



RBA Working Paper

Towards Food Security and Sovereignty in Africa

Regional Bureau for Africa
Strategy, Analysis and Research Team



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1. Introduction

For decades, food insecurity has been endemic in parts of Africa because of climate change, relatively low food productivity, and weak infrastructure for marketing and distribution. Over the last couple of years, two external shocks, the COVID pandemic and war in the Ukraine, have exacerbated preexisting vulnerabilities. Food trade has been disrupted and food prices have increased significantly, leaving more Africans either unable to afford or unable to access adequate food supplies.

These two shocks are just the most recent manifestation of the continent's long-term structural vulnerabilities, and lack of economic and food sovereignty. A long history of dependence on food-aid and imports, combined with weak productive capacity in agriculture and low rates of fertilizer application, have made the continent susceptible to both supply and price shocks in global food markets.

This policy brief explores three important issues. First, it makes an emphatic case for shifting the narrative from a focus on food availability, to building resilient food systems in Africa. Second, it tackles the thorny issue of food sovereignty, i.e. the ability of a country to feed itself. Third, it explores the potential to significantly increase food production via the judicious use of fertilizers.

Our simulations indicate that concerted efforts to move fertilizer application rates from the current 20 kg/ha to the 50 kg/ha target agreed by the 2006 Abuja Declaration could triple food production in the near term. We also find that increasing capacity utilization in Africa's existing fertilizer manufacturing plants could provide African farmers with all the fertilizer they need.

These steps would help decrease malnutrition by nearly 5%, improve health and education

outcomes, enhance gender equality, and have several beneficial macroeconomic impacts, namely faster growth, improved balance of payments, and reduced dependence on foreign financial flows, and less exposure to global commodity price volatility. Further increasing fertilizer production to 100% of existing capacity could enable the continent to eliminate Africa's dependence on fertilizer imports.

The paper concludes with policy options to maximize Africa's fertilizer production, including investments in human capital, reducing the cost of raw materials, and improving infrastructure. Policies to encourage fertilizer use include targeted subsidies (which can be financed via an output tax), productive safety net policy programs and food for work policies. Further research is needed at the country level on specific interventions on both the fertilizer production and application aspects of food systems.

2. Structural Challenges to Food Security in Africa

In order to move beyond the short-term and humanitarian aspects of food security in Africa to a long-term, structural and multidimensional approach, the concept of 'food systems' is essential. This requires looking at food beyond its role as a commodity being produced and traded and understanding the whole food system value-chain.

The International Food Policy Research Institute (IFPRI) defines food systems as "the sum of actors and interactions along the food value chain—from input supply and production of crops, livestock, fish, and other agricultural commodities to transportation, processing, retailing, wholesaling, and preparation of foods to consumption and disposal"¹.

1. <https://www.ifpri.org/topic/food-systems#:~:text=Food%20systems%20are%20the%20sum,foods%20to%20consumption%20and%20disposal>.

While the concept of food systems goes back over four decades², it has recently become more prominent in both research and policy circles. This increased relevance is due to the realization that food systems are linked to environmental issues, international trade, as well as geopolitical relations, and not just dietary needs and health requirements. It also marks a shift beyond just seeking to produce more food, taking into account issues of nutrition and food quality, environmental impacts, distributional considerations, and food systems governance³.

In this context, it is striking that rather than lacking fertile land, Africa has 60% of the world’s unexploited arable land, with a little over a quarter of its agricultural land being harvested⁴. One reason for the low rate of utilizing arable land may be Africa’s historic import dependency. Oftentimes, well-meaning initiatives of food-aid have supported policies that undermined the continent’s incentives to produce its own food. Examples include the U.S. Agricultural Trade Development and Assistance Act, also known as PL480, and the European Union’s Common Agriculture Policy. These policies established foreign food aid as a priority, but some analysts believe that the reduction of donor surpluses and protection of their agricultural sectors remained the main objective⁵.

The impacts of increased dependence on food aid and imports were two-fold. First, free or cheap food imports made local food production in Africa less competitive (e.g., rice and maize in West

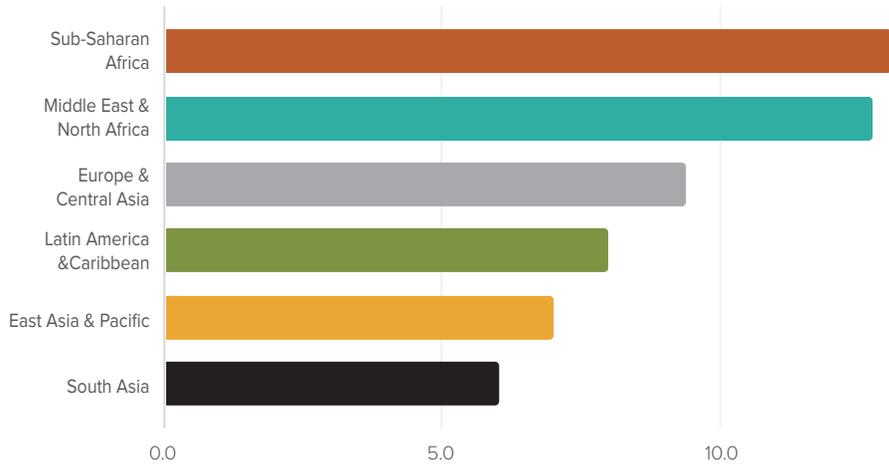
Africa). This comparative disadvantage, in turn, shifted consumer preferences away from local brands to foreign ones.

Over the decades, the cumulative effects of import dependency have meant that Africa is now the most food-import-dependent region in the world, dedicating more than 13% of its import expenditure to buying food and agricultural commodities (Figure 1). However, this average masks enormous variation, with food representing more than 40% of imports in Benin and Comoros, compared to less than 10% in Congo DRC, South Africa, Tanzania, and Zambia.

Another structural issue contributing to insufficient food production in Africa is the low productivity of its agricultural sector. Agriculture accounts for over half of Africa’s employment and nearly a fifth of its value-added, implying that food production per worker is low, and the sector could benefit from modernization.

One driver of this low agricultural productivity in

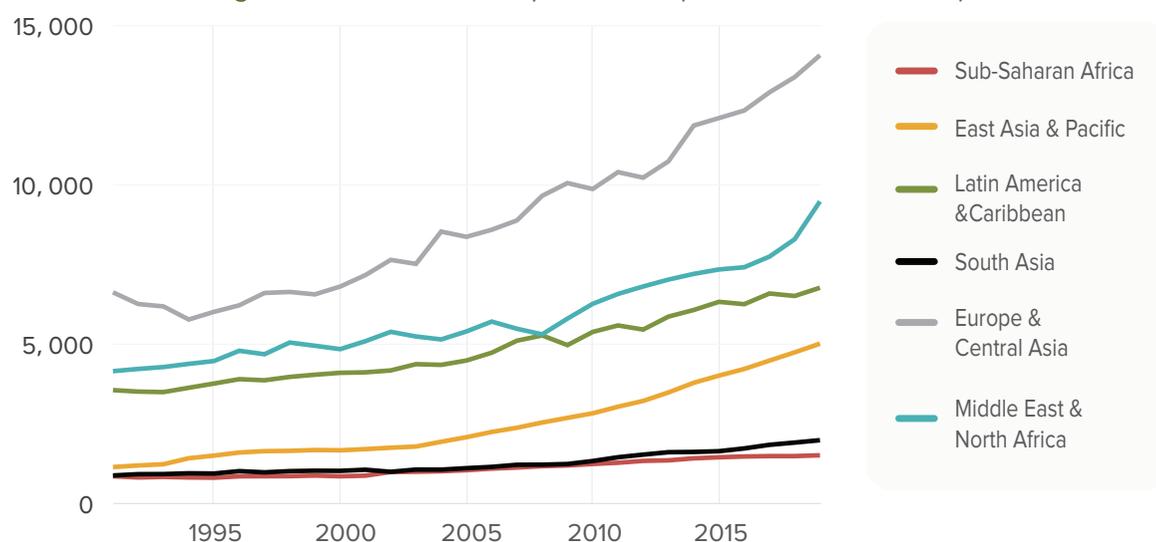
Figure 1: Food imports (% of merchandise imports), 2017-2019 average



Source: World Bank, World Development Indicators. Series TM.VAL.FOODZS UN. Last accessed 3 September 2022

2. Kneen, 1989, Marion, 1986, Sobal, 1978.
 3. Béné, C., Oosterveer, P., Lamotte, L., Brouwer, I. D., de Haan, S., Prager, S. D., ... & Khoury, C. K. (2019). When food systems meet sustainability—Current narratives and implications for actions. *World Development*, 113, 116-130.
 4. <https://www.africafertilizermap.com>
 5. <https://history.state.gov/milestones/1961-1968/pl-480>

Figure 2: Agriculture, forestry, and fishing in 2019
value added per worker (constant 2015 US\$)
2019 Agriculture value added per worker (in constant 2015 US\$)

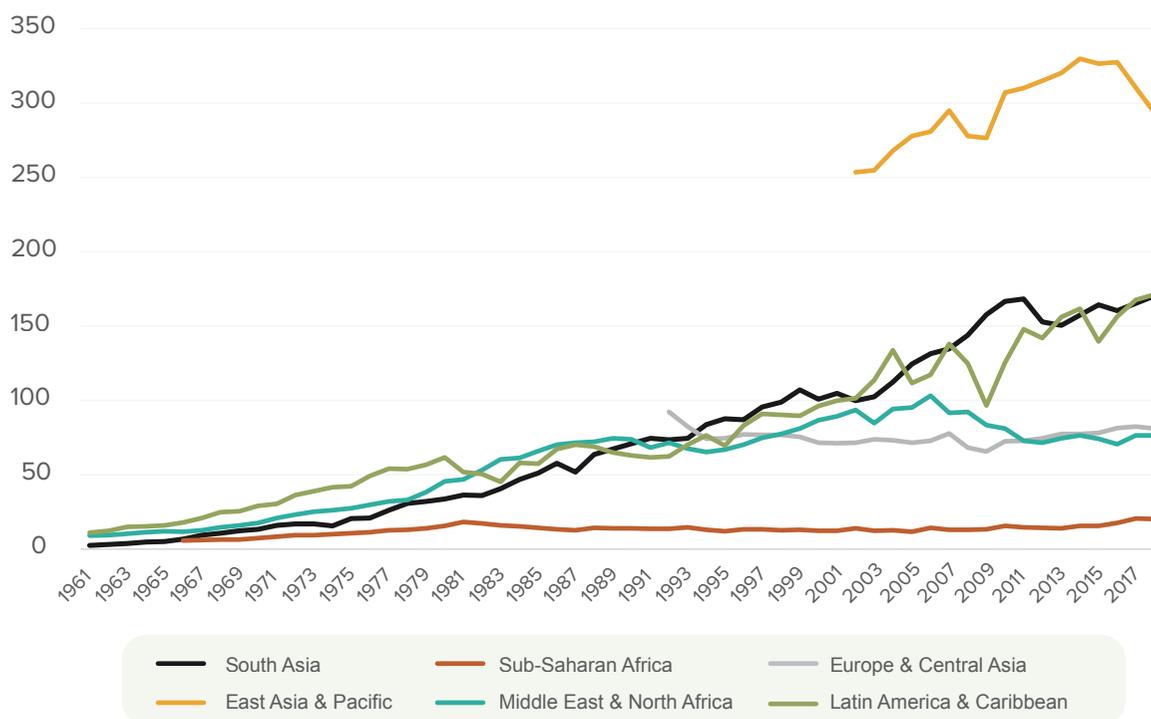


Source: Author's elaboration based on World Bank, World Development Indicators. Last accessed 3 September 2022

Africa is its comparatively low use of fertilizers. East Asia and the Pacific averages around 300 kg. of fertilizer per hectare, compared to 170 in South Asia and Latin America, 75-80 in the Middle-East, North Africa, Europe and Central Asia, and only 20 in Sub-Saharan Africa.

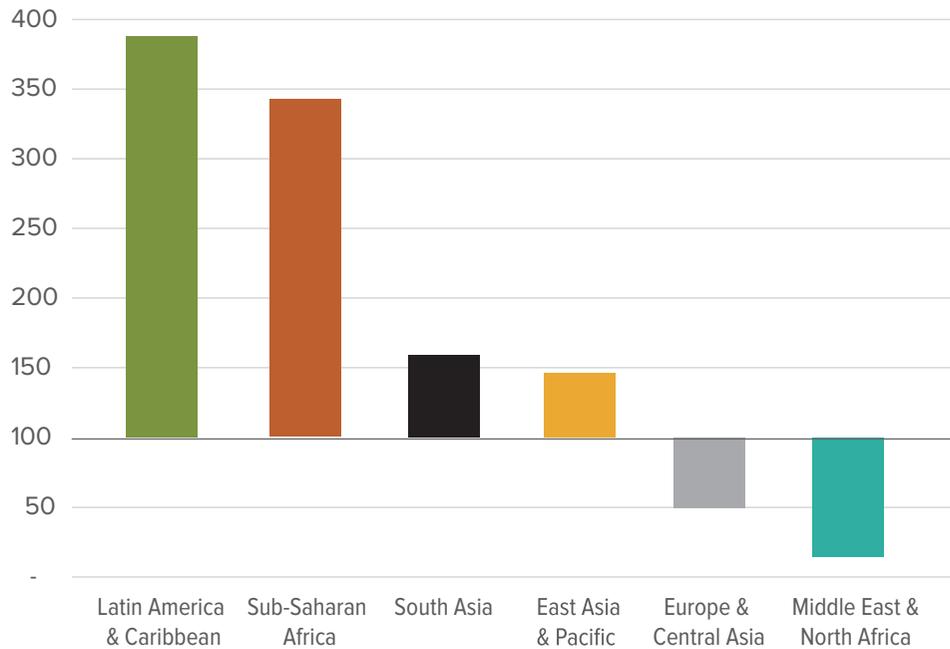
Furthermore, in over half a century (between 1966-2018), fertilizer application rates only increased by 2.5% annually in Africa, compared to 3.6% in the Middle-East and North Africa, 4.4% in Latin America and the Caribbean, and 6.3% in South Asia.

Figure 3: Fertilizer consumption (kilograms per hectare of arable land)



Source: World Bank, World Development Indicators. Series AG.CON.FERT.ZS. Last accessed 3 September 2022

Figure 4: Fertilizer consumption (% of fertilizer production)



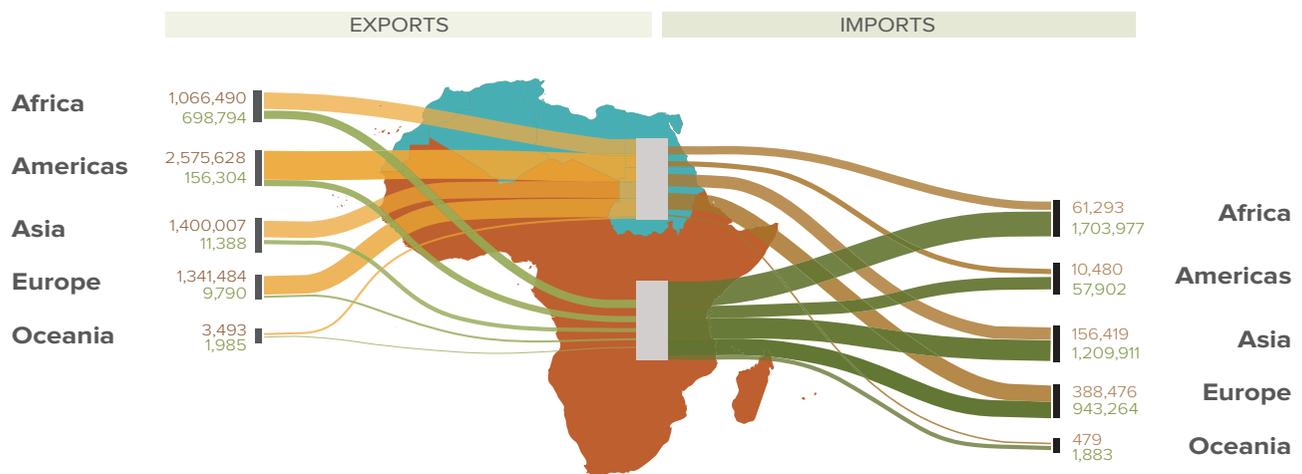
Source: World Bank, World Development Indicators. Series AG.CON.FERT.PT.ZS. Last accessed 3 September 2022

Within the continent, however, there is wide heterogeneity in fertilizer application rates. Seychelles uses 516 kg. per hectare, Mauritius 187. By contrast, Uganda, Guinea, Republic of Congo, DR Congo, Niger and the Central African Republic all use less than 5 kg. per hectare. These rates are far below the

2006 Abuja Declaration target of increasing fertilizer application on the continent from 20 to 50 kg. per hectare.

Africa is also - on average - a net importer of fertilizer, second only to Latin America and the Caribbean in the ratio of its consumption to production of fertilizers (Figure 4).

Figure 5: Africa's fertilizer imports and exports



Source: UN Comtrade

These factors combined, but especially the low production and application of fertilizers, mean that beyond short-term shocks to Africa's food supply, even in the long-term, agricultural yields may not be sufficient to feed a growing population. This makes the continent's food and fertilizer sovereignty - its availability and affordability - key to unlocking other parts of the food systems sustainability.

3. Dynamics of Fertilizer Production and Food Security in Africa

Fertilizer, like any other agricultural commodity, is best understood using balance-sheets. These accounting tools help understand how much is produced domestically, what role imports and exports play, and what is the resulting domestic supply. In the model below, we add a few more variables to also examine Africa's capacity utilization and its implications for fertilizer application rates on the continent.

The most basic balance-sheet relationship states that the domestic supply (S) of any commodity, in this case fertilizer, equals domestic production (P) less exports (X) plus imports (M):

$$S = P + M - X \quad (1)$$

While figures on exports and imports are readily available from FAOSTAT, total production is not. We therefore estimate production from supply, but first we need a rough idea of supply itself. This could be done if we assume that the use of fertilizer in Africa is equal to supply, i.e., that none is wasted.

To estimate supply in this way, we multiply the average application rate of fertilizer in

Africa - 20 kg. per hectare (according to the World Bank) - by the total harvested area in the continent - 286,291 million hectares (from FAO). This gives us a total of 5.7 million tons of fertilizer consumed/supplied in 2018.

According to the World Bank, in 2018 Africa's fertilizer consumption was 342% of its production. Hence we can estimate fertilizer production at $5.7 / 3.42 = 1.7$ million tons.

The difference between supply and production must come from net imports:

$$NX = S + P \quad (2)$$

Subtracting 1.7 million tons produced from the supply figure of 5.7 million, we get net imports of 4.1 million tons.

This basic model already reveals several striking issues. First, Africa imports far more fertilizer than it produces. Without these, the application rate would be only 5.9 kg per hectare rather than 20.

Second, given the estimates⁶ of demand for fertilizer at 6.7 million tons, there is currently a supply gap of 0.9 million tons. An initial response to this finding would be to think that Africa's productive capacity is insufficient to meet its fertilizer demand. But this is not the case.

However, FAO estimates that Africa's fertilizer plants have a supply capacity of 14.8 million tons. This implies that actual production on the continent operates only at just 11% of capacity. In other words, African countries only produce less than half the fertilizer that they can, given existing capacity.

Column 1 in Table 1 shows the various figures described above, with exogenous data marked in bold font.

6. www.africafertilizermap.com

**Table 1: Capacity Utilization in Fertilizer Production:
Baseline Scenario and Three Paths Forward**

| | Baseline | African Union Target | Full capacity | Fertilizer Sovereignty |
|-------------------------------|-------------------|----------------------|-------------------|------------------------|
| Theoretical capacity (tonnes) | 21,433,000 | 21,433,000 | 21,433,000 | 21,433,000 |
| Supply capability | 14,818,000 | 14,818,000 | 14,818,000 | 14,818,000 |
| Demand | 6,646,000 | 6,646,000 | 6,646,000 | 6,646,000 |
| Supply | 5,725,810 | 14,314,525 | 18,868,439 | 14,818,000 |
| Production | 1,675,371 | 10,264,086 | 14,818,000 | 14,818,000 |
| Net Imports | 4,050,439 | 4,050,439 | 4,050,439 | - |
| Harvested area (ha) | 286,291 | 286,291 | 286,291 | 286,291 |
| Fertilizer use (kg./ha) | 20 | 50 | 66 | 52 |
| Capacity utilization | 11% | 69% | 100% | 100% |

Source: Author's calculations based on data from FAOSTAT, Africa Fertilizer Map and World Development Indicators.

The second column in Table 1 simulates how much production would be necessary to meet the Abuja declaration target of 50 kg. per hectare. Keeping exports and imports constant, changing the application rate from 20 to 50 kg. per hectare and multiplying by the harvested area of 286,291 hectare necessitates a supply of 14.8 million and a production of 10.3 million tonnes. While this seems to be a big step compared to the benchmark scenario, it only requires raising capacity utilization from 11% to 69%, a relatively small increase.

We can now carry our thought experiment to its logical conclusion and see what happens if Africa's fertilizer plants produce at full capacity. This time, in addition to exports and imports, we take production as given (and equal to capacity at 14.8 million tons). Supply thus increases to 18.9 million tons, which - given the

fixed harvested area - implies an application rate of 66 kg. of fertilizer per hectare.

Producing fertilizer at full existing capacity also gives the continent a choice. It can continue to import 4 million tons. Or it can achieve full fertilizer sovereignty by eliminating the need to import. This would make it more resilient during global shocks and prevent the pass-through of global fertilizer shocks into domestic inflation. It would also have the added-benefit of relieving national budgets of the need to earn foreign exchange and improve balance of payments positions. Ultimately, fertilizer sovereignty can contribute to overall economic sovereignty in Africa and expand its policy space⁷.

7. Assa, J. (2022). Decolonization 2.0: Realizing Africa's Promise through Economic Sovereignty and Strategic Finance. ResearchGate working paper, DOI: 10.13140/RG.2.2.23025.76641.

Box 1: Why is Africa producing fertilizer at a low capacity?

Fertilizer production capacity in Africa is still low even after the Abuja Declaration which called for application rates to increase from 20 kg. per hectare to 50kg. Constraints hindering the production capacity of fertilizers in Africa include weak market and infrastructural capacity, inadequate human capital, uncertain environmental policy, limited access to finance and high fertilizer retail prices, expensive raw material, limited infrastructure quality and quantity and an inadequate input dealer network. Therefore, Nigeria, Togo, Burkina Faso, Côte d'Ivoire, Ghana, and Mali are West Africa's largest importers of fertilizer from Russia, which amounts to nearly 0.24 million tons. In Nigeria for example, if fertilizer producing plants were working at full capacity (Dangote's full capacity is 3 million tons and Indorama's 1.4 million tons), the country could meet its 1.5 million tons of fertilizer consumption while meeting the rest of the region's needs⁸.

4. Linkages to the Sustainable Development Goals and Policy Options

Going beyond the immediate and crisis-related aspects of food security, increasing the production and application of fertilizers in Africa could have far-reaching implications for achieving many of the Sustainable Development Goals on the continent. This section looks at the potential impacts on various SDGs, and then considers policy interventions to increase fertilizer production and application in Africa.

The SDG Impact of Increased Fertilizer Production and Application

As the food systems approach mentioned above suggests, making progress in one link of the food value-chain can lead to various improvements in other parts. Using the fertilizer model and scenarios discussed above, we simulate how increased production and utilization of fertilizer in Africa can impact various SDGs.

The most direct impact of increased fertilizer production - holding imports and exports

constant - is improved agricultural yield and higher food production. The average consumption of fertilizer in Africa increased from 15.4 in 2010 to 20 in 2018, with cereal production rising from 168 to 208 million tons over the same period. To simulate the impact of increased fertilizer application in this period, we take the ratio of cereal output to fertilizer input as given and increase the latter by 3.5 kg. per hectare per year (reaching 50 by 2020).

Even with this gradual increase of the application rate from 20 to 50 kg. per hectare as envisioned in the Abuja declaration, food production over 2010-2020 would have grown cumulatively by 209% instead of just 24%. This is in line with several of the targets under SDG 2 on raising agricultural productivity (Figure 7).

We can further extrapolate these results to see their impacts on undernourishment. Regressing the proportion of the population undernourished (using World Bank data) on the growth rate of cereal production between

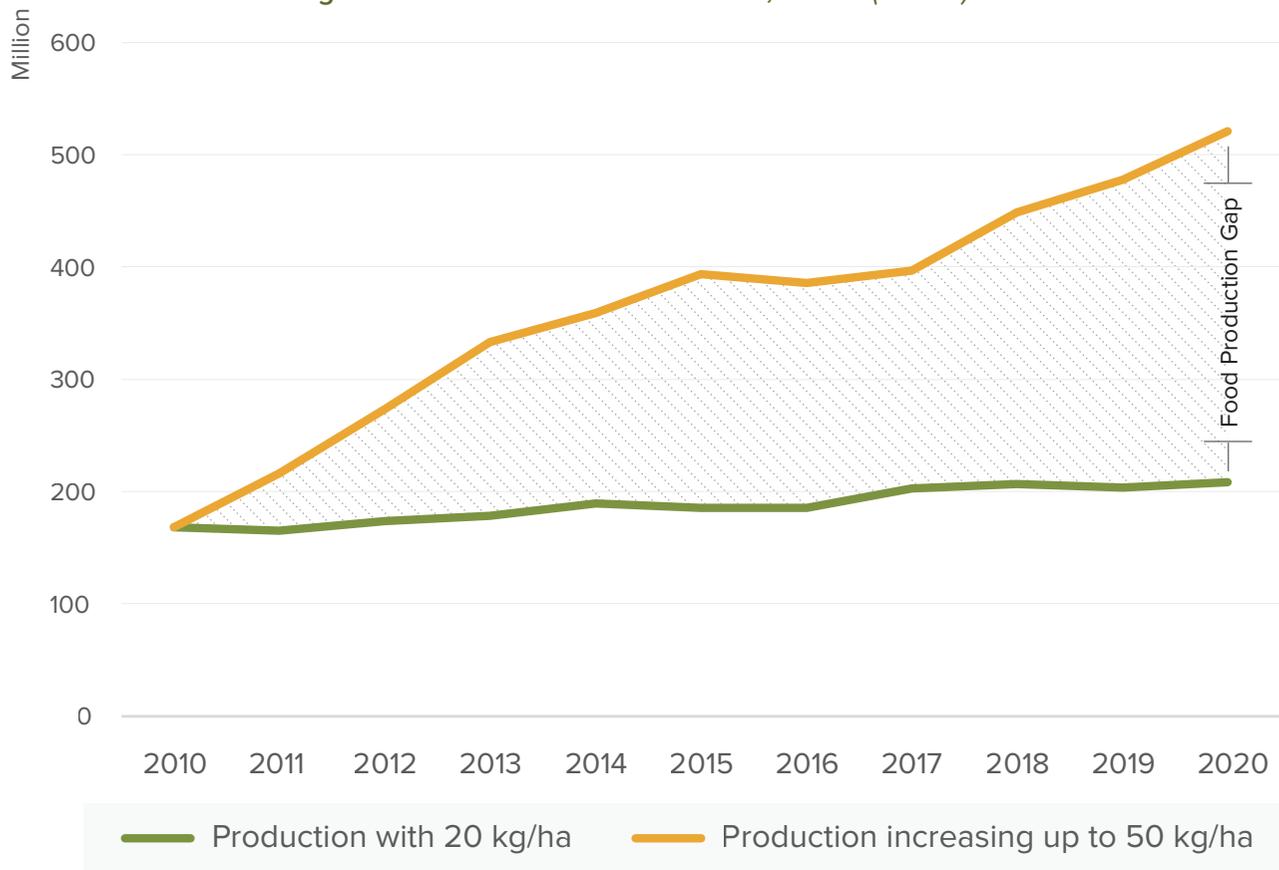


8. Bouët, A. Laborde, D.Traoré, F. 2022. West Africa faces mixed food security impacts from the Russia-Ukraine conflict

Figure 6: Potential SDGs Impacts of Increased Fertilizer Production and Utilization in Africa



Figure 7: Cereal Production in Africa, Tonnes(Million)



Source: Author's elaborations based on FAOSTAT data

2010-2019, we obtain coefficients which we then use with the increased fertilizer application rates as above.

The fitted values indicate that rather than increasing from 20% to 20.3% over this period, the undernutrition rate in Africa would have declined to 16.6% by 2019. And while this reduction may seem moderate, it is only based on meeting the Abuja target of 50 kg. per hectare. If the full capacity of fertilizer production is utilized, as in the third and four scenarios in section 3 above, the reduction in hunger could have been much more significant.

Malnutrition is also a major threat to health in developing countries and constitutes the biggest global risk factor for death and illness, especially affecting hundreds of millions of young children and women. The main effects of malnutrition in developing countries include various vitamin deficiencies, with a vicious cycle forming between infectious diseases and poor diets⁹.

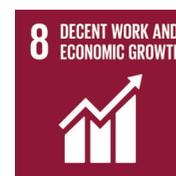


Poor nutrition can also hamper the cognitive development and educational prospects of children and adolescents. Specifically, iron deficiency - which can be caused by malnutrition, elevated needs such as pregnancy, and chronic illness caused by parasitic infections - can lead to fatigue and anemia, lower physical strength and growth, and impaired cognitive development¹⁰.

The increased agricultural productivity from enhanced fertilizer use can also have significant positive impacts on women and girls, helping Africa make more progress on SDG 5 regarding gender equality. Research by the Food and Agriculture Organization estimates that women comprise 43% of the agricultural labor-force in developing countries, and mainly concentrated in harvesting and weeding. Women's work burden is higher than that of men, as it includes more unpaid household work such as collecting water and fuel and preparing food. Women in agriculture are also paid less than men and are more likely to be in part-time or seasonal work, especially in Africa¹¹. Improving agricultural yields through higher fertilizer application can lighten the burden of many of these women and girls (and also leave more time for their education).



Enhancing fertilizer production and application can also contribute toward SDG 8. Higher output in both the fertilizer and food sectors will increase GDP growth, and while increased agricultural productivity will imply lower employment in this sector, this could enable more people to move to urban areas and pursue higher value-added manufacturing jobs.



Furthermore, the reduced need for importing fertilizer and food will improve African countries' balance of payments, and also make them less vulnerable to pass-through

9. Müller, O., & Krawinkel, M. (2005). Malnutrition and health in developing countries. *Cmaj*, 173(3), 279-286.

10. Dickson R, Awasthi S, Williamson P, Demellweek C, Garner P. Effects of treatment for helminth infection on growth and cognitive performance in children: systematic review of randomized trials. *BMJ* 2000;320:1697-701; Black MM. Micronutrient deficiencies and cognitive functioning [review]. *JNutr* 2003;133(11 Suppl 2):3927S-31S.

11. Raney, Terri & Anríquez, Gustavo & Croppenstedt, André & Gerosa, Stefano & Lowder, Sarah K. & Matuschke, Ira & Skoet, Jakob, 2011. "The role of women in agriculture," ESA Working Papers 289018, Food and Agriculture Organization of the United Nations, Agricultural Development Economics Division (ESA).

inflation from global commodity markets.

Finally, enhanced fertilizer and food sovereignty will make the achievement of SDG 17 - means of implementation - much less dependent on foreign financial flows.



The combination of higher economic growth and domestic income, an improved balance of payments, and the resulting increase in the availability of domestic resources could greatly reduce the need for foreign aid, debt and remittances, making African countries more resilient both in normal periods and in times of crisis, when foreign flows tend to dry up.

Policy Options for Increasing Fertilizer Production and Use

Given the enormous potential of increased fertilizer production and use to help Africa achieve many SDGs, the obvious question becomes what policies and interventions could make more fertilizer both **available** and **affordable** for African farmers.

Two key policies dominate the policy debate on increased fertilizer use - fertilizer subsidies and productive safety net¹².

Despite objections from standard economic theory that subsidies distort markets, fertilizer

and other input subsidies gained in popularity in Africa, especially after the success of Malawi's program in 2006-2010. An analysis of this program found it to be pro-poor and increase both the quantity of yields and their resilience to droughts¹³.

The annual expenditure on inputs subsidies in ten African countries ranged from 14% to 26% of total public agricultural spending¹⁴. Fertilizer subsidies can be financed by output taxes, a combination which has been found to reduce both poverty and land degradation in Ethiopia¹⁵.

Another policy to encourage fertilizer use has been the productive safety net policy program (PSNP), for example in Ethiopia since 2005. This program targets households and communities that are chronically food insecure, and offers insurance, food or cash supply, and investment in public goods such as soil and water conservation. This program, as well as food-for-work policies, has been shown to increase the likelihood and extent of fertilizer use¹⁶.

5. Recommendations

Addressing both food security and food sovereignty in Africa will require coordinated policy changes and concerted action to increase food productivity, improve

12. Holden, S. T. (2018). Fertilizer and sustainable intensification in Sub-Saharan Africa. *Global food security*, 18, 20-26.

13. Arndt, C., Pauw, K., & Thurlow, J. (2016). The economy-wide impacts and risks of Malawi's farm input subsidy program. *American Journal of Agricultural Economics*, 98(3), 962-980.

14. Jayne, T. S., Mason, N. M., Burke, W. J., & Ariga, J. (2018). Taking stock of Africa's second-generation agricultural input subsidy programs. *Food Policy*, 75, 1-14.

15. Holden, S. T., Bekele, S., Shiferaw, B. A., & Pender, J. (2005). Policy analysis for sustainable land management and food security in Ethiopia: A bioeconomic model with market imperfections (Vol. 140). Intl Food Policy Res Inst.

16. Bezu, S., & Holden, S. (2008). Can food-for-work encourage agricultural production?. *Food policy*, 33(6), 541-549. Gilligan, D. O., Hoddinott, J., & Taffesse, A. S. (2009). The impact of Ethiopia's Productive Safety Net Programme and its linkages. *The journal of development studies*, 45(10), 1684-1706. Hoddinott, J., Berhane, G., Gilligan, D. O., Kumar, N., & Seyoum Taffesse, A. (2012). The impact of Ethiopia's Productive Safety Net Programme and related transfers on agricultural productivity. *Journal of African Economies*, 21(5), 761-786. Villegas, L., Smith, V. H., Atwood, J., & Belasco, E. (2016). Does participation in public works programs encourage fertilizer use in rural Ethiopia?. *International Journal of Food and Agricultural Economics (IJFAEC)*, 4(1128-2016-91985), 101-124.

distribution, ensure affordability and reduce dependency. Taking these steps to strengthen food systems in African communities and countries, in the wake of the COVID pandemic and the Ukraine war, will entail a strategic deployment of necessary financial investments and bespoke innovation. The benefits of such transformative changes will go beyond Africa, and would bode well for the global market for food-related goods and services.

Priority actions for food security

African countries should:

- Incentivize domestic and regional production to increase food supply. This will include facilitating the production and application of fertilizer to boost yields.
- Shift the narrative from food supply to the development of resilient food systems.
- Create facilities to ensure that no one is left behind when it comes to food security.

Africa's development partners should:

- Support programs that de-risk and boost critical investments in Africa's food sector.
- Direct financial and technical resources to modernize food production, storage and marketing in Africa.
- Promote efforts to scale up the production and marketing of affordable food, including through the Africa Continental Free Trade Area arrangement.

Priority actions for food sovereignty

African countries should:

- Promote efforts to maximize regional food trade by scaling up national and regional food systems. This would reduce dependency by diversifying the sources of food trade.
- Invest in technology that anticipates and

responds to shocks, particularly those caused by recurring natural disasters.

- Invest in food system infrastructure that would improve farm management, storage, distribution and marketing. This would help ensure that regional surpluses are directed to the areas of greatest need.

Africa's development partners should:

- Support investments in technology and managerial transfers that enhance production capacity across Africa.
- Invest in systems that facilitate the introduction of drought and pest resistant food crops.
- Reduce disincentives and inefficiencies in global markets - such as dumping, subsidies, tariff structures - that would disadvantage or discourage domestic production in African countries.

6. Conclusions

This policy brief discussed the importance of enhancing Africa's food security and sovereignty, both in light of recent global shocks - such as the COVID-19 pandemic and the war in Ukraine - and as a long-term strategy to improve the continent's resilience to shocks and economic sovereignty.

Africa has a long history of food dependency, the legacy of both food-aid policies and low domestic productive capacity. As a result, much of its food is imported, with the result that any major global shock can lead to trade disruptions, increased hunger, and pass-through inflation which further erodes household and public budgets.

A key component of increasing the continent's food sovereignty is increasing its ability to

produce and apply fertilizer to enhance agricultural productivity. Despite the Abuja Declaration's aim of reaching an application rate of 50 kg. per hectare, Africa still averages only 20, though some countries are far above this average (and others far below).

Our analysis shows that this is mainly due to underutilization of domestic fertilizer production capacity, currently around 11% across the continent. Constraints hindering the production capacity of fertilizers in Africa include poor market and infrastructural capacity, inadequate human capital, uncertain environmental policy, limited access to finance and high fertilizer retail prices, expensive raw material, limited infrastructure quality and quantity and an inadequate input dealer network.

The simulations in this paper show that an increase in capacity utilization from 11% to 69% could help Africa reach the Abuja target of increasing fertilizer application rates from 20 to 50 kg. per hectare. First-order effect of such a change would have decreased the prevalence of malnutrition on the continent from 20% in 2010 to 16.6% in 2020 (instead of the actual increase to 20.3%).

Second-order effects would positively impact other SDGs, including improved health and educational outcomes, reduced work-burden on women and girls, faster economic growth, improved balance of payments, and reduced dependence on foreign financial flows and global commodity prices.

To make this potential turnaround a reality, investments need to be made in human capital, access to financing, improved availability of raw material (potentially through regional mechanisms such as the AfCFTA), and infrastructure quality. Policies to encourage fertilizer use include targeted subsidies (which can be financed via an output tax), productive safety net policy programs and food for work policies. Further research is needed at the country level on specific interventions on both the fertilizer production and application aspects of food systems.

Ensuring Africa's fertilizer sovereignty - implying increased availability and affordability - is key to the continent's economic sovereignty, sustainable development, and achievement of the Sustainable Development Goals.

Appendix: Production and Blending Capacity in African Countries

Existing capacity: blending

| Country | Number of Blending units | Capacity (total tonnes/hour) |
|-----------------------|--------------------------|------------------------------|
| Angola | 1 | 20.0 |
| Burkina Faso | 2 | 120.0 |
| Cameroon | 2 | 40.0 |
| Ghana | 6 | 300.0 |
| Guinea | 1 | 90.0 |
| Côte d'Ivoire | 7 | 315.0 |
| Kenya | 6 | 205.5 |
| Malawi | 2 | 131.4 |
| Mali | 5 | 203.3 |
| Mauritius | 1 | 8.0 |
| Mozambique | 4 | 93.0 |
| Nigeria | 53 | 3678.7 |
| Rwanda | 2 | 51.4 |
| Senegal | 1 | 40.0 |
| Sierra Leone Blending | 1 | 60.0 |
| Tanzania | 5 | 306.0 |
| Uganda | 1 | 50.0 |
| Zambia | 4 | 30.3 |
| Zimbabwe | 8 | 347.1 |

Existing capacity: manufacturing

| Country | Number of Manufacturing units | Capacity (total tonnes/hour) |
|--------------|-------------------------------|------------------------------|
| Burkina Faso | 1 | 0.02 |
| Kenya | 1 | 0.02 |
| Madagascar | 1 | 0.02 |
| Mali | 1 | 0.03 |
| Nigeria | 5 | 0.83 |
| Senegal | 3 | 0.04 |
| South Africa | 3 | 0.53 |
| Tanzania | 1 | 0.01 |
| Togo | 1 | 0.46 |
| Zimbabwe | 2 | 0.04 |

Existing capacity: organic

| Country | Number of Organic units | Capacity (total tonnes/hour) |
|---------------|-------------------------|------------------------------|
| Benin | 1 | 8.0 |
| Burkina Faso | 2 | n.a |
| Ghana | 5 | 0.13 |
| Nigeria | 2 | 13.0 |
| Senegal | 2 | 5.0 |
| Côte d'Ivoire | 1 | n.a |
| Uganda | 1 | n.a |

Planned capacity

| Country | Upcoming projects units | Expected Completion | Capacity (tonne/hour) |
|---------------|-------------------------|---------------------|-----------------------|
| Burkina Faso | 1 | 2022-2023 | n.a |
| Ethiopia | 1 | 2023-2025 | 0.26/0.17 |
| Côte d'Ivoire | 1 | 2022-2023 | 100.0 |
| Niger | 1 | 2022-23 | 70.0 |

We welcome your comments and questions, please direct them to **Jacob Assa**: jacob.assa@undp.org

Source: IFDC, ifa, FAO, African Union & afap, 2018. Register of fertilizer Manufacturing & processing facilities in Sub-Saharan Africa. https://www.africafertilizermap.com/interactive_desktop.html

