the Fertilizer (bulk procurement) Regulations of 2017 be postponed pending further investigation, analysis, and consultation.

Furthermore, there is a perception, at least among private sector stakeholders and development partners, that the public consultation process, prior to the signing of the bulk procurement regulations, was inadequate. This has created uncertainty in the market.

Through a more inclusive consultation process and additional analysis on the specifics of the regulations, which were only recently published, it will be possible to consider several alternative modalities through which fertilizer costs can be reduced, and among these, choose those that would be in the interest of improving access to fertilizer for smallholder farmers.

Some of the specific findings and recommendations are listed below:

The vibrancy of the fertilizer market

- The private sector is already importing large quantities of fertilizer at competitive prices and local markets seem to be well-integrated with the global fertilizer market. In 2016, over 40 percent of fertilizer cargoes exceeded 10 000 tonnes. Multi-country cargoes have also become common, with staggered discharges in different ports. Importers are also sourcing products from different countries, although the bulk of fertilizers come from four countries – the Kingdom of Morocco, the Kingdom of Saudi Arabia, the People's Republic of China and Russian Federation. The BPS may discourage further development of this system that has developed organically.
- Price savings on a shipment of more than 30 000 tonnes are limited – around USD 4/tonne. Such savings are unlikely to offset the increase in price resulting from the withdrawal of fertilizer price support offered to smallholder farmers under NAIVS.

Port constraints

- Potential savings resulting from bulkier shipments could be compromised by escalating demurrage in case the proper berth space is not available for discharging the cargo in the port. Typically, demurrage charges are USD 15 000 per day for a 30 000 tonne of cargo if the ship is not unloaded in the stipulated time. For a smaller cargo, demurrage charge could be USD 0.75/tonne/day to USD 1.00/tonne/day.
- Generally, cargoes larger than 20 000 tonnes cannot easily be handled at the Port of Dar es Salaam because of limited berth space. There is only one berth, berth #7, that can handle large ships bringing 20 000–35 000 tonnes of cargo; it has a draft of 12.2 meters. All other berths have more shallow drafts and can only handle smaller vessels.

Potential risks of the tender process

- A tendering process for identifying a lead importer of fertilizer can prompt some fertilizer companies to exit the market in the United Republic of Tanzania and discourage the participation of potential new entrants, especially if companies cannot get a better (or similar) return as when they source directly from the international market. Many of the Tanzanian fertilizer importers have regional and international linkages that may be compromised by a BPS.
- The BPS import procedure is based on a series of tenders, first with the fertilizer importer and then with agro-dealers. There is a risk that if TFRA faces any obstacles in carrying out its functions and organizing the competition while the remainder of importers are prevented from importing, farmers' access to fertilizers may be compromised.
- More significantly, under the BPS, importers lose their freedom of decision making as more control is handed to regulatory authorities and the government; this may reduce long-term investment in market development due to the uncertainty in winning tenders. Ultimately, it could lead to the establishment of fertilizer monopolies – or a higher degree of concentration in an already oligopolistic market – which tends to be associated with higher prices. More disconcerting is the possibility of fertilizer companies compromising on quality in an attempt to become the lowest-cost bidder.
- With a single importer, the country may risk supply shortages and compromise food production if there are delays in product delivery or the product delivered is contaminated or sub-standard. The country should consider awarding tenders to at least two importers to ensure fertilizer security and competition in the fertilizer market.

Risks accompanying indicative pricing and penalties

- Indicative pricing can encourage the development of a parallel market. The potential for rent-seeking by opportunistic traders/regulators is high; even if an indicative price is enforced at the retail level, farmers may still end up paying a higher price to those who have the liquidity to purchase fertilizer in large volumes at the indicative price.

- BPS relies on a series of penalties at various stages in the fertilizer supply chain, creating a regimented market. Penalties could displace or discourage actors in the supply chain. A more positive outcome for the fertilizer market would be an increase in competition.
- For the above reasons, BPS may counteract the visions and objectives of the Government of the United Republic of Tanzania to modernize and commercialize small-, medium-, and large-scale agricultural enterprises for enhanced productivity, employment creation, profitability and increased incomes.
- A particular concern centres around the socio-economic implications in rural areas, both for smallholder farmers and for small-scale agro-dealers. With respect to agro-dealers, our analysis has found that a large number of agro-dealers are women, and therefore BPS may also have gender implications that need to be better understood.

Areas for improvement in the fertilizer supply chain

- The BPS is based on the assumption that significant savings could be realized by channelling imports through one importer, thereby reducing the import (CIF) price. In fact, the major cost build-ups relate to domestic components of the supply chain as domestic marketing costs account for nearly one-half of all costs between the global market and the farm-gate. Significant factors in this regard include inefficiencies in port operations, transportation, and storage and bagging at the regional centres, and not necessarily bulk procurement from international markets. Improvements in these areas could generate larger reductions in farm-level price than savings in CIF price through BPS.
- Though the estimated gross margins for the United Republic of Tanzania account for a significant portion of domestic marketing costs (DMCs), this does not necessarily imply that businesses are making excessive profits. These gross margins consist of profits and other costs including interest, rent, utilities, wages, and salaries. Therefore, these are costs that businesses incur while selling fertilizer (and other products) in their shops or premises.
- It would be useful to conduct a more detailed study to clearly estimate these individual costs in order to inform on the nature of economic returns made at import, wholesale, and retail levels. Moreover, competition will cause marketing margins to decline, as happened in Kenya; hence, this report concludes that encouraging private sector participation rather than discouraging it is a more effective means of reducing retail prices.

Key recommendations

The authors of this report recognize the significant progress of the United Republic of Tanzania toward the development of a reliable and efficient fertilizer supply chain: In the last two decades, fertilizer use has increased and yields have gone up. The investment of the government in empowering smallholder farmers, strengthening the supply chain, and creating an enabling environment for the private sector-based competitive fertilizer market has been paying off. The fertilizer market is more efficient, competitive, and well-integrated with the global and regional fertilizer markets. Private companies have developed linkages in the international market, resulting in a stable supply. The report also acknowledges the continued commitment of the Government of the United Republic of Tanzania to reduce fertilizer prices for farmers.

Based on an in-depth assessment of the fertilizer market, the following recommendations are made:

Postpone the implementation of the BPS

The proposed fertilizer BPS is unlikely to achieve the intended effect of reducing fertilizer prices for farmers. In addition, the disruption to the existing marketing system caused by the BPS and the proposed indicative price system could be substantial, ultimately compromising freedom of decision-making, competition, and innovation in the marketplace. Most stakeholders from the private sector, financial institutions, and development partners did not see the need for the BPS. Rather, they stressed the need to alleviate constraints in the supply chain, echoing the conclusions of the Policy Roundtable Discussion of November 2016.

Moreover, the publication of the BPS regulations has created heightened anxiety in the market and among development partners. Therefore:

- It is advised that the implementation of the BPS be postponed until further notice, pending further investigation and consultation of stakeholders.

- Rather than an indicative pricing mechanism, government should implement a FMMIS (e.g., through the existing MISA) as a tool for monitoring district-level fertilizer stocks and retail prices. Such a system would help identify markets where fertilizers are in short supply and prices are relatively high, thereby warranting corrective measures for easing supply shortages.

Implement a limited pilot programme

If the government chooses to continue the implementation of the BPS, the authors we advise as follows:

- Implement a pilot of the bulk procurement system with one or two products, such as calcium ammonium nitrate (CAN) and NPK 15-15-15 (or NPK 17-17-17). Both are nitrate-based fertilizers and suitable for topdressing and basal application, respectively, for a large range of crops.
- Consider selecting two importers instead of one to minimize the risk of shortages in the market, should one importer's product be delayed or sub-standard. Such a move will also keep the supply chain competitive.
- Do not enforce indicative prices during the pilot phase, so that realistic estimate of savings through BPS could be documented and then further necessary action taken.
- Carefully and independently evaluate the pilot programme based on consultation with all public and private sector stakeholders involved.
- Establish mechanisms for independent oversight and complaints management of the tender procedures of the bulk procurement system.

Improve the supply chain

As an alternative to implementing regulated bulk procurement for fertilizers, the authors recommend adopting the following general short-term measures to increase the efficiency of the supply chain and reduce prices:

- Explore the possibility of "priority discharge" for vessels carrying 25 000 tonnes or more of fertilizer products to encourage bulk procurement and shipping by eliminating the risk associated with demurrage charges if the required berthing is not available. Importers in return should work with TPA to ensure discharge within seven days, so as not to hold up other vessels and to save on shipping costs.
- Accelerate the establishment of the "One-Stop Clearance Centre" in the Port of Dar es Salaam to reduce processing time and transaction costs. This should be accompanied by a reduction in on-vessel quality inspections and an intensification of quality inspections at retail level.
- Clearly define the roles and responsibilities of the Tanzania Bureau of Standards (TBS) and TFRA to avoid duplication in their functions.
- Create a stable and conducive policy environment for fertilizer market development.
- Conduct a detailed study to clearly estimate the individual costs that compose margins in the fertilizer supply chain in order to inform on the nature of profits made at import, distribution, and retail levels.
- Explore and assess different fertilizer delivery models, including tripartite agreements between financial institutions, farmers, and processors, in order to facilitate financing for inputs – according to many stakeholders, the key constraint in the United Republic of Tanzania.

In addition, the authors make the following recommendations for the medium-term:

- Commission a feasibility study of improving the draft of one or two additional berths in the Port of Dar es Salaam to increase discharge capacity for larger ships.
- Develop innovative solutions to handle collateral requirements for increased access to finance.
- Strengthen the capacity of the Tanzania-Zambia Railway Authority (TAZARA) and the Tanzania Railway Corporation (TRC) to handle fertilizer transports from the Port of Dar es Salaam to the main consumption areas of fertilizer in the country and neighbouring markets.
- Strengthen agro-dealer networks.

It is acknowledged that the majority of recommendations are not quick-fix solutions that will immediately offer the same kind of reductions in farm-gate fertilizer prices offered by subsidies or envisioned in the proposed Bulk Procurement System. However, if addressed, the sector will continue to expand and become increasingly competitive to the benefit of farmers and food security for Tanzanians. Finally, a stable policy environment, infrastructure improvements, and exchange rate stabilization will be fundamental in the effort to ensure the lowest possible fertilizer prices for farmers.

1. Introduction

1.1. Background

The United Republic of Tanzania is predominantly an agricultural economy. Agriculture accounts for more than two-thirds of employment in rural areas and provides 30 percent of gross domestic product (GDP). Enhancing productivity in the agriculture sector is essential to promote economic growth and food security, reduce poverty, provide employment and livelihood, and generate additional income in rural areas. By global standards and even by the standards of developing countries, crop yields are low in the United Republic of Tanzania. Adoption of yield-enhancing modern technologies embodied in improved seed and mineral fertilizers is critical to promoting growth in crop productivity and food production and sustaining the natural resource base, especially among the smallholder farmers who subsist on nutrient-poor soils.

Therefore, to reduce prices and ensure timely supply of fertilizers to smallholder farmers in the United Republic of Tanzania, the Ministry of Agriculture, Livestock, and Fisheries (MALF) decided to introduce a system of consolidated procurement at the import level, the so-called bulk procurement system (BPS) for fertilizer. Since the fertilizer industry is capital-intensive, large-scale production and procurement are generally cheaper than small-scale production and procurement carried out in a fragmented way. The underlying rationale is that an importer procuring 20 000 to 30 000 tonnes of fertilizer may get a better price than the one importing smaller quantities from the global market.

Consequently, by means of a formal request in July 2016, MALF of the Government of the United Republic of Tanzania requested the Food and Agriculture Organization of the United Nations (FAO), through its Monitoring and Analysing Food and Agricultural Policies (MAFAP) Programme, to conduct an assessment of the proposed BPS for fertilizer supply in the country. The terms of reference involved two tasks:

1. Comparative analysis of the bulk procurement systems in other countries.
2. Mapping of fertilizer marketing in the United Republic of Tanzania, with a special focus on implementing a bulk procurement system for fertilizers.

To undertake these tasks, FAO/MAFAP requested the involvement of the International Fertilizer Development Center (IFDC) having extensive experience in soil fertility management, fertilizer technologies, and fertilizer market development in developing countries. Jointly, FAO/MAFAP and IFDC assembled a team of professionals to conduct an assessment of the BPS for fertilizer in February/March 2017.² The Assessment Team (AT) visited the United Republic of Tanzania from 6 February to 5 March 2017 and was composed of the following members:

B.L. Bumb, Team Leader, FAO/MAFAP Consultant
J. Ariga, Senior Economist, IFDC
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N. Nkonya, National Counterpart, MALF - FAO/MAFAP

1.2. Methodology

The AT followed a two-pronged approach to complete its tasks. First, it conducted a survey of the literature dealing with the BPSs in other countries. The AT searched not only available literature, but also international government policy document repositories (such as Food and Agriculture Policy Decision Analysis (FAPDA) at www.fao.org/in-action/fapda/fapda-home/en) and found no instance of a similar system being implemented in any country. Therefore, the team decided to look into economies of scale in contracts and shipments in the global fertilizer market by associating the price with the size of shipment or contract. Second, the AT visited the United Republic of Tanzania and had discussions with more than 100 stakeholders, including fertilizer importers, distributors, and agro-dealers; policymakers, financial institutions, farmer groups, and port and transport authorities; output aggregators, development partners, and other related stakeholders such as representatives of the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) and the DSM Corridor Group (DCG). Approximately three-fifths of the stakeholders visited were outside governmental

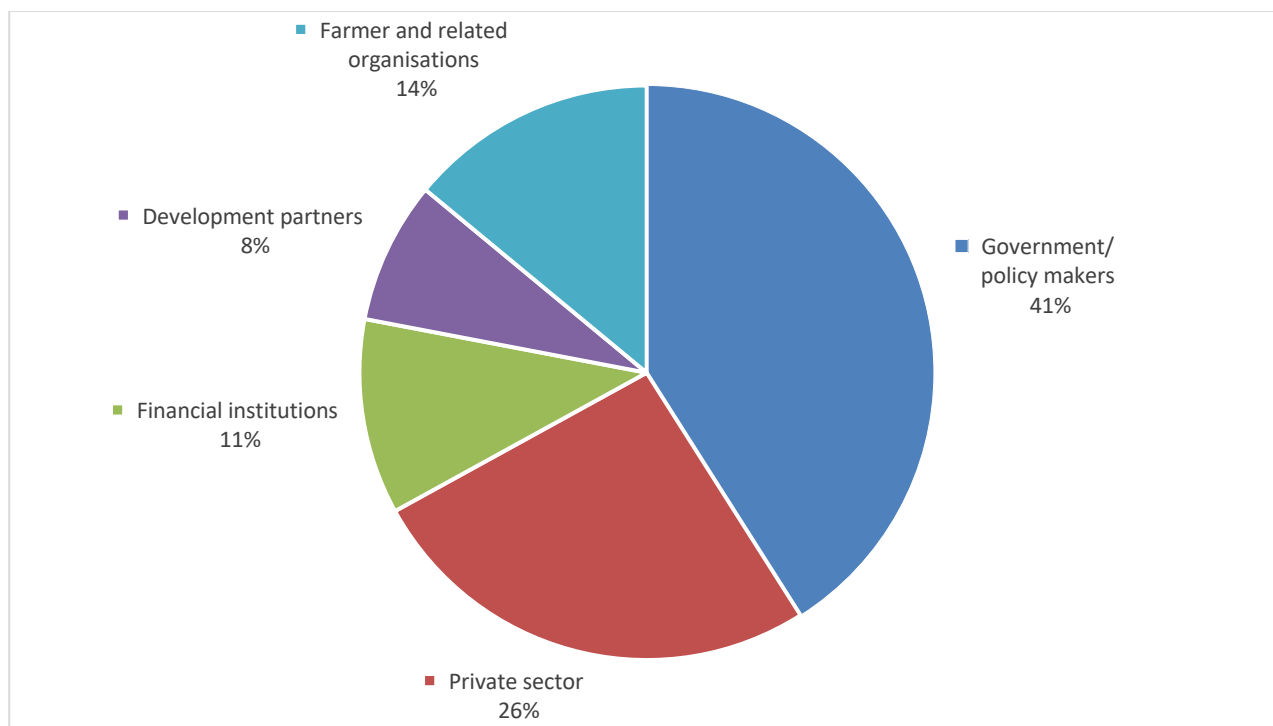
² IFDC's participation was supported by funding from the USAID under its core grant.

departments and agencies (Figure 1). Field visits, including courtesy visits to the regional commissioners, were made to Arusha and Mbeya (Figure 2), where fertilizer producers, importers, agro-dealers, and crop processors were consulted.

Discussions were non-structured and open-ended so that stakeholders had freedom to express their views about both fertilizer supply and demand in the country and the ways to improve the supply chain, including the proposed BPS. Consultations with a wide cross-section of stakeholders allowed the AT to develop a better and more objective perspective on the issues involved in the proposed BPS regulation.

The field work was preceded by the Policy Roundtable Consultation organized by the MALF on 29 November 2016 by Porfirio Fuentes, Senior Economist/Scientist, Markets, Economics, and Policy at the IFDC and Christian Derlagen, Policy Advice and Advocacy Coordinator for MAFAP at FAO, led the discussions at the Roundtable. Various participants at the roundtable stressed that “the potential cost savings to be realized from bulk procurement are uncertain” and that there is also a need to look for potential savings in the domestic supply chain. These issues are elaborated in the following sections.

Figure 1. Composition of stakeholders interviewed



Source: Authors' own elaboration.

Outline of the report

To set the stage for the assessment of the BPS, the next section of the report documents the dynamism and growth in the United Republic of Tanzania's fertilizer market and explains the potential for savings through bulk procurement in the global market. Cross-country evidence on the impact of government interventions in the fertilizer market is also included here. In Section 3, an analysis of the proposed BPS is included. Section 4 discusses the Petro Model and its relevance to the fertilizer market. An in-depth assessment of the BPS is in Section 5. Other measures needed to improve the efficiency of the fertilizer supply chain are discussed in Section 6. The summary and key recommendations are presented in Section 7.

Figure 2. Map of the United Republic of Tanzania



Source: FAO, 2021. Conforms to Map No. 3667 Rev. 6 UNITED NATIONS (January 2006).

2. Setting the stage: national and global fertilizer markets

2.1. Recent developments in the fertilizer market in the United Republic of Tanzania

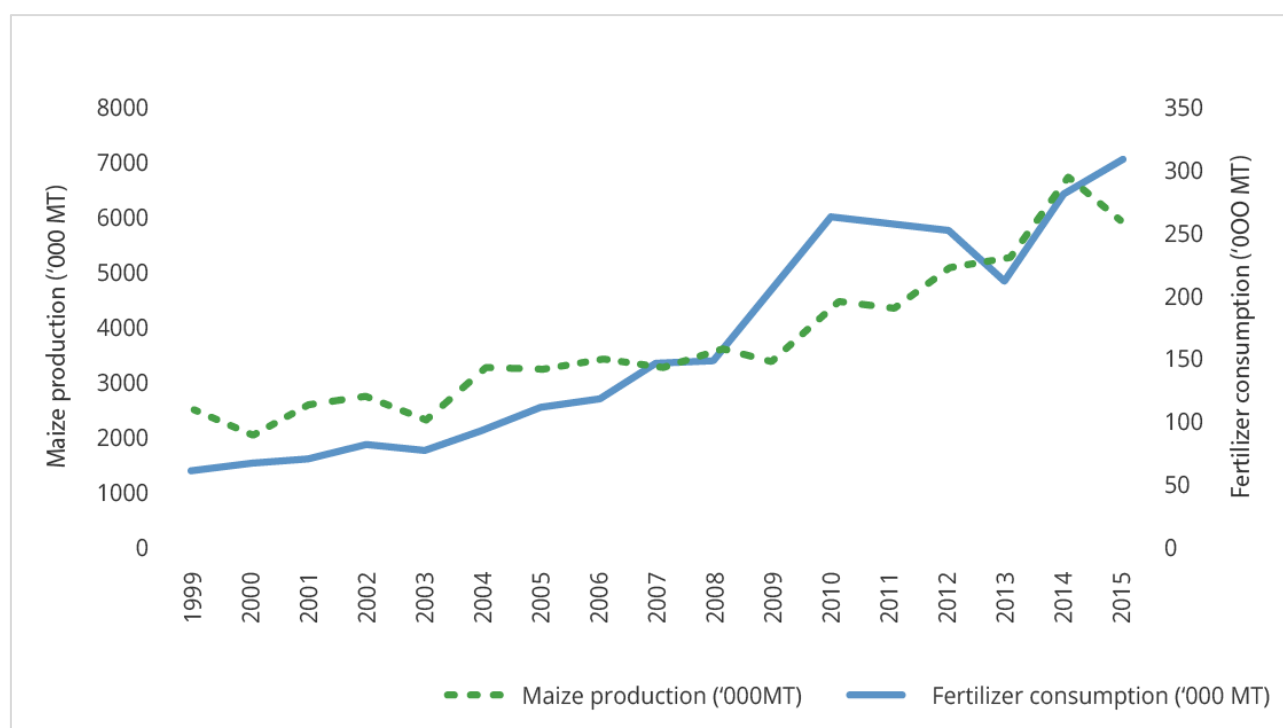
Since 2000 and particularly after 2007, the fertilizer market in the United Republic of Tanzania has witnessed significant improvements. These improvements are briefly summarized in this section.

From 2000 to 2015, both food production and fertilizer consumption increased significantly. Cereal production increased from an average of 3 million tonnes during 2000–2007 to approximately 6 million tonnes during 2013–2015 (Figure 3).

Fertilizer consumption has also increased from less than 100 000 tonnes during the 1990s to approximately 300 000 tonnes during 2014–2015. That means the size of the market has increased substantially. This allows the private sector to import in large quantities (shipments) to benefit from economies of scale in procurement, as over 90 percent of fertilizer products used are imported.

The United Republic of Tanzania is also not far from the international standard in procurement volumes since the majority of international consignments are between 10 000 and 30 000 tonnes.³ At the port of Dar es Salaam, approximately one-third of fertilizer cargoes discharged in 2016 were more than 15 000 tonnes in size and more than 40 percent were of 10 000 tonnes or more (Figure 4). In addition to price risks faced by fertilizer importers internationally, the United Republic of Tanzania has country-specific constraints, such as port infrastructure and high interest.

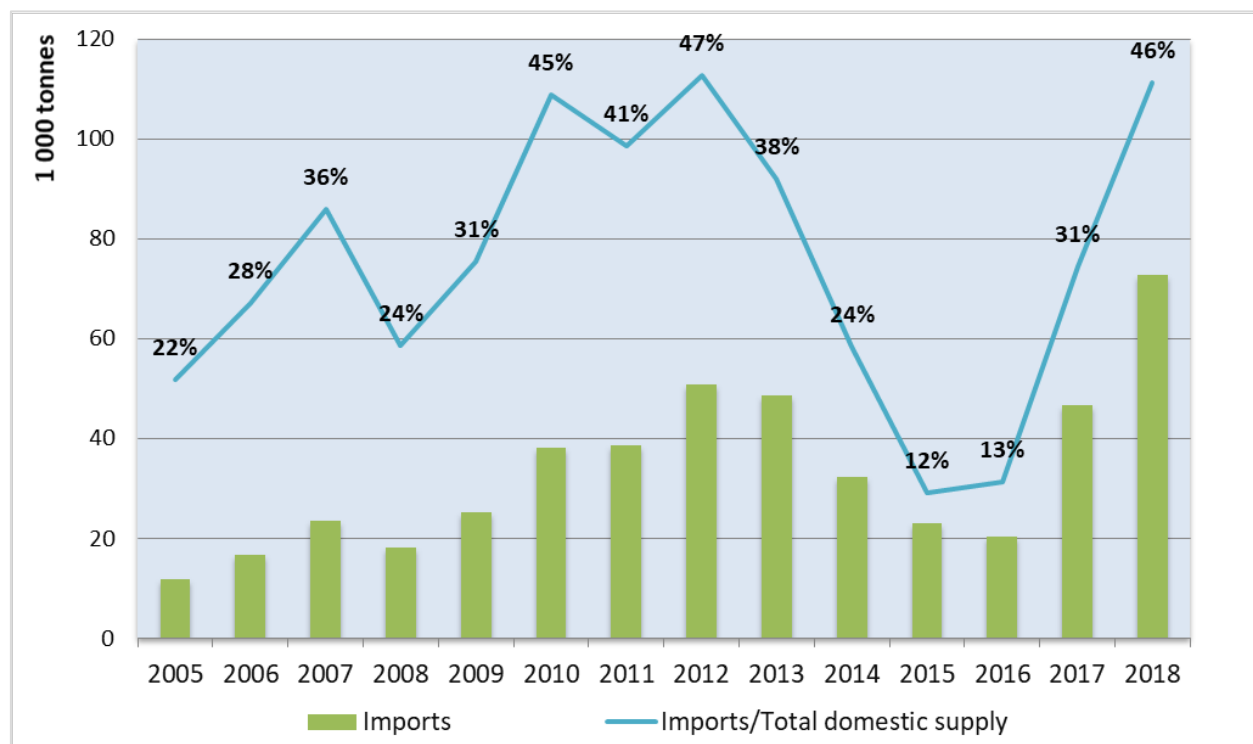
Figure 3. Maize production and fertilizer consumption in the United Republic of Tanzania, 1999–2015



Source: Authors' own elaboration based on MALF data.

³ See Table 3 and Section 6 for details.

Figure 4. Number of vessels discharging fertilizer at Port of Dar es Salaam



Source: Author's own elaboration based on TPA data.

Of the 34 cargoes discharged at DSM port, 15 cargoes came from the Arabian Gulf, 16 from Baltic/Europe, and three from East Asia. China, Morocco, Russian Federation and Saudi Arabia accounted for over one-half of these cargoes. In terms of quantity, these four countries accounted for nearly 60 percent of all quantity imported. In all, 14 countries exported fertilizer products to the United Republic of Tanzania in 2016.⁴

Three cargoes were for neighbouring countries, namely, Malawi, Rwanda and Zambia. This shows that the United Republic of Tanzania's private sector has established a strong presence in the global market and has an outreach in regional markets. According to Tanzania Revenue Authority (TRA) data, urea alone accounted for over 35 percent of all fertilizers imported in 2016.

Arrival of fertilizer cargoes was spread throughout the year, though more than two-thirds of the product was delivered during July through December 2016 (Table 1), facilitating the supply of fertilizer products for the Fall and the Spring seasons. Planting season starts in October/November in the Southern Highlands and March–April in the northern part of the country. Individually, February, August, and November received relatively larger cargoes of 49 000 tonnes to 59 000 tonnes. Given the spread of fertilizer demand and supply through the year, savings through bulk procurement through a centralized system may be limited.

Furthermore, there is vibrancy in the market; small and large importers are sourcing fertilizer products from different parts of the globe and reaching out to agro-dealers in rural areas. For example, one agro-dealer in Mbarali was observed selling fertilizer bags coming from four different sources—China, Croatia, Norway, USA—and imported by four different importers. His total stock, however, was less than 15 50-kg bags, because he was unable to access bank finance and the supplier provided limited 30-day credit. Other agro-dealers were also selling products from different sources. Any future intervention should aim to build on the successes of the subsidy scheme and continue to aim at strengthening the growth and vibrancy in the market and financial capacity of agro-dealers.

⁴ Other countries were Croatia, Greece, Finland, Libya, Norway, Sweden, Qatar, Ukraine, Turkey and United Arab Emirates.

Table 1. Distribution of fertilizer cargoes by months, 2016

Month	Cargo (number)	Volume (tonnes)	Share (percent)	Peak month
January to March	8	64 680	19	February
April to June	6	45 401	13	April
July to September	9	111 136	32	August
October to December	11	123 905	36	November
Total	34	345 122	100	August

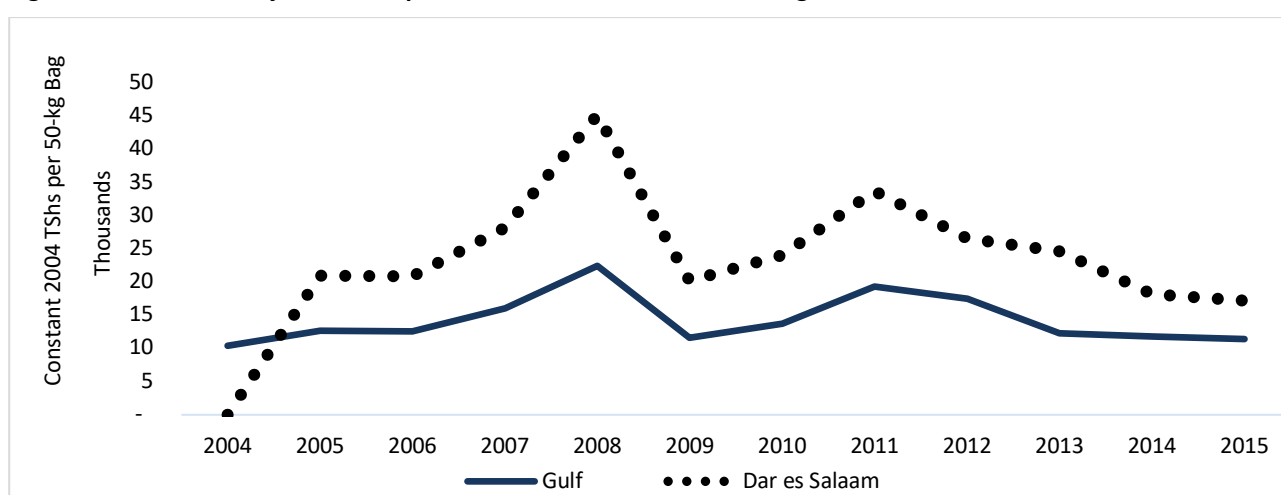
Source: TPA.

The United Republic of Tanzania’s fertilizer market seems to be reasonably well-integrated with the global fertilizer market. Retail fertilizer prices (adjusted for inflation) in Dar es Salaam follow the trend in prices in the Arabian Gulf market (Figure 5). Dar es Salaam is a large coastal fertilizer market and a hub for supplying fertilizers to neighbouring countries, including Malawi, Rwanda, Uganda and Zambia.

Capacity of the private sector has improved significantly. In the 1990s, the private sector imported small shipments of 5 000 tonnes or less, thereby paying higher product prices and freight charges (IFDC, 2005). Now, key importers, namely Yara, ETG, and Premium Agro, are in a position to negotiate competitive prices for large shipments directly with global suppliers. They have also established linkages with financial institutions to finance fertilizer imports. However, small importers have limited access to finance for import.

Key importers have created a regional presence by developing multi-country markets and import products for both the local market and neighbouring country markets, such as Malawi, Rwanda, Uganda and Zambia. Such developments allow importers to combine orders and get better prices and freight rates. To economize on freight charges, importers use staggered shipments such that fertilizer products from the same large ship are discharged in different ports, e.g., Mombasa, Dar es Salaam, and Beira or Durban.

Although Dar es Salaam port operations still need improvement,⁵ the discharge rate for unloading fertilizer ships has improved from 1 000–1 500 tonnes/day to 3 000–5 000 tonnes/day.⁶ Moreover, the arrival of DCG has enhanced and complemented TPA’s cargo handling operations. This has improved discharge rates, thereby leading to saving in both time and costs incurred in unloading fertilizer ships.

Figure 5. Inflation-adjusted Urea price in Dar es Salaam and Arabian gulf markets

Source: Authors’ own elaboration based on IMF inflation data and Argus FMB prices.

⁵ See Section 6.

⁶ As per discussions with DCG.

The road ahead

In 2012, IFDC (2012a) estimated the fertilizer quantities required to meet the agricultural production targets for 2015 as envisaged in the Tanzania Agricultural and Food Security Investment Plan (TAFSIP, 2011/12–2020/21). Using the crop growth targets in the TAFSIP, it was estimated that the United Republic of Tanzania would need to double its annual fertilizer use from a base of 263 000 metric tonnes in 2010 to 528 000 tonnes in order to meet the agricultural growth targets for 2015. The assessment also examined the United Republic of Tanzania's capacity for delivering this quantity of fertilizer product to its smallholders and noted that the logistics needed to improve in order to distribute the additional 265 000 tonnes through the United Republic of Tanzania's congested ports, stretched trucking fleets, poor roads, and insufficient rural storage capacity. However, this additional volume was expected to benefit from economies of scale to reduce prices and raise access to farmers, increasing productivity. The key recommendations from the 2012 IFDC report are listed below:

- Investing in transportation and storage infrastructure.
- Improving procurement and delivery for subsidized fertilizer.
- Strengthening capacity and outreach of agro-dealers.
- Training farmers in good agricultural practices.
- Enhancing farmer purchasing power through financing arrangements.
- Strengthening fertilizer demand by developing crop markets.

Due to the large investments needed to procure and distribute the estimated half million tonnes of fertilizer by 2015, it was recommended that a realistic balance be struck between public and private sector efforts aimed at unleashing the full capacity of the latter.

Although national fertilizer consumption fell short of the 2015 target by approximately 200 000 tonnes (38%), maize and rice production targets from the 2012 IFDC assessment were surpassed. The 2012 IFDC study projected that maize production would increase from 4.5 million tonnes in 2010 to 5.6 million tonnes in 2015. Data from MALF indicates that national maize production in 2015 was 5.8 million tonnes. However, targets for sorghum, cassava, tea, tobacco, sugarcane, and cotton were not met.

The high cereal production may be attributed to the focus on food security and the prioritization of fertilizer subsidy for cereal crops, especially maize and rice. Therefore, though the total national fertilizer targets were not met, substantial gains were made for fertilizers intended for maize and rice production.

To promote productivity growth in agriculture in general and key crops in particular, the United Republic of Tanzania should continue to promote growth in fertilizer use and supply. All future efforts should strengthen the momentum and dynamism the fertilizer market has achieved in recent years.

2.2. Economies of scale in bulk procurement in the global market

As no other country is using a government-directed or centrally planned fertilizer procurement system, the AT looked at the global market to identify economies of scale in procurement, i.e., reduction in price as the size of contract increases. The reason for looking at the FOB price is grounded in the BPS rationale of reducing farm-level prices by saving on FOB prices by buying in bulk (cargoes of 30 000 tonnes to 50 000 tonnes) in the global market.

Table 2 provides data on the size of shipment/contract and price for granulated urea in the global market. Data were compiled from the contracts negotiated by international companies importing for various countries in three global markets: the Arabian Gulf (Middle East), Baltic/Black Sea, and East Asian markets (as reported in the Argus FMB Weekly reports during 2016). However, as the Arabian Gulf market included the maximum number of contracts, data from that market are reported here. The total number of contracts included in the table is 207; of which, a little less than one-half falls in the range of 11 000 tonnes to 30 000 tonnes and only 22 percent of the contracts are more than 30 000 tonnes in size (procurement range BPS is supposed to promote).

Table 2. Global urea (granulated) prices by size of contract in the Arabian gulf market, 2016

Size (tonne)	Number	Percent share	Price (USD/tonne)
0–10 000	62	30	224.0
11 000–20 000	44	21	219.8
21 000–30 000	55	27	215.5
31 000–50 000	38	18	213.3
Over 50 000	8	4	207.1
Total contracts	207	100	

Source: Authors' own elaboration.

According to the economies-of-scale concept, as the size of the contract increases, the price paid should decrease. It is clear from the table that as the size of contract increases from 10 000 tonnes or less to over 50 000, the average price per tonne of urea drops from USD 224/tonne to USD 207.1/tonne.

However, after 30 000 tonnes, further increases in size generate only a small benefit in the price of about USD 2/tonne for shipments involving 31 000–50 000 tonnes (more relevant for the BPS given the size of the market and seasonality in demand).

Of course, contracts involving more than 50 000 tonnes can save approximately USD 6/tonne. As the private sector is already importing cargoes of 15 000–20 000 tonnes, the relevant question is: what additional savings could be generated if the BPS imported in cargoes of 30,000 tonnes to 50,000 tonnes or more.

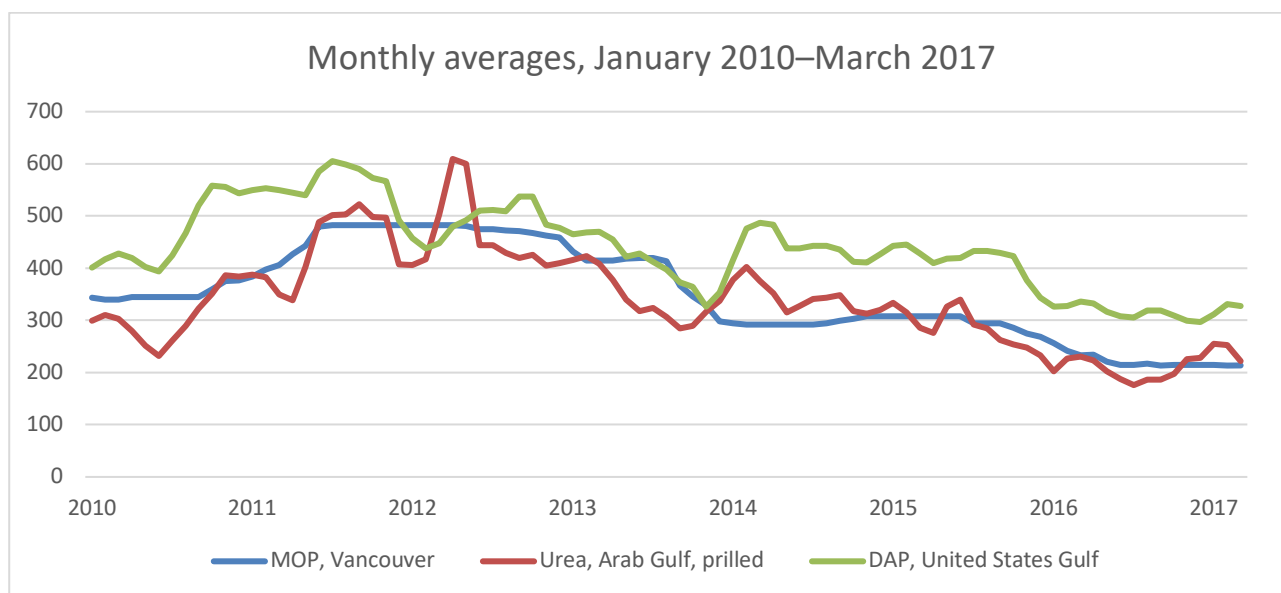
Such improvements in price need to be compensated against other costs, such as demurrage, if a large ship is not unloaded in the stipulated period, as the DSM port has limited berth capacity to handle large cargoes.

Moreover, global fertilizer prices are volatile and have been decreasing since 2012 (Figure 6). Under such environment, it may be risky to buy large quantities at higher prices. Buying in small cargoes may save on capital cost because the product bought at a higher price has to compete with the one bought thereafter at a lower price in the market.

While the size of contract plays an important role, other factors can also influence negotiated price and may allow the importer price advantage at medium size (10 000 to 20 000 tonnes) cargoes, even for a small one in isolated cases. Such factors include the supply-demand situation in the market at a given point in time (week or month), long-standing relationship and trust between the exporter and the importer (e.g., one importer in Dar has been dealing with the same supplier for the last 20 years), creditworthiness of the bank (issuing the letter of credit), and cross-border regional trade.

Many fertilizer manufacturers prefer to deal with large traders who can supply to small importers in the market. If there is an excess supply in the market, then manufacturers or traders may sell even small lots such as 5 000 tonnes or less at a competitive price. Individual traders, who may have leftover stocks after big deals, may also offer the quantity at a lower price even for a small shipment just to clear the stocks. Cross-border trade can produce price deals with a small size of contract, with a large trader.

Figure 6. Fertilizer prices (Free on Board, bulk) in USD/tonne, 2010–2017



Source: Authors' own elaboration based on data in Argus/FMB Reports.

It is also clear from above tables that the majority of internationally procured consignments are in the range of 10 000–30 000 tonnes. If procurement in lots in excess of this were profitable and efficient, we would expect that importers in other countries would be following that approach as well. The fact that they are not says a lot about the potential risks and benefits involved and the manner in which free competitive markets operate.

Freight charges

Whereas the price advantage for large cargoes may be small, there may be savings in freight charges for large cargoes. Freight charges per tonne for a shipload of 25 000 tonnes or more (Panamax ships can carry 60 000 tonnes to 70 000 tonnes) are generally lower than that for small cargo of 5 000 tonnes or less.

A small cargo of 5 000 tonnes to 10 000 tonnes can cost USD 20–USD 25/tonne, whereas a large ship carrying 25 000 tonnes to 30 000 tonnes can cost only USD 10–USD 12/tonne. To economize on freight charges even with small cargo for the United Republic of Tanzania, importers in Dar el Salaam practice staggered discharges in different ports, such as Beira, Dar es Salaam and Mombasa. Discussions with importers revealed that there are more savings in freight charges than in price for large shipments, without the risk of blocking capital should the global prices decrease over time (see example of Kenya below).

This is not to say that there are no advantages in buying in large quantities if the domestic demand permits. There are advantages if we compare the price for small cargo (less than 10 000 tonnes) and that for over 50 000 tonne cargo. But benefits can be eclipsed by other factors if the port cannot handle large cargoes (as is the case at DSM port) and the cost of tied capital is high if global prices are on a downward trend. Therefore, a better way would be to create supportive conditions in the market for the current importer to move in that direction by improving port operations, creating an enabling policy environment, and stabilizing the exchange rate.⁷

⁷ Government of the United Republic of Tanzania (2017) Second Schedule.

2.3. Cross-country review

In addition to understanding international practices in procurement by the private sector, the assessment team also analysed procurement and distribution practices by governments in countries other than the United Republic of Tanzania. It is not uncommon for government to intervene in procurement and distribution of fertilizer for the sake of improving access by resource-poor farmers. However, this is usually financed by public funds in one way or another. The United Republic of Tanzania is phasing out its fertilizer subsidy scheme in favour of a private sector-financed but government-regulated procurement scheme.

Our survey of the literature has not revealed any examples of such systems being used elsewhere. However, much can be learned from international experiences of government intervention in the fertilizer market in general, which has mostly been in the form of input subsidy programmes with government involved directly or indirectly in procurement.

Therefore, based on cross-country experiences, the following section outlines some success stories but also the known risks associated with tender systems and indicative or maximum pricing. From this we draw lessons to help inform the implementation of the new proposed fertilizer BPS in the United Republic of Tanzania.

During the 1960s and the 1970s, public sector monopoly and pan-territorial pricing were common in the fertilizer sectors of many developing countries and centrally planned economies. Increasing fiscal burdens, poor efficiency in procurement, production, and distribution, and rent seeking by regulators and opportunistic traders forced many governments to liberalize, deregulate, and privatize fertilizer markets.

By the end of the 1990s, few countries in Africa had government-managed or -directed procurement and distribution systems for fertilizers. These policy changes encouraged the participation of the private sector in procurement and distribution. In Ghana, Kenya, Malawi, the United Republic of Tanzania and other countries, participation of the private sector increased significantly. However, stagnation in fertilizer use after policy reforms forced governments to rethink these policy reforms and motivated them to introduce selective interventions in the fertilizer market during the mid-2000s, in particular the re-emergence of subsidies.

The risk of uncertainty in tender systems

An important similarity between the proposed BPS and subsidy programmes elsewhere in SSA is the presence and operation of a tender system to award contracts for procuring fertilizer. Subsidy programmes in both Malawi and Zambia had government-led procurement and distribution of fertilizer, awarding contracts to private companies based on a public tender. However, actual implementation was quite different in Malawi and Zambia. Whereas Malawi awarded contracts to around 12 or more companies every year, Zambia—although supplying a programme of a similar size in terms of fertilizer tonnage—generally awarded contracts to only two companies.

More specifically, in Zambia, under the Fertilizer Support Program (FSP), fertilizer suppliers were selected through a national tender to distribute fertilizers to main depots in the country. Despite intentions for the system to be competitive, the same two companies—Omnia and Nyiombo—succeeded in winning the bid each year (Mason *et al.* 2013).

In hindsight, this outcome was not surprising given that tender bidding requirements favoured incumbents and inhibited an open and competitive process. To be eligible to bid, companies had to provide evidence of having supplied large quantities of fertilizer in the past; including proof of contracts previously awarded. It should be noted however, that from an operational point of view, it may be risky to give large tender award (almost half the market) to a new dealer without previous experience. Yet the process should have included other fertilizer distributors in the tender award.

In addition to the tender system favouring large established companies, the Competition and Consumer Protection Commission (CCPC) of Zambia also found collusion between Omnia and Nyiombo in the tender process, effectively creating a cartel by agreeing on prices and dividing markets geographically among themselves (Roberts and Vilakazi, 2017).

Reforms in the bidding process since 2012–2013 have increased competition and reduced market concentration. In terms of finance, major importers have access to trade finance at internationally competitive rates. In contrast, distributors and small retailers face difficulties accessing financing in the domestic market. Local nominal interest rates are high, hampering efforts to expand businesses, especially in the agribusiness and agriculture sector. As a lesson, the

United Republic of Tanzania should ensure that the pre-qualification for competing in the tender is not too restrictive; but should safeguard against collusion by not awarding tender to the same company or two every year.

In addition to the dangers of collusion, tender systems can also introduce uncertainty in a market. In Malawi, during the early years of the Farm Input Subsidy Program (FISP), there were over 12 private companies involved in the procurement of fertilizer. The uncertainty of winning the tender coupled with state-owned enterprises (SOEs) competing in the fertilizer market, placed private importers at a disadvantage and has driven many agro-dealers out of business (IFDC, 2013). Uncertainty in winning the tender meant that suppliers had no incentive to ensure input provision year-round and would wait to ensure the tender is secured before importation and distribution. Long term planning may become compromised if a company is unsure of winning the tender for the coming seasons.

The proposed BPS carries comparatively less risk of enabling cartelistic behaviour in the domestic market since although only one company will win the tender to import, the remaining companies will act as distributors. However, all importers still face uncertainty and risk compromising their already established networks in the region.

The main difference between subsidy models in SSA and the proposed BPS is that there is a single “client” (i.e., government) who orders set amount and guarantees paying the subsidized portion of that fertilizer; under BPS there is no guarantee that the required quantities will be imported if distributors and agro-dealers cannot prepay to the importer.⁸ Thus, in the proposed new system, financing may become a key constraint unless the government guarantees the payment to the importer.

Interestingly, even with only one client and two types of fertilizer supplied under FISP (urea and NPK) the largest order ever for any one type of fertilizer was 32 000 mt (in 2006–2007 for NPK). It is not clear whether or how fertilizer suppliers collaborate to import fertilizer. In Malawi, during 2006–2007 and 2015–2016 tenders of 90 000–170 000 tonnes were awarded annually to anywhere between 10 and 25 suppliers (importers). The smallest contracts were for about 2 500 tonnes while the largest ones ranged from 15 000–50 000 mt over time. This is yet another indication that certain characteristics of fertilizer limit the potential cost-savings of bulk importation.

Cost and service delivery inefficiency

It is generally well known that over-regulation can impede the efficient functioning of markets, increasing time and costs of service and inputs delivery even if the intention of the regulation is to the opposite effect.

In Zambia, there were essentially two separate supply chains: one for commercial fertilizer and the other for the subsidy under FSP. In an assessment of the cost efficiency of the FSP distribution system, the World Bank (2010) compared the cost of the subsidy pack with commercial retail prices in the same locations and found that in four of the five provinces sampled, the commercial retail price was lower by an average ZMK 123 787 (USD 32) than the cost of the subsidized fertilizer without the subsidy. They calculated that in total for the 2007–2008 season, even though farmers paid less for fertilizer, the cost of the FSP versus the commercial supply chain to Zambia was roughly ZMK 15.5 billion (USD 4.03 million).

In addition to cost inefficiencies, considerations about timing of delivery are also a major concern with strong government regulation. In both Malawi and Zambia, timely delivery of inputs has been a major concern. In Zambia, according to the same World Bank report, 70 percent of farmers reported that they did not receive inputs in time for start of the rains. Considering that timeliness of planting and fertilizer application is extremely important, the Ministry should ensure that the regulation surrounding the procurement of fertilizer, including the financing and delivery, do not impede farmers’ ability to plant on time.

How NAIVS strengthened the development of a competitive fertilizer market in comparison to other subsidy programmes in Africa

The National Agricultural Input Voucher Scheme (NAIVS) in the United Republic of Tanzania subsidized half the cost of seed and fertilizer inputs (World Bank, 2014). Unlike other subsidy programmes in SSA, NAIVS relied on the private input supply channel. Government distributed vouchers to targeted beneficiary households and then allowed the private sector retail input supply channel to meet the demand. The only area of intervention in the supply chain was in the selection

⁸ See Section 6.

(“targeting”) and training of commercial agro-dealers to participate as licensed NAIVS input suppliers at retail level. The redemption of vouchers through commercial agro-dealers was meant to encourage the development and expansion of a sustainable wholesale to retail input supply channel (World Bank, 2014). Otherwise, there was very little government involvement in the procurement and distribution of fertilizer supplied under the programme.

By contrast, in Malawi, procurement and logistics are entirely managed by the Government of Malawi through its Logistics Unit (LU). Contracts are awarded to private and public sector companies for the importation and delivery of fertilizer to three regional depots operated by Smallholder Farmers Fertilizer Revolving Fund of Malawi (SFFRM), where private transporters are employed to bring fertilizer to ADMARC/SFFRM district distribution centres at a fixed cost per kilometre determined by the LU (Logistics Unit, 2015).

There is a perception that Malawi’s FISP significantly undermined small private importers and retailers that were emerging under the donor support programmes targeted to improving agribusiness acumen. It has also skewed the private fertilizer market to the commercial-export production sector. Private companies have developed a wide network of outlets for the provision of inputs other than fertilizer (IFDC, 2013a). A major issue is the uncertainty faced by private companies resulting from continuous involvement of the SOEs in the fertilizer market and ad hoc budget allocations. Also, the development of agro-dealer networks has suffered as private agro-dealers were not allowed to redeem vouchers because the Agricultural Development and Marketing Corporation (ADMARC), a parastatal, was given the exclusive rights to redeem vouchers.

Private investments can be limited by competition from state agencies that may not be subject to the same regulations. This was the case for the private companies that have withdrawn from the fertilizer market in Malawi. Greater competition will contribute to more efficient operations (IFDC, 2013). Whereas the distribution of subsidized fertilizer products is done by SOEs (SFFRM and ADMARC), private companies are still involved in procurement and importation of fertilizer products for both subsidized and non-subsidized (commercial) segments of the market.

Kenya: an example of a fully liberalized fertilizer market

In 1991, the Kenyan government liberalized the importation and distribution of fertilizers. Prior to this, the government used to control fertilizer importation and prices in the country. Currently, the majority of Kenya’s fertilizer, including estate fertilizer (tea, coffee, sugarcane, and flowers), is imported by the private sector. Since the liberalization of the fertilizer trade, there has been a significant increase in Kenya’s fertilizer demand from about 270 000 tonnes in 1996 to approximately 550 000 tonnes in 2015-2016.

The main reason is that the Kenyan Government has been consistent with its liberalized policy on fertilizer importation and marketing over the past two decades. This facilitated the growth of a strong private sector participation in the marketing of agricultural inputs in the country. There are about five to six strong private companies involved in fertilizer marketing with approximately 500 wholesalers and 8 000 small agro-dealers network countrywide. The consistent policy of the Kenyan Government to let the private sector take ownership has led to a thriving fertilizer market with a significant outreach in the rural areas, thereby reducing the distances travelled by smallholder farmers to access inputs at cost-effective prices (IFDC 2012b, Sheahan *et al.*, 2016).

However, there is a caveat in Kenya’s success story. After the 2007–2008 fertilizer price hike, global fertilizer prices dropped significantly towards the end of 2008 (e.g., urea prices dropped from USD 800 to USD 400/tonne). The severe and sudden price shock gave importers no time to adjust their stock levels and fertilizer companies were selling the product at prices well above world market prices in order to recover their procurement costs. This led to a *misperception* in the Ministry of Agriculture that the private sector was making unnecessarily large profits. The government’s response was to import 140 000 tonnes of fertilizer which they proceeded to sell locally at a 50 percent subsidy. This led to huge losses to the private sector. Having a public-private policy dialogue would have created a better understanding of market dynamics and avoided such drastic action.

Experiences in India

In contrast to the three African countries mentioned above, India's experience is different by virtue of its size and complexity; yet it offers valuable lessons in government intervention in the fertilizer market. India is the second largest fertilizer importer and consumer globally, with an annual consumption of about 55 million tonnes and widespread network of importers, distributors, and agro-dealers.

The Government of India (GOI) used to provide subsidy on all major fertilizer products; this led to an increase in fertilizer consumption. However, it also raised the subsidy bill – from USD 5.7 billion (Rs 262 billion) in 2006–2007 to USD 16.6 billion (Rs 766 billion) in 2008–2009 (at current exchange rate). This led the GOI to rethink the subsidy model for fertilizers. The nutrient-based subsidy (NBS) programme, which sought to liberalize subsidy on non-urea fertilizers (P & K), was expected to reduce the subsidy burden substantially (Himanshu, 2015).

During the implementation of the NBS, the price of certain fertilizers (DAP and MOP) increased by 2.5 to 3 times and farmers started to replace it with urea; this resulted in indiscriminate increase in urea consumption (leading to increasing subsidy on fertilizers back to USD 16 billion, i.e., Rs 730 billion, in 2015–2016).

The immediate result of NBS was a sharp rise in fertilizer prices, particularly for phosphoric and potash fertilizers, which increased on an average of USD 150 (Rs 10 000) per tonne before the introduction of NBS to USD 375 (Rs 25 000) per tonne in 2013. This led to a sharp decline in the use of phosphate and potash fertilizer products and distorted the NPK ratios.

In contrast to recommended NPK (nitrogen:phosphate:potash) ratio of 4:2:1, NPK ratio in 2013–14 was 8.2:3.2:1. In certain states it was worse. For example, in Punjab- the cradle of the Green Revolution, it was 62:19:1. The deterioration in NPK ratio not only affects crop productivity but also worsens long-term soil health. No wonder, fertilizer response rate has decreased over time (Sharma 2013).

Although urea prices remained administered, the surge in demand for urea meant that not only was urea selling in the parallel market at twice the administered price, but there was also a severe shortage of urea in the market. As a result, neither the government nor the farmers benefited from the NBS policy, as fertilizer prices more than doubled during the last four years and NPK ratios deteriorated.

Lessons learned

The researchers have not found any example of a bulk procurement system, as adopted by the Government of the United Republic of Tanzania, elsewhere. Therefore, the lessons that can be drawn from success or failure of application of such a system in other countries is limited. However, based on an assessment of government interventions in fertilizer markets in other countries, evidence suggests that the government interventions in the market are often not conducive to creating well-functioning (efficient and effective) fertilizer markets. Rather, the government is advised to focus on creating a supportive policy environment and improving infrastructural facilities for the market, which will bring fertilizer prices down for farmers.

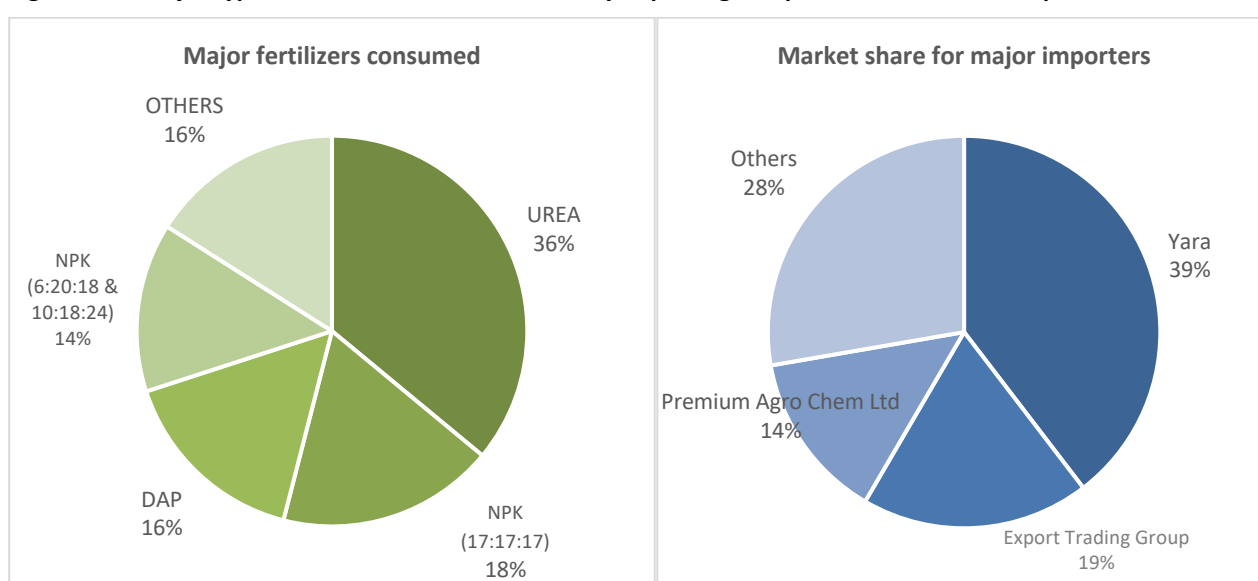
3. Overview of the bulk procurement system for fertilizer

3.1. Rationale

The Minister of Agriculture, Livestock, and Fisheries (MALF) signed the Regulation for establishing the BPS for fertilizers on 10 February 2017. The Regulation GN 49 entitled as The Fertilizer Act (CAP.378), The Fertilizer (Bulk Procurement) Regulations, 2017, was included in the Gazette of the Government of the United Republic of Tanzania (No. 7 Volume 98, dated 17 February 2017). The rationale for such regulation is based on the economies of scale in procurement, such that if a large quantity of fertilizer is procured by a single importer, then significant savings can be obtained in purchase price and that can lead to reduced prices at the farm-gate. While this is true in theory, evidence shows that this is not necessarily the case in practice (as explained in Section 2.2).

Currently, there are 20 active importers. The three dominant importers are Yara, ETG, and Premium Agro-Chem.⁹ These three importers account for more than 70 percent of the quantity imported; urea, diammonium phosphate (DAP), and NPK fertilizers account for 84 percent of all products used in the country (Figure 7).

Figure 7. Major types of fertilizer consumed and key importing companies in the United Republic of Tanzania



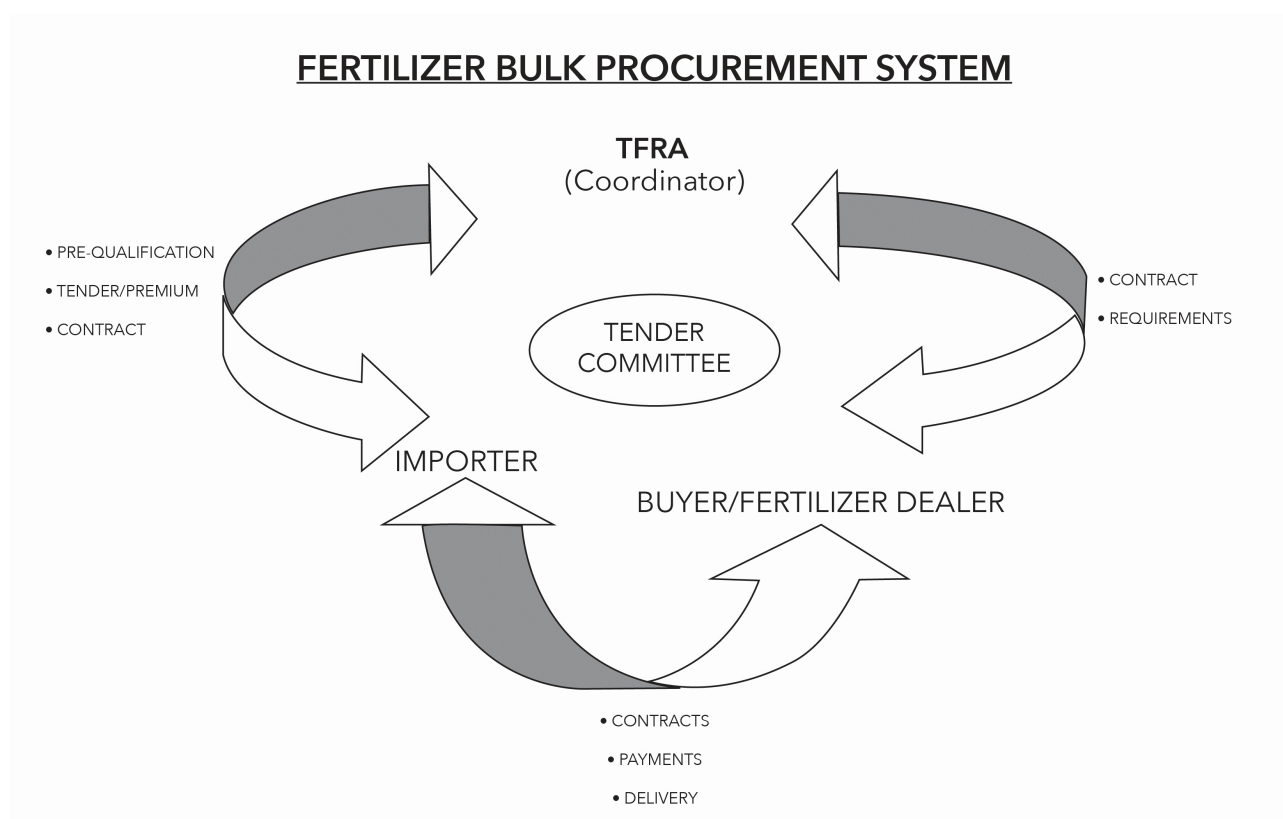
Note: Averages are based on fertilizer quantities for 2008/2009 through 2014/2015.

Source: Prepared by the AT based on data from the Inputs Unit, MALF.

⁹ In 2003, there was only one large importer importing 70 000 tonnes; all others imported between 1 000 tonnes and 12 000 tonnes (IFDC 2005, p.54).

Key features of the BPS

Figure 8. Interactions between public and private stakeholders in the BPS



Source: Tanzania Fertilizer Regulatory Authority (TFRA).

Figure 8 above provides an overview of the interactions between the various stakeholders (public and private) within the bulk procurement system.

The bulk procurement regulation stipulates the following procedures for bulk procurement

A. Selection of the importer

The TFRA will be responsible for implementing the BPS.

- TFRA will aggregate the fertilizer requirements from different distributors and pre-select a few importers on the basis of a set of criteria from existing importers.
- Tenders will be invited from pre-selected importers to supply the required quantity of the fertilizer product at a cost-effective price. The tender will be awarded to the importer that tenders to supply the entire quantity needed at the lowest CIF price.
- No one will be allowed to import fertilizers outside the BPS except excluded products.
- Since the funds will not be from the national budget (see below), the tendering process will not follow the systems stipulated in the public procurement Act. The intended benefit is to shorten the time spent in selecting a successful bidder.

B. Financing of import

- The selected importer will provide a letter of credit from his or her bank to finance the required quantity of imports to the TFRA.
- Fertilizer dealers (distributors and other importers) will provide a letter of credit or cash payment to the selected importer for the quantity requested. This should be done 30 days in advance of the arrival of fertilizer cargo.

C. Selection of fertilizer products

- TFRA will have full discretion to identify products selected for the BPS. The Regulation stipulates to cover most products including urea, DAP, and NPKs. However, for the Pilot phase in 2017, urea and DAP have been selected.¹⁰

D. Indicative prices

- Based on the tendered price, transport cost, and mark-ups, the TFRA will determine maximum wholesale and retail prices at different locations in the country. Such determination will be done in consultation with key stakeholders in the supply chain. All distributors and agro-dealers will be required to sell fertilizers at indicative prices.
- Failure to obey indicative prices may invite severe penalties, including the cancellation of license to sell or import fertilizers.

E. Penalties

- The regulation stipulates penalties for different actors in the supply chain (see Annex). There are penalties for importers if they fail to import, for fertilizer dealers if they fail to pick up their orders, and for agro-dealers if they sell product at prices higher than indicative prices. Annex III, Second Schedule provides more details on penalties for various operational defaults.

¹⁰ Personal communication with Tanzania Fertilizer Regulatory Authority (TFRA).

4. The petroleum model

The BPS system is inspired by and designed on the basis of the petroleum procurement model (herein after referred to as the Petro Model), which is implemented by the Petroleum Bulk Procurement Agency (PBPA) along similar lines:

- Selection of an importer through tendering from a pool of pre-specified importers.
- Pre-payment by distributors/oil marketing companies (OMCs) to the importer for requested quantity.
- Indicative pricing and severe penalties for any default on pre-payment or indicative pricing.
- However, the Petro Model is not applicable to the fertilizer market for the following reasons.

First, fertilizer demand is seasonal and risky and mostly limited to six months (September through March). Different crops require different products, and even the same crop needs different products for planting and topdressing. Moreover, crops are planted and harvested during different months in a year, requiring different fertilizer products at different times. In contrast, demand for petroleum products is generally stable and continuous throughout the year. Therefore, it is easy for OMCs to estimate petroleum requirements, whereas the fertilizer dealers may be forced to make adjustments in the quantity of fertilizer purchased if weather conditions change (e.g., drought).

But if they have prepaid for the product, they do not have that freedom to cancel the contract and are forced to incur losses on the tied-up capital and storage costs until the next season, if they are not allowed to export BPS fertilizer to neighbouring markets.

Second, the product cycle is much longer for fertilizer products than for petroleum products. Demand for petroleum products can be estimated two months in advance, whereas for fertilizer products, it could be four to six months, depending on season and region.

Third, as mentioned earlier, finance is a severe constraint in the supply chain, and therefore distributors may not be able to pre-pay to the importer. In turn, the importer may not import the product unless guaranteed by the government. However, if distributors do not pre-pay and the government does not provide guarantee to the importer, there may be fertilizer shortages.

Fourth, and most importantly, petroleum ships get “priority in discharging” at the DSM port. According to the PBPA staff, the major source of savings in petroleum price was the reduction in demurrage charges as petroleum ships are discharged on a priority basis: demurrage charges decreased from an average of USD 45/tonne to USD 2–3/tonne.

If fertilizer ships carrying over 25 000 tonnes (requiring the sought-after berth 7) are also given priority in discharging, considerable savings could be generated and transferred to the farmer. Thus, the Petro Model cannot be applied directly to fertilizer products. As a result, this report advises that it should not be used to guide the BPS for fertilizer imports.

5. Assessment of the bulk procurement system (BPS)

The assessment of the BPS is conducted from two vantages. First, given the local and global market context mentioned earlier, is there a need for the BPS? Second, what are its limitations, and how will it impact the competitive fertilizer market currently operating in the country?

5.1. Is there a need for the BPS?

Based on the discussions the AT has had with different stakeholders and the evaluation of existing data and information and market dynamics, evidence does not support the need for a Bulk Procurement System, as explained below.

The fertilizer market in the United Republic of Tanzania has expanded significantly, from less than 100 000 tonnes during the 1990s to over 300 000 tonnes during 2014–2015. Such a large market already allows the private sector to import in bulk to realize economies of scale.

The capacity of the private sector has expanded considerably. The private sector has a regional presence and linkages with global suppliers and serves multi-country markets of neighbouring countries. Key importers also have easy access to hard currency finance to pay for imports. Therefore, the private sector is already in a position to import in bulk but prefers to import medium-sized shipments of 10 000–15 000 tonnes for two reasons. First, the DSM port has limited berth capacity to handle large-sized cargoes. It has only one berth (berth #7) that can unload 30 000–35 000 tonnes of cargo. The other berths are capable of handling only 15 000–20 000 tonnes of cargo. Moreover, unlike petroleum ships, fertilizer ships do not get “priority clearance.” Second, the demand for fertilizers is seasonal and risky, as fertilizer use is affected by weather/rainfall conditions. Therefore, the private sector does not like to tie up its capital in large cargoes.

However, the private sector tries to get economies of scale in price and freight charges by procuring large quantities for multi-country markets and using staggered discharges at different ports on the eastern/southern coast of the Atlantic Ocean, such as Mombasa, DSM, and Beira or Durban.

Although there are economies of scale in procurement, the price benefit of large contracts in the global market is rather small after a certain size (i.e., 30 000 tonnes). For example, based on data in Table 4, the additional savings is only USD 2/tonne for a cargo of 31 000–50 000 tonnes compared to a cargo of 20 000–30 000 tonnes.¹¹ Even for cargoes in the range of 20 000 tonnes to 30 000 tonnes, additional savings are only USD 4/tonne over the 10 000–20 000 tonnes range. However, such a small savings in price could be compromised due to the risk of tied-up capital and demurrage charges if the large ship cannot be discharged in the stipulated time. Demurrage charges can be approximately USD 15 000/day for a ship carrying 30 000–35 000 tonnes of cargo (approx. USD 0.5/tonne/day).¹²

In addition to constraints in port capacity, another reason why fertilizers are largely procured in shipments of 20 000 tonnes or less is to avoid the risk of price changes on the international market. Fertilizer prices are volatile and unpredictable (Figure 6). If large quantities of fertilizer are purchased at the wrong time, and the price drops, they must sell at above market retail prices to cover costs – or face losses. Also, it is better to buy small quantities more frequently in order to reduce working capital costs. The cost of working capital is very high in the United Republic of Tanzania – 20 to 22 percent per annum.

5.2. Limitations of the BPS and its likely impact on the current market

Whereas the need for the BPS is not well-founded, our analysis indicates that the disruption to the existing competitive fertilizer market could potentially be substantial as explained below.

Potential risks of the tendering process

- Tendering may introduce uncertainty in the market and push existing importers out of the market, as they lose freedom of decision-making about procurement, distribution, and pricing.

¹¹ As BPS is based on the assumption that country can save significantly if it buys in large quantities, the range 31 000 to 50 000 is taken as a possible point of comparison. The Port of Dar es Salaam does not have capacity to unload cargoes of 50 000 tonnes or more.

¹² For smaller shipments, demurrage charges could vary between USD 0.75 and USD 1.00/tonne/day.

- If the tendering process favours one or two suppliers every year, then other importers may leave the field and the market could become monopolized, as happened in Zambia. Even when tender is awarded to different importers every year, the uncertainty of not winning tender may discourage the private sector from investing in market development, e.g., dealer network, storage and bagging, market information, and agronomic advice to smallholder farmers.
- Moreover, for the bidding process, importers have to get a guarantee from global suppliers to supply the product. Given the uncertainty of winning tender, global supplier(s) may not commit to supply the product especially when the supply situation is tight in the market. Thus, in the long run, importers may lose connections with global suppliers if a bidder does not get selected a couple of times.
- A system based on a single importer has its own risk. If the importer fails to get the product on time or the product is sub-standard, then there may be fertilizer shortages in the market and they may affect food production.
- Fertilizer demand is seasonal and uncertain. Therefore, agro-dealers need freedom to make decisions about when and where to buy fertilizers and what kind. If distributors and agro-dealers must pay the importer in advance for requested quantities, they lose the freedom to adjust the quantity needed depending on weather conditions.

Risks associated with indicative pricing and penalties

- Competitive (so-called “free”) markets are efficient because of three freedoms: freedom of pricing, freedom of marketing, and freedom of entry and exit. The freedom of pricing signals entry into or exit from the market: Efficient (low-cost) suppliers enter into the market, whereas high-cost suppliers leave it. By establishing the indicative prices, the BPS removes the freedom of pricing from the equation and therefore reduces the market’s efficiency.
- Another disadvantage of indicative pricing is that the agro-dealer may not have the freedom to adjust prices depending on available stocks and market conditions. In an environment where prices are decreasing, an agro-dealer may be forced to sell carry-over stock at lower prices, even though the stock was bought at a higher price in the previous period (month or season). If the product is sold at a price higher than the indicative price, the agro-dealer may lose his or her license to sell fertilizer products. The national goal should be to increase, not decrease, the number of agro-dealers in rural areas; so that the fertilizer market has better outreach and the distance travelled by farmers to access fertilizer is reduced, as happened in Kenya.
- Access to finance is a big constraint at all levels in the supply chain, especially for smallholder farmers, agro-dealers, and distributors. The latter two groups do not have access to bank credit due to collateral requirements. They operate their businesses based on meagre personal savings, which restricts the size of business operations. BPS assumes that agro-dealers and distributors will have enough finance to pre-pay to the selected importer. Not having access to finance could compromise implementation of the BPS, unless the government provides the guarantee to the selected importer.
- As mentioned earlier, the BPS has several punitive measures about pricing and pre-payments down the supply chain. Such penalties could create disincentives and push out the agro-dealers and distributors from the market. So rather than strengthening the functioning of the market, the BPS may compromise the efficiency of the market by pushing actors to exit from the market and thereby create supply shortages.
- For the above reasons, BPS may counteract the vision and objectives of the Government of the United Republic of Tanzania to modernize and commercialize small-, medium-, and large-scale agricultural enterprises for enhanced productivity, employment creation, and increased incomes, especially in rural areas. Furthermore, as most agro-dealers in rural areas are women, the government’s stated objectives to focus development particularly on youth, women, and smallholders may be compromised.
- The private sector has developed a strong presence in regional markets (i.e., neighbouring countries). In the regulation, it is not clear that a distributor will be allowed to export surplus fertilizer products if changing weather conditions in the country reduce domestic demand. Freedom of coordinating demand in regional markets will be compromised. This will compromise one of the tenets of the Abuja Declaration on the development and integration of regional fertilizer markets (IFDC, 2007).

6. Improvements needed in the fertilizer supply chain in the United Republic of Tanzania

If the BPS is neither necessary nor desirable, then what can be done to reduce farm-level prices of fertilizers for smallholder farmers? This issue is addressed by looking at the fertilizer supply chain in the United Republic of Tanzania and other countries and identifying areas that require improvement. At this stage, identification of constraints and proposed improvements are *qualitative*. More research and field work should be done to quantify resources needed to alleviate such constraints.

6.1. Overview of the fertilizer supply chain

The efforts of the government to strengthen the fertilizer sector and provide an enabling environment for agro-dealers and importers are paying off. However, despite the successes: namely that the size of the fertilizer market has expanded significantly, and the private sector has strengthened its business capacity, regional outreach, and global linkages, the fertilizer supply chain still has key constraints that keep farm-level prices higher than normal. Key constraints that compromise the efficiency of the supply chain and keep farm-level prices higher are those related to port operations, transportation services, access to finance, depreciating exchange rate, and limited outreach of the fertilizer market in rural areas, among others.

Key components of the supply chain

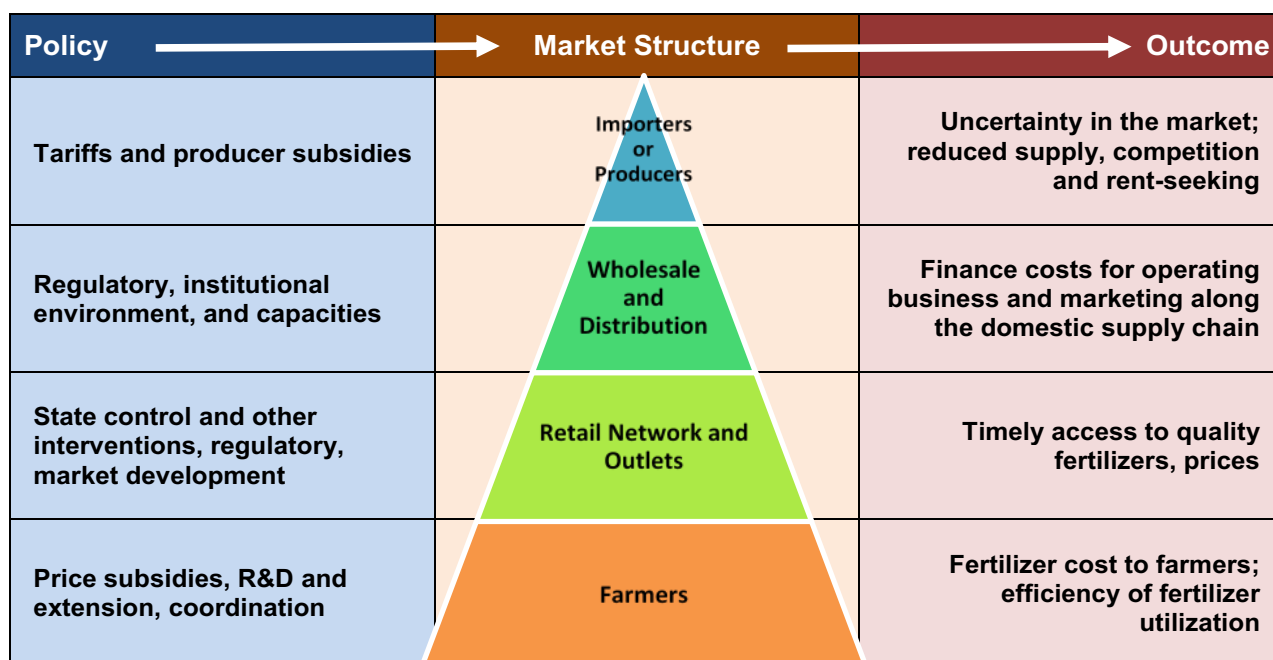
Cost components in the supply chain cover all costs from the global market to the farm level:¹³ free on board (FOB) price, shipping charges, port clearance, storage and bagging, transportation, finance, taxes, and mark-ups. A typical fertilizer supply chain is illustrated in Figure 9. It is important to note that because of capital intensity and economies of scale, the fertilizer supply chain is mostly in the shape of a pyramid, with fewer importers (and/or producers) at the top and a large number of agro-dealers at the bottom. Creating an efficient supply chain requires a supportive policy environment at every link in the supply chain, as the supply chain is as strong as the weakest link in the chain. As will be shown, the retail link is the weakest link in the United Republic of Tanzania's fertilizer supply chain, because this level faces many problems including poor quality products or underweight bags; limited access to finance, information, and market outreach; and inadequate knowledge and resources to treat soil acidity problems.

Supply chain costs can be divided into two groups: upstream costs and downstream costs. Upstream costs refer to all costs prior to the port of entry in a country. These include FOB price, insurance, and ocean freight. The sum of these three cost components is referred to as cost, insurance, and freight (CIF) price. The BPS aims to reduce these costs, although as shown earlier, there is limited scope for the BPS to improve upon the existing upstream situation, as the private sector is already realizing significant economies of scale in procurement.

Downstream costs are domestic marketing costs (DMCs) and include charges for port clearance, bagging and storage, finance, transportation, taxes, and mark-ups. It should be stressed that mark-ups are not only profit margins, especially at the retail levels, but also cover all costs that cannot be identified separately, such as rent, interest, utilities, wages and salaries, and profit margins because the fertilizer business is generally a part of a larger business that includes seed, fertilizer, crop protection products, and consumer goods such as sugar, flour, soft drinks, and other items in the store, and agro-dealers do not keep detailed records on each business item.

¹³ In a country where fertilizer products are produced domestically, the supply chain will include all costs from the factory gate to the farm gate.

Figure 9. Overview of the fertilizer supply chain



Source: Authors' own elaboration.

Cross-country comparison of cost build-up

Table 3 provides data on both upstream (CIF) and downstream (DMC) costs for three countries—Myanmar, Philippines and the United Republic of Tanzania—all coastal countries. It is interesting to note from this table that DMCs account for a much larger share of total cost in the United Republic of Tanzania (47 percent) than in Myanmar (23 percent) and the Philippines (16 percent).

The United Republic of Tanzania and Myanmar are both developing fertilizer markets, whereas the Philippines is a mature competitive fertilizer market – with an average annual consumption of 1 800 thousand tonnes (approximately six times the size of the fertilizer market in the United Republic of the United Republic of Tanzania). Because of competition and the large size market, DMCs account for a much smaller proportion in the Philippines than in the United Republic of Tanzania: In the Philippines, DMCs are only a third of what they are in the United Republic of Tanzania.

Table 3. Supply chain cost components (percent share)

Cost component	the United Republic of Tanzania 2015	Myanmar 2013	Philippines 2013
Cost, insurance and freight (CIF)	53	77	84
Domestic marketing cost (DMC)	47	23	16
Port, storage and bagging	9	7	2
Transportation	19	3	4
Finance	4	5	*
Taxes	1	0	0
Mark-up	14	8	10
Total cost	100	100	100

Note: * Included in mark-ups.

Source: Aoyama and Ariga (2016) for Tanzania, Hnin et al (2013) for Myanmar, and Briones (2013) for Philippines.

The striking difference is in infrastructure costs (port operations and transportation): In the Philippines, infrastructure costs account for 6 percent of the total cost, whereas in the United Republic of Tanzania they account for 28 percent. Non-infrastructure costs are also high in the United Republic of Tanzania—19 percent compared with 10 percent in the Philippines.

Doing business is more costly in the United Republic of Tanzania than in the Philippines. Therefore, improving the efficiency of these components can reduce farm-level prices. Reducing the cost of capital (finance) should also receive higher priority, because the cost of obtaining finance is not only high (20–25 percent) in the United Republic of Tanzania, but it is also difficult, which adds to the transaction cost by limiting the scale and scope of fertilizer business and thereby keeping fertilizer prices higher in rural areas.

There is a misperception in some domain of the government that distributors and agro-dealers are making excessive profits and keeping prices high by keeping high mark-ups. As mentioned earlier, all mark-ups are not profit margins. It would be useful to conduct a more detailed study on margins in the supply chain to clearly estimate the individual costs in order to inform on the nature of profits made at import, wholesale/distribution, and retail levels.

It is particularly difficult to do this in SSA where most small businesses do not keep detailed records of their financial accounts. It is important to note that whenever there exists a competitive market, these margins get smaller, as happened in Kenya (Sheahan *et al.*, 2016); and so encouraging increased private sector participation in such markets should be a priority.

6.2. Needed improvements

As many of the downstream operations affect the supply chain, the government should focus on improving the efficiency of the supply chain downstream, or in the domestic markets. BPS does not address these inefficiencies, so MALF should work with other governmental agencies to improve domestic marketing of fertilizers. The following improvements are needed to make the supply chain more efficient and effective.

Port operations and regulatory aspects

There are two issues dealing with port operations: cargo clearance and unloading of cargoes.

Cargo clearance

Before any cargo can be unloaded for storage and bagging, the importer has to seek clearances from the following agencies:

- Tanzania Fertilizer Regulatory Authority (TFRA).
- Tanzania Bureau of Standard (TBS).
- Radiation Commission.
- Chief Chemists (Government).
- Weights and Measures Agency (WMA).
- Surface and Marine Transport Regulatory Authority (SUMATRA).

Once the importer clears with the above institutions, then they have to deal with:

- Tanzania Revenue Authority (TRA).
- Tanzania Port Authority (TPA).
- Apart from TRA, TPA, and SUMATRA, all other regulatory requirements overlap with TFRA mandates.

Obviously, these procedures are time-consuming, delay the discharge of cargoes, and add to transaction cost. Although levies paid by importers may account for only 1 percent of the retail price of fertilizer, they cost importers around USD 12/tonne (Cameron *et al.*, 2016; Ngowi *et al.*, 2015).

Furthermore, the hassle of getting clearances from so many agencies is cumbersome, time-consuming, and result in demurrage charges. The government should consolidate all these operations and establish one centre so that cargoes can be unloaded quickly. There are overlapping mandates with various institutions which could be simplified. Creating a one-stop clearance centre, preferably with TFRA, for all clearances should be considered.¹⁴

¹⁴ The AT was informed that a request for creating One-Stop Center is pending with the Prime Minister's Office. Such a request should be expedited.

Table 4. Estimation of regulatory fee costs for fertilizer import in the United Republic of Tanzania

Assumptions		
Free on Board (FOB)	USD 438.60	63% of final price
Cost, insurance and freight (CIF)	USD 500.00	Indicative price used in AGRA and MALF (2015) calculations
Retail price	USD 600.88	37% above FOB
Estimation of charges		
Regulatory fees	USD 11.95	0.53% * FOB
Tanzania Bureau of Standards (TBS)	USD 2.32	0.2% * CIF
Tanzania Atomic Energy Commission (TAEC)	USD 1.00	per ton
Surface and Marine Transport Regulatory Authority (SUMATRA)	USD 0.25	0.2% * FOB
Weights and Measures Agency (WMA)	USD 0.88	1.5% * CIF
Railway development	USD 7.50	0.53% * FOB

Source: Cameron *et al.*, 2017.

Table 4 shows an estimation of the regulatory fee costs to importers totalling almost USD 12 per tonne. Simplification of the fee structure as proposed by AGRA (2015) and MSU/GISAIA (2016), i.e., replacing fees with a single 1.2 percent levy on CIF payable to TFRA, will cut the costs in half to about USD 6 per tonne; though the real cost savings will be found in time saved through reduced administrative procedures.

TFRA is also responsible for the issue of business licenses. To sell fertilizers, an agro-dealer has to obtain a business license from TFRA as a fertilizer dealer and also obtain a trading license from local authorities for business premises. These licenses are valid for a year and have to be renewed annually. The licensing process with the TFRA and local authorities may take up to a maximum period of two months. These procedures could also be simplified as is done in other countries by issuing licenses for a longer period and allowing automatic renewals (World Bank, 2017).

Port discharges

- Berths available at the DSM Port have following discharge capacities:
- Berth 1–4: smaller vessels carrying 10 000 tonnes or less.
- Berth 5–6: cargo of up to 20 000 tonnes.
- Berth 7: cargo of maximum 40 000 tonnes.
- Berth 8–11: for unloading containers.

Obviously, any large cargo of over 30 000 tonnes has to use Berth #7, which is in excess demand from large cargoes of grain and other commodities and not easily available for fertilizer ships. Not having an easy access to berthing naturally discourages importers from importing large shipments.

Suggested measures

- Explore the possibility of allowing “priority discharge” for large fertilizer shipments that require Berth #7, as this was found to be the major source of costs savings for petroleum ships under the Petro Model.
- Conduct a feasibility study on how to improve drafts of one or two other berths so that large shipments can be unloaded on other berths as well.
- Create “One-Stop Clearance Centre” for getting cargo clearance.

- Establish a clear division of labour between TBS and TFRA. TBS should continue to handle pre-shipment inspections upstream, whereas TFRA should focus on quality inspection at the retail level.
- During the last three years, TBS did not discover any cargo having adulterated or fake fertilizer products. Since well-known pre-shipment agencies check the cargoes loaded for exports and ensure that product is consistent with specifications, inspection by TBS and other agencies should be minimal. While adulteration happens at the retail level in the country, TFRA's capacity to conduct inspections at the retail level should be strengthened.

Transportation

Currently, road transportation is the main source of transporting fertilizer products across the country. Railways are much cheaper but not dependable. The efficiency of the railway system should be improved to move fertilizers in bulk through covered wagons and block trains. This will help in moving bagging operations from the DSM port to regional consumption centres.

A move from road/trucking to railways will generate significantly more savings than the BPS. One company reported that moving fertilizers by railway to Tabora can save approximately USD 20-30/tonne. If the efficiency of TAZARA Railway can be improved, it can move fertilizers to Southern Highlands—the breadbasket of the United Republic of Tanzania—more efficiently and promote the development of multi-country markets with Mbeya as a hub for the Malawi, United Republic of Tanzania and Zambia.

Finance

Access to finance is highly restricted for actors in the supply chain, namely agro-dealers, distributors, and small importers. As importers and distributors generally do not sell on credit, agro-dealers have to rely on their personal savings to run a business. Major constraints are collateral requirements by the commercial banks. MALF should work with financial institutions to explore innovative ways to handle collateral requirements. Partial government guarantee may be one such option. Using fertilizer as commodity collateral may be another (IFDC, 2005). Commercial banks should become more innovative in this domain.

6.3. Impact of exchange rate depreciation

Unlike the real (inflation adjusted) prices in Figure 6, here the impact of changes in exchange rate is estimated on the nominal prices for three reasons. First, as many smallholders are not producing for the market, they do not benefit from increased crop prices (due to inflation).

Second, increased nominal prices have financial implications for small agro-dealers, increasing their requirement for finance. Third, there is a lag in increase in fertilizer price (at the beginning of the season) and increased crop prices at the end of season. This lag could be 4–6 months depending on the crop cycle- requiring seasonal credit. Therefore, if the currency is depreciating regularly throughout the year, smallholder farmers and agro-dealers cannot catch up.

Table 5 provides data on the impact of changes in exchange rate (defined here as the value of USD in local currency) on fertilizer price in China and the United Republic of Tanzania. Exchange rate/value of USD (increased from TSh 800 in 2000 to TSh 1 991 in 2015 – 2.5-fold increase in the United Republic of Tanzania).

Table 5. Impact of exchange rate on Urea price, 2000–2017

Year	Global Free on Board price (USD /tonne)	The United Republic of Tanzania exchange rate (TSh/USD)	Urea rice (TSh/bag)	China exchange rate (yuan/USD)	Urea price (yuan/bag)
2000	200	800	8 000	8.28	82.8
2003	200	1 064	10 640	8.28	82.8
2005	200	1 166	11 660	8.19	81.9
2010	200	1 409	14 090	6.77	67.7
2015	200	1 991	19 910	6.77	67.7
2017 (February)	200	2 200	22 000	6.87	68.7
% change (2015/2000)	0	149	149	-18%	-18%
% change (2017/2015)	0	10.5	10.5	1.5	1.5

Source: Authors' calculation based on data from IMF and Exchange Rate web.

In contrast, the value of USD decreased from Yuan 8.28 in 2000 to Yuan 6.27 in 2015 in China. The FOB price of urea in the global market is assumed to be constant at USD 200/tonne to gauge the impact of exchange rate variation on urea price in the local market (in local currency). Because of the depreciation of the Tanzanian shilling, even though the price of urea was constant in the global market, farmers in the United Republic of Tanzania were paying 149 percent more for a bag of urea in 2015 than what they were paying in 2000 (8 000 TSh/bag vs. 19 910 TSh/bag).

In China, farmers were paying 18 percent less during the same period because of appreciation of the local currency. Even during 2015 and 2017, the price of urea has increased seven times more in the United Republic of Tanzania than in China, all due to depreciation of Tanzanian shilling. Increase money supply by the Central Bank increases exchange rate.¹⁵

Increasing the value of the dollar in Tanzanian shilling affects all other costs, such as freight and insurance, port operations, and transport costs, which are affected by exchange rate fluctuations, and therefore, local prices increase more even when global prices are stable.

The purpose of this exercise is to show that local fertilizer prices can increase, not because fertilizer importers and agro-dealers are earning excessive margins but simply because the value of USD is increasing in local currency. Fertilizer being a traded (imported) commodity, its price increases in direct, if not more, proportion of increase in the value of dollar in local currency. Thus, exchange rate stabilization is critical to stabilize fertilizer prices in the country and promote growth in fertilizer consumption. Had the exchange rate stabilized at the 2003 level, approximately at 1 000 TSh/USD, urea prices would have been 50 percent to 55 percent lower in 2017; thereby relegating the need for fertilizer subsidies. Of course, more nuanced calculations would be needed, but qualitatively, the message is clear. Any future research must look this aspect more carefully.

¹⁵ In November 2020, exchange rate was TSh 2320 to USD.

Policy stability

Like exchange rate stability, stability and conduciveness of fertilizer policy is essential to promote growth in fertilizer use and supply. Since 2000, fertilizer policy has passed through three phases: Phase I: 2000 to 2003: Free market policy, no subsidy; Phase II: 2003 to 2007: Transport subsidy (up to district headquarters); and Phase III: 2008 to 2013: 50 percent price support through vouchers.

During the last phase, the United Republic of Tanzania had the most market-friendly and farmer-friendly fertilizer policy in sub-Saharan Africa (Wanzala *et al.*, 2013) and reaped significant benefits in terms of increased maize production and fertilizer use.

However, after 2013, fertilizer policy has changed in an ad hoc manner. After the removal of voucher support, the government tried to introduce a seasonal credit subsidy (at 4% interest rate for agriculture vs. 15 percent to 20 percent commercial interest rate) but the scheme was not successful as the government could not provide guarantee funds to the National Microfinance Bank (NMB); therefore, the NMB did not want to lend funds on subsidized interest rate to farmers so the credit scheme never got off the ground. After a gap of a year or two, the subsidy was re-introduced in 2016–2017 at a reduced scale (30 percent vs. 50 percent earlier) to a limited number of farmers (300 000). The total quantity under subsidy was 30,000 tonnes and funds allocated were TSh 20 billion, as against TSh 70–80 billion in the past (Mather and Ndyetabula, 2016).

Admittedly, there were leakages and misuse of vouchers in the implementation of the NAIVS (World Bank, 2014), but the scheme made a significant contribution to fertilizer use and maize production, as well as technology profile to 2.5 million smallholder farmers who did not use improved seed and mineral fertilizer during the previous five years. Unfortunately, owing to declining contributions to Agriculture from the National Budget, and reduced donor support, the support for the voucher scheme was reduced significantly. The government should have developed a scheme to phase it out gradually.

The introduction of the BPS regulation has introduced additional uncertainty in the market as importers are not sure of the government's future plans and signals from the market indicate that importers therefore holding back on ordering.¹⁶ Under the new BPS regulation, it is forbidden to import fertilizer outside the system.

Other improvements

- Establish market monitoring and information system for agricultural products, including fertilizers, potentially through the Management Information System for Agriculture (MISA).
- Strengthen the development of agro-dealer networks in rural areas so that the distance travelled by farmers is reduced.
- Strengthen the technical capacity of existing agro-dealers so that they can relay extension messages to farmers.
- Create demand for fertilizer by improving farmer knowledge and promoting the Hub-Spoke Models for aggregating produce purchases (like Mtenda is doing for rice in Mbeya) and supply inputs on seasonal credit or provide bank guarantee for input purchases.
- In areas where soil acidity compromises the efficiency of applied fertilizers, farmers should be educated about soil amendments and lime treatments. Integrated nutrient management and appropriate fertilizer recommendations should also be promoted.
- In summary, promote competition, information, agro-dealer networks, and enforcement of regulatory frameworks to improve efficiency of the supply chain to supply fertilizers at cost-effective prices and in timely manner to all farmers.

¹⁶ Discussion with importers.

7. Conclusions and recommendations

The availability of affordable mineral fertilizers is an essential condition to increase the agricultural productivity of smallholder farmers in the United Republic of Tanzania. This report recognizes the significant progress the United Republic of Tanzania has made in this area: In the last two decades, fertilizer consumption has increased, and yields have gone up. The fertilizer market is more efficient and competitive. Private companies have developed linkages in the international and regional markets, resulting in a stable supply.

This report also acknowledges the government's continued awareness of the importance of a stable supply of high-quality and affordable fertilizers to raise agricultural productivity, boost small farmers' incomes, and reduce food insecurity. The authors applaud the efforts of the Government of the United Republic of Tanzania to find policy solutions that increase the efficiency of the fertilizer market and that will reduce prices for farmers, such as the recently adopted regulatory reforms of registration and field-testing requirements for new fertilizer products.

Based on the in-depth assessment of the fertilizer market in the United Republic of Tanzania, carried out through reviews of data and documentary evidence as well as through interviews with over 100 sector stakeholders, this report makes recommendations in three categories, namely: (1) on the feasibility of the bulk procurement system and its impact on fertilizer market; (2) on the implementation of the bulk procurement system, in case the Government of Tanzania will implement it, and (3) on other aspects of the supply chain that could be enhanced through government policy or investment.

Recommendations on the overall impact of the bulk procurement system

The proposed fertilizer BPS is unlikely to achieve the intended effect of reducing fertilizer prices for farmers. In addition, the disruption to the existing marketing system caused by the BPS and the proposed indicative price system could be substantial, ultimately compromising the freedom of decision-making, competition, and innovation in the marketplace. Most stakeholders in the private sector (both large and small enterprises), financial institutions, and development partners did not see the need for the BPS. Rather, they stressed the need to remove constraints in the supply chain.

- The main conclusion of this report is that the proposed system for bulk procurement of fertilizer is unlikely to achieve the intended effects of significant fertilizer price reductions for farmers and compensate for the increase in prices resulting from subsidy removal. Therefore, it is advised that the implementation of the BPS is postponed until further notice, investigation, and consultation of stakeholders.
- Rather than an indicative pricing mechanism, government should implement a fertilizer market monitoring and information system (FMMIS) (e.g., through the existing MISA) as a tool for monitoring district-level fertilizer retail prices. Such a system would help identify markets where fertilizer shortages or limited competition or collusive practices are resulting in relatively higher prices and require remedial measures.

Recommendations on the implementation of the BPS – a pilot project

However, if the Government of the United Republic of Tanzania chooses to continue the implementation of the bulk procurement system as laid down in the Bulk Procurement Regulation, the authors advise as follows:

- Implement a pilot of the bulk procurement system with one or two products, such as calcium ammonium nitrate (CAN) and NPK15-15-15 (or NPK 17-17-17). Both are nitrate-based fertilizer products and suitable for topdressing and basal applications, respectively, for a large range of crops. This pilot should be for limited duration, not more than one year.
- The government should consider selecting two importers to minimize the risk of shortages in the market should one importer's products be delayed or contaminated. Such a move will also keep the supply chain competitive.
- Indicative prices should not be enforced during the pilot phase, so that realistic estimates of savings through BPS can be derived and further necessary action taken if needed.
- The pilot effort should be evaluated by independent experts, who will consult with government representatives and private sector stakeholders, in order to comprehensively assess the impact of the bulk procurement system test-run on different actors and the functioning of the supply chain in general. Additionally, such an evaluation will allow the

government to identify challenges in the implementation of the Bulk Procurement Guidelines, for example, regarding the tender procedures, pre-financing requirements, and logistical modalities.

- Establish mechanisms for independent oversight and complaints management of the tender procedures and contracts enforcement of the bulk procurement system.

Recommendations beyond the bulk procurement system

As mentioned above, the assessment indicates that the bulk procurement system is unlikely to result in significant reductions of fertilizer prices at the retail level. Therefore, the authors have aimed to identify alternative policy reform options that could increase the efficiency of the fertilizer supply chain and could contribute to significantly lower fertilizer prices. To enhance the efficiency of the fertilizer supply chain, the Government of the United Republic of Tanzania is advised to adopt and implement the following short- and medium-term measures detailed below.

In the short term

- Explore the possibility of allowing priority discharge for vessels carrying 25 000 tonnes or more to encourage bulk procurement and shipping by eliminating the risk associated with requiring Berth #7 at the Port of Dar es Salaam. Importers, in return, would guarantee discharge within seven days so as not to hold up other vessels, and additionally save on shipping costs.
- Accelerate the implementation of the “One-Stop Clearance Centre” for importers to obtain all necessary permits and clearances for unloading cargoes in the shortest possible timeframe. This should be accompanied by a reduction in on-vessel quality inspections and an intensification of quality inspections at the retail level.
- Create a stable and conducive policy environment for the development of the fertilizer market. Any changes in policy should be announced at least six months in advance so that fertilizer importers and dealers can incorporate those changes in their business planning and operations.
- Conduct a detailed study to clearly estimate the individual costs that compose margins in the fertilizer supply chain in order to inform on the nature of profits made at import, distribution, and retail levels.
- Explore and assess different fertilizer delivery models, including tripartite agreements between financial institutions, farmers, and processors in order to facilitate financing for inputs – according to many stakeholders, the key constraint in the United Republic of Tanzania.

In the medium term

- Commission a feasibility study of improving the draft of one or two additional berths in the Port of Dar es Salaam to increase discharge capacity for larger ships. This would reduce delays in offloading fertilizer and avoid demurrage costs.
- Develop innovative ways – for example through partial government-backed guarantees – to handle collateral requirements to increase access to finance for agro-dealers, distributors, and small importers of fertilizers.
- Increase funding to Tanzania-Zambia Railway Authority (TAZARA) and Tanzania Railway Corporation (TRC) to increase the efficiency, reliability, and capacity of the railway networks, and transport fertilizers from the Port of Dar es Salaam to the main consumption areas at a significantly lower cost.
- Implement a training programme for agro-dealers to strengthen their capacity and outreach in delivering agricultural extension services to farmers.

It is acknowledged that the majority of recommendations are not quick-fix solutions that will immediately offer the same kind of reductions in farm-gate fertilizer prices offered by subsidies or envisioned in the proposed Bulk Procurement System. However, if addressed, the sector will continue to expand and become increasingly competitive to the benefit of farmers and food security for all Tanzanians.

Finally, an enabling policy environment, infrastructure improvements, and exchange rate stabilization will be fundamental in the effort to ensure the lowest possible fertilizer prices for farmers and enhanced food security for the country.

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Annex

Table A1. Penalties for the breach of bulk procurement system

Offence	Penalty	Additional penalty
Delay to open LC or to make pre-payment	USD 0.5 per metric tonne.	Not to be allowed to participate in tenders until when the product paid for and all penalties have been paid. Pay demurrage resulting from failure to open LC.
Fertilizer dealer failure to make arrangement to receive the ordered quantity including payment of wharfage	USD 0.5 per metric tonne.	Pay all cost associated with failure to make arrangement to receive/ordered quantity such as demurrage.
Fertilizer dealer refusal to take part in day to business of the authority	Three million Tanzanian shillings and one million for each day of continuity of breach.	
Failure to make arrangement to receive the ordered quantity	Five million Tanzanian shillings and one million for each day of continuity breach.	Pay demurrage resulting from failure to receive the ordered quantity.
Importer acts which endangers the security of supply such as late delivery	USD 0.5 per metric tonne per day.	Pay demurrage resulting from cascading effect. Invoke the Performance Bond as per the terms and conditions of the contract.
Importer bring off specification product	One-hundred million Tanzanian shillings.	Invoke the Performance Bond as per the terms and conditions of the contract. Pay penalties as per the shipping and supply contract. Being blacklisted.
Conducting malpractice(s) when receiving fertilizer from the delivery vessel	Fifty million Tanzanian shillings.	Suspended to participate in the subsequent Bulk Procurement System tenders.
Contaminating fertilizer after being confirmed that the fertilizer conform to the approved specifications	Fifty million Tanzanian shillings.	As stipulated in the shipping and supply contract. Invoke the bank guarantee or performance bond. Pay all cost associated with evacuation of contaminated product.

Sources: Government of the United Republic of Tanzania (2017) Second Schedule and TFRA.

MONITORING AND ANALYSING FOOD AND AGRICULTURAL POLICIES [MAFAP]

The Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme seeks to establish country owned and sustainable systems to monitor, analyse, and reform food and agricultural policies to enable more effective, efficient and inclusive policy frameworks in a growing number of developing and emerging economies.

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