

GOLDEN BULLET OR BAD BET?

New dependencies on synthetic fertilisers and
their impacts on the African continent



LIST OF ABBREVIATIONS

| | |
|--------|---|
| AGRA | Alliance for a Green Revolution in Africa |
| BMGF | Bill and Melinda Gates Foundation |
| CAADP | Comprehensive Africa Agriculture Development Programme |
| CFS | Committee on World Food Security |
| CSA | Climate-Smart Agriculture |
| FAO | Food and Agriculture Organization of the United Nations |
| FFPI | FAO Food Price Index |
| FISP | Farm Input Subsidy Program |
| GACSA | Global Alliance for Climate-Smart Agriculture |
| IMF | International Monetary Fund |
| NAFSN | New Alliance for Food Security and Nutrition in Africa |
| PPP | Public-Private Partnership |
| SAGCOT | Southern Agricultural Growth Corridor of Tanzania |
| USAID | United States Agency for International Development |
| WEF | World Economic Forum |

Published by:

INKOTA-netzwerk e. V., Chrysanthemenstraße 1–3, 10407 Berlin, Phone: +49 (0)30 42 08 20 20, Email: inkota@inkota.de, website: www.inkota.de

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We would like to thank Audrey S. Darko (SABON SAKE), Anne Maina (BIBA Kenya), Theodora Pius (MVIWATA), and Amin Zakarias for their valuable contributions, and Roman Herre (FIAN Germany) and Jan Urhahn (Rosa-Luxemburg-Stiftung) for their constructive review.

Translation: Linguatransfair

This text is a translated version based on the German publication “Goldkugel oder Krisenverstärker? Neue Abhängigkeiten von synthetischen Düngemitteln und ihre Folgen für den afrikanischen Kontinent”, first published in July 2022.

Layout: Marischka Lutz Grafikdesign, www.marischkalutz.de

August 2022

Supported by Bread for the World with funds from the Church Development Service, the State Office for Development Cooperation Berlin, MISEREOR and Engagement Global on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

The English translation was funded by Bread for the World. The content of this publication is the sole responsibility of INKOTA-netzwerk e. V. The positions presented here do not reflect the position of the funding agencies.

Brot
für die Welt



MISEREOR
IHR HILFSWERK





“

The continent has no fuel to fire agriculture. Some say fertiliser is no silver bullet. They are right: it is not. From my perspective, it is a golden bullet.

”

Akinwumi Adesina, President of the African Development Bank and former Regional Director of the Rockefeller Foundation (AGRC, 2007, p. 92)

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1. FERTILISERS AT THE CENTRE OF GLOBAL FOOD CRISES

A further aggravation of the global food crisis seems inevitable. Rising food prices mean that economic pressure, especially on lower-income groups, is mounting across the world, while many people in the Global South face an acute shortage of food. As in the global food crisis of 2007/08, synthetic fertilisers play a crucial role, as they are central to a crisis-prone food system that is dependent on fossil fuels such as gas and oil.¹

Global supply chain disruptions in the wake of the COVID-19 pandemic have already sent fertiliser prices worldwide soaring. With Russia's invasion to Ukraine, this price crisis is now escalating dramatically (see Figure 1). Trade sanctions and war-related disruptions in the supply of gas and other raw materials needed for synthetic fertiliser production are effectively turning fertilisers into a geopolitical weapon, with potentially dramatic consequences for farmers and consumers. The looming agricultural crisis therefore raises more fundamental questions concerning the sustainability and justice of a food system dependent on synthetic fertilisers – and thus fossil fuels.

The fact that fertilisers have a military origin is not new. The Haber-Bosch process, i. e. the production of ammonium nitrate from a synthesis of atmospheric nitrogen and hydrogen, was first used on an industrial scale in 1913 by the Badische Anilin- und Soda-Fabrik (BASF) and celebrated as “bread from air.”² Highly explosive ammonium nitrate was initially used to produce explosives and munitions during World Wars I and II. After 1945, the technology was adopted for civilian purposes and used to develop synthetic fertilisers, with military production facilities being

converted to manufacture fertilisers to “fire up” agriculture. Today, in the wake of more than 70 years of an expanding and increasingly global use of synthetic fertilisers, it is estimated that more than half of the world's agricultural production relies on nitrogen fertilisers to immediately increase its yield.³ In terms of its significance, the production of synthetic nitrogen fertiliser is therefore often considered to be on a par with the invention of the wheel, the light bulb, or telecommunications.

Despite being initially celebrated as a global success story, the prospects linked to the use of fertiliser seem less positive today. Fertiliser is increasingly criticised for the following reasons:

- 1. The production process uses large amounts of energy and resources and is dependent on fossil fuels such as oil, gas, and coal.⁴**
- 2. Fertilisers are often used in conjunction with unsustainable agricultural technologies and practices. This promotes the use of chemical pesticides, hybrid seeds, and monocultures.**
- 3. Nitrous oxide emissions resulting from the use of nitrogen fertilisers are particularly harmful to the climate.⁵**
- 4. Excess nitrate has long-term negative impacts on the soil and water.⁶**

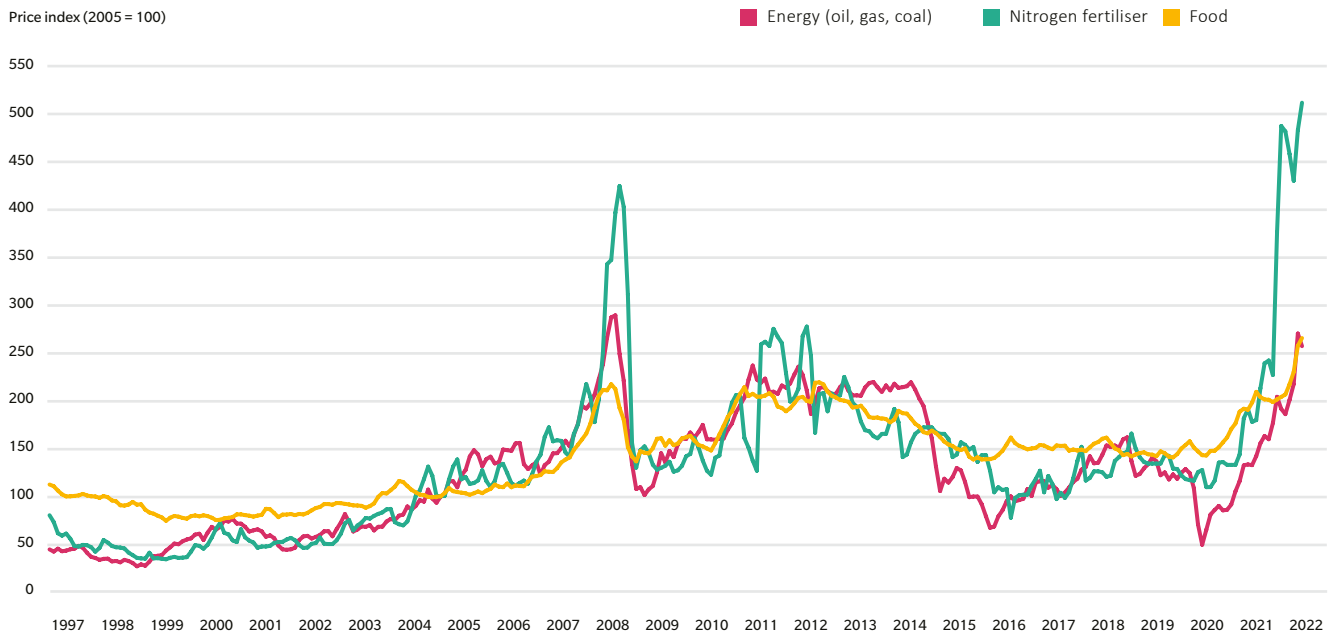
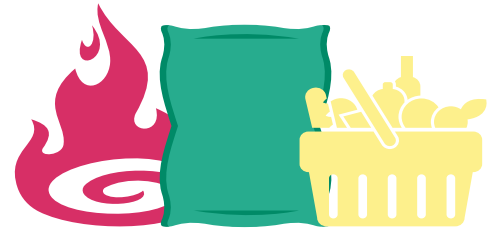
Even though South Asia and South America have been able to increase their yields and experience so-called Green Revolutions through the use of fertilisers and constructed irrigation, much of this increase contributes neither to an ecologically sustainable nor a socially just food system to

1 The authors are aware that the current food crisis is driven by a complex set of factors, including current trade restrictions, price speculation for staple foods, and poor weather conditions in the northern hemisphere. However, the study primarily highlights the role of price surges and shortages of synthetic fertiliser in the context of the food crisis.
2 For more on the history of how fertiliser was invented, see: <https://www.freitag.de/autoren/the-guardian/brot-aus-luft> [last accessed on 22 May 2022].
3 Erisman et al., 2008, p. 637.
4 Menegat et al., 2021, pp. 2.
5 Davidson, 2009, p. 660.
6 Nosengo, 2003, p. 894; Stevens, 2019, pp. 578.

Figure 1

Price of fossil fuels, nitrogen fertilisers and food, 1997 to 2022

Data: IMF, 2022



feed the world's population. On the contrary, excessive consumption of animal products, the combustion of cereals and oilseeds for agrofuels, and the massive amounts of wasted foods would not have been possible without the widespread use of fertilisers. Our food system's dependence on synthetic fertilisers is unsustainable and inevitably increases the amount of gas, oil, and coal on our plates.⁷ Along with the environmental and climate-related damages, increasingly complex economic and political interdependencies linked to fertiliser as a global commodity are exacerbating global inequality and long-term risks. The current international crisis affecting the prices for fertilisers and food is no exception to this trend. In the Global North, short-term financial support for farmers, the provision of alternative land, relief payments for consumers

and other measures may help to cushion some of the negative impacts for farmers and consumers, albeit at the cost of environmental sustainability. In the Global South, however, small-scale food producers and consumers are likely to be hit with full force by the the crisis.

Against the backdrop of the looming food crisis, this paper highlights the dependence on synthetic fertilisers and the lack of their sustainability. It focuses in particular on the increasing dependence of African small-scale food producers on global fertiliser supply chains. In recent years, multinational fertiliser companies have systematically penetrated African markets. This study will analyse and evaluate this trend and its impacts on African small-holders in relation to the global food crisis.

7 Pfeiffer, 2006.

2. THE GLOBAL FERTILISER INDUSTRY

A closer look at the structures and recent developments of the global fertiliser industry exposes the ways in which synthetic fertilisers are creating new ecological and economic dependencies. Synthetic fertiliser production is still firmly tied to the oil, gas, coal, and mining industries and uses large amounts of energy and resources. Up to 80 percent of production costs involved in manufacturing nitrogen fertiliser via the Haber-Bosch process, for example, are determined by the variable fuel costs for oil, natural gas, or coal.⁸ In addition, the mineral raw materials needed to produce phosphate and potash fertilisers are in short supply worldwide, and they can only be mined in few regions.⁹ Since fertilisers require enormous amounts of resources and energy, the industry needs cheap and reliable access to fossil fuels and raw materials.

However, the structure of the fertiliser industry has changed fundamentally in recent decades. While the industry used to operate almost exclusively in regional fertiliser cartels and was often placed under direct government control due to its strategic role in explosives production (and later in ensuring food security),¹⁰ the production and marketing of fertiliser as a global commodity is today dominated by multinational corporations.¹¹ This shift is driven by three key factors: privatisation, consolidation, and the recent pressure being put on the industry to make the sector more sustainable.

Fertiliser production in the hands of a few private companies

The privatisation of formerly state-owned or cooperatively managed fertiliser companies began in the early 2000s. When today's largest fertiliser companies went public (e. g. Yara, Mosaic Company, Potash Corporation in 2004, CF Industries in 2005), this initially forced fertiliser companies to maximise profits to guarantee high share prices and dividend pay-outs. Since then, this pressure has been

countered by massive investments to expand production capacities and develop new sales markets across the globe.¹² This resulted in higher growth rates, a trend that was further accelerated by the global food crisis of 2007/08. While rising raw material costs for fertiliser production forced small and regional producers out of the market, global fertiliser companies were able to use their size and their roots in the petroleum, natural gas, and mining industries as leverage to generate strong additional profits during the crisis. Customers were willing to pay higher prices and demand for fertilisers was on the rise, but there were further reasons behind their success. According to studies, 42 to 51 percent of the crisis-related price increases can be traced back to price agreements and cartel structures between companies.¹³ It is hardly surprising, then, that fertiliser companies emerged from the 2007/08 food crisis with lucrative earnings. The share price of the Norwegian manufacturer Yara, for example, tripled from around 17 euros, peaking at over 50 euros during the crisis. The current crisis similarly promises to bring record profits for the fertiliser industry (see Chapter 4).

The consolidation of the industry was the second essential dynamic and is closely tied to the general shift towards privatisation since the 2000s: an ever smaller group of corporations is coming to dominate an ever larger share of the global fertiliser market, giving them increasing power within the global food system. While global producers were able to make unexpected short-term profits during the world food crisis of 2007/08, the industry has since been undergoing a structural transformation that has spawned ever larger and globally active corporations. This consolidation is due to the fact that power relations have shifted both horizontally (among fertiliser companies) and vertically (between fertiliser companies and farmers). Horizontally, takeovers of regional producers by multinationals,

8 Yara, 2018, pp. 29.

9 Cordell et al., 2009, p. 295; Tanchum, 2022.

10 Chapman and Edmond, 2000, pp. 759.

11 Hernandez and Torero, 2013, pp. 724.

12 Hernandez and Torero, 2013, p. 726; Lie, 2015, pp. 75.

13 Gnutzmann and Spiewanowski, 2014, p. 12.

Figure 2

Acquisitions and mergers of the largest fertiliser companies

Illustration based on own research
 Photo: Andrey_Popov/Shutterstock.com

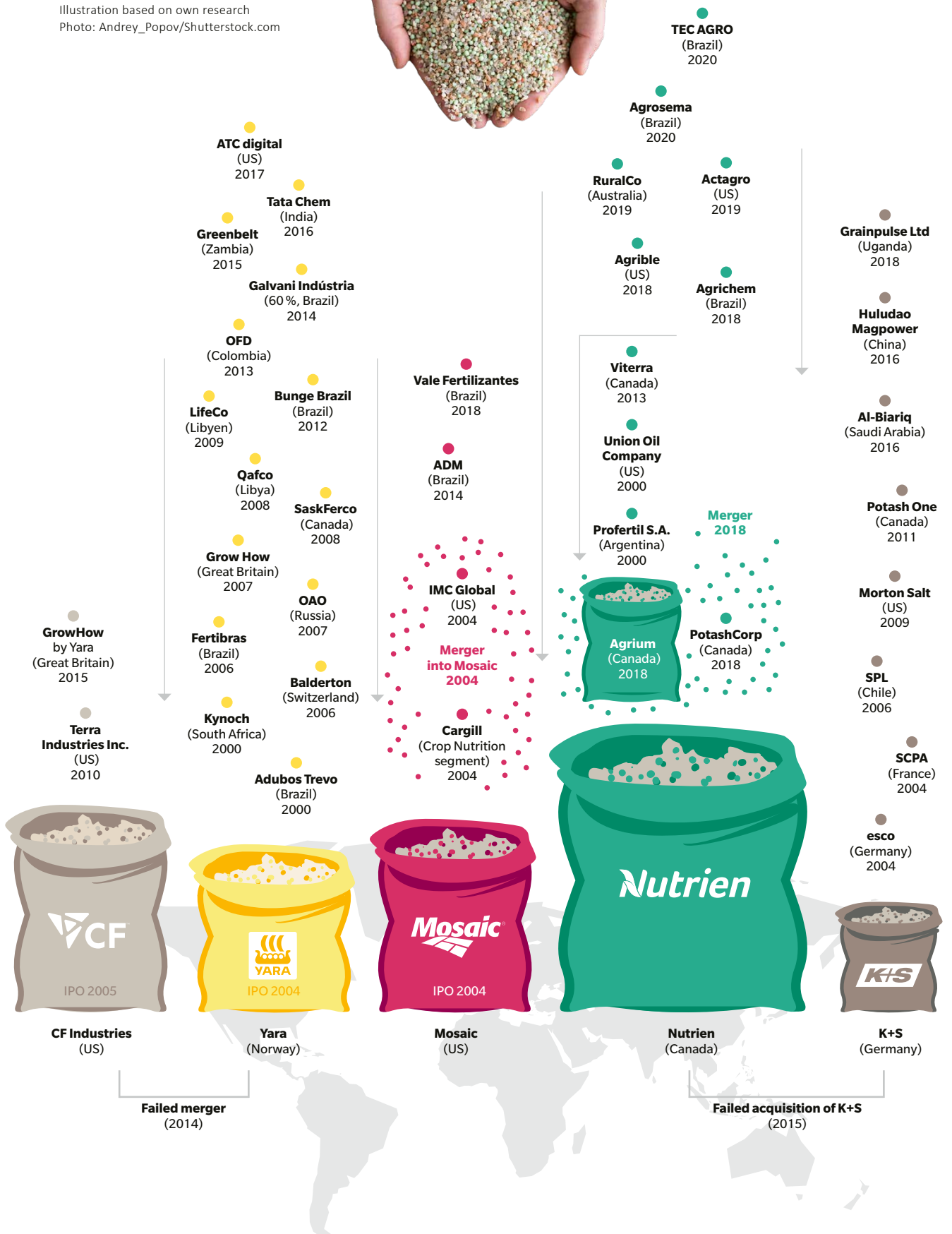




Figure 3

The growing market power of multinational fertiliser companies is reflected in their supply chains, which reach into deeply rural areas.

Photo: Gideon Tups, 2019

as well as mergers between global producers, have increased market concentration (see Figure 2). Today, the four largest fertiliser producers, Nutrien, Yara, CF Industries and Mosaic, produce around 33 percent of all nitrogen fertilisers sold globally. However, consolidation is lower than in adjacent industries such as pesticides or seeds, where the share is 65 and 50 percent, respectively. Yet unequal access to fossil fuels and mineral raw materials creates regional sales monopolies, and thus leads to problems linked to market dominance.¹⁴ Since today the fertiliser sector is dominated by only a few multinational companies which have set up regional monopolies – or fertiliser cartels – to market their products, antitrust authorities have repeatedly had to intervene in order to prevent, for example, the planned merger between CF Industries (US) and Yara (Norway) in 2014 or the take-over of K+S (Germany) by Nutrien (Canada) in 2015. In

addition to such horizontal consolidation, there is an increasing trend towards vertical monopolisation: prior to the food crisis of 2007/08, global fertiliser trade was organised almost exclusively through numerous global trading houses and regional importers and suppliers. Today, global fertiliser companies aim to seamlessly integrate logistics and marketing in order to have full control over the fertiliser supply chain from factory to farm and ultimately rake in profits from all segments of the supply chain (see Fig. 8 on p. 18).

The pressure on profit margins and growth, as well as the struggle for increasingly scarce raw materials and new sales markets often means that corporations are willing to take high business risks, or even tolerate human rights violations. Corruption scandals and open support for totalitarian regimes have become commonplace in the expanding fertiliser industry. Between 2004 and 2009, for example, the Norwegian fertiliser company Yara spent USD 8–14 million bribing members of the Gaddafi regime in Libya, state officials in India, and suppliers in Russia – the largest corruption scandal with Norwegian involvement in history.¹⁵ Another instance is Yara’s close partnership with the Belarusian state-owned company Belaruskali, which was terminated shortly before Russia’s invasion of Ukraine.

¹⁴ Hernandez and Torero, 2013, p. 732; Vilakazi and Roberts, 2019, pp. 8.

¹⁵ See: <https://www.reuters.com/article/yara-corruption-idUSL5N0KQ0WL20140116> [last accessed on 15 May 2022].

The company's financing of the totalitarian Lukashenko regime and its acceptance of severe human rights violations caused by poor working conditions in the company's potash mines attracted widespread criticism.¹⁶ Andrey Melnichenko, Dmitry Mazepin and Andrey Guryev, the CEOs of Russia's top three fertiliser companies (EuroChem, Uralkali, PhosAgro) were among the first oligarchs the EU sanctioned for their ties to Russian autocrat Vladimir Putin in the context of his invasion of Ukraine.¹⁷

How the fertiliser industry responds to calls for increased sustainability pressures

Along with privatisation and consolidation, the pressure to make production more sustainable is currently providing the fertiliser industry with new momentum. Companies are proactively responding to the diverse forms of political pressure – sustainability goals, environmental standards, and climate protests – by strategically adopting sustainability management measures and fine-tuning their public relation efforts.

Not only do synthetic fertilisers have extremely harmful effects on the climate because their production consumes vast amounts of energy (see Box 1), they also lead to environmental degradation. Their use causes high emissions of nitrous oxide, a potent greenhouse gas, eutrophication, which entails environmental and health-related hazards (algae blooms and drinking water pollution), and the long-term degradation of organic matter in the soil. Experts therefore agree that the increasingly excessive use of fertilisers worldwide has been a significant factor in causing humanity to transgress the planetary boundaries for the biochemical cycles of nitrogen and phosphorus.¹⁸ As a result, political goals and regulations to minimize the use of chemical fertilisers are leading to mounting pressure on the industry. The European Farm to Fork strategy, for example, calls for a 20 percent reduction in chemical fertiliser use by 2030. China, the world's largest consumer and producer of fertilisers, has recently also launched an effective programme to significantly reduce fertiliser use – the Action Plan for Zero Growth of Chemical Fertiliser Application Until 2020. Within its key markets, the fertiliser industry has begun to address this increasing focus on

Box 1

SYNTHETIC FERTILISERS: KILLING THE CLIMATE

A recent study¹⁹ concluded that the nitrogen fertiliser value chain alone was responsible for 1.25 gigatons of CO₂ equivalents in 2018, or 2.4 percent of global greenhouse gas emissions, even exceeding the share of global business flights in the same year. About one-third (35.2 percent) of these emissions can be attributed to the actual production of artificial fertiliser, while around two-thirds (62.4 percent) are caused by nitrous oxide emissions which occur when nitrogen not absorbed by the plant escapes into the atmosphere. Nitrous oxide is a greenhouse gas that is about 300 times more potent than CO₂. The reason for the extremely negative impacts of nitrogen fertiliser production on the climate is that the process of synthesising ammonia from hydrogen and nitrogen – known as the Haber-Bosch process – requires enormous pressure and extremely high temperatures of around 500 °C. No chemical reaction consumes more energy than the production of ammonia to manufacture nitrogen fertiliser, which accounts for one percent of global energy consumption.

sustainability, which ultimately threatens its business model, through a variety of measures both within and outside the industry. These are aimed at enforcing the view that despite the looming climate crisis there are no alternatives to the use of synthetic fertilisers.

Measures outside the industry primarily focus on intensive lobbying, ensuring that key industry players are present at global forums on agricultural or sustainability issues. At the World Climate Forum, and the World Economic Forum (WEF) in particular, the fertiliser industry has again and again presented itself – either through associations

16 See: <https://norwaytoday.info/news/norways-yara-international-accused-of-funding-belarus-dictatorship-can-you-live-knowing-you-helped-murderers-and-rapists/> [last accessed on 15 May 2022].

17 The sanctions against the CEOs as well as other oligarchs were imposed because of their close ties to Vladimir Putin (Official Journal of the European Union, online at: <https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=OJ:L:2022:080:FULL&from=EN> [last accessed on 15 May 2022]).

18 Campbell et al., 2017, pp. 3; Conijn et al., 2018, p. 249.

19 Menegat et al., 2021. Preprint.

CLIMATE-SMART AGRICULTURE IN KENYA AND TANZANIA

The governments of Kenya and Tanzania are increasingly adopting what is referred to as Climate-Smart Agriculture (CSA) policies. CSA was originally developed by the United Nations Food and Agriculture Organization (FAO) but was never fleshed out in detail. The Global Alliance for Climate-Smart Agriculture (GACSA) was launched in 2014 as a multistakeholder platform and now has more than 500 members, including synthetic fertiliser manufacturers such as Yara and Mosaic Company, as well as regional and international fertiliser industry advocacy groups. However, the official global CSA agenda does not seem to pave the way for alternatives to climate-damaging synthetic fertilisers.

However, Kenya's and Tanzania's government strategies paint a more differentiated picture. In Kenya, the CSA approach has been enshrined as an official goal in the Kenya Climate-Smart Agriculture Strategy 2017–2026 (KCSAS). The Tanzanian government adopted a national CSA programme in 2015, followed by a CSA guideline in 2017. Both documents define the following CSA measures as suitable for farming in Tanzania: agroforestry, use of green manure to cover soil, rainwater harvesting, composting, crop rotations with legumes, organic-fertilisers and crop diversification, along with "improved" (such as drought-resistant) seeds and "conservation agriculture" – approaches that by no means exclude the use of genetically modified seeds and chemical pesticides.

Similarly, it is difficult to judge whether the actors involved in implementing the strategy are actually open to give agricultural policy a more progressive direction. A comparison of their positions on climate change adaptation, climate change mitigation (including measures to minimize greenhouse gas emissions), and productivity shows that only one of the involved institutions, an environmental policy institute, invests 35 percent of its CSA budget in active climate change mitigation actions, while the remaining actors regard this goal as less important. In addition to progressive NGOs, the list of participating actors includes the Alliance for a Green Revolution in Africa (AGRA) and the Southern Agricultural Growth Corridor of Tanzania (SAGCOT), both of which represent the interests of the private sector and take an agro-industrial approach to supporting small-scale food producers implement CSA measures. The state provides 78 percent of the funding for these measures, taking them from its budget for development assistance.

These measures show that governments, too, try to make the agricultural transformation more sustainable. At the same time, however, there is always a risk that sustainability measures might be instrumentalised and watered down, especially by players from the agricultural industry.

such as the International Fertiliser Association, an international umbrella organisation of the fertiliser industry, or through independent campaigns – as a key driver of sustainability in agriculture. International platforms launched by multinational fertiliser companies²⁰ are also used to lobby not only for the promotion of industrial,

input-intensive agricultural models, but equally serve as political spaces to raise public and private capital for specific agricultural projects. The New Vision for Agriculture platform founded by fertiliser company Yara at the 2009 World Economic Forum, for example, ultimately had the purpose to raise funds and gather political support for

20 Examples of such platforms include the New Vision for Agriculture and the African Green Revolution Forum (both launched in 2009), Grow Africa (2011) or the more recently established Food Action Alliance (2019).

two agricultural corridors in Tanzania and Mozambique. It hardly comes as a surprise that the platform and especially the investments related to the corridors were closely tied to the goals of the fertiliser industry, whose primary aim was to break into new sales markets and increase fertiliser use.²¹ At the political level, the fertiliser industry's principal aim is to ensure that agricultural models which are strongly reliant on external inputs are endorsed as one of the main building blocks in international efforts to make the agricultural sector sustainable.²² This can be seen as a direct response to calls for locally adapted agricultural alternatives such as agroecology that respect local nutrient cycles and are less dependent on external inputs and global supply chains.

Alongside these external measures, fertiliser companies are also implementing internal measures to address their sustainability challenges, at least on a superficial level. The vertical monopolisation of supply chains from factory to field now allows fertiliser companies to directly interact with farmers and sell this communication as a means to a sustainable transformation. Specifically, companies are keen to communicate their campaigns to provide farmers with "on the field" advice as directly leading to a more climate-friendly application of fertilisers. Their rationale is based on the implicit assumption that farmers tend to over-fertilise or fertilise at the wrong time of year, making them responsible for high nutrient discharges. However, this framing ignores an essential conflict of objectives faced by agribusiness corporations: on the one hand, their goal is to increase fertiliser sales, while on the other, sustainability targets force them to minimise fertiliser use.

Digital platforms are also playing an increasingly important role in such attempts to make farmers and their supposedly improper use of fertilisers responsible for sustainability issues. Nutrien, for example, is currently working with BASF, while Yara is collaborating with tech giant IBM to develop a digital platform which offers farmers advanced services, such as seamless monitoring of crop data, digital

consulting, and even digital marketing, as a packaged solution if they buy their fertiliser.²³ The companies tend to market these digital platforms as part of their shift towards sustainability. Yara and IBM, for example, claim that the digital algorithms developed through their partnership will help to manage 7 percent of the world's agricultural land in a more sustainable manner.²⁴ According to these companies, digital monitoring and algorithm-based analyses will lead to a more productive and thus less resource-intensive use of farmland. However, such technology-based promises should be treated with caution, as they tend to overestimate the potential of digital "solutions" to make agriculture more sustainable while underestimating the new dependencies arising between corporations and farmers.²⁵

Beyond the farm level, too, fertiliser companies have recently been trying to make the production process more sustainable.²⁶ Even if the long-term prospect is to electrify entire production sites,²⁷ scenarios speaking of hydrogen storage technologies that will pave the way for electricity-based fertiliser production and logistics remain visions that need to be treated with scepticism. Firstly, hydrogen-based electrification would cause considerable additional costs resulting in price increases for fertilisers. Secondly, internal industry studies show that to date, 94 percent of the promised "green" capacities are nothing more than preliminary and highly optimistic process designs, i. e., they have not been tested in terms of their technological and economic feasibility.²⁸ To sum up, the industry's measures remain fundamentally superficial, highly speculative as to their impact, and are aimed at glossing over the resource-intensive extraction of raw materials and fertiliser production – both on the ground, along the supply chain, and in production facilities. It appears that the voluntary measures adopted by fertiliser companies tend to cement the status quo and defer urgent problems into the future. Essentially, they are therefore to be criticized as greenwashing strategies.

21 Tups and Dannenberg, 2021, pp. 28.

22 For a detailed evaluation of the lobbying goals of the Alliance for a Green Revolution in Africa (AGRA) and their implementation, see Bred for the World et al., 2021.

23 For more information on digital platforms in the agricultural sector, see: INKOTA, 2021.

24 An illustrated account is available at: <https://www.ibm.com/services/client-stories/yara> [last accessed on 22 May 2022].

25 Brooks, 2021, pp. 1.

26 Ammonia Energy Association, 2019.

27 The fertiliser company is currently planning to develop a pilot project to electrify an entire production plant in Porsgrunn, Norway. Although the technical details of the project remain unclear, the priority is to set a precedent for the planned IPO of Yara's new hydrogen division.

28 CRU Group, 2021.

3. AFRICA: THE FERTILISER INDUSTRY'S LAST FRONTIER

The African continent is the only remaining market for multinational fertiliser companies to unlock if they aim to substantially increase their sales in the future. While other markets (Europe, North and South America, South Asia, China) do not hold the potential for further sales increases due to already excessive fertiliser use, or are even seeing declining sales as a result of restrictive regulations, the fertiliser industry is hoping to sell significantly larger amounts of fertiliser by moving into the African market. This hope, however, has been frustrated by disillusioning experiences in the past and therefore relies on African agriculture making a fundamental transformation towards input-intensive models.

For a long time, Africa was an un-lucrative market in the eyes of the fertiliser industry. Today, however, the opposite is the case. To understand this turnaround, we first need to look at the development of fertiliser use on the continent in the past.

Young post-colonial African governments sought to organise the strategic production and marketing of fertiliser independently through state-owned enterprises. This secured them a certain degree of sovereignty in terms of agricultural policy and control to limit foreign exchange outflows triggered by fertiliser imports (see Figure 5). As a result, the first fertiliser markets developed under tight government regulation and management beginning in 1960, with little room for private profit.

However, the structural adjustment measures implemented by the International Monetary Fund (IMF) following the global oil, economic, and food crises in the late 1970s

largely dismantled state sovereignty over domestic fertiliser production and marketing, creating the first niches for the private sector to gain a foothold. Back then it was assumed that an efficient private sector could replace state structures. This, however, was never the case. To avoid taking losses following the phase-out of government support, the early private-sector fertiliser industry consisting of local traders and importers was only able to sell fertiliser to a few market- or export-oriented farmers. Low demand in conjunction with small-scale food producers' limited purchasing power meant that multinational fertiliser companies repeatedly faced high losses whenever they invested in long-term strategies to break into the African market, and many companies withdrew.²⁹ As agricultural markets in general and the fertiliser market in particular became increasingly liberalised, fertilisers only played a marginal role in Africa from the 1980s onward.

The situation changed drastically in the early 2000s. Increased use of fertilisers was regarded as a central pillar for implementing the African Green Revolution. This was essentially driven by the adoption of the Maputo Declaration on Agriculture and Food Security in 2003, which initiated the Comprehensive Africa Agriculture Development Programme (CAADP). According to the CAADP, GDP growth in the continent's agricultural sectors was to reach at least 6 percent annually. In return, it promised a renaissance in government spending on agriculture. The pan-African agreement established that member states should invest at least 10 percent of their budgets in agriculture. In 2006, CAADP was followed by the Abuja Declaration on Fertiliser for an African Green Revolution, a crucial agreement that enshrined fertiliser

²⁹ Porter et al., 2014, p. 9.



Figure 4

Postcolonial governments saw domestic fertiliser production as a means to escape dependence.

The photo shows Julius Nyerere, the first president of Tanzania, together with German investors from the Kloeckner-Humboldt-Deutz Group in front of a newly opened nitrogen fertiliser factory in Tanga in 1971. Photo: Gideon Tups, 2020

as a key driver of the Green Revolution. The declaration signed between member states of the African Union calls for an average increase in fertiliser use from 8 to a minimum of 50 kilograms of nutrients per hectare of agricultural land by 2015. This figure was lower compared to fertiliser use for example in Europe or Asia with 76 and 256 kilograms per hectare, respectively. Still, given the scarcity of water in many of Africa’s agricultural regions, the declaration set an extremely ambitious – if not utopian – target.³⁰ Starting in 2010, the Abuja Declaration was followed by a full wave of subsidies for fertilisers, with at least 10 African countries providing financial support, some of them on a massive

scale, funded through loans from the World Bank.³¹ On average, these subsidies accounted for approximately 30 percent of the agricultural budgets of the countries involved, and in extreme cases such as Ethiopia, Malawi, or Zambia, even far more than 50 percent.³² These programmes generated enormous costs. While in Malawi, for example, more than 8 percent of the total government budget was spent on fertiliser subsidies between 2006 and 2008, the soaring fertiliser prices during the world food crisis caused that budget to explode to more than 16 percent, forcing the government to make cuts in other areas (such as education, infrastructure, culture, other agricultural programmes and technologies). Farm Input Subsidy Programmes (FISPs) allowed African small-scale food producers to use fertilisers on a large scale without suffering massive financial losses – at least since the adoption of the Abuja Declaration. Without these subsidies, which would generally cover half the price of fertilisers, purchasing these products would not have

30 Water availability is key to achieving yield increases with fertilisers. Without artificial irrigation, the use of fertilisers is associated with high economic risks. For example, while the Asian Green Revolution of the 1960s relied heavily on public investment in irrigation, the African continent has only very limited natural potential (flat terrain, few rivers) and funds available to expand irrigation.

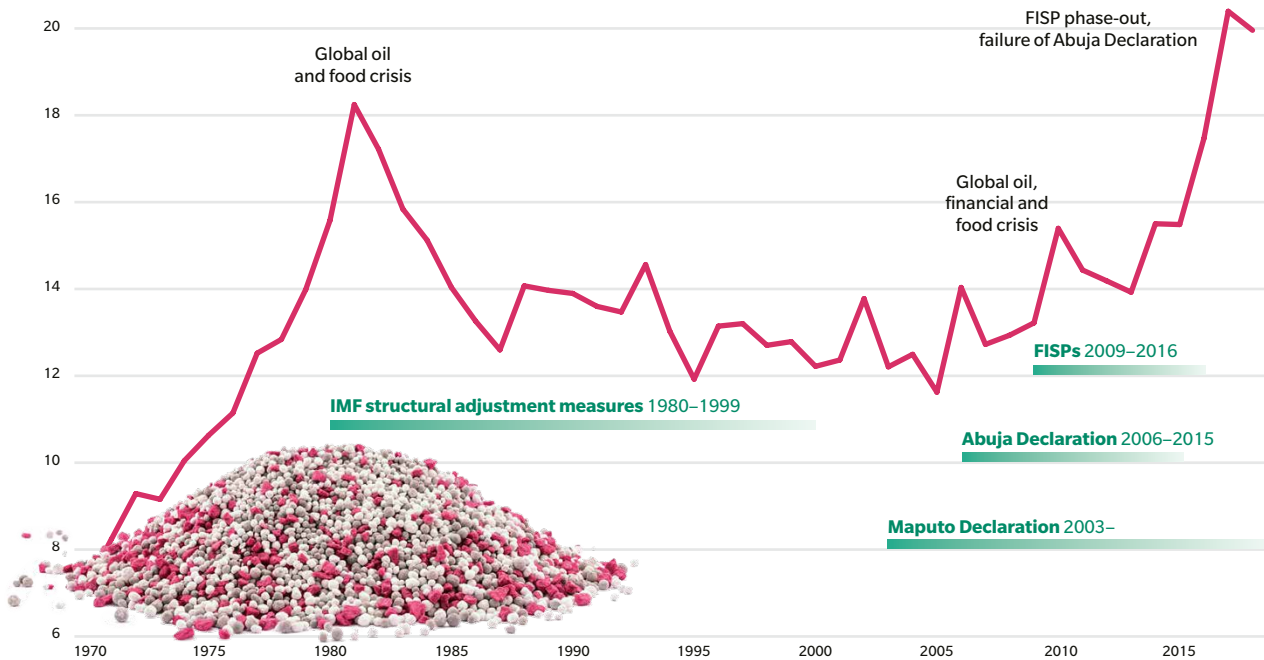
31 ACBIO, 2014, pp. 34; ACBIO, 2016, pp. 4.

32 ACBIO, 2016, p. 4; Jayne et al., 2018, p. 2.

Figure 5

Fertiliser use in southern Africa, kg/ha

Data: World Bank, 2022
Photo: Hemerocallis/Shutterstock.com



been a reasonable investment for many small-scale food producers. On top of this, they were also facing higher risks of crop failure and uncertain marketing prospects (see Boxes 3 and 4).

These cost-intensive subsidies provided by African governments, which need to be provided year after year and are therefore economically unsustainable, were accompanied by a new interest in agricultural development on the part of international development cooperation agencies. Already in 2006 – the same year the Abuja Declaration was adopted – the Rockefeller Foundation and the Bill and Melinda Gates Foundation (BMGF) founded the Alliance for a Green Revolution in Africa (AGRA), one of the leading projects promoting a Green Revolution in Africa and a model for many similar initiatives. Through AGRA, development cooperation agencies (such as USAID, UKAID) work with African governments and in close cooperation with multi-

national agricultural corporations (Yara, Bayer, BASF and OCP, among others) to improve small-scale food producers' access to commercial inputs (seeds, fertilisers, pesticides, loans) and markets. To date, AGRA has raised approximately USD1 billion in funding and invested in various measures to intensify agricultural production. In direct response to the world food crisis of 2007/08, the then G8 countries launched the New Alliance for Food Security and Nutrition in Africa (NAFSN) in 2012 to back CAADP measures with international funds and public-private partnerships (PPPs). NAFSN donor countries pledged to contribute a total of USD6.2 billion over ten years to support Africa's agricultural transition. The private sector made even steeper promises, pledging to initiate direct investments totalling USD8 billion, with Yara (USD1.5 billion) and the seed company Syngenta (USD500 million) alone promising to provide around a quarter of all direct investments as part of the African Green Revolution agenda.³³

³³ European Parliament, 2015, p. 11.

MARKET LIBERALISATION AND STATE-REGULATED DEMAND IN KENYA

Based on a report by Anne Maina,
BIBA Kenya

Kenya's fertiliser market is largely dependent on imports and has been firmly in the hands of foreign fertiliser manufacturers and their subsidiaries since the country's independence in the mid-1970s. While a 1970 FAO report shows there were a range of fertiliser suppliers, including companies such as Hoechst and BASF from Germany, today two players dominate the market: the Norwegian fertiliser giant Yara and the Kenyan manufacturer MEA, which now not only imports but also produces in Kenya and supplies other East African countries with its products.³⁴

As a result of the liberalisation in the 1990s, the market was no longer driven solely by fertiliser donations from foreign donor agencies and state regulation. Once government price controls and limited import licences had been lifted, this freed the path for private companies, which went on to import and sell most fertilisers from then on. Fertiliser sales then doubled in just 15 years. With virtually no local production of fertilisers, market liberalisation initially made farmers more dependent – one of the reasons being the unclear timing of deliveries, which in turn affected the start of the planting season.

Following 15 years of liberalisation, the Kenyan government launched a comprehensive subsidy programme for fertilisers in the wake of the 2007/2008 world food crisis, which included a campaign to distribute fertiliser at no cost to particularly marginalised farmers.³⁵ As in many countries in eastern and southern Africa, the programme in Kenya mainly targeted smallholder producers. The World Bank and other donors have launched similar schemes. The programme, however, revealed the country's strong dependence on fertiliser imports. This



Figure 6

BIBA Kenya trains farmers to make them independent of external inputs such as synthetic fertilisers and chemical pesticides.

Photo: BIBA Kenya

in turn spurred the Kenyan government in 2013 to adopt a national transformation strategy that promotes the establishment of fertiliser factories through PPP projects. By producing fertilisers domestically, the Kenyan government aims not only to boost domestic production, but also to reduce its dependence on imports and cut transport costs. This has benefited local producer MEA, now one of the two major dominant companies in the country. This strategy, however, has not helped to diversify the fertiliser market or wean the country off fossil fuels.

Having to deal with low agricultural productivity, hunger, as well as the high costs of fertiliser subsidies, the government is now increasingly doubting the effectiveness of its subsidy programmes. Scientific studies show that subsidies provided in isolation without schemes offering agricultural advice or soil and market analyses often fail to have the expected effect on growth rates.³⁶ Farmers only increase production if they have previously had access to synthetic fertilisers, whereas marginalised farmers have little to no benefits.³⁷

34 FAO, 1975.

35 D' Alessandro et al., 2015, p. 41.

36 Jayne et al., 2018, pp. 7.

37 ACBIO, 2016, pp. 4; Andrews 2021, pp. 289.

This two-track approach, comprising on the one hand an increase in government spending through fertiliser subsidies and, on the other, collaboration with international cooperation actors, philanthropic foundations, and multinational agricultural corporations therefore marked a turning point in the continent's agricultural development – and thus for the marketing of fertilisers.

Much effort, little effect: poor results of the fertiliser boom

While agronomists and soil experts in particular generally regard synthetic fertilisers as a “necessary evil” due to their detrimental effect on the environment and stress that arguments for and against their use must be weighed carefully³⁸, African development cooperation actors and politicians long held a rapid increase in fertiliser use to be a universal and often unquestioned solution to solving the continent's agricultural challenges. As far back as 2007, the current president of the African Development Bank, Akinwumi Adesina (then regional director of the Rockefeller Foundation) emphasised at the African Green Revolution Conference in Oslo:

“

The continent has no fuel to fire agriculture. Some say fertiliser is no silver bullet. They are right: it is not. From my perspective, it is a golden bullet.

”³⁹

Although significant resources were invested over the last ten to fifteen years into further enhancing the “golden bullet” (subsidies, development cooperation and foundation projects), the promised Green Revolution has failed to meet expectations – not only in terms of its promises and goals but also regarding its many negative impacts. Firstly, the government failed to find the permanent funding needed to implement the CAADP agreement aimed at increasing government spending on agri-

culture. Secondly, fertiliser use never reached the target of 50 kilograms per hectare, flatlining instead at around 20 kilograms per hectare. The fertiliser subsidies, while causing extreme costs, have often either sustained existing problems or even created new challenges. Studies on FISPs in Africa show that only a small share of small-scale food producers actually succeeded in tripling the yields of nutrient-hungry crops such as maize and rice. Lack of rainfall and high soil acidity frequently resulted in far lower yields than expected.⁴⁰ The realities of small-holder farming simply did not reflect the conditions encountered in laboratory-style trials. In addition to these sobering results on the ground, FISPs were repeatedly overshadowed by political scandals and conflicts.⁴¹ On the one hand, political elites and the fertiliser industry itself often diverted subsidy payments which then failed to reach farmers. On the other, whenever fertilisers were distributed, successful farmers received preferred treatment, while those who would have benefited most from increased yields walked away empty-handed. Fertiliser subsidies that deepen the social divide between poor and socially disadvantaged farmers and rich and socially advantaged farmers may even exacerbate local inequality, marginalisation and, in the worst case, malnutrition and hunger. If at the local level individual, better-off farmers benefit disproportionately from subsidies, this can dramatically worsen the situation of poorer farmers because they face increased competition in terms of marketing their produce and securing access to arable land.⁴²

Both internal and external evaluations carried out within the framework of AGRA and NAFSN show that the programmes not only fall far short of expectations, but in some cases have failed outright. While NAFSN was quietly phased out as early as 2015 – just three years after it had been initiated,⁴³ AGRA remains active, but data prove that it has failed. AGRA's own internal evaluations have recently confirmed the fundamental criticism of AGRA's agricultural model. The studies show that AGRA has failed to achieve its goals⁴⁴ neither in terms of productivity increases nor in terms of ending hunger and poverty. Publicly available

38 Lal and Stewart, 2018, pp. 361.

39 AGRC, 2007, p. 92.

40 Andrews, 2021, pp. 288; Jahari, 2018, pp. 88; Javdani, 2012, pp. 150; Jayne et al., 2018, pp. 7.

41 ACBIO, 2016, p. 25; Andrews, 2021, pp. 288; Jayne et al., 2018.

42 ACBIO, 2016, p. 17; Andrews, 2021, pp. 288.

43 Prášková and Novotný, 2021, pp. 1751.

44 AGRA's goals include doubling yields and halving hunger in 13 countries by 2030.



Figure 7

Multinational fertiliser companies launch elaborate advertising campaigns to build their market power in Africa.

Photo: Roman Herre, 2022

data show that many farmers who participated in AGRA projects were not even able to earn an income above the poverty line. The evaluations further show that AGRA has systematically influenced fertiliser and seed legislation in partner countries to benefit agribusinesses by sending staff or providing direct financial support to ministries or advisory bodies of African governments. Using its financial resources and other lobbying efforts in this way, AGRA thus promotes and creates an institutional framework – of legislation and generally favourable conditions – in many African countries that cements its own Green Revolution approaches.⁴⁵

In summary, although African states as well as development actors have mobilised substantial and costly resources, the promises associated with the fertiliser boom, such as increased yields, have failed to materialise.

New marketing strategies, new dependencies

Despite the failures and the disillusionment associated with the promise of a rapid African Green Revolution, multinational fertiliser companies have seized the opportunity in recent years to ensure they profit in the long term from Africa’s untapped markets. The players in the fertiliser industry understand that it will take years before they can expect to make substantial profits, but they believe it is worth investing in the African market today in order to secure tomorrow’s earnings. The South African fertiliser company Omnia, for example, markets its business as “less commercial, more social at first”.⁴⁶ To generate

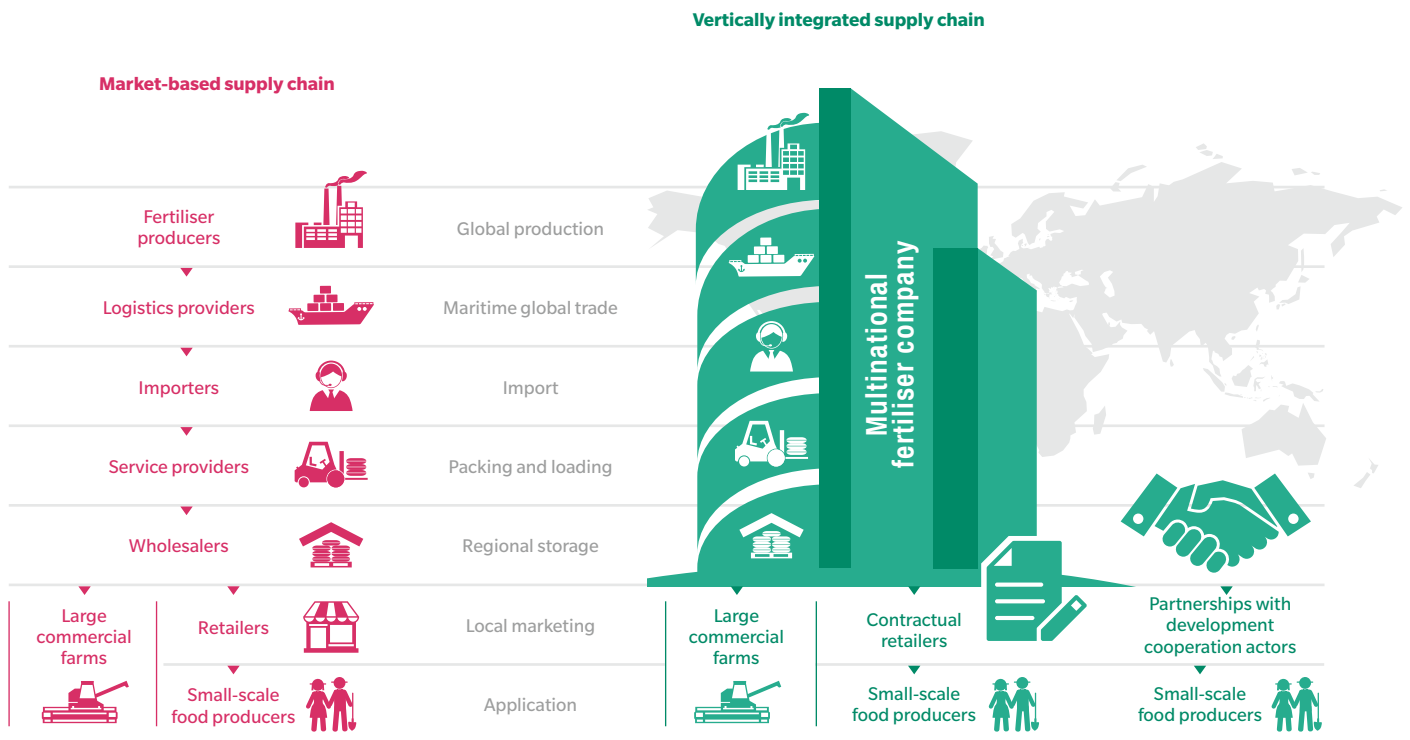
45 Bread for the World et al., 2021.

46 Webinar: Africa Fertiliser Ecosystem – Unlocking Africa’s potential, AFRIQOM – 7 October 2020.

Figure 8

Fertiliser marketing: Market-based vs. vertically integrated supply chain

Own Illustration



conventional profits on the African market in the long term, they argue, requires socially responsible investments in the short and medium term. The Moroccan fertiliser company OCP follows a similar line of argument, insisting that the only way to unlock the African market is to ensure that initial investments are development-oriented and partnership-based.⁴⁷ Yara’s CEO Svein Holsether found similar words to outline his company’s guiding principle at the 2016 World Economic Forum in Davos: “Yara recognised early on that the international private sector cannot simply ‘supply’ the African market as it is; the private sector must be part of the ‘creation’ of that market.”⁴⁸

This explains why fertiliser companies operating on the African continent have a strong interest in driving the

expansion of supply chains deep into rural regions in the long term. At the same time, they are well aware that they will only be able to earn profits on the African market if they promote the broad adoption of capital and input-intensive agricultural models. Small-scale food producers, who largely produce for their own subsistence and local markets, are a less attractive target group for the fertiliser industry due to their low sales potential and lack of purchasing power. Small-scale food producers will only become reliable buyers of synthetic fertilisers if large-scale partnerships with governments or development organisations raise awareness of fertilisers’ potential benefits, and often only if development projects directly or indirectly increase farmers’ purchasing power. As a result, African markets have given rise to new marketing strategies and fundamentally different supply chains.

47 Ibid.

48 World Economic Forum, 2016, p. 12.

During the long phase of liberalisation described above, when the agricultural sector received little state support, supply chains for fertilisers became increasingly market-oriented, with many domestic companies entering the market (see Fig. 8). Large importers would purchase fertiliser on the world market from a wide variety of producers through tenders. After reaching the seaports, the fertiliser would be portioned and packaged by regional companies into commercially available quantities (bags of 25 to 50 kilograms). Wholesalers would then organise the logistics to distribute and store fertiliser products close to the core agricultural regions. Finally, the “last mile” would be handled by thousands of small fertiliser dealers who would take on local marketing, mostly by selling individual bags of fertiliser to households. For a long time, this was the dominant supply chain, with many more or less independent actors involved in bringing fertiliser from a very concentrated multinational market to the field. Market-based supply chains have the advantage that they prevent individual players from creating imbalances, for example by charging high prices or directly influencing agricultural practices. Under these conditions, farmers preferably buy fertiliser from those suppliers that offer the best prices. Thus, inflated prices tend to be the exception in market-based supply chains.

By contrast, global fertiliser companies which started to invest in African markets when fertiliser subsidies were introduced, pursue a fundamentally different supply chain strategy. Instead of outsourcing the individual stages of the supply chain to different actors, global fertiliser companies take advantage of the strength of their capital to make long-term investments and seize control of the entire supply chain from factory to farmer. By establishing their own infrastructure, such as import terminals, warehouses, and sales outlets, and by closely monitoring all logistics and marketing steps along the supply chain through hierarchical corporate structures, multinational fertiliser corporations are not only able to secure a vertical monopoly along the supply chain. In many African markets, this model allows them to create also monopolistic conditions in whole markets, especially in the long term. In this way, fertiliser corporations are not only pushing players out of their own supply chains, they are also exerting massive pressure on market-based supply chains and their many employees. This highly integrated supply chain model allows fertiliser companies to dictate prices, redefine

agricultural standards and practices, and keep alternative fertiliser brands at bay.

This new and highly integrated supply chain allows fertiliser companies not only to cement their dominance vis-à-vis farmers and competing companies. They also benefit from agricultural partnerships and public funding. Development cooperation projects that aim to promote the African Green Revolution by encouraging smallholders to increase fertiliser use often provide an exclusive platform for fertiliser companies to place their products. Both internal and external evaluations show that agricultural projects working directly with farmers along the last mile (such as AGRA and NAFSN projects) almost exclusively tend to promote the products of large fertiliser corporations, leaving the local fertiliser industry to fend for itself. Typically, arrangements are made at the diplomatic level between donors (e. g. USAID) and representatives of the state in which the fertiliser company is based (e. g. the Norwegian embassy for the Norwegian company Yara). These agreements determine which fertilisers from which companies are purchased and promoted at the project level.⁴⁹ The privileged position of multinational fertiliser companies creates a further marketing advantage that damages actors in market-based supply chains. Small-scale food producers who are trained, advised, and integrated into new supply chains in the context of development cooperation projects usually do not just apply greater amounts of nitrogen fertiliser – they also tend to buy from multinational fertiliser companies instead of domestic producers. Above all else, integration into the hierarchically organised supply chains of multinational fertiliser companies means that prices are no longer determined by the market but are dictated by the company. Fertiliser companies no longer simply supply their goods, but are increasingly gaining direct influence over changes in agricultural practices by offering on-field advisory services in collaboration with development projects (see Box 4).

The central role of public subsidies and accompanying development cooperation projects in helping the fertiliser industry to tap into new markets is particularly evident in regions with favourable agricultural growing conditions (water availability, transport infrastructure, soil conditions, etc.) (see Box 4).

49 Tups and Dannenberg, 2021, pp. 31.

FERTILISER BOOM IN TANZANIA'S IHEMI CLUSTER

Tanzania's Ihemi Cluster is a good example of the effort and disillusionment associated with increased fertiliser use by small-scale food producers, and of who profits. Often described as Tanzania's breadbasket, the Ihemi Cluster encompasses the main agricultural region of the Southern Agricultural Growth Corridor of Tanzania (SAGCOT). SAGCOT is an agricultural development corridor initiated by fertiliser producer Yara and established through a PPP between the Tanzanian state, development cooperation organisations, and other food and agribusiness companies such as Unilever and Monsanto (now Bayer) in 2011.⁵⁰

Yara in particular, but also other fertiliser companies such as the Moroccan phosphate producer OCP, have been able to greatly expand their market presence in the Ihemi Cluster in recent years. Today, there are farms in almost every village that are organised by Yara or OCP in close partnership with Syngenta or Bayer and agricultural advisors from the Tanzanian government. Development cooperation projects such as the national AGRA project or the Tanzanian NAFKA project (funded by the US), but also philanthropic projects such as the One Acre Fund⁵¹ (funded by the Bill and Melinda Gates Foundation) played a decisive role in organising smallholders into groups and promoting the use of capital-intensive inputs such as seeds, fertilisers, pesticides, and loans. By purchasing the fertiliser, these projects indirectly subsidise the transport and marketing of fertilisers.

Evaluating the impact of ten years of subsidies aimed at promoting fertiliser use and intensive agriculture in the Ihemi Cluster, representative household surveys with small-scale food producers confirm that fertiliser use has increased massively.⁵² While around 25 percent of farmers used synthetic fertilisers in the 2007/08 season, this figure had risen to 64 percent in 2018/19. The average amounts used in maize cultivation increased from formerly 5 kilograms per hectare of fertiliser to 101 kilograms, making the Ihemi Cluster a highly

attractive market for the fertiliser industry. On average, fertiliser use across Tanzania is much less widespread, with only 16 percent of all small-scale food producers applying synthetic fertilisers.⁵³

However, this intensification of smallholder agriculture has not brought about the envisioned socioeconomic effects, such as higher yields and incomes. Much of the intensification is focused on the cultivation of maize, which requires large amounts of nutrients but is difficult to market. While a smallholder household spent an average of USD30 on inputs per season on maize cultivation in 2007/08, expenses rose to USD160 in 2018/19. Since maize is almost exclusively cultivated in rainfed agriculture, i.e. without constructed irrigation, these rising expenses translate into a high production risk. For example, in the 2017/18 season, small-scale food producers were able to produce record yields due to high rainfall, but in response the price of maize collapsed from an average of around USD300 per ton to as little as USD130 per ton. Eroding prices meant that many small-scale food producers were unable to repay their loans with fertiliser companies or other lenders such as the One Acre Fund, either in cash or in kind, and in some cases lenders ended up seizing farmers' collaterals (e.g. bicycle, motorcycle or even land). The following season of 2018/19, by contrast, was characterised by drought and high yield losses. Although this caused maize prices to rise as high as USD520 per ton, small-scale food producers were again unable to earn a profit on maize sales after deducting the crops needed for their own subsistence.

The example of the Ihemi Cluster shows that the large-scale increase in fertiliser use failed to deliver on the promises made in advance, despite the comprehensive support provided. While the cluster became the most important market in Tanzania for the fertiliser industry, there is no evidence that small-scale food producers benefited from the measures. On the contrary, the increasing and credit-based use of fertiliser has been tied to significant economic risks for small-scale food producers, even before they were hit by the global fertiliser price crisis.

50 Sulle and Hall, 2013, pp. 2; Tups and Dannenberg, 2021, pp. 28.

51 One Acre Fund is a non-profit social enterprise that provides loans for agricultural inputs to small farmers. Farmers must provide collaterals (vehicle, land, house). One Acre Fund bundles the needs of farmers and distributes fertiliser and seeds directly to the borrowers. At the end of the growing season the farmers repay their loans using either cash, their harvest, or – in case of hardship – their deposited collateral.

52 The comparison is based on survey data from Tanzania's Agriculture Sample Census Survey 2007/08 and Gebrekidan et al., 2021.

53 Wineman et al., 2020, p. 693.

4. SOARING GLOBAL FERTILISER PRICES AND THEIR IMPACTS IN AFRICA

Fertiliser prices have reached an unprecedented high, with the world market price for one metric ton of nitrogen fertiliser crossing the mark of USD900 in March 2022. At the same time, the FAO Food Price Index (FFPI) also reached a record high in March 2022, rising by 13 percent compared to the previous month. This food price crisis was triggered by the impacts of the COVID-19 pandemic combined with the exceptional geopolitical situation following the Russian invasion of Ukraine. However, such price crises and the food crises that follow in their wake are caused by the underlying structure and non-resilience of a food system that is highly dependent on fossil fuels.

Food crises and the central role of fertilisers

Previous food crises (1974/75 and 2007/08) have already revealed that fertilisers are a central factor linking fluctuating fossil fuel and food prices. Studies show that on a global average a doubling of fertiliser prices leads to a 44 percent increase in food prices.⁵⁴ During the 2007/08 food crisis, this unleashed a rapidly unfolding cascade of effects that was almost impossible to control: rising fossil fuel prices almost instantly led to rising prices for fertilisers and other inputs, such as diesel and pesticides. In response, farmers either reduced their investment in inputs or were forced to produce at significantly higher costs. This had a particularly dramatic impact on urban populations in the Global South: prices for staple foods exploded, provoking civil uprisings, especially in the urban centres of Africa and Asia, for instance in the context of the Arab Spring. At the same time, we see not only fertiliser companies but food speculators, too, taking advantage of the general

uncertainty and the fear of food shortages to profit from the crisis on commodity futures exchanges.

The current price increases for fertilisers that further exacerbate the food crisis have similar cascading effects – although their impact might possibly be even more devastating. Fertiliser prices had already risen steadily during the COVID-19 pandemic. While the world market price for nitrogen fertiliser was below USD250 per ton in January 2020, it had climbed to more than USD600 per ton by December 2021. Prior to the Russian attack on Ukraine, market analysts attributed these price increases to the slow restart of global supply chains and bottlenecks at key seaports for fertiliser in the Middle East and the Black Sea. In addition, temporary export bans imposed by Russia and China to protect domestic agriculture led to an artificial but predictable shortage of global export volumes for fertilisers.⁵⁵ In January 2022, experts were still assuming fertiliser prices would peak in the short term, as they had during the world food crisis of 2007/08, but that they would return to lower levels again in the medium term. This hope has now vanished: fertiliser prices are far above 2007/08 levels and are likely to remain this high due to current geopolitical tensions.⁵⁶ Russia and Belarus are not only among the world's most important producers of fertilisers, they also control major mining regions, which makes them suppliers of natural gas, potash, and phosphorus.

The Russian attack on Ukraine was immediately met with sanctions on Russian fertiliser exports. Yet even without these sanctions, marine logistics providers refused to serve the disputed ports in the Black Sea. The already

⁵⁴ Gnutzmann and Spiewanowski, 2016, pp. 1.

⁵⁵ China and Russia produce roughly one-third of the nitrogen fertiliser used globally. See: <https://ourworldindata.org/fertilizers> [last accessed on 22 May 2022].

⁵⁶ See: <https://www.agrarheute.com/markt/duengemittel/duengerpreise-inputkosten-steigen-dramatisch-neue-agrarwelt-591919> [last accessed on 22 May 2022].

Figure 9

**Profits made by the fertiliser industry during the crisis:
Net income of the largest fertiliser producers
in the first quarter of 2022, compared to the first quarter of 2021**

Data: Companies' quarterly reports 2021/2022



1st quarter 2021



1st quarter 2022



tense global fertiliser market has since experienced a “perfect storm.”⁵⁷ While fertiliser companies based in or maintaining close business ties to Russia and Belarus are currently forced to reorganise or bring their supply and production chains to a halt, competing companies (such as US-based companies Nutrien and CF Industries) with alternative access to raw materials are taking advantage of the sudden shortage to rake in high profits. As in the world food crisis of 2007/08, the share prices of the largest corporations have been sent soaring. The US-based groups Mosaic and CF Industries have seen their share prices double since the beginning of 2022 from around EUR30 and EUR50 to over EUR65 and EUR100, respectively. Even hard-hit corporations that are heavily dependent on Russian and Belarusian suppliers have been navigating the crisis surprisingly well. Yara’s net income, for example, has surged from USD14 million to USD947 million in the first quarter of this year.⁵⁸ Germany’s K+S also increased its first-quarter net income in 2022 by about a third compared to the same period last year (see Fig. 9).⁵⁹ Commenting on these unprecedented earnings, Yara’s CEO said cynically:

“Higher food and fertiliser prices may positively impact Yara’s bottom line in the short term. However, the societal and economic perspectives are completely in sync in the long term.”⁶⁰

Fertilisers are a key element of a new food crisis that was already unfolding during the global COVID-19 pandemic. According to FAO estimates, the number of people suffering from hunger worldwide increased by as much as 161 million during the pandemic.⁶¹ However, the price developments for fertilisers were not only caused by the temporary slowdown in global trade caused by the COVID-19 pandemic, but also, and more importantly, by the escalating geopolitical tensions, which is why analysts are describing the unprecedented surge in fertiliser prices and the possibility that this might become a permanent trend as a “complete upheaval of the world of agriculture.”⁶² It is becoming apparent that fertilisers and raw materials for fertiliser production will become geopolitically significant in the short and medium term. Their strategic importance to industrial agriculture has literally turned

57 The term “perfect storm” was coined in 2008 by the scientist and then highest advisor to the British government, Professor John Beddington to describe the mutual amplification of different crises such as the food, oil price, financial and climate crises.

58 See: <https://www.yara.com/siteassets/investors/057-reports-and-presentations/quarterly-reports/2022/1q-2022/yara-1q-2022-report.pdf> [last accessed on 22 May 2022].

59 See: <https://www.kpluss.com/de-de/presse/presseinformationen/erfolgreicher-start-in-das-neue-geschaeftsjahr/> [last accessed on 22 May 2022].

60 See: <https://www.yara.com/news-and-media/news/archive/news-2022/war-and-food-crisis-in-europe/> [last accessed on 22 May 2022].

61 FAO, 2021.

62 See: <https://www.agrarheute.com/markt/duengemittel/duengerpreise-inputkosten-steigen-dramatisch-neue-agrarwelt-591919> [last accessed on 22 May 2022].



Figure 10

A lot of nitrogen fertiliser is used today in Tanzania's Ihemi Cluster, especially to cultivate maize.

Photo: Gideon Tups, 2019

them into an economic weapon. At the same time, there is reason to fear that the highly privatised and consolidated fertiliser industry will exploit the current uncertainties and conflicts much in the same way it did during the world food crisis of 2007/08 to make unexpected profits during the war – profits for which global agriculture will have to pay a steep price.

The impacts of the fertiliser price crisis on Africa

A look at agriculture and food trade in the Global North may initially signal relief. Rapid and perhaps unexpectedly broad interventions launched by governments currently ensure that a variety of countermeasures are being discussed to cushion the effects of the price crisis for both farmers and consumers. Additional direct subsidies for fertilisers, export bans on strategic resources, a softening of sustainability goals (such as cultivation on fallow land and conversion areas), a temporary ban on the cultivation of energy crops for biofuel, and last but not least funding made available to subsidise consumption – all these

testify to how agribusiness representatives and conservative agriculture advocacy groups in the Global North are exploiting the crisis to slow down the transformation towards a sustainable and resilient food system. At the same time, the interventions also reflect how much determination and financial resources in particular are being used to keep larger farms and consumers from being exposed to more drastic economic effects.

In contrast, farmers and consumers in the Global South, especially in Africa, are being hit much harder. In a dramatic speech in April 2022, for example, Akinwumi Adesina, president of the African Development Bank, stressed that Africa must prepare for an “inevitable global food crisis,”⁶³ even if it is in actual fact an exacerbation of an already existing crisis. During the height of the COVID-19 pandemic, African governments were still able to launch measures to soften the impacts of logistical bottlenecks and gradual price increases for fertilisers, for instance by easing import restrictions or cutting taxes.⁶⁴ But the current situation is much more critical: African governments simply do not have the power to rein in prices for fertilisers that have been sent soaring since the outbreak of the Russo-Ukrainian war, and they can do just as little to avoid existing trade restrictions. Africa covers around 80 percent

63 See: <https://amaghanaonline.com/2022/04/25/africa-must-prepare-for-the-inevitability-of-a-global-food-crisis-says-afdb-president-adesina/> [last accessed on 22 May 2022].

64 See: <https://ifdc.org/2021/10/29/latest-data-on-covid-related-fertilizer-impacts-in-africa-2/> [last accessed on 22 May 2022].

ORGANIC ALTERNATIVES

Already during the COVID-19 pandemic, fertiliser prices rose significantly in many African countries, leading to shortages of agricultural inputs. This motivated many Tanzanians to set up home gardens, and frequently they used organic fertilisers. Biofertilisers are also playing an increasing role in agriculture in Tanzania and Ghana, for example. The current price rise of synthetic nitrogen fertilisers means that most farmers cannot afford to buy as much fertiliser as they have in the past, and a collapse in crop production seems inevitable. This price crisis has given a significant boost to the organic fertiliser market, which had been slow to develop prior to the COVID-19 crisis.

Farmers not only benefit from lower prices. According to Amin Zakaria, a producer of organic fertilisers for various traders in Tanzania, many farmers point to additional advantages such as improved soil fertility, higher nutrient density and better tasting produce. Audrey Darko, founder of Sabon Sake, a biofertiliser producer in Ghana, is making similar observations. Given the current crisis and surging fertiliser prices, which have doubled there as well, farmers are desperately looking for alternatives to prevent crop failure.

Not only is there a growing demand for organic fertilisers, which are based on plant residues (for example from sugar cane cultivation), animal dung or worm compost, farmers are also keen to learn how to produce organic fertilisers themselves. In systems where agricultural advisory services and government support have so far almost entirely focused on the application of synthetic chemical products, farmers are now learning about the advantages of using organic alternatives, for example through training courses run by Sabon Sake. In this way, farmers can save costs and help to improve biodiversity and soil fertility. The switch to organic agriculture also increases the soil's carbon storage capacity, creating another positive impact on the climate. For Audrey Darko, the current crisis offers a great opportunity to reduce Ghanaian farmers' dependency on fertiliser imports and to establish a more sustainable agricultural model.

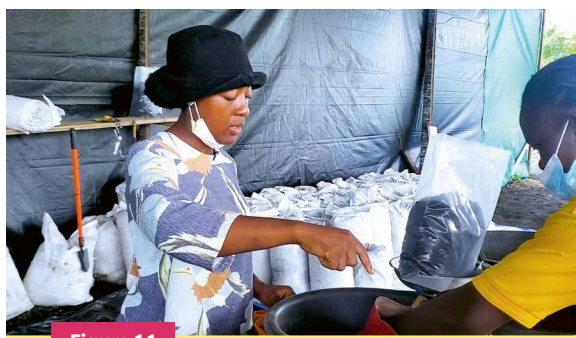


Figure 11

Audrey S. Darko produces biofertilisers in Ghana, for example from sugar cane waste.

Photo: Richard Ocloo Dzaba, Deutsche Welle

At the same time, there are major challenges preventing the broader use of organic fertilisers in Tanzania and other countries, not least because the expertise of private and state-run agricultural training providers is almost exclusively limited to synthetic fertilisers. There is only marginal awareness of alternatives, and knowledge concerning the appearance, consistency and application of such fertilisers is sparse. Accordingly, demand for organic fertiliser is low, with only a few companies currently producing or importing such products. The entire narrative disseminated through public channels consists of a flourish of promises that the use of more synthetic fertilisers will bring better yields.

The Senegalese government, by contrast, has taken a significant step in the right direction. In November 2021, it announced plans to promote agroecological alternatives by allocating 10 percent of agricultural subsidies to produce organic fertilisers. There is also cause for hope in Kenya, as Anne Maina of BIBA Kenya reports: "Though a long way off, the government has gradually started to appreciate the alternative approaches to industrial agriculture. However, through the continuous lobbying and creating awareness to the policy makers, some counties have begun to train their agriculture officers on agroecology and began policy formulation in support of agroecology."

of its demand for synthetic fertilisers through imports, while even under stable conditions 70 percent of the consumer price of fertilisers is determined by the import price of fertilisers. This means that even costly emergency subsidies, such as those recently adopted in Kenya, or government attempts to cap prices, as in the case of Tanzania, fail to have a substantial effect.⁶⁵

It is impossible to predict the short to long-term consequences for small-scale food producers who have recently adopted intensive production methods and are now reliant on synthetic fertilisers and long supply chains instead of local nutrient cycles to secure their livelihoods. In all likelihood, the sharp rise in prices, along with a general reluctance on the part of the fertiliser industry to supply markets with low purchasing power, will force farmers to massively cut their use of fertilisers (see Box 5).

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The current fertiliser crisis has resulted in an increased cost of production. Small-scale farmers cannot meet the rising costs, which disadvantages them as compared to large scale farmers. This has an effect on food security at the household and national level. Yet, in Kenya, small-scale farmers' production represents roughly 75 percent of the total agricultural output.

The cost of fertilisers has more than doubled since January, 2022 with farmers appealing to the government for subsidies. Recently, the government has agreed to allocate funds to input subsidies but it is yet to reach the farmers.

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Anne Maina, BIBA (Kenya)

Apart from ensuring short-term food security, it is also important to focus on preserving and improving soil quality in the long term. After all, healthy soils that are cultivated using locally adapted and sustainable farming methods, that are only exposed to a minimum or even no synthetic fertilisers at all, are not affected by the scarcity of artificial

fertilisers. On the other hand, soils that have become acidified by years of intense fertiliser application and depend on a constant supply of nutrients are in danger of degrading rapidly once they cease to be treated with fertiliser. The compulsion to always use (ever more) fertiliser to maintain soil quality is now threatening to take its toll in regions where fertiliser has been massively advertised and used.

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Farmers in many areas have failed to acquire the required amounts of fertiliser due to availability, regarding supply and cost. In some areas, farmers have been taking steps to learn on organic soil fertilisation and in some areas farmers have been left with no option, as even the existing extension model by the government favours the use of fertilisers.

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Theodora Pius, MVIWATA (Tanzania)

The costly measures aimed at a rapid agricultural intensification – especially synthetic fertiliser subsidies – must be examined critically, especially now that we face disrupted supply chains and geopolitical tensions. Africa's agricultural sector is increasingly dependent on a narrow set of technologies, a handful of global corporations and supply chains that are neither resilient nor sustainable. The sobering results of costly blanket subsidies, which only helped a few fertiliser corporations to consolidate their market shares and power, and African states' waning control over the production and supply of domestic fertiliser have shown that the “golden bullet” has failed to live up to its expectations. This general disillusionment is now coming to a head due to the price crisis. The impending collapse of the African continent's agricultural system, which is increasingly dependent on artificial fertilisers, is driven by a sudden, albeit predictable, price crisis for fossil fuels and thus for fertilisers, and it raises urgent questions concerning the sector's ecological and economic sustainability.

65 Data: AFRIQOM, 2020.

5. CONCLUSIONS AND DEMANDS

To sum up, this paper has made clear the need for a food system that is ecologically sustainable and resilient. We must drastically minimise our structural dependence on fossil energy and especially on synthetic fertilisers in agriculture. To advance this transformation in the face of the current world food crisis and in order to help small-scale food producers in the Global South to achieve food sovereignty, the German government should take immediate action by implementing the following measures:

The necessary first step is to closely monitor the current food crisis as it unfolds in other countries. The government should immediately introduce an **excess profits tax for fertiliser companies** to restrict the unprecedented profits fertiliser companies are making during the crisis and to bolster public funding for social security programmes. Additional **price caps for fertiliser** could prevent corporations from making disproportionate profits. To lend short-term financial support to small-scale food producers in the Global South, the German government should promote the establishment of a fund with sufficient financial resources that is coordinated by the FAO. This fund could be used to finance **national programmes to provide access to high-quality, long-term organic fertiliser at reduced prices**, primarily for marginalised farmers, as well as ad hoc advice on implementing simple measures to increase soil fertility. The funds should also be made available to support small and medium-sized local fertiliser companies in African countries instead of helping multinational agricultural corporations to expand their markets. A return to previous forms of unsustainable subsidies that increase the use of synthetic chemical fertilisers is no help.

In the medium term, the German government should stop funding development projects that build on the intensification regimes promoted by Green Revolution approaches and rely on chemical and synthetic fertilisers. We call on the German government to **terminate its cooperation with AGRA**.

The German government should instead promote bilateral and multilateral projects that focus **on strengthening holistic, agro-ecological regimes** and closed nutrient cycles. Such projects support the integrated production of organic fertilisers and improve soil fertility, for example by promoting the cultivation of legumes (intercropping), the covering of soil with organic material, integrated livestock breeding that makes use of farm manure, and agroforestry systems. The Federal Government should further support the development and production of organic fertilisers through development cooperation projects funded by the Ministry for Economic Cooperation and Development (BMZ). Farm advisory systems in partner countries should help to transfer knowledge and disseminate expertise related to agroecological practices – this gap must not be filled by agricultural corporations. This is the only way to ensure that farmers have access to balanced advice on organic soil management.

Finally, global food trade must **move away from export-oriented agriculture** and a system that integrates farmers into global value chains and promotes the cultivation of monocultures such as maize and soy which in many cases do not directly contribute to food security. Instead, it is much more beneficial to strengthen local and regional marketing systems in the Global South and the Global North, not least in order to reduce the use of fossil energy for storage and transport. Discussions focusing on such a transformation of trade should be coordinated by the U.N. Committee on World Food Security (CFS) in close collaboration with the World Trade Organization (WTO). Smallholder advocacy groups in particular should be given a voice and a say.

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