10. Conclusion: trade, food security and climate risks

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This is a book that is neither wholly about agricultural policy nor wholly about trade policy nor wholly about climate policy. The research team that came together under the Africa Trade Policy Programme at the London School of Economics Firoz Lalji Institute for Africa sought to understand and explain why Africa struggles with food availability and stability, which are the essential pillars of food security. We took the intersection between trade, agriculture and climate policies as the point of entry for our enquiry into why 280 million Africans, a fifth of the continent's population, live with malnutrition and 340 million Africans, a quarter of the population, face hunger. We applied analytical tools and data to these policy areas, which enabled us to alight on some insights on why food deprivation on this scale persists in Africa.

We established that the continent's status as a net food importer has stabilised over the last decade in absolute terms and has not worsened despite rapid population growth and rising per capita incomes during much of this time. In 2021, Africa as a whole recorded an annual net trade deficit of $34 billion in the food and agricultural sector but below the peak of $47 billion reached in 2011 (in nominal prices, which suggests underappreciation of how much more significant the deficit was in 2011). If we read gains in productivity and output into these figures as fairly good news for the continent as a whole, the sobering reality is that food insecurity remains widespread in 42 of the 54 African countries, as the headline numbers on food deprivation attest.

We traced the root of Africa's food security challenges to an economic structure that is based on mainly unprocessed, primary products being exported in return for imports of final consumption goods. Lack of economic diversification from primary commodities has been described as 'the heart of the matter' for African development (Mangeni and Mold 2023). The implication

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is that Africa's commodity trade supports value addition, economic growth and jobs elsewhere in the world while reinforcing high rates of poverty at home. Since poverty, unemployment and food insecurity are interrelated, it is an economic model that is inherently vulnerable to food security risks, which is intensified when terms of trade shift or shocks emerge, as the recent Covid-19 pandemic and post-Covid-19 food price inflation attest. The Economic Commission for Africa of the United Nations estimates that 50 million more Africans were in poverty in 2023 than in 2019, an increase of 28 per cent (United Nations Economic Commission for Africa 2024). Africa's population grew by an estimated 10 per cent over the same period, so this largely driven by a rise in the poverty rate (not only population growth).[1] Overall, 476 million Africans – about a third of the population – were in poverty in 2023. As poverty rates have declined elsewhere in the world, 60 per cent of the world's extreme poor now live in Africa. Food deprivation is inherently a symptom of poverty. An assessment of the economic growth requirements for achieving the sustainable development goal of halving poverty by 2030 in African countries concludes that, on average, African countries will not only need to grow by 6 per cent or more every year up to 2030 but also need to ensure that the benefits of growth are widely shared through social protection policy measures that take prevailing inequalities into account (Fofana, Chitiga-Mabugu and Mabugu 2023).[2]

We recognised climate change as a factor that is making an already-trying agriculture and food security situation even more difficult. Agricultural emissions are also part of the problem. This requires greater scrutiny of the sustainability of production systems. We outlined an approach for thinking about the interaction between trade, food security and climate risks and identified the varying effects of climate change particularly on the production of the eight food products most widely consumed in Africa, which we referred to as Africa's basic foods.

The eight basic products of yam, cassava, maize, rice, wheat, meat, poultry and fish contribute significantly to daily calorific intake across the continent. We established that yields in almost all of these products generally trailed global productivity and output, despite nominal growth in production. Yams are the main exception and cassava a partial exception.

Agricultural policies are important determinants of food security outcomes. Finance, investment, foreign aid, institutions, actors and capacities interact with policies in playing a key role in resource allocation along the food value chain, from production to consumption, from supply to demand. We unpacked the chokepoints in policy implementation, resources, capacities, climate and sustainability risks that hold Africa back from becoming an agricultural powerhouse despite having 60 per cent of the world's arable land area.

We probed the observable patterns of food trade within the continent or at the intra-African level and with foreign partners. A major consequence of underperformance in Africa's food production is that intra-African trade

in food products remains relatively small, although this trade has grown in value in real terms over the last 10 years. This is in line with our finding that the continent's status as a net food importer has stabilised and not worsened. Facilitating greater intra-African trade could boost the continent's food production if it allows African producers to gain a greater share in the African market. Small-scale informal cross-border trade is ubiquitous and reflects the dominance of the smallholder farming model. By creating a detailed partial equilibrium model to simulate the expected impact of the African Continental Free Trade Area (AfCFTA), a major initiative to liberalise trade across the continent, we found that the impact of the AfCFTA on intra-African trade will be relatively modest. That is because much of that trade is already liberalised through pre-existing regional trade agreements, such as those of the EAC, COMESA, SADC and ECOWAS. It is through these regional arrangements that most of Africa's *current* intra-African trade in the agriculture sector flows.

This finding on the limited gains to be expected from the AfCFTA prompted us to examine the provisions of the AfCFTA Agreement and Protocols on non-tariff barriers. We found that the AfCFTA legal instruments embody best practices for harmonisation of food safety standards, technical regulations and regulatory compliance. If these provisions, along with other regulatory measures on services, investment, digital trade, competition policy and intellectual property rights, are implemented effectively, they could boost intra-African value chains in agriculture and agribusinesses, enhance efficiency and lower prices.

Concerning trade with foreign partners, we deconstructed the food trade deficit to reveal that the geography of these trade relationships is changing, with increasing food trade flows between African and emerging partners in the Global South. The changing geography is also reflected in trade in agricultural inputs as the European Union (EU) and United States (US) lose trade shares to China and India.

Finally, we turned our attention to the World Trade Organization (WTO), the world's trade regulator, where 42 African countries are part of the net food-importing developing countries group that coordinates efforts to keep international food markets open, monitors food aid flows and constitutes an important stakeholder group in negotiations to reform global rules on agricultural trade. We examined the contradictory role that food security plays in international trade. Agricultural subsidies in countries that can afford them incentivise food production not only for domestic consumption but also for trading in open markets and for food aid donations. While overproduction contributes to global food availability, it disincentivises production in poorer and net food-importing countries. The trade-offs in multilateral agricultural reforms need to be better understood by African negotiators as some reforms might be desirable from an African agricultural production perspective but not necessarily from a consumption perspective.

This leads us to the following conclusions, which are further elaborated on below:

1. Climate change poses multiple risks to food security.
2. Food production is responding to population pressure and expanding demand but not sufficiently to close the food trade deficit.
3. Productivity trails global levels for the vast majority of the basic foods that Africans commonly consume.
4. Gaps in agricultural policy implementation, finance, institutions and capacities enhance food security vulnerabilities.
5. Food dominates intra-African trade, which remains small despite growth in value in real terms over the past decade.
6. The impact of AfCFTA tariff liberalisation on food trade flows will be modest.
7. AfCFTA provisions on non-tariff barriers will have greater impact on food trade flows.
8. Beyond the AfCFTA, the reality is that most African countries are net food importers and increasingly source food imports from countries of the Global South.
9. Agricultural negotiations remain contentious at the WTO, with limited progress in addressing imbalances and asymmetries, but trade-offs implied in agricultural reforms need to be better understood.

10.1 Climate change poses multiple risks to food security

The risks of a changing climate on agricultural production cannot be overestimated. The varying effects of climate change on food production – in particular, rising temperatures, extreme weather variations and the frequency of adverse supply shocks – were outlined in a model we presented in Chapter 2 for thinking about the interaction between trade, food security and climate risks. In Chapter 3 we applied the model to identify risks such as water stress; shortened crop growing seasons; shrinking acreage of arable land; higher incidence of crop pests; inundation of cropland and erosion; and flood-induced damage to agriculture-related infrastructure. We noted that the indirect effects are equally impactful and include reduced labour productivity of farm workers, whether due to harsh climatic conditions or illness as vector-borne diseases proliferate and disincentive effects leading some farmers to abandon their farms altogether. Yields are projected to fall for most staple crops and from livestock across most of Africa, including important sources of food security such as wheat, maize, rice and meat.

At the same time, we recognised that agricultural activities such as enteric fermentation of ruminant livestock and irrigated rice farming practices are significant contributors to methane emissions and other greenhouse gases (GHGs). Land itself is both a source and a sink of carbon emissions.

The nationally determined contributions (NDCs) of African countries are replete with a variety of adaptation and mitigation measures. But NDCs remain a wish list in the absence of adequate financing to implement them. NDCs, which are set for multiple years in advance, also need to be adaptive to fast-changing knowledge and technologies that can be applied to adaptation and mitigation strategies.

Trade can help to reduce the impact of production shocks, including those affecting critical food security crops. As we observed, adverse supply shocks in certain places can be met by supply surpluses in other places through trade. But availability is only part of any solution as food security also requires purchasing ability to ensure access. Endemic poverty in Africa is among the factors that limits ability to access food.

We noted that trade in agricultural intermediates and inputs, as well as agricultural services and knowledge, can play an important role in agricultural adaptation to climate change. These help farmers utilise new seed varieties, agricultural machinery, fertilisers and agricultural extension services to address changing climate challenges. Trade reforms to reduce tariff and non-tariff barriers can help to facilitate access to these inputs.

10.2 Food production is responding to population pressure – but not enough

We unpacked the composition of the continent's persistent trade deficit in agriculture in Chapter 2 by reviewing the agriculture sector as a whole, including trade in basic foods like grains, tubers, meat and poultry, agricultural commodities such as cocoa, tobacco, coffee, tea and spices and trade in inputs like fertilisers and pesticides and capital equipment like farm machinery. We noted that, in 2021, African countries had an annual net trade deficit of $49 billion in basic foods and $9 billion in agricultural capital, while returning a net surplus of $16 billion in exports of agricultural commodities and of $6 billion in exports of agricultural inputs. This deficit widened dramatically from the early 2000s to 2011 before stabilising in the last decade, with the $36 billion deficit for the sector as a whole in 2021 being about a quarter smaller than it was in 2011.

As these are nominal figures, they underappreciate how much more significant the deficit was in 2011 and the steady if also gradual trend in closing the gap. However, the median African country spends a quarter of the revenue it earns through exports on food imports, while 16 countries spend more than 40 per cent on food imports. These countries risk serious food insecurities if adverse terms of trade shocks arise or if world food prices rise.

We therefore concluded that the agricultural trade deficit is driven by food imports along with production and export underperformance. Food imports include low-unit-value foods, such as cereals like wheat, rice and maize but also some higher-unit-value foods like fish, dairy and poultry. Demand for

the former grows fastest with population growth, the latter with rising per capita incomes. But it is also important to note that the deficit in Africa's food and agriculture sector has been reasonably stable over the last decade, despite both population growth and rising per capita incomes during this time.

10.3 Productivity trails global levels for most of Africa's basic foods

We inquired more fully in Chapter 3 into the role of yams, cassava, maize, rice, wheat, meat, poultry and fish as products or basic foods with high rates of per capita consumption in Africa. We distinguished between regional variations in production and consumption. We established that yields in the production of almost all of these basic foods generally trailed global productivity and output, although there has been an increase in production. With yams and cassava as the exceptions, the other foods are not produced at a scale and at levels of productivity that is sufficient to meet demand. While the comparative advantage of the African cassava- and yam-producing countries remains incessant, this is not the case for rice, wheat and maize, beef or poultry, which benefit from significant subsidies in richer countries, with trade-distorting effect. For maize specifically, Africa produces more than it consumes for food but the continent is a net importer. This is because the excess production over human consumption is not sufficient to meet demand for other uses of maize including feed for livestock and industrial processing and manufacturing.

We highlighted the challenges facing the fish sector, which include underinvestment in the management of fish stocks, the marine environment and freshwater habitats, illegal unregulated and unreported fishing by foreign boats and rising sea temperatures. As the sea temperatures rise, fish stocks migrate towards colder waters. This increases pressure on small-scale fishing communities to scale up operations by investing in equipment and vessels that can go out further into the sea.

10.4 Gaps in policy implementation, finance, institutions and capacities increase food security vulnerabilities

Having identified the climate risks, established what drives the agricultural trade deficit and considered productivity and output of the most widely consumed foods, we turned our attention in Chapter 4 to assess the policy and institutional issues that contribute to the vulnerabilities that were observed. On agricultural policy, we explained that African Union policy frameworks such as the Comprehensive African Agriculture Development Programme (CAADP) and the Malabo Declaration provide African countries with a blueprint for boosting agricultural development and trade, to achieve the much-vaunted green revolution. CAADP requires governments to allocate at least

10 per cent of public expenditure to agriculture and to aim for 6 per cent annual growth in the sector. Reviews, however, suggest that only one country – Rwanda – is on track to achieving the CAADP goals. Financial resources remain a major constraint. While there are many good examples of the impact of agricultural financing, there is scope for scaling up private investment, farmers' access to credit, foreign direct investment, foreign aid and, increasingly of importance, climate finance. Development partners provide relatively little assistance to agricultural development in Africa despite the clear understanding that this sector is critical for achieving international goals on poverty and hunger and overcoming gender inequalities. When it comes to food aid – a convenient channel for dumping by food surplus countries – we argued that this needs to be carefully managed in order not to disincentivise local production.

We saw that capacities vary among actors and institutions that mediate production, markets and value chains such as farmers, 'middlemen', cooperatives, commodity exchanges and agricultural marketing boards. We suggested that partnerships with multinational corporations that play a dominant role in global food supply chains can be beneficial where local interests are well safeguarded. With the bulk of African agriculture still in the hands of small-scale farmers, measures to boost production and productivity must necessarily focus on smallholders. The rise of contract farming and a class of medium-scale farmers are promising developments, especially since this class of farmers has stronger commercial ambitions than smallholders do. We argued that agricultural commercialisation is the most viable pathway for smallholders to increase their productivity, output, income and food security but there are huge challenges as regards imperfect or missing markets and institutions.

10.5 Food dominates intra-African trade

We probed in Chapter 5 the observable patterns of food trade within the continent or at the intra-African level. We noted that a major consequence of low productivity and output in agricultural production is that intra-African trade while dominated by trade in food products remains relatively small, although this trade has grown in value in real terms over the last 10 years. Cereals, tubers, vegetables and fruits, fish and fish preparations are the main food products that are traded. Food security in tubers has been achieved but African countries import almost twice as many cereals from the rest of the world as they do from each other. The smallholder farming model has given rise to small-scale informal cross-border trade that is widespread. Although difficult to quantify, estimates suggest that informal trade could be as high as 16 per cent of total formal intra-African trade and as much as 72 per cent of trade between neighbouring countries.

Each of the basic foods tends to be traded within Africa in its own way. The vast majority of trade in cassava takes place in Eastern Africa. Yams

are mainly traded in Southern and Western Africa. Trade in maize is concentrated in Eastern and Southern Africa. Rice is traded mainly in Eastern, Southern, Central and Western Africa, with intra-African rice imports in Northern Africa being negligible. Intra-African wheat trade is evenly distributed among the regions, except in Central Africa, which accounts for only a small share of these imports. Trade in meat and poultry also occurs predominantly within and between Eastern and Southern Africa. Almost half of intra-African fish imports occur in Western Africa, with the rest of this trade being more evenly split between Eastern, Central Africa, Southern and Northern Africa.

10.6 The impact of African Continental Free Trade Area tariff liberalisation on food trade flows will be modest

We reported in Chapter 6 the result of our partial equilibrium model to simulate the expected impact of the AfCFTA. The AfCFTA initiative is driven by the recognition that a liberalised trade regime across the continent could generate further growth in intra-African trade, including informal trade formalisation, as tariffs not already covered by regional trade agreements and non-tariff barriers fall. However, we found that the impact of the AfCFTA on intra-African trade will be relatively modest since much of the trade is already liberalised through pre-existing regional trade agreements across the continent.

Moreover, the AfCFTA is even less likely to have an impact on trade in cereals such as wheat, maize and rice. These products already have, on average, low tariffs and are mostly served by more efficient or highly subsidised suppliers outside the continent. We found that where the AfCFTA will have an impact in the immediate term is in the downstream consumable food part of the value chain, and especially with higher-unit-value foods like fish and seafood, vegetables, cereal preparations, vegetable oils, fruits and dairy. There are also relatively sizeable opportunities for exports of sugar and coffee, within agricultural commodities. In the upstream part of the value chain, though the prospects for trade creation are smaller overall, there are important opportunities for exporters of agricultural machinery, fertilisers and pesticides. South Africa, for example, might begin to supply more of the continent's needs of agricultural machinery, while more fertilisers and pesticides could be supplied by North African countries like Morocco and Mauritania.

10.7 African Continental Free Trade Area provisions on non-tariff barriers will have greater impact

In view of the limited impact to be expected from AfCFTA tariff liberalisation on food trade, we examined in Chapter 7 the provisions of the AfCFTA

Agreement and Protocols on non-tariff barriers (NTBs). We found that the AfCFTA legal instruments embody best practices for the harmonisation of food safety standards, technical regulations and regulatory compliance. We noted that customs and trade facilitation provisions that aim to streamline border processes are critical for perishable goods. The creation of a web portal where traders and governments can submit complaints about partners' NTBs is an important initiative that could help to discipline unwarranted controls. The protocols on services, investment, competition policy, intellectual property rights, digital trade and small and medium-sized enterprises led by women and youth, if fully implemented, could boost intra-African value chains in agriculture and agribusinesses, enhance efficiency, and lower prices for consumers.

On services, we noted that some, including financial, logistics, information and communication technologies, insurance, distribution and transport services, are intrinsically linked to food systems through agricultural production, distribution and trade, and through these channels to food security. Logistics services such as transport, and information and communication technology, are critical to reduce costs and uncertainty in agricultural trade. With very low levels of financial inclusion among African farmers, increasing access to financial services through their liberalisation could enhance the uptake of financial services utilisation. Intra-African liberalisation of these and other services could attract investment and enhance competition with transformative impacts on agricultural production, value chains and food security.

The investment facilitation provisions of the investment protocol address constraints issues such as excessive bureaucracy, lack of transparency about investment-related information, corruption, and inadequate coordination among regulatory institutions. These are key issues that hinder intra-African investment flows that typically target the agricultural sector. However, the protocol requires investors and their investments to respect and protect the environment while carrying out their business activities. Among specific investor obligations are the right to a clean and sustainable environment, complying with the principles of prevention and precaution to anticipate significant harm to the environment, carrying out an environmental impact assessment, and mitigating and restoring any environmental harm that companies have caused.

With increasing economic concentration in the production and trading of agriculture and food products both globally and within the African continent, implementation of the Protocol on Competition Policy could play an important role in addressing anticompetitive behaviour in the food sector. It aims to discipline practices such as abuse of dominant positions in the market and mergers or acquisitions that restrict or prevent competition.

The Protocol on Intellectual Property Rights applies to all categories, including seed and plant varieties, geographical indications, genetic resources

and traditional knowledge. Putting such protections in place can incentivise investment in innovation in the development of new, higher-yielding, or drought- and heat-tolerant plant varieties. But these protections need to be balanced by adequate access and benefit sharing provisions, to ensure for instance that farmers are not prevented from using new plant varieties. Safeguards are also needed to ensure that communities benefit from geographical indications, genetic resources and traditional knowledge.

The Protocol on Women and Youth addresses the historical challenges this category of farmers, entrepreneurs and business owners has faced, such as access to trade finance, participation in trade policymaking, support to enhance export capacity, and a range of trade facilitation measures that have not been gender sensitive. These protocol's provisions can help to ensure inclusivity in food production and trade.

The Protocol on Digital Trade is aimed at creating a digital enabling environment that can boost the uptake of digital technologies that are critical to boosting agricultural yields and enhancing food preservation. This includes, for instance, automated drip-irrigation technologies; digital technologies that enable up-to-date tracking of produce that is being transported to markets or access to information to optimise crop pests/disease mitigation strategies; and mobile phone applications that set out early-warning systems regarding weather events and access to real-time product prices.

10.8 Most African countries remain net food importers and increasingly source food from the Global South

Having established that implementation of the non-tariff provisions in the AfCFTA could have a much greater impact on agricultural production and agri-business, with significant benefits for food security, we returned in Chapter 8 to analyse the current reality that 42 African countries are net food importers. We examined how the food trade deficit breaks down with Africa's trading partners or on a bilateral basis. The main insight that we discovered is that the geography of these trading relationships is changing, with increasing food trade flows between African and countries in the Global South. The changing geography is also reflected in trade in agricultural inputs such as machinery, seeds, fertilisers and herbicides, with traditional partners such as the EU and the US losing trade shares to emerging partners.

Brazil is the largest net food supplier to Africa, followed by the EU and the US. The EU, however, remains Africa's most important market for both food exports and imports. The EU and the US are also significant suppliers of agricultural seeds, machinery and tractors to Africa. Among traditional partners, Russia and Ukraine are a major source of cereal exports to some African countries. The Russia–Ukraine war that started in 2022 disrupted the flow of these exports. But the concentration of Russia's and Ukraine's grain exports in

a few African countries limited a wider damaging effect, although the collapse of the Black Sea Grain Initiative after only one year in 2023 resulted in a surge in wheat prices.

We assessed the trade policy regimes that underpin trade flows with external partners. We saw that many African countries' agricultural exports benefit from market access concessions such as the EU's Everything but Arms, the US's African Growth and Opportunity Act and the WTO's initiative of duty-free, quota-free market access for least-developed countries. But there is a high level of agriculture sector protectionism in bilateral partners' markets through measures allowed by WTO rules. These include high import tariffs for farm products and subsidies to farmers, which lead to both overproduction and enhanced levels of GHG emissions in some food production sectors. Agricultural protectionism makes many African food exports less competitive, especially in traditional partners' markets. Capacity in several African countries to meet food safety standards required for exports is a perennial challenge. In the case of China, significant efforts have been made to work with African exporters to ease this difficulty through the introduction of 'green lanes'. Policies in the EU related to its Green Deal and Fit for 55 such as the Carbon Border Adjustment Mechanism and deforestation regulation will increasingly expose the nexus between trade and climate to greater scrutiny.

10.9 Agricultural negotiations remain contentious at the WTO, with limited progress

Finally in Chapter 9, we turned our attention to the WTO and noted that agricultural negotiations remain contentious, with limited progress in addressing imbalances and asymmetries. We argued that, while it is in the interest of the African group to work towards revitalising multilateral agricultural trade reform, trade-offs are inevitable as some reforms might be desirable in relation to African agricultural production but not in relation to consumption. Others would not only secure policy space and flexibilities for African Members but would simultaneously provide benefits for emerging countries with large agricultural production volumes, like China and India, with potentially negative implications for African agricultural producers.

We suggested that African Members would be advised to be pragmatic in agricultural negotiations, i.e. adopting an approach that focuses on results over principles, evidence and technical analysis over ideological positioning. We further suggested that African Members should call for new research that can offer fresh insights on multilateral trade rules and food security in a changing global economy and in the context of sustainability and the climate emergency.

We noted that most African Members have not used the Development Box for providing domestic support up to their allowed *de minimis* levels. This

suggests that the problem is not necessarily a lack of policy space but rather fiscal space along with national policies and priorities.

At the WTO, food security, agriculture and the environment are discussed in different fora and committees. Sustainability issues such as efficiency of water use in agriculture, the safety of food products derived from new technologies, food waste in supply chains from farm to consumer, and knowledge and technological applications for increasing product yield and reducing farm emissions need to be mainstreamed into agricultural negotiations, as advocated by the African Members (World Trade Organization 2023). This calls for enhanced cooperation between these relevant bodies, to streamline the discussions and bridge the silos. With very small delegations in Geneva, African countries will surely benefit from a rationalisation of the food security agenda at the WTO. This is also necessary to understand the trade-offs better and to make sure that effective solutions are reached.

10.10 Final word: the story of food deprivation in Africa is complex but overcoming poverty matters most

Our overall conclusion on why so many Africans endure food deprivation is that the story of Africa's food trade, food security and climate risks is complex, and resists being reduced to a simple, comprehensive narrative. But the keys that will unlock a sustainable pathway to food security on the continent are (1) economic growth and rising incomes that are widely shared; (2) more value added in regional and global value chains to transform the economic model that underpins poverty, unemployment and food deprivation on the continent; (3) attention to policy implementation, finance, investment, institutions, knowledge, capacities and behind-the-border trade measures that are required for boosting agricultural productivity and output and bringing trade costs down; and (4) adaptation and mitigation strategies in response to climate risks that are responsive to fast-changing knowledge and technologies. These are what matters most to bring down the high numbers of malnutrition and hunger among Africans.

This book has unpacked the critical issues that underlie food security in Africa. We have provided insights for interrogating policy choices and fiscal provisioning and for activism and campaigning at various levels of government, economy and society that interface food security. The book is published on an open access basis to make it easily accessible and to enrich discussion and engagement on the issues. Researchers are encouraged to go deeper into the ideas covered in this book. For teachers and educators, the book can be used in interdisciplinary courses on international development and across several disciplines in the social sciences including economics, law, politics and international relations. Most importantly, it is hoped that this book will help to generate a fuller understanding on what needs to be done to overcome food insecurity in Africa.

Notes

[1] Author's analysis based on United Nations Population Division (n.d.).

[2] NB: the Sustainable Development Goals target the total eradication of extreme poverty (defined for the purposes of the goals as persons living on less than $1.25 per day) and a halving of poverty according to national definitions (United Nations n.d.).

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