Options for reducing fertilizer prices for smallholder farmers in Tanzania

POLICY REPORT
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Executive summary

For nearly a decade, the Government of Tanzania has supported smallholder farmers to acquire seeds and fertilizers at reduced cost through its National Agricultural Input Voucher Scheme (NAIVS). Due to funding constraints and programme inefficiencies, funding to 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 inputs—most notably inorganic fertilizers—through alternative policy measures and/or through improvements in procurement and delivery efficiency and cost-saving regulatory reforms.

In March 2016, the Ministry of Agriculture, Livestock and Fisheries (MALF) of Tanzania requested the Monitoring and Analyzing Food and Agricultural Policies (MAFAP) programme of 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, also in the absence of subsidies. Preliminary findings were presented to senior MALF officials at a workshop in May 2016. This final report incorporates recommendations from that workshop.

Some of the policy options considered in this report have previously been proposed and/or analyzed by national and international institutions and research organizations, including FAO/MAFAP. As such the policy reform proposals in this report are a combination of recommendations flowing from original analysis and a synthesis of relevant recommendations from earlier works. We present policy reform options under seven main “themes” or areas of investigation:

- Reduce import costs;
- Reduce port inefficiencies, charges and taxes;
- Enhance domestic storage and transport infrastructure;
- Strengthen agro-dealer and contract farming;
- Increase on-farm fertilizer use;
- Increase domestic fertilizer production;
- Fertilizers regulations.

Where possible, the options have been assessed against their potential impact on input cost reduction; the implications for the government budget, mostly in qualitative terms; and the time and coordination required for their implementation. Based on this assessment, the report recommends that the Government of Tanzania considers a balanced package of options to address the aspects currently undermining the effectiveness and efficiency of the fertilizer sector with a view to increase access to and reduce the retail price of fertilizer for smallholder farmers. Importantly, 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. For this reason a gradual phasing out of farm-level fertilizer subsidies is recommended alongside the aggressive adoption of efficiency-enhancing measures in the supply chain. Moreover, those policy options that offer more immediate benefits to farmers are not budget-neutral; hence, if budget constraints are a reason for the removal of the current subsidy programme then these ‘quick fix’ policy options may also not be viable alternatives.

In order to reduce import costs, port inefficiencies, charges and taxes (see sections 3.1 and 3.2 of the report), our analysis supports two main recommendations: to streamline taxation and improve procurement modalities. To streamline and ultimately reduce taxation, the report supports notion of the creation of a single statutory fertilizer import levy of 1.2 percent on the CIF price, payable to the Tanzania Fertilizer Regulatory Authority (TFRA), and the simultaneous abolishment of the plethora of statutory levies payable to other authorities and agencies. This will reduce administrative procedures and fertilizer prices with immediate effect. The government or an external expert should assess the changes to regulations required to implement this measure.

Improving procurement modalities through public-private partnership (PPP) presents an option for reducing fertilizer import prices and port handling charges, although the particular approach to implementing such procurement
modalities requires additional analysis. Broadly, a three-pronged approach is proposed, involving: (a) regular roundtable discussions between fertilizer importers, the TFRA, MALF and the Ministry of Industry, Trade, and Investment (MITI) to improve procurement processes, and to find the right balance between spreading procurement periods to reduce port congestion and exploiting opportunities for bulk procurement and economies of scale; (b) PPPs to support the development of a package of financial instruments including release of letters of credit for commercial loans to help operators pool orders and arrange joint handling and storage; and (c) support (partial or total) to additional storage costs linked to the change in the current procurement time frame through subsidized credit interest rates, for example.

Enhancing storage and transport infrastructure by improving and utilizing rail networks was not considered the most cost effective measure to reduce fertilizer prices in the short term since using railway is estimated to reduce the retail price of fertilizer by 1 to 5 percent, while the high budgetary cost and the required level of coordination among ministries and other stakeholders means that the return on investments could take several years to pay off. However, improving railway infrastructure and services will be essential to overall long-term development of the country and should be evaluated as such.

Strengthening the agro-dealer network is a generally accepted and very well supported recommendation as this will improve accessibility of fertilizer and ensure lower prices through increased competition and information. The precise modalities for achieving this may vary by country context, but ensuring a predictable enabling environment for private sector development is the foundation of a vibrant fertilizer market. Expanding contract farming is also likely to yield positive results by providing input credit and reliable output market to farmers. However, further research is recommended on: (a) the basic conditions leading to a suitable development of an agro-dealer network; and (b) examining potential models for such arrangements between farmers, crop buyers, and financial institutions.

Farmers’ decisions about input use are determined not only by the price or access to fertilizer, but by the profitability of the use of that input generally. An important determinant of profitability is the expected price of the output produced. Trade restrictions and price controls can reduce farm-level profits and make investments in fertilizer more risky. Therefore, to increase fertilizer use, MAFAP recommends that output market distortions be addressed as a top priority to improve market functioning. As a starting point, a list of potentially distortionary government interventions in key commodity markets can be compiled, and each of these can be assessed and categorized according to their effects on domestic prices.

Tanzania has the potential to produce tailor-made fertilizer blends domestically, given domestically available phosphate rock and natural gas suitable for urea and ammonia fertilizer production. However, indications are that the government would likely need to subsidize the price of natural gas to make fertilizer production profitable. Further analysis is needed to weigh up the cost of domestic production, including possible subsidization of natural gas, against the cost of imported fertilizer, and taking into account the potential value-addition from having access to a broader range of specialized fertilizer products.

Several regulatory reforms to the 2011 Fertilizer Regulations have been proposed in the literature. MAFAP supports the proposal to reduce registration and licensing requirements. A simplified registration and licensing process would allow for new fertilizer providers to enter the market and should increase the availability of innovative and tailored blending products. The proposal to announce an annual indicative price of fertilizer however, is strongly cautioned against in this report. An alternative proposal is to implement a fertilizer market monitoring and information system that would announce market information on prices of fertilizer at the border, wholesale, and agro-dealer level in all districts. This will facilitate improved price transmission along the fertilizer supply chain and reduce potential exploitation of farmers. In addition, the institutionalization of a fertilizer supply chain monitoring system to analyze information at the end of each marketing season could identify areas where farmers were exploited or underserved and where the government could then consider intervening.

Finally, MAFAP recommends that the Government of Tanzania develops a medium-term fertilizer strategy that takes into account the following aspects:
a) Policy trade-offs around support to inputs: for example, large-scale public investments in infrastructure divert spending away from policies with more immediate impacts; or policies that promote fertilizer use or bulky procurement may worsen port congestion.

b) Implications of a policy shift away from farm-level subsidies towards introducing cost-saving measures higher up the fertilizer supply chain: a well-functioning supply chain is required to ensure effective price transmission; if this is absent, farm-level price subsidies may be more effective than measures that lower costs at the point of importation or wholesale distribution.

c) Even when price savings are passed on to farmers, policymakers need to understand how price changes will affect fertilizer demand, and whether there are other potentially more important constraints to fertilizer demand that should be addressed as a first priority (e.g. weak output markets; resource constraints; low returns to fertilizer use).

d) Ensure policies are complementary and avoid inconsistencies between input and output market policies; in general, a more holistic and sustainable approach to promoting fertilizer use should be adopted that considers supply and demand-side (or farm-level) aspects in both input and output markets.
1. Introduction

From 2007/08 to 2014/15, Tanzania supported farmers annually through the National Agricultural Input Voucher Scheme (NAIVS), which subsidized half the cost of seed and fertilizer inputs; sufficient for cultivating 0.4 hectares of land (World Bank, 2014). The size of the programme varied significantly from year-to-year depending on funding, with the number of beneficiaries ranging from 700 000 in 2008/09 and 2014/15 to over two million in 2010/11 (Msolla, 2016). In contrast to large-scale subsidy programmes elsewhere in the region, NAIVS has been commended for effectively targeting farmers that would not otherwise have purchased modern inputs (MSU, 2016). However, at the same time only around one-third of beneficiaries continued to purchase fertilizer inputs after graduating from NAIVS programme, thus bringing into question the sustainability of the programme (World Bank 2014). Similar to subsidy programmes in other countries, NAIVS has faced multiple implementation, logistical and funding challenges. In general, budget allocations to the Ministry of Agriculture, Livestock and Fisheries (MALF) have declined, from around ten percent in 2007/08 to seven percent in by 2013/14 (MAFAP, 2016). Furthermore, external funding for NAIVS from development partners gradually declined over the implementation period and was finally terminated in 2014/15. Funding constraints have therefore severely limited the government’s ability to continue implementing the programme in its current format.

In the face of these budget constraints and sustainability concerns, the Government of Tanzania is now seeking to implement alternative measures to reduce the cost of inputs for agricultural producers. This report is a response to a request from the Ministry of Agriculture, Livestock and Fisheries (MALF) of Tanzania, through the Directorate of Policy and Planning, to identify, analyze and recommend potential policy options to achieve increased access to inputs for farmers in Tanzania. In general, policies aimed at increasing fertilizer use with a view to raise agricultural productivity can adopt a number approaches. First, they can be geared towards lowering the price of fertilizer at the farm-gate level, either directly through price subsidies or removal of statutory fees and taxes, or indirectly through introducing efficiency-enhancing measures in the supply chain; second, they can focus on raising the efficiency of fertilizer use as measured by the nitrogen-grain response rate at the farm-level, which would increase profitability of fertilizer use and hence demand; and third, they can improve access to or strengthen output markets so as to create incentives for commercially-oriented farmers to invest in modern inputs. The analysis in this note focuses largely on the first issue, namely input prices, and specifically the price of inorganic fertilizer. Fertilizer, on average, accounts for around 70 percent of the cost of all crop inputs in Tanzania (Wilson and Lewis, 2015). Even when labor is included, fertilizer still accounts for over one-third of the total cost of production, making it the single largest cost component. Reducing fertilizer prices is therefore an effective way of lowering the overall cost of production.

Given the extensive research that has been carried out on input policies in Tanzania over the last few years, this report primarily draws on the ideas and analyses of other organizations such as Michigan State University (MSU), the Alliance for a Green Revolution in Africa (AGRA), the International Food Policy Research Institute (IFPRI), the International Fertilizer Development Center (IFDC) and MSU’s Guiding Investments in Sustainable Agricultural Intensification (GISAIA) programme. The report seeks to summarize policy options proposed by partners and, where possible, explain the potential costs and benefits of each option. Finally, it provides recommendations on the options that merit further consideration by the Government of Tanzania.
2. Context and background

2.1. Agriculture in Tanzania

Around 85 percent of Tanzania’s arable land is cultivated by smallholders with plots ranging from 0.2 to 2 hectares (ha) (IFDC, 2012). As part of the country’s commitment to accelerate agricultural growth, the Tanzania Agriculture and Food Security Investment Plan (TAFSIP) prioritizes various food and cash crops for which ambitious expansion targets have been set for 2010–2020 (United Republic of Tanzania, 2011). The priority food crops, which include cassava, maize, rice and soya, account for just over half of all cropland in Tanzania, while only around 13 percent of land is allocated to priority cash crops such as cashew, coffee, sugarcane, and sunflower (IFDC, 2012).

Already before the implementation of TAFSIP, during 2000–2010, agricultural output expanded steadily; for example, production of maize, Tanzania’s main staple crop, more than doubled over that period. Since 2010, maize production has expanded further from around five million tonnes to over 6.5 million tonnes in 2013/14 (MALF, 2015). However, the concerning factor is that output growth has been driven largely by land expansion while yields have remained low, averaging around 1.0-1.5 tonnes per ha. Benson et al. (2013) ascribe this trend to the abundance of uncultivated arable land, which makes it less costly to cultivate new land than investing in high-yielding technologies. In general, Tanzania’s maize yield levels and performance over time are disappointing considering what the IFDC (2012) believes is a potential maize yield of 5.1 tonnes per ha. In fact, food crop yields on average are thought to be 20-30 percent below their potential in Tanzania.

Low adoption rates for inorganic fertilizer and high-yielding seed varieties are considered a major determining factor of low yields in Tanzania. AGRA (2015) reports that fertilizer use is only around 7-9kg per ha in Tanzania, compared to an average of 16kg per ha in sub-Saharan Africa. Benson et al. (2013) however, arrive at an estimate of 26kg per ha arable land, which would actually put Tanzania at the median in the region as far as fertilizer is concerned. This is less than Kenya and Malawi but considerably more than Uganda and Mozambique and is far less than the African Union’s Abuja Declaration commitment to raising average fertilizer use to 50kg per ha. The fact that very few farmers use fertilizer in Tanzania — one-in-ten by some estimates (see Benson et al., 2013; AGRA, 2015) — provides significant scope for expanding the use of fertilizer. The NAIVS exploited this fact by providing fertilizer access to farmers that did not previously purchase it. By 2010/11 the programme provided 151 000 tonnes (57 percent) of the total quantity of fertilizer used in Tanzania (263 000 tonnes). Total fertilizer use expanded steadily to 344 000 tonnes by 2013/14 alongside the increase in maize output (Msolla, 2015), but this is still well below the more than 500 000 tonnes considered necessary to achieve the TAFSIP maize yield targets (IFDC, 2012).

In considering policy options for reducing fertilizer costs and/or further expanding fertilizer use, two factors are pertinent. First, given the large contribution of NAIVS to overall fertilizer supplied in Tanzania, the programme’s abrupt discontinuation will likely have a significant impact on average fertilizer prices and overall fertilizer use. This will demand alternative interventions to ensure continued affordability and availability of fertilizer at the farm gate level, many of which will not have immediate impacts. For this reason a gradual phasing out of NAIVS should be considered.

Second, as we elaborate on later in this report, the fertilizer supply chain is already constrained in terms of physical, human and institutional capacity. Port congestion, a stretched truck fleet, dilapidated roads, and limited rural storage contribute to high fertilizer trade and transport margins (“access costs”) (see MAFAP, 2016; IFDC, 2012). Should policy measures be successful in raising fertilizer volumes, access costs may rise further if capacity constraints are not addressed, thus ultimately negating other policy measures designed to reduce fertilizer costs. Therefore, as much as government action can influence prices (e.g., through changes in regulations or taxes), government inaction in terms of a failure to invest in public goods and infrastructure that reduce costs or risks can also affect fertilizer prices (Benson et al., 2013).
2.2. Fertilizer supply modalities and cost build-up

From the 1960s through to the 1990s, the Tanzanian Government oversaw fertilizer imports. However, in 1994 under Tanzania’s structural adjustment programme, the market opened up to private sector firms, several of which remain operational to this day (Benson et al., 2012). From these distribution points, fertilizer is supplied via one of three distinct supply chains that serve different types of farmers (Figure 1). The first is the fully privatized section of the market where fertilizer is sold to farmers via wholesalers and/or agro-dealers (retailers) at commercial retail prices. The second supply chain represents that of fertilizer supplied to farmers that are beneficiaries of subsidy programmes such as NAIVS. As such, this supply chain may fall away if NAIVS is officially abolished. Essentially the supply chain is the same as the first, with wholesalers and/or agro-dealers supplying fertilizer to farmers, but since beneficiaries can redeem their vouchers, the price paid is below the full commercial price. Farmers therefore pay the agro-dealers the difference between the face value of the voucher and the market price, while the agro-dealers in turn redeem the vouchers at an intermediary bank acting on behalf of the government.

Figure 1. Tanzania’s fertilizer supply chain

Source: Adapted from IFDC (2012)

A third chain involves out-grower schemes where the buyers of crops (e.g. farmers’ organizations or companies) produced by contracted farmers obtain fertilizer directly from importers and supply this to their contracted farmers. Usually, fertilizer supply is embedded in the contract and the cost of the fertilizer is recovered by buyers at the time of sale of the produce. The focus in our analysis is mostly on the first value chain, although cost reductions at the import level will also benefit out-grower schemes, possibly resulting in increased demand.

The IFDC (2012) fertilizer cost build-up for Tanzania confirms estimates by others (e.g. Bumb, 2009; Thapa, 2012) that the fertilizer retail price in Tanzania is 30-40 percent above the FOB price (Figure 2). Ocean freight contributes 7-9 percent to the cost, and finance and insurance 5-6 percent. Port charges amount to around 7 percent, which is considered well above the international norm. Included in these charges are a variety of taxes on services rendered, but importantly, Tanzania does not currently charge VAT or import duties on fertilizer itself (AGRA, 2015). Bagging adds a further 3 percent, while domestic transport costs contribute 7-10 percent. Finally, gross margins are estimated at 6-7 percent of the final retail price of fertilizer.
Port inefficiencies are highlighted by many as a major constraint in the fertilizer supply chain (see IFDC, 2012; AGRA, 2015; Benson et al., 2013). There is a 7-10 day delay before vessels can berth, and although the port has a discharge capacity of 2,000 tonnes per hour, the actual rate achieved is often half that. Furthermore, the port has inadequate bagging equipment, while congestion within the port perimeter causes further delays. For a standard 15,000 ton vessel, approximately 1,000 trucks are required to shift fertilizer from the port to on-site storage facilities. The process is repeated again when fertilizer is moved from port storage facilities to regional distribution warehouses. Congestion is aggravated by the fact that many importers bring in their consignments as close as possible to the start of the planting season. This is done in an attempt to save on storage costs which would increase if fertilizer is imported too far ahead of the planting season.

While many of these inefficiencies and constraints can be addressed with manageable efforts, there are some physical constraints that are harder to overcome. The Dar es Salaam port can only accommodate smaller vessels (30,000 tons max) which means ocean freight costs are higher per tonne. Also, given Tanzania’s limited export base, there are few backhaul opportunities, meaning importers incur additional costs to compensate shipping companies for leaving the port with empty vessels. IFDC (2012) estimates that ocean freight and port inefficiencies add approximately US$200 per tonne to the FOB price.

One shortcoming of the IFDC (2012) cost build-up analysis is that it does not adequately account for the significant regional differences in fertilizer prices observed in Tanzania. Regional differences are mainly a result of transport cost differentials, which reflect differences in: transport distances from port to regional warehouses or retail markets; road conditions, which affect transport time and truck maintenance costs, and; (potentially) average fertilizer use in a region, which affects the economies of scale of fertilizer distribution. Benson et al. (2013) show that road transport costs are almost two-and-a-half times more per kilometer per metric ton to some destinations (e.g. Dar es Salaam to Mwanza) as compared to road transport costs on major trunk roads (e.g. Dar es Salaam to Dodoma). To put this into perspective, compared to the fertilizer price at port, transport costs would add between US$10-25 per tonne (or 2-5 percent of the final price) for every 100 km travelled. Mbeya in the Southern Highlands and Tobora, which respectively account for 42 and 17 percent of fertilizer demand in Tanzania, are both over 800km from Dar es Salaam. Ocean freight charges range from US$5 per tonne from South Africa to US$35 per tonne from the USA (see IFDC, 2012), which explains why ocean freight charges add about the same amount as domestic freight charges to the final price of fertilizer (see Figure 2).

Price data confirms significant regional variation; for example, AMITSA (2007) data shows that the price spread
for CAN is about 18 percent, while the range of urea prices is 67 percent. Analysis by Ngowi (2014) confirms significant regional variation, with ranges exceeding those reported above.

3. Evaluation of fertilizer price-reduction options

Content. Various researchers and institutions have put forward a variety of proposals and recommendations for reducing fertilizer costs directly or indirectly. We group these into a number of categories according to their potential impact on the value chain (sections 3.1 to 3.4):

- Reduce import costs;
- Reduce port inefficiencies, charges and taxes;
- Enhance domestic storage and transport infrastructure;
- Strengthen agro-dealer and contract farming;

In addition, we also describe more general interventions that could make fertilizer use more profitable at the farm level, increase domestic fertilizer production or reduce the regulatory burden on registration of fertilizer (sections 3.5 to 3.7):

- Increase on-farm fertilizer use;
- Increase domestic fertilizer production;
- Fertilizers regulations.

Where possible, we have included an assessment of the potential impact of the measure, and its likely implications for the government budget. We also include recommendations for follow-up action or further analysis.

3.1 Reduce import costs

Currently, between 90 and 95 percent of inorganic fertilizer used in Tanzania is imported, and mainly from the Middle East, China and Russia (AGRA, 2015). This, together with the fact that the FOB price accounts for almost two-thirds of the domestic retail price, means that reductions in import prices could be an effective way of lowering fertilizer prices. Obviously, cost of production factors in fertilizer producing and exporting countries are beyond Tanzania’s control. However, several suggestions have been put forward for how importers can reduce costs through changes to procurement modalities, while the government is also considering options for directly reducing importers’ costs through subsidies at the point of importation.

➢ Enhance procurement modalities

The IFDC (2012) argues that expansion of the procurement time frame will reduce bottlenecks at the port, spread price risk, and has the potential to reduce price and freight premiums associated with procurement during seasonal price peaks. However, since domestic fertilizer demand from farmers is highly seasonal, fertilizer imported outside of the peak demand period will have to be stored. This has storage cost implications, not to mention opportunity cost of keeping stock (i.e., keeping fertilizer stocks means finances are tied up and cannot earn interest or be used for other purposes). The current evidence does not allow for a clear conclusion to be drawn as to whether savings would outweigh the increased costs, and further analysis is required.

As discussed earlier, port restrictions in Dar es Salaam mean that only smaller vessels (20 000 ton) can be easily accommodated; in fact, the average vessel size that enters port is around 15 000 tonnes (IFDC, 2012). In combination with the limited backhaul opportunities, these factors add 70-80 percent to the ocean freight cost per tonne (AGRA, 2015), which is largely an unavoidable expense. However, it has been proposed that freight and insurance costs could be reduced through “bulky procurement” (AGRA, 2015). This may be true, but this
issue requires additional research and understanding of importers’ import decisions before the recommendation can be taken into consideration.

Currently around six main importers are operational in Tanzania, but activities are highly concentrated among the largest three. Bulk procurement should in principle be more feasible given the high degree of concentration—and whether or not associated price savings ultimately reach farmers will depend on the extent to which authorities are effective at preventing importers from charging monopoly premiums—but as Benson et al. (2012) note, finance constraints as well as the diverse range of fertilizer demanded in Tanzania actually limits the extent to which importers can benefit from bulk orders. This may explain why average fertilizer consignments are only around 10,000 tonnes and do not fill a standard sized vessel.

When considering the proposal for bulky procurement, further information on costs and benefits are required in order to develop clear guidelines. For example, what are the potential savings from filling a 20,000 tonne vessel as opposed to utilizing only part of one; and furthermore, do economies of scale also apply when ordering 40,000 tonnes or 60,000 tonnes as one consignment but carried by several vessels? Another question is whether fertilizer importers will be guaranteed access to finance and, more importantly, access to foreign exchange. Additionally, an analysis of the cost implications associated with storage and increased congestion at the port, given current infrastructural constraints, is required.

Trade-offs should also be taken into account. Bulk procurement may be at odds with objectives of increasing competition among importers. Bulk procurement is also possibly at odds with the idea of expanding the procurement time frame and with current ideals of promoting the use fertilizer blends tailor-made to local soil and agronomic conditions. Depending on the relative extent of these trade-offs, policymakers could also consider the other extreme, namely that of facilitating direct imports of smaller consignments by agro-dealers (Box 1).

**Actions recommended by MAFAP:**

- Improve the dialogue among fertilizer importers, the Ministries of Agriculture and Industry and Trade to better plan the seasonal distribution of procurement and discuss potential government support to increase companies’ order capacity and creditworthiness. MALF could organize a yearly meeting between stakeholders. This action would have very limited budget implications and could yield results in the short term.

- Develop a package of financial instruments to support the private sector in pooling orders and arrange joint handling and storage. This must include an increase in the availability of foreign exchange and a system for finding the required collateral to obtain letters of credit for commercial loans. The government should also explore the possibility of a public-private partnership as institutional arrangement to facilitate the process.

- Support (partially or totally) additional credit or storage costs linked to the change in the current procurement time frame. It can be done, for example, through subsidized interest rates. Such a measure would have substantial budget implications for the Government of Tanzania and could yield effects in the short-medium term.

- Depending on the nature of trade-offs at the point of importation between concentration with economies of scale, on the one hand, and competition but smaller consignments, on the other, consider facilitation of direct imports by agro-dealers, as discussed in Box 1.
Procure fertilizer from China

In their report, AGRA (2015) argues that Tanzania should aim to procure fertilizer from China between June and October every year which is when China lifts their export levy on fertilizer to coincide with the period when domestic fertilizer demand is low. China is indeed a major exporter of fertilizer, capturing roughly 15 percent of the global export market share (UN Comtrade, 2016). More specifically, among exporters of nitrogenous fertilizer products, China is the largest one of Urea in the world with a 19 percent share, but it does not export other nitrogenous fertilizer products (AGRIUM, 2015). Urea makes up 46 percent of domestic fertilizer use in Tanzania (Benson et al. 2012). The balance is made up almost entirely of other nitrogenous products such as NPK, and virtually no phosphorous fertilizer products are used. China is also a major exporter of phosphorous fertilizer products (20 percent share), but Tanzania would be unaffected by a shift in Chinese policy on phosphorous fertilizer products.

The implication is that China indeed has sufficient market power to lower world fertilizer prices, and given Tanzania’s fertilizer demand profile this would affect about half the domestic market (Urea). However, the AGRA (2015) policy proposal is now obsolete: in 2015 China announced that it would scrap its policy of seasonal export levies in favor of a constant annual export levy. At the time market analysts adjusted their Urea price forecasts downwards by 9 percent from US$385 to US$350 per tonnes (AgriMoney, 2015). As a result, this option can no longer be considered.

There are no MAFAP recommendations related to this point.

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Box 1. Facilitating direct imports for agro-dealers

Notwithstanding the fact that even Tanzania’s large importers face finance and foreign exchange constraints, one area that merits further analysis is whether or not agro-dealers can save on procurement costs by importing fertilizer directly. Unsubstantiated evidence suggests agro-dealers could save around 15 percent if they were able to procure directly from international fertilizer exporters; however, it is not clear whether agro-dealers would be able to negotiate similar procurement terms as large importers for smaller consignments.

Table 1. Fertilizer cost comparison: direct imports versus procurement via importers

<table>
<thead>
<tr>
<th></th>
<th>Local purchase from importers (US$/50kg)</th>
<th>World price (direct imports) (US$/50kg)</th>
<th>Savings (US$/50kg)</th>
<th>Savings (percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UREA</td>
<td>22.9</td>
<td>18.3</td>
<td>4.6</td>
<td>20.1</td>
</tr>
<tr>
<td>NPK</td>
<td>37.8</td>
<td>33.0</td>
<td>4.8</td>
<td>12.7</td>
</tr>
<tr>
<td>DAP</td>
<td>31.2</td>
<td>26.6</td>
<td>4.6</td>
<td>14.7</td>
</tr>
<tr>
<td>Average</td>
<td>30.6</td>
<td>26.0</td>
<td>4.7</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Source: E-mail correspondence, Andrew Msola, 16 June 2016.
Establish preferential exchange rate

While it is difficult to assess the effect of changes in procurement modalities on prices, and impossible for Tanzania to affect world prices, one explicit way of lowering domestic prices paid by importers is through offering a subsidy. Since the Ministry of Agriculture, Livestock and Fisheries (MALF) no longer considers farm-level input subsidies appropriate, the Government of Tanzania has been exploring possibilities for a preferential exchange rate for fertilizer importers. More specifically, it proposes that, through the Bank of Tanzania, fertilizer importers are provided with a 15-20 percent reduction in the exchange rate applied for fertilizer imports, i.e., importers can buy foreign exchange at 15-20 percent below market value. This saving will then be reflected directly in the import price of fertilizer.

An important observation is that a preferential exchange rate policy is not cost-free. The Bank of Tanzania would have to be given a budget line to cover the loss associated with buying foreign exchange in the open market at the market exchange rate and selling this foreign exchange on to fertilizer importers at a preferential rate. It should further be noted that the economic implications of an exchange rate subsidy is no different from a price subsidy provided to importers upon submission of proof of procurement. Moreover, if the budget of the universal subsidy is the same as the budget of a preferential exchange rate system, the two policies will, in principle, deliver identical price savings to importers.

The real policy question that needs to be addressed is whether a universal subsidy/preferential exchange rate provided at the point of importation will be equally effective at lowering fertilizer prices at the farm gate as a farm-level subsidy to farmers with similar budget. Answering this requires an understanding of the efficiency of the price transmission system along the supply chain. If at any point less than 100 percent of the price savings realized at the point of importation is not passed on to the next level in the supply chain, farmers are set to lose out. One distinct advantage of farm-level subsidies is that authorities have more control over where the incidence of the benefit lies. Subsidies offered further up the supply chain may increase opportunities for smuggling fertilizer out of the country.

As shown in Figure 3, analysis by MAFAP (2016) indicates that in 2013 and 2014, the price of fertilizer at agro-dealer level was significantly above what it should have been based on the costs of imported fertilizer plus access costs along the supply chain (i.e., the reference price). This suggests that price transmission is hindered, which means subsidies at the point of importation, or at wholesale or agro-dealer level, may not be transmitted in full to farmers.

![Figure 3: Nominal rate of protection for fertilizer retailers](image)

Source: MAFAP (2016)
The government has proposed to deal with problems of imperfect price transmission by announcing indicative wholesale and retail prices that need to be adhered to. Prices will be agreed upon during negotiations between traders and government facilitated by the TFRA. Government further proposes to regulate borders to prevent smuggling (MALF, 2016). Both these “solutions” will evidently present new problems associated with increased government regulation and intervention in markets and supply chains. Government is currently reviewing the Fertilizer Regulation of 2011, with indicative pricing being considered as one of the proposals. This seems to contradict other calls for reduced regulation in the fertilizer sector. We consider this further in 3.7.

Actions recommended by MAFAP:

- Given the inefficiencies in the supply chain, a reduction in price at the point of importation, either through a subsidy for importers or a preferential exchange rate mechanism, is unlikely to benefit farmers as much as a farm-level subsidy with an equivalent budget. Using the example of the preferential exchange rate, a back-of-the-envelope calculation suggests that a two percent reduction of the exchange rate would cost the government around US$8M and would result in a 1.5 percent reduction in the retail price of fertilizer.

- While this measure could be rapidly implemented with effects in the short term, it is evident that the measure is not budget neutral and also not as efficient in ultimately transferring benefits to farmers. It is premature to recommend such action; further analysis is required to assess whether the reduced administrative burden of subsidization at the point of importation will outweigh deadweight losses associated with inefficiencies along the supply chain.

3.2 Reduce port inefficiencies, charges and taxes

Inefficiencies linked to infrastructural constraints add significantly to the cost of fertilizer. Together with fees for fertilizer bagging, which in Dar es Salaam is handled by port authorities, port expenses add around nine percent to fertilizer costs (Figure 2). These costs are inclusive of government taxes and regulatory fees.

- Improve port infrastructure and efficiency

Various studies point at the need for improving port infrastructure and removing operational inefficiencies as a way of reducing fertilizer prices in Tanzania (Benson et al., 2012; IFDC, 2012; AGRA, 2015). Low efficiency causes vessels to spend more time in port offloading. It is reported that the average unloading rate for the fertilizer was only 1,560 tonnes per day (2007 estimate), which means that ships can be moored for 1-2 weeks to offload their 10,000-20,000 tonne consignments. Losses associated with inefficient handling in the port are estimated at around US$20 million per year (AGRA, 2015). The World Bank (2013) estimates that for fertilizers, port inefficiency is equivalent to an extra-tariff of 5.2 percent, which, due to the little competition faced by importers on the local market, is almost fully passed down the supply chain to retail level.

While several studies argue that infrastructure needs to be improved, none have provided estimates for how much investment is required, or how this should be financed and/or budgeted for. Presumably this investments should be channeled via the Tanzania Ports Authority, which is a parastatal public corporation under the Ministry of Infrastructure Development. In the meantime, a new private fertilizer terminal with a capacity of 150,000 tonnes per year was opened by Yara International in the port of Dar es Salaam last year. The investment was the first project opened under the public-private Southern Agricultural Growth Corridor of Tanzania (SAGCOT) initiative.

In addition, it is difficult to estimate the potential price reduction associated with increased efficiency. Although port charges are high by international standards, at six percent of fertilizer prices, the effect of port efficiency improvements may be quite limited in comparison.
Actions recommended by MAFAP:

- Review the current incentive structures at the port with the objective to improve the balance of power and legal obligations among the main port authorities, i.e. Tanzania Port Authority, Tanzania International Container Services, and the Surface and Maritime Transport Authority. This would have limited budget implications for the government and may have effects in the short term. MAFAP suggests that a specific study be commissioned by the government.

- Intervene to limit any rent-seeking behavior that may discourage port use by private traders, including fertilizer importers. This includes more transparency on the port costs and more internal and external controls by the authorities on custom officials. MAFAP also recommends a stakeholders’ dialogue, considering that increased awareness on this issue and show of overt intentions to intervene is likely to reduce rent-seeking behavior in the short term.

➢ Reduce taxes on port services and regulatory fees

Following the AGRA (2015) recommendation that “trivial taxes” on port services be removed, MALF has shown interest in this idea. In reality however, the scope for significant price reductions is limited. For example, Benson et al. (2012) report that direct taxes and levies (2007 estimates) account for only 0.5 percent of fertilizer retail prices. The more recent analysis by AGRA (2015) shows that taxes amount to less than one percent of the retail price. In short, fertilizer is exempt from VAT as well as import and excise duties, and hence the sector already benefits from a highly liberalized tax environment. However, VAT (charged at 18 percent) is levied on wharfage and handling fees in the port, on bagging fees, and on service provided by clearing agents. In total, AGRA (2015) estimates that these costs amount to around US$6.3 per tonne or approximately one percent of the retail price of fertilizer. Further cost calculations and options for reducing regulatory fees and or taxes on those fees are provided in Box 2.

A more effective option could be to simplify the complex fertilizer regulatory system and the associated statutory levies imposed on fertilizers. MSU/GISAIA and AGRA have proposed that fees payable to various authorities such as Tanzania Bureau of Standards (TBS), Surface and Marine Transport Regulatory Authority (SUMATRA), Tanzania Audit Corporation (TAC), Weights and Measures Agency (WMA), and the Tanzania Fertilizer Regulatory Authority (TFRA) all be replaced by a single levy of 1.2 percent on the CIF price of fertilizer payable to TFRA. The tax itself contributes little to overall fertilizer prices—and regulation is indeed necessary to avoid counterfeit fertilizer entering the country—but limited capacity within regulatory authorities and overlapping mandates mean that importers experience significant delays in clearing port. Therefore, the real cost benefit associated with simplifying the regulatory system therefore lies in the savings on demurrage charges. Such savings could then ultimately be passed on to consumers.

Actions recommended by MAFAP:

- Policy reforms consisting of lifting VAT on in-port handling, clearing and storage fees (or those fees in their entirety) are certainly feasible and could be rapidly and quite easily implemented. However, as explained in Box 2, such measures are not budget neutral; the implication is that savings from removing fertilizer subsidies would simply be diverted to covering port authorities’ operational costs and or make up the budget shortfall associated with VAT zero-rating. Consequently this option should not be given priority.

- However, MAFAP supports proposals for simplifying the regulatory fee system by replacing the plethora of fees currently payable to several regulatory authorities with a single 1.2 percent levy on the CIF price payable to TFRA. However, this option is also not budget-neutral, as the other regulatory authorities’ revenue is set to fall by half if this proposal is adopted.
More important than the estimated one percent reduction in the fertilizer retail price associated with the simplified fee structure (see Box 2) is the potential opportunity afforded here to also greatly reduce the complexity of the in-port regulatory system. Significant price-savings can be realized if delays in port and associated demurrage charges can be reduced.

Box 2. Options for reducing port service charges and fertilizer regulatory fees

MALF (2016) estimates the potential for reducing fertilizer prices through removal of regulatory fees and taxes on those fees at between 15.7 and 18.3 percent. Our own calculations suggest this may be an overestimation. The original proposal by AGRA (2015) was to remove taxes on regulatory fees, and this equated to a saving of around one percent of the retail price of fertilizer (see earlier discussion). In this box we validate these calculations and also consider the effects of a complete removal of regulatory fees. The starting point, following AGRA (2015), is an assumption of a CIF price for fertilizer of US$500/tonne, which equates to an FOB price of US$439/tonne and a retail price (RP) of US$601/tonne (see Figure 2). Price savings associated with various combinations of reductions in service charges and regulatory fees are shown in Table 2.

Port handling fees: MALF (2016) estimates total in-port service charges at US$21.50/tonne, while VAT on those services amount to US$3.60/ton. Removal of VAT would result in a saving of 0.6 percent of the RP (column A). AGRA (2015) included clearing agent fees and in-port transport costs in their estimates (column B); hence also removing of VAT from these additional services would bring total savings to 1.0 percent of RP. Whereas the AGRA (2015) proposal only focus on VAT on services, MALF (2016) proposes a removal of all port charges including the applicable VAT; this will result in savings of between 4.2 percent (column C) and 7.1 percent (column D) of RP under the existing regulatory fee structure.

Regulatory fees: Total regulatory fees amount to around US$11.95/ton. Simplification of the fee structure as proposed by AGRA (2015), i.e., replacing fees with a single 1.2 percent levy on CIF payable to TFRA, will result in a price saving of 1.6 percent of RP (row Y). This equates to a roughly 50 percent reduction in total regulatory fee income. Removing fees altogether will save farmers an additional 2.0 percent of RP (row Z), assuming perfect pass-through from import/wholesale to farm gate level.

Table 2. Matrix of price effects: reductions in port handling and regulatory costs

<table>
<thead>
<tr>
<th>Regulatory fees</th>
<th>Remove VAT on port handling charges (A)</th>
<th>(A) + remove VAT on clearing and in-port transport charges (B)</th>
<th>Remove all regulatory service charges (C)</th>
<th>(C) + remove clearing and in-port transport charges (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>With existing regulatory fee structure (X)</td>
<td>-0.6 percent</td>
<td>-1.0 percent</td>
<td>-4.2 percent</td>
<td>-7.1 percent</td>
</tr>
<tr>
<td>With simplified regulatory fee structure (Y)</td>
<td>-1.6 percent</td>
<td>-2.0 percent</td>
<td>-5.2 percent</td>
<td>-8.1 percent</td>
</tr>
<tr>
<td>With all regulatory fees removed (Z)</td>
<td>-2.6 percent</td>
<td>-3.0 percent</td>
<td>-6.2 percent</td>
<td>-9.1 percent</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations

All of these policy options have direct budget implications and are not “free” or budget-neutral policy measures. Port and regulatory authorities will still incur costs to provide services, while in the case of VAT zero-rating, government revenue declines. Theoretically this makes these policy options similar to farm-level price subsidies; e.g., if NAIVS reduced the national average fertilizer price by 25 percent, the most optimistic scenario above (9.1 percent) would require a budget equivalent to 36 percent of NAIVS. However, not included in these estimates is the saving in port demurrage charges associated with a simplified regulatory system as this would require additional research.

The matrix of policy options shows the possible savings of combinations of policy options (i.e., proposals 1 or 2 or their variants).
3.3 Enhance domestic storage and transport infrastructure

Tanzania has a fairly extensive railway network, including to the coastal and north-eastern areas (Tanga and Arusha), the west and north-western regions (Mpanda, Kigoma, and Mwanza) and the south-western regions (Mbeya) (Figure 4). AGRA (2015) estimates that railway freight charges are 60-70 percent cheaper per tonne than comparable road transport costs; yet, up to 70 percent of all freight traffic in Tanzania is by road. IFDC (2012) ascribes this to the fact that railway lines are poorly maintained and service provision is weak; also, there is limited availability of “rolling stock” (wagons), which leads to delays in concluding shipments. For this reason transporters prefer more costly road freight, even during seasonal peak periods when supply pushes prices even higher.

Figure 4. Railway map of Tanzania


One of the key recommendations from AGRA (2015) and IFDC (2012) is that railway transport should be made more attractive again by improving infrastructure and service delivery. Increased use of railway transport would significantly lessen peak demand on truck transportation, increase competition in the freight market in general, and reduce fertilizer prices. As shown in
Figure 2 domestic transport already adds as much to fertilizer costs as international ocean freight (i.e., around 8 percent), and hence this is a potential source for significant savings.

Of course, there are some cost considerations. Firstly, storage and handling facilities at stations will have to be improved if transport volumes increase. Already within the vicinity of Dar es Salaam there is sufficient storage capacity (500,000 tonnes) to handle a significant increase in imported fertilizer volumes (IFDC, 2012), which if complemented by a well-functioning inland wholesale storage system, will allow retailers to respond more quickly to market signals and can reduce costs by pre-positioning stocks (AGRA, 2015). Secondly, since railways can only operate on fixed routes, it would be important to also improve feeder roads so as to ensure that costs associated with getting fertilizer from the station to retail outlets does not negate the cost savings of using railways.

Actions recommended by MAFAP:

- While MAFAP recognizes that an increased share of the national budget could be allocated to the upgrade/maintenance of feeder roads around train stations and support to the TZA Railways Ltd to increase rolling stock availability, such an option would require close collaboration and coordination with other Ministries (in particular, the Ministry of Transport) and would imply a high budgetary cost to be spread over several years. Depending on the effectiveness of the coordination mechanism the necessary inter-ministerial consultation could take time.

- Moreover, the benefit of such an investment would largely depend on the volumes that could be re-routed through the railways system. This re-routing of inputs would imply a behavioral change for various operators to adjust to new opportunities and conditions to market their produce; usually such adjustments also take time. Depending on the volume actually redirected through the railways, preliminary estimates suggest transport cost reductions could result in a decline in fertilizer retail prices of anywhere between 1 and 5 percent; however, further analysis would be required to reduce uncertainty around these numbers and estimate the long-run return on investment in railway infrastructure.

3.4 Strengthen contract farming and agro-dealer networks

AGRA (2015) puts forward as one of its main recommendations the strengthening of agro-dealer networks. Further analysis and consultations are required to arrive at specific recommendations as to how this might be achieved or what policy interventions are required. In general, however, the idea of strengthening agro-dealer networks and bringing them closer to end users has merit and will improve fertilizer distribution efficiency. Currently, low margins and small volumes at retail level means there is limited incentive to develop or invest in retail operations, especially in more remote areas. IFDC (2012), in turn, believe the emphasis should be on strengthening the capacity of agro-dealers to conduct business and advise farmers on fertilizer use. Agro-dealers should also be trained in the on-farm use of fertilizer, as this knowledge could help them better market their products and therefore increase farmers’ demand for fertilizer. Also, through training in the proper handling of fertilizer products, degradation can be reduced.

Strengthening contract farming networks is another under-explored area of potential cost-savings for farmers. When the buyers of crops are involved in the provision of inputs and extension services, they tend to not require additional incentive to provide quality, crop-specific fertilizer and seed in addition to targeted extension services to their farmers. This is because they have a vested interest in the output produced, unlike agro-dealers under the status quo systems. This type of arrangement, where farmers are provided inputs on credit to be repaid upon sale of their produce, is already common for cash crops such as sugar cane, tea, and cashew nut, and is succeeding as well for paddy rice in the Southern Highlands. One recommendation put forth has been to extend this system to maize, possibly through the COPB or the NFRA. However, questions remain regarding
whether this system, if channeled through parastatal companies, could result in a drain on public finances. Moreover, if channeled through the private sector, questions arise as to how to promote investments in milling and agro-processing, and whether the legal and financial frameworks can be adapted to contract farming for food security crops such as maize.

Actions Recommended by MAFAP:

- MAFAP recommends these options to be further explored and it suggests that the government commissions well targeted studies on: (a) the basic conditions leading to a suitable development of an agro dealer network; and (b) how the contract farming system for rice in the Southern Highlands can be adapted for other areas or crops, in particular maize.

- However, these options are not actionable in the short term and therefore should be seen as longer-term strategies for lowering fertilizer costs and giving access to inputs and credit through structured schemes.

3.5 Increase on-farm fertilizer use

In line with suggestions that fertilizer prices may decline when importers can exploit economies of scale or agro-dealers can benefit from increased turnover, one option for the government is to directly increase demand for fertilizer. Since price is an important determinant of fertilizer demand, the supply chain reforms considered above that reduce prices may lead to an increase in farmers’ demand for fertilizer; however, there are many other factors that determine fertilizer demand independently from the price that, if addressed, may lead to increased traded volumes of fertilizer and hence lower prices. We briefly consider some of these below.

➢ Relieving credit or cash constraints

Benson et al. (2012) argue that inadequate access to credit and cash constraints are significant deterrents to smallholder fertilizer demand in Tanzania. The authors also found that only 18 percent of their sample purchased fertilizers with credit coming from sources other than traders. Furthermore, only a tiny fraction of this 18 percent corresponds to commercial loans, while the majority are predominantly family or NGO loans. These findings point at the quite marginal role played by commercial banks in access to credit. Also the IFDC (2012) argues that measures to strengthen farmers’ purchasing power are needed to stimulate fertilizer demand. Various modalities exist to improve access to credit. Agreements between agro-processors and farmers (e.g., in the form of contracts or out-grower schemes) could be structured in such a way that farmers access inputs but only pay for it when they supply the produce (see MAFAP, 2016). In this instance agro-processors essentially act as guarantors for loans. Farmers may also negotiate for access to credit and/or acquire inputs at wholesale prices when operating jointly under well-organized farmers’ organizations (MAFAP, 2016).

A more direct approach is for the government to establish or promote credit schemes, which are often in the form of a subsidy on the cost of credit (interest rate). In 2014/15, the option of a credit subsidy scheme was considered by MAFC (now MALF) as a viable alternative to the input subsidy programme. A small pilot was launched that same year but failed to get buy-in from banks with the result that the programme was never brought to scale. Two important observations can be made. First, providing credit is risky especially when it is provided to individual farmers. When third-party institutions such as agro-processors (e.g. sugar millers), cereal buyers (e.g. of rice paddy), farmers’ organizations or government act as guarantors, banks may be more willing to participate. Second, access to credit does not lower the cost of fertilizer. When high prices are an important determinant of fertilizer demand, measures that directly lower prices may be more effective at raising fertilizer use. However, programmes that provide access to subsidized credit address resource constraints and price-
related deterrents to fertilizer use simultaneously. Understanding the determinants of farm-level fertilizer demand is therefore important when designing input policies.

**Actions recommended by MAFAP:**

- MAFAP considers that the option of subsidizing the interest rate to increase farmers’ access to credit to purchase fertilizers is worth exploring, but the pilot and its results will first need to be assessed.

- Moreover, given the marginal role of commercial banks in facilitating the access to credit relative to the share of loans that come from traders, family and NGOs, MAFAP suggests that, at the request of the government, a review of options to improve access to credit for small-farmers especially through public-private partnerships be commissioned. This review could include promising experiences for financing agriculture in other countries and regions.

➢ **Strengthen output markets**

One of the key IFDC (2012) recommendations for raising fertilizer demand is to strengthen output markets. Farmers’ decisions about input use are determined not only by the price or access to fertilizer, but by the profitability of the use of that input generally, and an important determinant of profitability is the expected price of the output produced. Access to markets, the availability of market information, and price stability therefore all become crucial ingredients in the fertilizer demand equation, since in the face of uncertainty farmers will be reluctant to produce for the market or to invest in modern inputs. Similarly, variability in seasonal rainfall is also a source of risk that affects demand for fertilizer (Benson et al., 2012).

It is often true that governments intervene in both input and output markets; whereas input market interventions aim to stimulate the use of modern inputs, interventions in output markets—often in the form of trade restrictions or price controls—tend to create disincentives for production since they favor (urban) consumers and reduce farm-level profits given their food security objectives. Such policy inconsistencies should be avoided if governments are serious about sustainable intensification as a key pillar of their long term food security strategies.

**Actions recommended by MAFAP:**

- The role played by price incentives in output markets for tradable commodities is an essential component of the elasticity of demand for agricultural inputs. Although the situation may vary between commodities, MAFAP has generated substantial evidence on the distortions affecting commodity markets either induced by explicit trade and other domestic policies or resulting from structural constraints often associated with market failures. As an example, maize producers have faced price disincentives of about -14 percent between 2010 and 2014, with the effects of excessive marketing costs representing an additional 3 percent of the producer price (MAFAP, 2016).

- MAFAP recommends that output market distortions be addressed as a top priority to improve market functioning. As a starting point, a list of potentially distortionary government interventions in key commodity markets can be compiled, and each of these can be assessed and categorized according to their effects on domestic prices.

➢ **Enhance returns to fertilizer use through better extension services**

Both IFDC (2012) and Benson et al. (2012) emphasize the importance of training farmers through the extension system in good agro-practices in order to enhance the returns to fertilizer use. Investment in research is also required to continually refine and update extension messages and recommendations around appropriate input use. More recently, analysts have stressed the importance of providing context and agro-economic zone-specific extension support. This requires knowledge of localized soil characteristics together with specialized soil
fertility management and fertilizer use recommendations. Soil fertility and soil quality are key if agricultural intensification practices are going to be sustainable in the long term. Of course, importing specialized fertilizer blends may be more costly; hence more information is required to assess the costs and benefits of using specialized blends. However, as discussed below, some of the demand for specialized blends could be satisfied by domestic production and blending facilities, as discussed below.

**Actions recommended by MAFAP:**

- MAFAP recommends that a holistic approach to raising fertilizer returns be adopted. Such an approach would center around: (a) substantial commitment and coordination by government and various stakeholders to generate and share knowledge that would raise returns to fertilizer use; (b) the reallocation of government resources to extension services and research and development; and (c) training to develop human capital, especially among extension agents. Results are not realizable in the short term; hence this is a long-term commitment.

- Government could commission a study on the basic tenets of a holistic approach to achieving higher returns to fertilizer use. MAFAP is willing to provide support to the development of the terms of reference of such a study in partnership with other institutions more specialized in extension and research and development.

### 3.6 Increase domestic fertilizer production

Demand for specialized fertilizer blends is on the rise, particularly for horticultural and other export crops that have specific nutrient requirements and should meet the health or phytosanitary requirements of importing countries.

Tanzania has the potential to exploit the opportunity to produce fertilizer blends domestically, given domestically available phosphate rock and natural gas suitable for urea and ammonia fertilizer production (Msolla, 2015). This may bring about significant cost savings, especially since importation of smaller quantities of specialized blends can be expensive. However, for blends to be fully effective in Tanzania, there is a need to update knowledge of current soil characteristics and adapt fertilizer recommendations accordingly. Existing recommendations are based on soil testing conducted in 1993 or earlier.

**Actions recommended by MAFAP:**

- MAFAP is not in a position to make a recommendation on this option yet due to limited expertise in this technical domain.

- MAFAP considers that the potential benefits as well as costs of such an approach are difficult to quantify at this stage. However, as the focus is put on developing a domestic supply of blends, this implies substantial government involvement to generate the appropriate enabling environment and adopt production incentives for the market to emerge. This is likely to be a matter of years rather than months, with no immediate benefits to farmers.

- MAFAP proposes that a study be commissioned by the government on the basic conditions leading to the suitable development of fertilizer blend production.
3.7 Fertilizer regulatory reforms

Remove excessive fertilizer licensing and registration requirements

The fertilizer market is regulated by the 2009 Fertilizer Act and the 2011 Fertilizer Regulation. The Fertilizer Regulation specifies that for any new fertilizer, either imported or blended, samples need to be submitted for testing. According to Article 4(3), the TFRA will “carry out laboratory and field tests for at least three consecutive seasons so as to determine the suitability for use of the fertilizer or fertilizer supplement”. According to AGRA (2015), this requirement is excessive even for large-scale importers which bring in full vessels. It also acts as a deterrent to blending of smaller batches that better match specific crop or soil requirements in different agro-ecological zones, which is much more effective, efficient and environmentally sustainable than application of 2-3 standard, bulk-traded fertilizer types such as urea or DAP alone.

Approvals of new fertilizer imports are granted on a shipment by shipment basis, not for an estimated volume that could be imported over a longer period, such as a growing season. The 2016 report by the World Bank’s Enabling the Business of Agriculture initiative confirms that Tanzania’s fertilizer registration and licensing procedures are long and costly. According to the EBA indicators, in total five procedures need to be completed before fertilizer is allowed on the market (application for registration; content verification report; field testing; environmental report; approval by a national committee). The total time required to register new fertilizer is 578.5 days, and the costs that need to be incurred for fertilizer registration amount to USD 9,889. As a result, the current regulatory framework inhibits the entry of smaller firms that wish to import or blend specialized fertilizer products. This results is a less competitive market with higher prices.

Actions recommended by MAFAP:

- The current process of reviewing the 2011 Fertilizer Regulation is a welcome development. In particular, MAFAP welcomes the proposed amendment to reduce the testing period to one season, and also to introduce more flexibility in the registration of fertilizer blends.

Use of indicative pricing to ensure fair farm-level prices

One of the reforms of the 2011 Fertilizer Regulation under consideration is to introduce indicative pricing with the aim to deter monopoly pricing and ensure that farmers obtain fair prices. It is envisioned that stakeholders will convene annually under the auspices of the TFRA to arrive at a fair fertilizer retail price. The price will be announced publically and will serve as a ceiling price that will be strictly enforced. The price ceiling will consider prevailing market prices and access costs, and will incorporate reasonable profit margins for traders. Significant penalties, including hefty fines and/or jail time, are proposed for traders who sell fertilizer at above ceiling prices.

The proposed amendment will bring several challenges. Firstly, access cost data is difficult to come by, making the calculation of a reference price challenging. Secondly, the recommendation will only be reasonable if realistic regional indicative prices can be estimated, which is highly unlikely considering the hefty data constraints. In other words, it is unrealistic to imagine that an accurate, district-specific, and timely indicative price can be calculated every year. If indicative prices are set too high, farmers may be discouraged from purchasing fertilizers; likewise, if set too low, traders will be unwilling to supply fertilizer, leading to excess demand and underutilization. If only a single national indicative price is announced, this is a very likely outcome, particularly in more remote locations.

Actions recommended by MAFAP:

- Rather than announcing an indicative price, MAFAP recommends announcing market information on prices of fertilizer at the border, wholesale, and agro-dealer level in all districts, alongside contextual
information that would help farmers understand and appreciate regional differences in prices. With additional information farmers are less likely to be exploited. Reliable, timely and widely accessible market information will ultimately improve the price transmission effect and improve market functioning.

- MAFAP is opposed to the idea of strictly-enforced indicative prices; instead, and in addition to the market information system proposed above, the institutionalization of a fertilizer supply chain monitoring system mandated to collect market prices and access costs ex-post is proposed. The system should be designed to analyze information at the end of each marketing season in order to identify areas where farmers were exploited or underserved. The government could then consider intervening only in areas where markets failed.

- In addition to providing market information and ex-post analyses, fair prices are best ensured through increased competition among traders. An enabling policy environment devoid of external price-fixing and draconian penalties for non-compliance with restrictive regulatory measures is strongly advised.

4. Recommendations

The purpose of this report is to provide the Government of Tanzania with an overview of the various policy proposals that have been identified and analyzed in prior research by other organizations and FAO/MAFAP and that could potentially serve as interventions to increase access to inputs for smallholder farmers in lieu of the NAIVS. The report does not contain any detailed “plug-and-play” policy solutions. Any single option listed in this report will require more in-depth analysis and elaboration to ensure that it is actionable and will achieve the intended objectives. MAFAP stands ready to further support the Government of Tanzania towards adoption of any inputs policy reform, if so requested.

Taking into account these considerations, based on the existing evidence and a preliminary assessment of the impacts and costs of options for input policy reform, MAFAP recommends that the Government of Tanzania considers a balanced package of options to address the aspects currently undermining the effectiveness and efficiency of the input sector. More in particular, it recommends Government assessment and decisions on:

1. Taxation - Create a single statutory fertilizer import levy of 1.2 percent on the CIF price, payable to the TFRA, and abolish the statutory levies payable to other authorities and agencies. This will reduce administrative procedures and fertilizer prices with immediate effect. The government or an external expert should assess the changes to regulations required to implement this measure.

2. Public-Private Partnership - Improve procurement modalities through public-private dialogue and increased access to finance. The MALF is advised to follow a three pronged approach including:
   i. regular roundtable discussions between fertilizer importers, the TFRA, MALF and the Ministry of Industry, Trade, and Investment (MITI) to improve procurement, and to find the right balance between spreading procurement periods to reduce port congestion and exploiting opportunities for bulk procurement and economies of scale;
   ii. public-private partnership to support the development of a package of financial instruments including release of letters of credit for commercial loans to help operators pool orders and arrange joint handling and storage;
   iii. support (partial or total) to additional storage costs linked to the change in the current procurement time frame through subsidized credit interest rates, for example.
3. Efficient Value Chains - Remove policy distortions in output markets of Tanzania’s main value chains to improve farm gate prices. MAFAP recommends that the Government commissions an analysis of the government’s main distortionary policies in key commodity markets and that each of these be assessed and categorized according to their effects on domestic prices, and that alternative policies are formulated.

4. Legal Framework - Review the 2011 Fertilizer Regulation to reduce registration and licensing requirements. This would allow for new fertilizer providers to enter the market and should increase the availability of innovative and tailored blending products.

5. Fertilizer market monitoring and analysis - Rather than announcing an indicative price, MAFAP recommends announcing market information on prices of fertilizer at the border, wholesale, and agro-dealer level in all districts. This will significantly improve price transmission and reduce potential exploitation of farmers. In addition, the institutionalization of a fertilizer supply chain monitoring system to analyze information at the end of each marketing season could identify areas where farmers were exploited or underserved and where the government could then consider intervening.

Finally, MAFAP recommends that the Government of Tanzania develops a medium-term fertilizer strategy which takes into account the following aspects:

i. Policy Trade-Offs
   The Government will need to develop a vision on the policy trade-offs around support to access to inputs. For example, large-scale public investments in infrastructure divert spending away from policies with more immediate impacts. Reducing taxes has positive price effects but negative budgetary implications.

ii. Implications of a policy shift away from farm-level subsidies
    A well-functioning and competitive supply chain is required to ensure effective price transmission along the value chain; if this is absent then farm-level price subsidies may be more effective than measures that lower costs higher up the supply chain.

iii. Need to understand determinants of fertilizer demand
    Even when price savings are passed on to farmers, there is a need to know how changes in price affect fertilizer demand and whether there are other (possibly more important) constraints to fertilizer use (e.g., weak output markets, resource constraints; low returns to fertilizer use). Also, it is important to know how significant a price reduction should be to bring about a shift in demand, as many policy options may only yield small price shifts, and sometimes at significant cost.

iv. Complementary policies
    Avoid inconsistencies between input and output market policies and adopt a more holistic and sustainable approach to promoting fertilizer use.
### Table 3. Summary of assessed policy options

<table>
<thead>
<tr>
<th>Area of Intervention</th>
<th>Policy Option</th>
<th>Impact</th>
<th>Costs/Drawbacks</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enhance Procurement Modalities</td>
<td>Reduce bottlenecks at port; spread importers’ price risk and reduce peak period freight premiums; reduce freight and insurance costs by filling vessels.</td>
<td>Increased need for storage; cost and financing implications. Finance constraints and growing diversity of fertilizer demand means bulky procurement not always feasible; proposal potentially at odds with idea of extending procurement time frame or increasing competition among many importers.</td>
<td>Relatively high potential savings compared to cost. Further analysis needed to understand gains (price declines) and costs (finance and storage costs)</td>
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<td></td>
<td>Procure Fertilizer from China</td>
<td>No longer a policy consideration, since China currently imposes a flat tariff throughout the year.</td>
<td>N/A</td>
<td>No longer to be considered.</td>
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<td></td>
<td>Establish Preferential Exchange Rates and/or Universal Price Subsidy to Importers</td>
<td>Subsidy can be transferred at point of buying foreign exchange or upon submission of an order document or invoice; impact is reduced price along the value chain which may stimulate demand and lead to increased import volumes.</td>
<td>Importers will only import as much as is demanded by farmers; price reduction at farm gate level will determine demand effect. Inefficiencies in the price transmission effect along the supply chain may prevent farmers from benefiting in full.</td>
<td>While this measure could be rapidly implemented with effects in the short term, it also entails a number of important drawbacks difficult to justify given the relatively small expected effect on the retail price of inputs. MAFAP recommends that this option be discarded and that other options focusing on the downstream part of the value chain be preferred.</td>
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<td></td>
<td>Improve Port Infrastructure and Efficiency</td>
<td>Improved port storage, handling and transport infrastructure will reduce offloading times and lower demurrage fees.</td>
<td>Improved infrastructure will be a positive development with no known drawbacks, other than financing costs and high budgetary implications. More pertinently, the cost of not upgrading infrastructure needs to be taken into consideration, especially in anticipation of growth in import volumes in the future.</td>
<td>Though port charges are high compared internationally, at 6% percent of fertilizer prices the effect of port efficiency improvements may be quite limited in comparison. As a next step, it will be essential to review the current existing incentive structure at the port.</td>
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<td>Reduce Taxes on Port Services and Regulatory Fees</td>
<td>Remove “trivial taxes” will not have a significant impact on prices. However, combined with simplification of the regulatory system and reductions of administrative procedures it could have a significant effect if it leads to reduced unloading times in port. In addition, the cost implications of this measure are relatively limited and could be implemented in the short term.</td>
<td>Budgetary implications associated with zero-rating VAT on port services, although likely insignificant. Capacity constraints in Tanzania Fertilizer Regulatory Authority (TFRA) could hamper efforts to improve regulatory efficiency.</td>
<td>MAFAP recommends that the government consider an improvement and a drastic simplification of the regulatory system funded through a TFRA levy of 1.2% percent on the CIF price. It advises to request an expert to identify the regulatory changes to be adopted to implement this measure.</td>
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<tr>
<td>Action</td>
<td>Description</td>
<td>Challenges</td>
<td>MAFAP Recommendations</td>
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<tr>
<td>Improve railways, facilities at stations</td>
<td>Improved railway infrastructure and services could generate demand for railway freight leading to very significant domestic transport cost declines; improved storage and rural road infrastructure will improve fertilizer distribution efficiency and enhance timely access to fertilizer.</td>
<td>Vested interests in profitable road transport businesses and fertilizer distribution contracts may oppose investments in railway infrastructure; railway and storage infrastructure maintenance and logistics management requires specialized skills.</td>
<td>As with port infrastructure the cost of not upgrading facilities may be an increase in price in the future, which will hamper efforts to promote increased use of fertilizer.</td>
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<td>Train agro-dealers</td>
<td>Train agro-dealers in fertilizer handling, fertilizer use, marketing, and business strategies.</td>
<td>Stronger, more efficient agro-dealer business and networks closer to farmers will improve timely access to fertilizer.</td>
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<td>Relieve cash or credit constraints</td>
<td>Cash subsidies or access to credit could relieve lack of fertilizer demand linked to household resource constraints.</td>
<td>Credit schemes do not lower the price of fertilizer; unless cost of credit is subsidized the policy is not a replacement for input subsidies; credit risk is a major deterrent to banks’ buy-in.</td>
<td>MAFAP recommends these options to be further explored and it suggests that the Government commissions well targeted studies on a) the basic conditions leading to a suitable development of an agro dealer network and b) how the contract farming system for rice in the Southern Highlands can be adapted for other areas of Tanzania and other crops, in particular maize.</td>
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<td>Strengthen output markets</td>
<td>Access to markets, market information, and market stability will encourage commercial production and provide incentives to invest in modern inputs.</td>
<td>Production constrained by short-term policies designed to benefit consumers and enhance food security.</td>
<td>Highly recommended to avoid inconsistent policies where input use is promoted but output markets are constrained. MAFAP suggests that an analysis is commissioned to identify distorting policies and that these are removed as soon as possible.</td>
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<td>Enhance returns to fertilizer use</td>
<td>Higher returns will increase profitability and hence stimulate demand for fertilizer; focus on integrated soil fertility management and promotion of specialized fertilizer blends; also explore options for domestic production of fertilizer.</td>
<td>Specialized fertilizer blends means reduced opportunities for benefiting from economies of scale in the import market.</td>
<td>MAFAP recommends that this holistic approach focusing on extension be further explored. The potential benefits as well as costs are difficult to quantify at this stage, but likely to require (a) substantial government institutions’ involvement, (b) the (re)allocation of resources to extension services as well as research, and (c) training to develop human capital. All this is unlikely to be achieved in the short term.</td>
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<td>Support blending of new fertilizer batches that better match demand</td>
<td>Increases the availability of better blends in the domestic market at lower costs than when imported.</td>
<td>New private investments and entry of new companies into the market has a long-term horizon.</td>
<td>MAFAP is not in a position to make a recommendation on this option yet due to limited expertise in this technical domain. MAFAP proposes that the government commission a study on the basic conditions leading to the suitable development of fertilizer blend production.</td>
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<td>Review the Fertilizer Regulation to reform registration and licensing requirements</td>
<td>Reductions of administrative procedures can create a more competitive fertilizer market, promote new entrants (especially smaller companies) and incentivize the marketing of small-batch, innovative fertilizer blends that with better productivity-enhancing characteristics for Tanzania’s agro-ecological zones.</td>
<td>None</td>
<td>Highly recommended to pursue, as Tanzania’s registration and licensing procedures are lengthy and costly, also in international comparison.</td>
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<td>Avoid indicative pricing and draconian penalties for non-compliance</td>
<td>Indicative pricing is counterintuitive to ambitions of removing excessive fertilizer regulation and may harm market functioning, ultimately discouraging private sector engagement.</td>
<td>Reduce private sector participation in the fertilizer supply chain may lead to less competition and monopoly pricing.</td>
<td>Foster a free-market environment rather than attempting to control price; access and availability requires participation of the private sector.</td>
</tr>
</tbody>
</table>

Source: Authors’ summary
References


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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