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Requiem for Africa's Green Revolution:

An updated assessment of a failing agricultural productivity strategy

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Requiem for Africa's Green Revolution:
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By Timothy A. Wise[1]

Abstract

The Alliance for a Green Revolution in Africa, now known simply as AGRA after a "rebranding" that removed the explicit association with the controversial input-intensive development strategy, turns twenty this year. My 2020 assessment drew on national-level data through 2018 to evaluate AGRA's progress toward its stated goals of doubling productivity and incomes for 30 million small-scale farming households while reducing food insecurity by half. The data revealed poor progress in nearly all of AGRA's 13 focus countries on those goals. Most alarming, weak productivity gains contributed to a 31% increase in the number of hungry people in those countries. As AGRA turns twenty, I update that data through 2024 to assess whether any greater progress has been made. I find that productivity growth has slowed even further, with the Green Revolution's promotion of improved seeds and fertilizers generating not the desired "sustainable intensification" – growing more food on existing land – but massive expansion onto new lands to grow supported crops such as maize. Other traditional crops have suffered as a result. My Staple Yield Index of a basket of key food crops shows slower productivity growth in the years since AGRA was founded than before the multi-billion-dollar strategy was launched. Tragically, the number of undernourished in AGRA's 13 countries has nearly doubled in the last six years, raising the growth in the number of undernourished since AGRA to 58%.

This assessment does not pin the blame for these outcomes primarily on AGRA. Rather, it serves as an evaluation of the much larger Green Revolution approach, which was heavily supported by donors and is now primarily funded by the World Bank Group. It was also supported by African governments through their Comprehensive African Agricultural Development Program, which set many of the same productivity, income, and hunger objectives and which no African country was able to meet. As such, the evidence in this paper should be instructive as donors and governments seek more effective ways to catalyze agricultural development. This paper includes comparative evidence from Senegal, a non-AGRA country, which succeeded in halving the number of undernourished in part by pursuing a more diversified set of agricultural policies than did AGRA countries.

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Introduction

The Alliance for a Green Revolution in Africa was founded in 2006 by the Bill and Melinda Gates Foundation and the Rockefeller Foundation with the overarching goal to "catalyze a farming revolution in Africa." As the name made clear, the catalyst for that revolution would be improved seeds, inorganic fertilizers, and other modern inputs which were central to the first Green Revolution in India in the 1960s and 1970s. That first Green Revolution did not take hold in Africa, for a wide variety of reasons. Now, AGRA's founders argued, modern crop breeding and other technological advances would allow Africa to experience its own Green Revolution, with modern inputs more carefully designed to serve the continent's farmers.

The explicit goal was "sustainable intensification," raising food production by increasing productivity to allow more food to be produced on existing farmland, which would relieve pressure on land and water resources from growing populations. The resulting productivity revolution would transform African agriculture, raise incomes on the world's poorest continent, and dramatically reduce hunger through sustained growth in both food production and incomes.

AGRA's ambitious goals were to double productivity and incomes for 30 million small-scale farming households while cutting food insecurity in half by 2020.[2] Those objectives aligned with those of the Comprehensive African Agricultural Development Program (CAADP), an African Union initiative launched the same year as AGRA to stimulate greater investment by African governments in agriculture. CAADP's goals became enshrined in the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods.[3] Among a broad set of objectives to stimulate government investment in the sector, the goals for 2025 included doubling productivity by doubling the adoption of modern inputs, increasing average fertilizer use to 50kg per hectare, halving poverty through agriculture, and cutting the percentage of moderate to severe food insecurity in half. The goal was to reduce the share of the population suffering severe "undernourishment" to less than five percent by 2025.

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[2] AGRA, "What We Do: Grants," accessed May 18, 2020, https://web.archive.org/web/20190406032154/https://agra.org/grants/. AGRA is inconsistent in how it describes its goals, usually weakening them by saying it will "contribute to" doubling yields and incomes, or reducing them to just "increasing" yields and incomes. Some documents extend their timeline to 2021, though many still refer to the original 2020 deadline. As of June 11, 2020, AGRA had taken the explicit goals statement off its grants web page.

[3] Assembly of the African Union, *Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods*, Assembly/AU/Decl.1(XXIII) (African Union, June 2014), https://www.nepad.org/caadp/publication/malabo-declaration-accelerated-agricultural-growth.

My 2020 assessment, based on national data through 2018 for AGRA's 13 focus countries, found that AGRA was not on track to meet any of its productivity, income, or food security goals by 2020. In fact, there was little sign of a productivity revolution in any AGRA country, even for heavily promoted crops such as maize. Less favored staple crops such as millet and cassava showed declines in yields over the 12-year period. Contrary to the objective of sustainable intensification, growth in overall food production was driven not by productivity gains on existing lands but by expanded farming on new land. Green Revolution incentives to grow monocultures of maize, rice, and a few other priority crops caused a decline in other staples as land moved out of millet, sorghum, and other traditional staples. Declining crop diversity translated into reduced diet and nutritional diversity. Tragically, but unsurprisingly, hunger in AGRA countries was not cut in half, it increased 31% by 2018.[4]

These disappointing results were an indictment not simply of AGRA but of the larger Green Revolution strategy, which had attracted billions of dollars in bilateral aid, philanthropic donations, and most significantly subsidies and incentives by African governments for farmers to use Green Revolution inputs. AGRA offered a concentrated and well-funded campaign in 13 focus countries to demonstrate that Africa could indeed have its own Green Revolution. Its lackluster performance called into question the premises on which the input-intensive productivity strategy was based.

AGRA commemorates its 20-year anniversary in 2026. The purpose of this study is to update my earlier assessment with six more years of data, through 2024. The present study further documents AGRA's failures to meet its ambitious early goals. AGRA abandoned those goals in 2022 with its "AGRA 3.0" emphasis on food systems and policy reforms. Beyond AGRA, this study can inform African governments as they reflect on CAADP's own 2025 deadlines for improvement, which no country was able to meet.

AGRA's changing narrative

Much has changed at AGRA since the 2020 assessment, but much has remained the same. A donor-commissioned evaluation in 2021, the first detailed assessment of the billion-dollar initiative, confirmed that AGRA had indeed failed to meet its topline productivity, income, and food security goals.[5] The assessment, carried out by consulting firm Mathematica, criticized the organization's weak monitoring and evaluation efforts and called for more rigorous documentation of the efficacy of AGRA's efforts to modernize

[4] Timothy A. Wise, "Failing Africa's Farmers: An Impact Assessment of the Alliance for a Green Revolution in Africa," Working Paper No. 20-01 (Global Development and Environment Institute, July 2020), 38, https://bpb-us-e1.wpmucdn.com/sites.tufts.edu/dist/0/5123/files/2020/07/20-01_Wise_FailureToYield.pdf.
[5] Mathematica, *Partnership for Inclusive Agricultural Transformation in Africa (PIATA) Final Evaluation Report* (Bill & Melinda Gates Foundation, February 2022), https://agra.org/wp-content/uploads/2023/08/PIATA-Final-Evaluation-Report-Volume-I.pdf.

smallholder production and improve farmer welfare. (I did a detailed analysis of the Mathematica evaluation, which was far from comprehensive.[6])

Where AGRA's own assessment of its 2017-21 Partnership for Inclusive Agricultural Transformation in Africa (PIATA) touted that it had exceeded its goals by "reaching" more than 30 million farmers, there was no definition of what that meant nor whether such interventions had improved farmers' yields, incomes, or food security. AGRA acknowledged as much, noting that "given the scale of external factors, we cannot yet demonstrate direct causality between AGRA's actions and improvements in farmer income and food security."[7]

AGRA's stubborn faith in its failing "theory of change" would prevent meaningful changes in strategy. The most visible change was AGRA's announcement at its annual Green Revolution Forum in September 2022 that it was "rebranding," changing its name to simply AGRA and effectively removing its association with the Green Revolution. Future Green Revolution Forums would now be called Africa Food System Forums, aligning the organization with the larger international effort to transform food systems following the weaknesses and vulnerabilities revealed by the COVID pandemic.

AGRA officials never explained the rationale for its name change, and officials declined my request for their reasoning. But the retreat from the Green Revolution was not lost on the media. The Devex media outlet proclaimed, "The end of the Alliance for a Green Revolution in Africa."[8] Bill Gates' hometown newspaper, the Seattle Times, was more blunt: "Gates-funded 'green revolution' in Africa has failed, critics say."[9]

AGRA's new strategy, enshrined in its AGRA 3.0 five-year plan for 2022-27, would emphasize policy development and food-systems transformation.[10] These were among the few positive contributions that Mathematica credited to AGRA: effectiveness in shaping national and continental policies to advance Green Revolution approaches, such as seed law reforms, market development, private sector investment, and expanded access to

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[6] Wise, "AGRA: Still Failing Africa's Farmers," *Institute for Agriculture and Trade Policy*, March 4, 2022, https://www.iatp.org/agra-still-failing-africas-farmers.
[7] AGRA, *Life of Strategy Report: 2017–2021* (AGRA, September 2022), 42, https://agra.org/wp-content/uploads/2023/11/AGRA-Life-of-Strategy-Report-2017-2021.pdf.
[8] Teresa Welsh, "The End of the Alliance for a Green Revolution in Africa," *Devex*, September 14, 2022, https://www.devex.com/news/devex-dish-the-end-of-the-alliance-for-a-green-revolution-in-africa-103987.
[9] Nina Shapiro, "Gates-Funded 'Green Revolution' in Africa Has Failed, Critics Say," *The Seattle Times*, September 8, 2022, https://www.seattletimes.com/seattle-news/gates-funded-green-revolution-in-africa-has-failed-critics-say/.
[10] AGRA, *Sustainably Growing Africa's Food Systems: AGRA's Five-Year Strategy* (AGRA, 2022), https://agra.org/wp-content/uploads/2023/08/AGRAs-Five-Year-Strategy_Sustainably-Growing-Africas-Food-Systems.pdf.

modern inputs. AGRA was praised for advancing 72 different policy reforms across its focus countries.

AGRA 3.0 was launched under the confusing banner, "Sustainably Growing Africa's Food Systems," as if Africa most needed larger food systems. Under the new strategy, AGRA stepped back from many of its direct efforts to improve smallholders' productivity and welfare, focusing instead on enabling industrialized agriculture to take root and grow. Many donors pulled back as well. While the Gates Foundation maintained its own faith in the Green Revolution approach with a $200 million, five-year grant in 2022, other key funding partners reduced support. The Rockefeller Foundation ceased funding AGRA's core work. So did the IKEA Foundation. Both now support only the annual AGRA-convened African Food Systems Forum.[11] Bilateral donors from the United States, United Kingdom, and Germany, beset by constraints on humanitarian and development funding, eliminated or significantly curtailed funding (the exact donations are difficult to determine).

Into the funding breach stepped the Mastercard Foundation with a $350 million five-year donation restricted to promoting youth employment, not part of the core Green Revolution strategy.[12] AGRA also secured a $105 million grant from the Green Climate Fund for a program to reduce post-harvest crop losses as a form of climate adaptation and mitigation.[13] By 2024, AGRA's annual budget was larger than ever at more than $120 million, but little of that funding now went to farmer-oriented Green Revolution promotion, and little of it was unrestricted and available for general support. AGRA may face funding constraints to cover high overhead costs, which support an expanded number of consultants and ten country offices heavily focused on policy reform. Between 2021 and 2024, according to tax filings, the amount spent on "executive compensation" at AGRA quadrupled to nearly $4 million.[14]

AGRA is neither the largest nor the most important funder of Africa's Green Revolution. The African Development Bank (AfDB) has increased its involvement through the "Feed Africa" initiative, which has heavily promoted fertilizer use and other Green Revolution approaches.[15] The World Bank has also stepped in with its AgriConnect program to spur

[11] Personal communication from a staff member at both foundations.
[12] AGRA, "Youth Entrepreneurship for the Future of Food and Agriculture: Empowering Africa's Youth," accessed July 8, 2026, https://agra.org/yeffa/.
[13] Green Climate Fund, "RE-GAIN: Scaling Solutions for Food Loss in Africa," https://www.greenclimate.fund/portfolio/projects/fp257.
[14] Andrea Suozzo, Alec Glassford, Ash Ngu, and Brandon Roberts, "Agra - Nonprofit Explorer," ProPublica, May 9, 2013, https://projects.propublica.org/nonprofits/organizations/980513530.
[15] African Development Bank Group, "Feed Africa Strategy 2016–2025: ACSA Progress Report 2024" (African Development Bank Group, June 2024), https://www.afdb.org/en/documents/feed-africa-strategy-2016-2025-acsa-progress-report-2024.

investments in "agribusiness, jobs, and subsistence farming."[16] Of course, the largest financial support for Green Revolution technologies comes from African governments themselves, which continue to spend large portions of their agriculture budgets on subsidies for seeds, fertilizers, and other Green Revolution inputs. Reliable numbers are difficult to determine, but such incentives have been estimated to exceed $1 billion per year.[17]

This updated assessment is thus not narrowly an evaluation of AGRA's work but more broadly an assessment of the entire Green Revolution approach, which has dominated agricultural development strategy over the last two decades.

Since my 2020 assessment, history has not been kind to a strategy dedicated to the promotion of imported inputs derived from fossil fuels. Climate change has only accelerated, amplifying the warning signs. Many saw the 2020 COVID pandemic as a clear signal about the vulnerability of food systems dependent on external inputs delivered through long global supply chains. Still, AGRA, donors, and African governments largely doubled down on those strategies, only to be reminded of their vulnerability by a Russia-Ukraine war that drove up prices for fuel and fertilizers. The ongoing U.S. and Israeli war in Iran presents a further reminder, though its impact will not be revealed in the data presented here. Still, dire warnings of impending food crises from energy-market volatility and more expensive fertilizers are likely to worsen the already precarious hunger problems documented here.

Methodology

As in the 2020 assessment, I use readily available national data for the 13 countries that have been a significant focus of AGRA's work since 2006. Those include Burkina Faso, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Tanzania, Uganda, and Zambia. Niger ceased being an AGRA focus country in recent years, and Zambia for several years was not formally part of AGRA. I include the same 13 countries that I covered in the original 2020 assessment for consistency.

Crop data comes from the UN Food and Agriculture Organization (FAO), as do figures on food insecurity. Poverty and fertilizer estimates come from the World Bank. In the absence of more specific impact estimates from AGRA, its donors, or independent researchers, I use national estimates to gauge whether Green Revolution programs and incentives have generated the kinds of improvements promised by AGRA: doubling productivity and

[16] World Bank Group, "AgriConnect: Agribusiness, Jobs & Subsistence Farming," https://www.worldbank.org/ext/en/agriconnect.
[17] T. S. Jayne and Shahidur Rashid, "Input Subsidy Programs in Sub-Saharan Africa: A Synthesis of Recent Evidence," *Agricultural Economics* 44, no. 6 (2013): 547–62, https://doi.org/10.1111/agec.12073.

incomes for 30 million farming households while reducing food insecurity by half by 2020, later revised to 2021. That represents a large portion of those growing food in AGRA countries, so national-level data should reflect significant improvements toward those goals. (In fact, AGRA claims it exceeded its goals by "reaching" 37 million farmers, 11 million directly and 26 million indirectly.)[18] AGRA abandoned those goals in 2022, and AGRA no longer lists measurable goals for farmer productivity, incomes, or food security. Because similar objectives are also reflected in CAADP's Malabo benchmarks for 2025, they remain a relevant yardstick by which to measure the Green Revolution's achievements. A more complete description of the methodology can be found in the 2020 working paper.

The full crop data is presented in Appendix 2. It includes a range of key food crops and crop categories through 2024 for each AGRA country and for AGRA as a whole. I add data for Yams and Sweet Potatoes to the crops tracked in 2020 since they are important staple foods in many countries. I report the changes in production, yields, and area harvested as well as the share of total cropland accounted for by each crop or crop group. I use a three-year average for 2004-6 as the baseline, 2016-18 as the measure of AGRA's first 12 years as reported in the 2020 assessment, and 2022-24 as the three-year average to estimate AGRA's full performance. That represents 18 of AGRA's 20 years of work. Using three-year averages accounts for wide variations that can occur due to cropping conditions.

One of the many failings in AGRA's own program monitoring is its use of single-year estimates and short time periods, as in its 2022 Life of Strategy report. That effort compared improvements for an unspecified group of "target farmers" in a few select AGRA countries compared to an unspecified control group from 2018 to 2020, a two-year period too short to reliably assess progress and too compromised by the COVID pandemic to make 2020 data at all indicative. Neither AGRA nor its donors has produced comprehensive impact data for all AGRA countries across a range of food crops and for the life of AGRA's work, which is why this assessment fills an important gap in the data.

For comparison purposes, I include Senegal in this report because it stands out as one African country that succeeded in halving food insecurity since 2006. Senegal has not been an AGRA focus country, though it partners with AGRA on some initiatives and hosted last year's African Food Systems Forum. As such, Senegal's success in reducing hunger may offer insights about more successful hunger-reducing agricultural policies.

Due to revisions in FAO data for previous years, the results do not perfectly match those reported in the 2020 assessment. Where I found significant discrepancies, I examined the

[18] AGRA, *Life of Strategy Report*, 41.

underlying data, which mostly comes to FAO from national governments. If that data seemed unreliable, such as being off-trend for a particular crop or year, and I could not clarify them via other sources, I excluded such data. Those exclusions are few; they are detailed in the source information for the crop tables in Appendix 2 and noted in some other tables.

In 2020 I developed the Staple Yield Index to capture productivity changes across a basket of staple food crops. For most countries, the index is based on yields for maize, millet, sorghum and roots and tubers as a group, weighted by their relative importance based on harvested area. For countries in which other crops are major staples (e.g. wheat in Ethiopia, rice in Tanzania and Nigeria), the index is derived from yields for Total Cereals and Roots & Tubers. The same approach is used to calculate AGRA's Staple Yield Index.

I contacted AGRA with a detailed set of questions regarding its own monitoring and evaluations of its impacts. There is now even less publicly available data from AGRA on farmer impacts than there was when I carried out my 2020 assessment, a reflection of the organization shifting its focus from farmers to food systems. I did not receive any new impact data from AGRA, nor did officials answer my questions. (My questions are listed in Appendix 1.)

Results: Still failing Africa's farmers

The added six years of data show that AGRA and its Green Revolution are still failing to "catalyze a farmer revolution" in Africa. The most recent period from 2018 to 2024 (the middle columns in Table 1) reveals even worse outcomes than I reported through 2018. Annual yield growth rates allow comparison between the more recent six years and the earlier 12-year period after AGRA was launched.

Annual yield growth for maize in the most recent six years declined from 2.1% to 1.5% in AGRA's 13 countries. Cereal yields overall grew at just 1.2% per year, barely more than half of their previous weak growth. Productivity growth for other staples was even worse. Millet yields rose just 2% over the entire six-year period, sorghum yields declined 5%, while roots and tubers saw a 10% decline in yields. My Staple Yield Index, combining weighted yields for maize, millet, sorghum, and roots and tubers, or for AGRA countries cereals plus roots and tubers, grew just 2% over the entire six-year period.

Table 1

AGRA: Productivity Gains in Select Staple Crops
Percent Change in Yields (MT/Ha), 13 AGRA Countries
2004–06, 2016–18, 2022–24, and Annualized

		2004–06 / 2016–18	Ann.	2016–18 / 2022–24	Ann.	2004–06 / 2022–24	Ann.
AGRA Total	Maize	28%	2.1%	9%	1.5%	40%	1.9%
	Millet	-19%	-1.7%	2%	0.4%	-17%	-1.0%
	Sorghum	9%	0.7%	-5%	-0.9%	3%	0.2%
	Cereals, Total	30%	2.2%	8%	1.2%	39%	1.9%
	Roots/Tubers, Total	-1%	-0.1%	-10%	-1.8%	-11%	-0.7%
	Staple Yield Index	**22%**	**1.7%**	**2%**	**0.4%**	**25%**	**1.2%**

Source: FAOSTAT Crops Data, https://www.fao.org/faostat/en/#data/QCL, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers. For AGRA Total, it is the weighted sum of total cereals plus roots/tubers.

That leaves AGRA's balance sheet for productivity growth after 18 years of data (the last two columns) even weaker than I last reported. Yields for maize increased just 40%, an anemic 1.9% growth rate for AGRA's most heavily subsidized priority crop, well behind AGRA's promised 100% increase by 2020. Productivity in other key staples stagnated or declined, with just 3% total growth in sorghum yields and declines of 17% for millet and 11% for roots and tubers. Groundnut yields also fell, by 10% since AGRA was launched, as Table 2 below shows. Overall, AGRA's Staple Yield Index was just 25%, or 1.2%/year. That is slower than the 1.3% annual staple yield growth calculated for those same countries in the 12 years before AGRA.[19]

Subsidies and support to maize and rice continued to drive unsustainable extensification rather than the promised "sustainable intensification" – growing more food on existing agricultural land. Table 2 shows changes in production, area harvested, and yields for a range of key food crops and crop groups. It shows that food production increased significantly, but for nearly every crop that growth came far more from area planted – extensification – than from yield growth. That was particularly true for crops heavily promoted by AGRA, CAADP, and African governments: maize, rice, cassava, and soybeans. Even those crops showed lackluster yield growth, well below AGRA's and CAADP's goals to double productivity.

[19] Rosa Luxemburg Stiftung et. al., *False Promises: The Alliance for a Green Revolution in Africa (AGRA)* (July 2020), 26, https://www.rosalux.de/fileadmin/rls_uploads/pdfs/Studien/False_Promises_AGRA_en.pdf.

Table 2

AGRA: Limited Signs of Green Revolution
% Change, Select Crops, 13 AGRA Countries
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	139%	71%	40%
Rice (Paddy)	190%	93%	51%
Wheat	159%	48%	76%
Millet	-27%	-12%	-17%
Sorghum	13%	9%	3%
Cereals, Total	79%	29%	39%
Cassava	68%	113%	-21%
Yams & Sw Potatoes	93%	92%	0%
Roots/Tubers, Total	79%	102%	-11%
Groundnuts	55%	73%	-10%
Soybeans	253%	183%	24%
Pulses, Total	114%	43%	50%
Staple Yield Index			25%
Total Cropland Expansion		46%	
Change in # of Undernourished		+58%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for cereals and roots/tubers. Some crops exclude countries for which data is unavailable; see appendix table.

- Production of maize grew 139% in 18 years, but mainly because of a 71% increase in land planted to maize, with yield gains of just 40%.
- Rice production expanded 190%, driven by a near-doubling (93%) of land planted to rice. Yields grew a modest 51% over 18 years.
- The two cereal crops now occupy 20% of cropland, up from 17% when AGRA started in 2006.
- Millet and sorghum, more nutritious and drought-tolerant crops, were more prevalent than maize and rice before AGRA, but their combined share of cropland has fallen from 25% to 17%. Millet was particularly hard-hit by underinvestment and crop-shifting. Production fell 27%, with planted area declining 12% and yields decreasing 17%.
- Land planted to soybeans also saw dramatic increases, which is not surprising since the crop is favored by CAADP and supported by some input-subsidy schemes. It is expanding in some countries for use with maize as feed for poultry and other industrial livestock operations. From a very low level of production in 2006, soybean production in AGRA countries has grown 253% with land planted to soybeans increasing 187%. Yield growth has been weak at just 24% over those 18 years.
- Land planted to cassava more than doubled, in part due to its rising use as a feedstock in biofuel production in some countries. Overall, yields still declined 21% for this African staple.
- Overall, cropped land in AGRA's 13 countries expanded 46% since 2006. By comparison, maize yields grew only 40% and staple yields as a whole grew just 25%. There is little evidence of sustainable intensification in AGRA countries as a group. Green Revolution incentives seemed instead to be encouraging farmers to shift land out of prevailing staple crops and bring new land under cultivation.

Table 3

AGRA at Twenty:
Weak Productivity, Rising Hunger
Percent Change, 2004–06 to 2022–24

	Staple Yield Index	Number of Undernourished
Burkina Faso	-3%	25%
Ethiopia	93%	-11%
Ghana	77%	-16%
Kenya	-8%	104%
Malawi	78%	61%
Mali	20%	93%
Mozambique	38%	24%
Niger	36%	36%
Nigeria	-14%	244%
Rwanda	50%	3%
Tanzania	46%	20%
Uganda	1%	106%
Zambia	12%	33%
AGRA Total	25%	58%
Senegal	73%	-50%

Source: FAOSTAT, Crops Data & Food Security Indicators, http://www.fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers. (Exception: Ethiopia, Nigeria, Tanzania, and AGRA Total are weighted sums of total cereals plus roots/tubers.) Due to unreliable cassava reporting, Zambia's calculation uses sweet potatoes as a proxy for roots/tubers.

By and large, all that maize, rice, and soybeans did not translate into welfare gains for small-scale farmers or others facing food insecurity. Table 3 shows the 18-year change in staple yields and changes in the number of people categorized as severely undernourished in each AGRA country, in AGRA as a group, and, for comparison, in Senegal where the number of hungry fell by 50%.

- In AGRA as a whole, the number of undernourished people increased 58% since 2006 to 150 million, after AGRA set the goal of cutting the number by 50%.
- The 31% increase in hunger reported in our 2020 study worsened significantly over the subsequent six years, bringing the total rise in undernourished people across AGRA countries to nearly double the number six years earlier.
- That is barely better than Sub-Saharan Africa as a whole, which saw a 60% increase in people undernourished, suggesting that there was little Green Revolution "dividend" for AGRA countries.
- Of AGRA's 13 focus countries, only Ethiopia and Ghana reduced the number of undernourished people, by 11% and 16% respectively. Overall, 55 million more people in AGRA countries were undernourished in 2024 than before AGRA, with particularly dramatic increases in Nigeria and Kenya. 100 million more were undernourished in Sub Saharan Africa as a whole.
- Senegal is noted in the data because it has been very successful in reducing hunger. It achieved the AGRA goal of cutting hunger in half, and it met the CAADP benchmark of reducing the share of the population suffering severe hunger to less than 5%.

Table 4

Rising Hunger in AGRA Years									
	Number of Undernourished (Millions)				Prevalence of Undernourishment (%)			Moderate & Severe Food Insecurity, 2022–24	
	2004–06	2022–24	Change (Millions)	Change (%)	2004–06	2022–24	Change (% Pts)	Millions	Prevalence (%)
Burkina Faso	2.4	3.0	0.6	25%	17%	13%	-3.9	9.5	41%
Ethiopia	28.5	25.4	-3.1	-11%	36%	20%	-16.7	79.1	61%
Ghana	2.5	2.1	-0.4	-16%	11%	6%	-4.8	15.0	45%
Kenya	10.1	20.4	10.3	102%	28%	37%	8.6	40.9	74%
Malawi	2.8	4.5	1.7	61%	22%	21%	-0.1	17.2	82%
Mali	1.6	2.9	1.3	81%	12%	12%	0.6	4.9	21%
Mozambique	5.9	7.3	1.4	24%	29%	22%	-7.4	-	-
Niger	2.5	3.4	0.9	36%	18%	13%	-5.1	13.3	51%
Nigeria	13.2	45.4	32.2	244%	9%	20%	10.8	170.4	75%
Rwanda	2.9	3.4	0.5	17%	32%	24%	-7.4	-	-
Tanzania	11.2	13.4	2.2	20%	29%	20%	-8.3	38.7	58%
Uganda	5.2	10.7	5.5	106%	19%	22%	3.2	26.6	55%
Zambia	5.8	7.7	1.9	33%	49%	37%	-12.2	9.4	45%
AGRA Total	**94.6**	**149.6**	**55.0**	**58%**	-	-	-	-	-
Senegal	1.8	0.9	-0.9	-50%	16%	5%	-10.7	5.3	29%
SSA	165.9	266.0	100.1	60%	22%	22%	-0.2	766.7	63%

Source: FAOSTAT Food Security Indicators, http://fao.org/faostat/en/#data/FS, accessed July 2026. "-" indicates missing data.

Table 4 shows hunger data in more detail for AGRA countries and Senegal. It lists both the number and prevalence of undernourishment, tracking changes since AGRA was launched. It also shows the FAO's estimates of the number and prevalence of those suffering either moderate or severe food insecurity. (It is not easy to reliably aggregate measures of the prevalence of hunger for AGRA countries as a group, so I do not include that here.)

Measures of the prevalence of undernourishment, as shares of growing populations rather than absolute numbers, show more signs of progress, with small declines in most AGRA countries. Ethiopia, Ghana, Rwanda, and Zambia posted more significant improvements. Kenya, Mali, Nigeria, and Uganda, on the other hand, all showed rising shares of their populations suffering severe hunger. Recent data on moderate and severe food insecurity pose greater concern. Every AGRA country had more than 40% of its people experiencing some level of food insecurity, with the exception of Mali, which reported just 21% in that category. Even some countries that posted both gains in staple yields and reductions in severe hunger reported high levels of food insecurity, with 61% of Ethiopians still food insecure in the 2022-24 period.

It is difficult to gauge changes in farmers' incomes, which were supposed to double by 2020. Global institutions such as the World Bank no longer provide updated estimates of rural poverty, and CAADP does not detail such data in its benchmarks. According to the World Bank's national estimates, poverty rates for AGRA countries continued their trend of slow declines since 2006, with rates for 2021 ranging from 33% in Ghana to 77% in Mozambique. Malawi and Kenya saw poverty rates increase.[20] Rural poverty tends to be worse.

It is telling that AGRA, in its 2022 Life of Strategy report on the 2017-21 PIATA program, acknowledges as much, conceding that "the evidence of AGRA's impact on increasing incomes, food security, and resilience at this stage is limited.... Given the scale of external factors, we cannot yet demonstrate direct causality between AGRA's actions and improvements in farmer food security and income."[21]

Wide country variations

Table 5

AGRA: Productivity Gains in Select Staple Crops
Percent Change in Yields (MT/Ha), 13 AGRA Countries and Senegal
2004–06, 2016–18, 2022–24, and Annualized

		2004–06 / 2016–18	Ann.	2016–18 / 2022–24	Ann.	2004–06 / 2022–24	Ann.
AGRA Total	Maize	28%	2.1%	9%	1.5%	40%	1.9%
	Millet	-19%	-1.7%	2%	0.4%	-17%	-1.0%
	Sorghum	9%	0.7%	-5%	-0.9%	3%	0.2%
	Cereals, Total	30%	2.2%	8%	1.2%	39%	1.9%
	Roots/Tubers, Total	-1%	-0.1%	-10%	-1.8%	-11%	-0.7%
	Staple Yield Index	**22%**	**1.7%**	**2%**	**0.4%**	**25%**	**1.2%**
Senegal	Maize	-20%	-1.8%	58%	7.9%	26%	1.3%
	Millet	40%	2.8%	32%	4.7%	85%	3.5%
	Sorghum	22%	1.6%	44%	6.2%	75%	3.2%
	Cereals, Total	46%	3.2%	34%	4.9%	96%	3.8%
	Roots/Tubers, Total	52%	3.5%	18%	2.8%	79%	3.3%
	Staple Yield Index	**28%**	**2.1%**	**37%**	**5.4%**	**73%**	**3.1%**

Source: FAOSTAT Crops Data, https://www.fao.org/faostat/en/#data/QCL, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers. For AGRA Total, it is the weighted sum of total cereals plus roots/tubers.

There was wide variation in performance across different AGRA countries, though none came close to achieving AGRA's and CAADP's goals of doubling productivity while

[20] Regional Strategic Analysis and Knowledge Support System (ReSAKSS), "Tracking Indicators," accessed June 2026, https://www.resakss.org/node/11.
[21] AGRA, *Life of Strategy Report*, 42.

cuttinghunger in half, even four years beyond AGRA's original deadline. As Table 3 showed, only Ethiopia, Ghana, and Malawi demonstrated significant productivity growth that translated into stronger Staple Yields Index improvements. Worst performers were Nigeria and Kenya, with declines in staple yields over the 18-year period and dramatic increases in hunger. Uganda also performed poorly, with just 1% yield growth and a doubling in the number of undernourished.

Table 5 shows yield increases for selected crops for AGRA countries and Senegal, for the period studied earlier (2004/6-2016/18), the more recent six years through 2024, and the full 18 years since AGRA's founding and CAADP's launch. (Similar tables for all countries are included in Appendix 2.) Yield growth failed to approach AGRA's original goal of doubling productivity, even for maize, its most heavily subsidized and promoted crop.

Table 6

Fertilizer Use under AGRA
Kg/Ha of Arable Land
(CAADP Goal: 50 Kg/Ha)

	2004–06	2022–23	% Change
Burkina Faso	11.3	15.5	37%
Ethiopia	10.8	41.6	286%
Ghana	13.4	33.0	145%
Kenya	31.7	41.9	32%
Malawi	33.9	55.5	64%
Mali	16.5	8.1	-51%
Mozambique	2.8	11.6	316%
Niger	0.4	0.6	61%
Nigeria	7.3	5.8	-21%
Rwanda	2.8	30.8	1015%
Tanzania	5.5	20.5	274%
Uganda	1.2	3.0	141%
Zambia	27.9	70.9	155%
AGRA Total	**12.7**	**26.1**	**105%**
Senegal	8.3	13.5	63%

Source: World Bank, World Development Indicators (derived from FAO), accessed June 2026.
Note: Fertilizer consumption measures the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate). Traditional nutrients—animal and plant manures—are not included.

Yields grew slowly despite large increases in fertilizer use in most AGRA countries. For AGRA as a whole, usage more than doubled to 26 kg/ha. Still, this increase fell far short of the CAADP goal of 50 kg/ha, a level that only Malawi and Zambia achieved. The largest percentage increases came in Rwanda, Mozambique, Ethiopia, and Tanzania. (See Table 6.)

There is little consistent data on the uptake of the other key Green Revolution input, commercial seeds. AGRA reports 123,000 tons of seeds sold due to its efforts.[22] But it fails to document how many of its "target farmers" adopted those seeds and their associated fertilizers permanently. Government input subsidies tend to sustain the use by smallholders of the costly inputs, but adoption often drops when subsidies are removed. With the Green Revolution technology package raising yields slowly,

[22] AGRA, "Our Impact," accessed July 10, 2026, https://agra.org/our-impact/.

farmers often do not see income gains that can sustain the purchases of expensive inputs.[23]

Following are some illustrative country examples of performance in the AGRA years. Data for all crops and countries are presented in Appendix 2.

Kenya: Hunger doubles in AGRA's backyard

The data has Kenya as one of AGRA's worst performers. This is somewhat surprising given that AGRA is headquartered in Nairobi and the country has been a priority since the organization's inception. Staple crops saw an 8% decline in yields since 2006. Maize yields fell by a similar amount, despite all the incentives to produce maize. Yields fell even with a 32% increase in the use of synthetic fertilizer. What gains were registered in production came instead from a 36% expansion in cropped land, rather than "sustainable intensification."

Table 7

Kenya Percent Change, Select Crops 2004–06 to 2022–24	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	30%	39%	-8%
Rice (Paddy)	298%	142%	60%
Wheat	-8%	-29%	30%
Millet	16%	2%	13%
Sorghum	61%	62%	-3%
Cereals, Total	30%	34%	-3%
Cassava	111%	40%	52%
Yams & Sw Potatoes	9%	-12%	23%
Roots/Tubers, Total	22%	47%	-17%
Groundnuts	-2%	9%	-12%
Soybeans	469%	367%	29%
Pulses, Total	114%	44%	50%
Staple Yield Index			-8%
Total Cropland Expansion		36%	
Change in # of Undernourished		+104%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

It is tempting to attribute Kenya's alarming increase in the number of chronically hungry people to an historic drought from 2020-2023. Severe hunger doubled since AGRA started, to more than 20 million, and the prevalence of hunger increased to 37%, with 74% suffering moderate or severe food insecurity. The recent drought aside, Kenya has underperformed from the beginning, posting declines in yields in many staples in AGRA's first twelve years through 2018. (See Appendix 2.) It seems clear that despite heavy input investments Kenya's agricultural strategy failed to build climate resilience. It incentivized monocultures of maize, leaving smallholders vulnerable when severe droughts struck the Horn of Africa.

[23] African Centre for Biodiversity (ACBio), *Running to Stand Still: Small-Scale Farmers and the Green Revolution in Malawi* (ACBio, 2014), http://acbio.org.za/wp-content/uploads/2015/02/Malawi-running-to-stand-still.pdf.

Malawi: Better yields but rising hunger

Along with Ethiopia and Ghana, Malawi emerges as one of the better performers for yield-growth among AGRA countries. Nonetheless, all three failed to achieve AGRA's original productivity goal of 100% increase by 2020. Unlike Ethiopia and Ghana, Malawi saw the number of hungry continue to grow.

Table 8

Malawi
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	88%	6%	80%
Rice (Paddy)	112%	64%	31%
Wheat	-88%	-55%	-70%
Millet	133%	66%	40%
Sorghum	204%	66%	84%
Cereals, Total	91%	11%	75%
Cassava	147%	59%	56%
Yams & Sw Potatoes	-	-	-
Roots/Tubers, Total	241%	94%	76%
Groundnuts	152%	73%	45%
Soybeans	486%	251%	68%
Pulses, Total	170%	45%	86%
Staple Yield Index			78%
Total Cropland Expansion		39%	
Change in # of Undernourished		+61%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Still, staple yields increased 78% through 2024. Maize yields grew 80%, contributing to an 88% increase in production with only a 6% rise in land planted to maize. Yields grew for other staple crops important to Malawians, with production of sorghum, cassava, and yams increasing from both expanded planting and rising yields. Total cropland expanded by 39%, a high level of "extensification" in a land-constrained country such as Malawi. Environmental impacts can be severe from expanding cultivation onto marginal lands.

Production gains did not translate into significant reductions in food insecurity, a pattern common among Green Revolution countries. More maize does not automatically reduce hunger or promote climate resilience. The number of chronically undernourished Malawians increased 61% to 4.5 million people, and 82% of the population was estimated to suffer moderate or severe food insecurity after 18 years of Green Revolution programs.

Senegal: Reducing hunger, investing in diversity

I introduce a comparison with Senegal, a non-AGRA country (until recently) that followed a more diversified set of agricultural policies. By comparison with AGRA countries as a group, Senegal in the same time period achieved the goal of reducing the number of hungry by 50% and achieving the CAADP goal to bring the percentage below 5% of the population, well below the continental hunger rate of 22%. Of AGRA countries, only Ghana approached that goal, with 6.5% of its population undernourished.

Senegal outperformed AGRA, and nearly every AGRA country, with 18-year productivity growth across a range of crops coupled with reductions in severe hunger. Senegal was not one of AGRA's priority countries, and its agricultural policies have been less narrowly focused on promoting high-input production of priority crops such as maize. Fertilizer use increased to only 14 kg/ha, barely half the average for AGRA. Senegal has also shown greater openness to a range of approaches, including agroecology. The results are instructive as a contrast to AGRA.

Table 9

Senegal
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	146%	97%	26%
Rice (Paddy)	572%	347%	51%
Wheat	-	-	-
Millet	143%	33%	85%
Sorghum	200%	71%	75%
Cereals, Total	233%	71%	96%
Cassava	416%	176%	81%
Yams & Sw Potatoes	704%	730%	-3%
Roots/Tubers, Total	478%	207%	79%
Groundnuts	175%	77%	56%
Soybeans	-	-	-
Pulses, Total	271%	50%	156%
Staple Yield Index			73%
Total Cropland Expansion		74%	
Change in # of Undernourished		-50%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Modest yield growth for maize (26%), a less important staple, was compensated by dynamic yield growth for millet (85%), sorghum (75%), and roots and tubers (79%). With more broad-based productivity gains not driven by maize, Senegal's Staple Yield Index grew an impressive 73% compared to AGRA's 25%. Senegal's two most important staples, millet and groundnuts, retained their importance instead of losing ground to maize. Groundnut planting increased 77% with 56% yield growth; by comparison, groundnuts in AGRA countries as a whole saw 10% yield declines.

As in many AGRA countries, production gains were driven by extensification, bringing 74% more land under cultivation in the 18-year period. Primary area growth was in: rice (347%), an important staple much of which is imported; cassava (176%); and groundnuts (77%), the country's largest staple and export crop.

Zambia: Soybeans, extensification, and hunger

Zambia's maize productivity continued to stagnate. Yields for Zambia's most heavily promoted crop remain disappointing, especially given the success in raising fertilizer use to 71 kilograms per hectare, the highest of any AGRA country. Despite that, maize yields declined 7% from 2018 to 2024 and increased only 14% since 2006. All those incentives failed to generate a productivity boom, but they certainly fed extensification. Maize land expanded 82% since 2006.

Two notable developments in the most recent six-year period, in AGRA countries generally and especially in Zambia, are the expansion of land planted to soybeans and cassava, soybeans for industrial livestock feed and cassava as feedstock for a nascent biofuel industry. Both have increased dramatically in Zambia

Table 10

Zambia
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	113%	88%	14%
Rice (Paddy)	236%	226%	-3%
Wheat	127%	86%	22%
Millet	-27%	-42%	23%
Sorghum	-62%	-60%	-11%
Cereals, Total	109%	73%	21%
Cassava	266%	76%	103%
Yams & Sw Potatoes	62%	106%	-18%
Roots/Tubers, Total	249%	80%	92%
Groundnuts	135%	142%	-4%
Soybeans	719%	884%	-16%
Pulses, Total	108%	110%	-2%
Staple Yield Index			12%
Total Cropland Expansion		95%	
Change in # of Undernourished		+33%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and sweet potatoes.

From a very low level of production in 2006, soybean production in AGRA countries has grown 253% with land planted to soybeans increasing 187%. Yield growth has been weak at just 24% over those 18 years. Soybeans have been a priority for CAADP, primarily to pair with maize as a feed crop for poultry and other livestock. That can be controversial, particularly when incentives for soybean production create competition for land previously planted with food crops for direct consumption. Small-scale farmers who switch to soybeans often do not earn enough from sales to buy the poultry their land is feeding. Most factory-farmed chicken goes to urban markets, leaving some farmers with less food than they had access to before. Incentives for soybeans can also feed large-scale industrial livestock farms, putting pressure on land access for smallholders. Soybeans have been one of the crops seen to be driving land-grabbing in parts of Africa.[24]

In the last six years, soybean expansion has been particularly strong in some AGRA countries, often those with input subsidies or incentives to plant the oilseed. Malawi, Ghana, Nigeria, and Rwanda have all shown significant growth, but Zambia stands out, with an estimated 13% of all cropland now accounted for by soybeans. Before AGRA just

[24] Wise, "What Happened to the Biggest Land Grab in Africa? Searching for ProSavana in Mozambique," *Food Tank*, December 20, 2014, https://foodtank.com/news/2014/12/what-happened-to-the-biggest-land-grab-in-africa-searching-for-prosavana-in/.

3% was planted to soybeans. The largest jump has come since 2016. One of the main buyers is Zambeef, one of the region's large and growing factory-farming operations.[25]

Cassava production has also expanded in recent years, partly to feed biofuel company Sunbird and other enterprises in producing ethanol. The Zambian government has offered incentives and mandates to reduce its dependence on imported fossil fuels, and to supplement energy supply on Zambia's electrical grid, which depends on hydropower vulnerable to drought and climate change. Zambia also has growing demand for cassava for beer-making and flour. Cassava is a crucial staple in Zambia, an emergency food reserve poor farmers can leave in the ground until the need arises. Introducing additional demand for the crop from outside the food sector is fraught with risks, as biofuel companies can outbid poor consumers for the crop and persuade poor farmers to sell rather than store their cassava. Sunbird has reportedly expanded outgrower schemes employing up to 20,000 farmers to expand access to the feedstock. New fast-maturing varieties are accelerating the ramp-up of biofuel production, which is expected eventually to consume more than 25% of the country's cassava harvest.[26]

FAO data on cassava are notoriously unreliable, relying on a flawed methodology employed by the Zambian government. Rather than track annual production and area harvested independently to calculate yield, the government estimates planted or harvested area for the crop (it is not consistent), then infers annual production levels based on an assumed yield.[27] That makes the cassava estimates in Table 10 questionable. What is beyond doubt, though, is that in recent years Zambia has witnessed a boom in land planted to cassava and in its use not as food for humans but as feedstock for energy production. According to government estimates, as much as 12% of Zambia's cropland is planted to cassava.

That combines with soybean expansion to occupy some 25% of Zambia's agricultural lands. Soybean and cassava expansion certainly contributed to Zambia's high levels of extensification, which saw total cropland nearly double since 2006, increasing 95%. The

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[25] African Development Bank Group, "Transforming Zambia's Agricultural Landscape: African Development Bank Approves Guarantee for Zambeef's Expansion Project," May 3, 2025, https://www.afdb.org/en/news-and-events/press-releases/transforming-zambias-agricultural-landscape-african-development-bank-approves-guarantee-zambeefs-expansion-project-83353.

[26] Sunbird Bioenergy, "Zambia," accessed July 8, 2026, https://www.sunbirdbioenergy.com/zambia-bioenergy.

[27] According to Zambia's agricultural research institute, IAPRI, its last annual survey put 2018 production, area planted, and yield at 1 million mt on 370,000 hectares with a yield of 6.1 mt/ha. For the same year, FAO, using Zambian government data, estimated production at 4.1 million mt (four times higher), area harvested at 117,000 ha (less than one-third the IAPRI estimate), and yields of 34 mt/ha (five times the IAPRI estimates and three times the yields now used to estimate annual production.) Source: Indaba Agricultural Policy Research Institute (IAPRI), Rural Agricultural Livelihoods Study (RALS), 2019. Because most cassava takes three years to mature, the area "planted to cassava" is much larger than the area "in mature cassava" ready for harvest. The Zambian government and FAO are inconsistent and unclear which area estimates they are reporting.

vast majority of that new land was planted to maize, soybeans, and cassava, which expanded 124% - nearly one million more hectares - in the AGRA years. Together they account for three-quarters of the new land put into cultivation. To the extent those products are serving as feed for industrial livestock or biofuels rather than food for farming families, their expansion may be one of the reasons Zambia's rural poverty and hunger rates have shown little improvement despite higher levels of production. Rural poverty is particularly severe, estimated at 79%.[28]

Over the full 18-year period, by comparison, millet production in Zambia, which used to cover 4% of cropped land, has seen a 42% drop in land planted to the hardy, nutritious staple. Now just just 1% of cropped land is in millet. Not surprisingly, Zambia's Staple Yield Index rose just 12% while the number of undernourished people increased by one-third.

Zambia's Green Revolution incentives to grow maize have contributed to one of AGRA's more dramatic cases of unsustainable extensification. Such policies have also left the country's farmers more vulnerable to climate change, as the proliferation of maize monocultures undermines resilience to climate shocks such as droughts. A drought in 2024 resulted in what the African Centre for Biodiversity (ACB) called a "food system collapse" as maize-dependent farmers and consumers saw their primary crop wither in the dry heat. ACB explicitly faulted Zambia's Green Revolution policies as one of the culprits in the crisis.[29]

A tale of two staples

One of the more worrisome trends in the last twenty years of Green Revolution promotion is the ascendance of maize over other more climate-resilient and nutritious staples such as millets. Long a reliable food grain across much of Africa, a wide range of local millet varieties provided small-scale farmers with a low-cost, low-labor food that was highly nutritious and could survive widely variable climate conditions. The United Nations designated 2023 as the "International Year of Millets" to highlight their climate-resilience and nutritional benefits compared to water- and fertilizer-intensive cereals like maize and wheat.[30] Sorghum provides similar food-security benefits.

Both suffered under the relentless Green Revolution promotion of maize, rice, and other favored crops. But millet saw the steepest declines in planted area, production, and yields.

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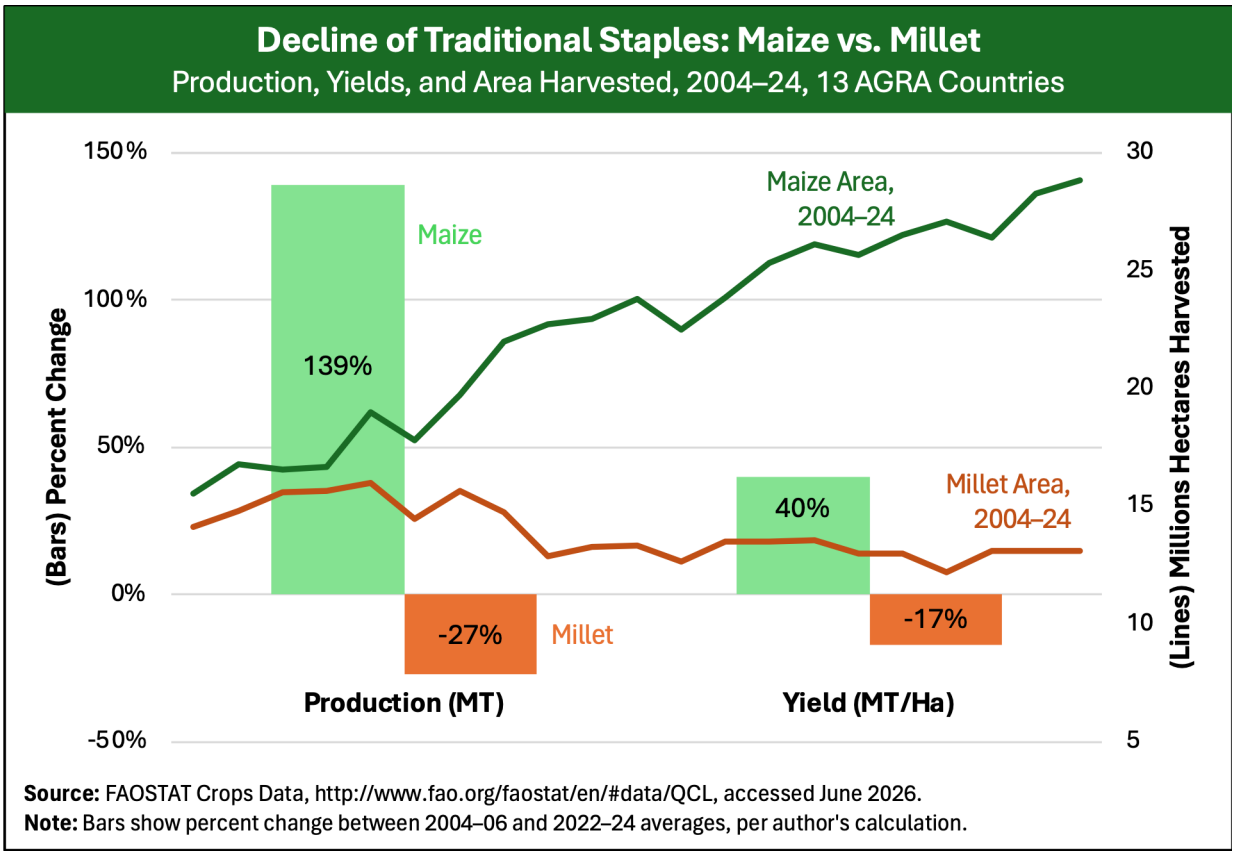
[28] Lucia Da Corta and Richard Bwalya, *Rural Pathways out of Poverty in Zambia* (Institute of Development Studies, 2025), https://doi.org/10.19088/CPAN.2025.002.
[29] ACBio, "Is Zambia's Food System Collapsing?," July 18, 2024, https://acbio.org.za/corporate-expansion/is-zambias-food-system-collapsing/.
[30] Food and Agriculture Organization of the United Nations (FAO), "International Year of Millets 2023," accessed July 24, 2026, https://www.fao.org/millets-2023/en.

As Figure 1 shows, the heavy promotion of maize in AGRA countries has undermined that food resource. Before AGRA's Green Revolution push, millet covered almost as much land as maize. By 2024, maize production more than doubled. Yields increased but accounted for a smaller share of the production increase than expanded planting, which expanded 71% (the line in the graph), adding more than 11 million hectares under cultivation. Millet, by contrast, saw a 12% reduction in area harvested, a 17% decrease in yields due to disinvestment, and a 27% drop in production.

Figure 1



Given the nutritional and climate-resilient benefits of millet compared to maize, this represents a net loss in food security and nutrition, even considering the 139% increase in total maize production. The Green Revolution's overemphasis on starchy commercial staples such as maize and rice ended up contributing to declines in nutritional diversity, particularly for small-scale farming households. While maize provides high caloric density per hectare, as least under ideal conditions, millets and sorghum are superior in micronutrients (iron, zinc, calcium, fiber).[31] Replacing millet and sorghum with starchy

[31] FAO, "International Year of Millets 2023."

monocultures represents a net loss in dietary quality, deepening "hidden hunger" across smallholder communities.

Discussion

The rising use of food crops as feedstock points to AGRA's abandonment of smallholder farmer-based food producers as the intended beneficiaries of its policies. Now crops are mainly intended to reduce food and energy costs for swelling urban populations, which are growing in part due to the exodus from rural areas. AGRA's web site now has scant mention of productivity or small-scale farmers. It lists few measurable goals. Claimed achievements feature the number of commercial seeds produced, private financing generated, and enterprises created.[32] AGRA's new focus on food systems and policy development leaves it largely untethered from direct work with small-scale farmers.

Of course, AGRA has never succeeded in reaching the number of farmers it claims as beneficiaries. One obvious explanation for AGRA and its Green Revolution's limited evidence of improvements in productivity, incomes, and hunger is that the initiatives failed to impact enough farmers to influence national-level data on those metrics. AGRA's own spotty impact-monitoring suggests that far fewer than 30 million farmers are being persuaded to change their practices to "catalyze a farming revolution."

As I noted the following in 2020 about AGRA's latest impact report, "Farmers are listed mainly as benefiting from training in ISFM techniques – Integrated Soil Fertility Management – AGRA's term for its technology package. The report lists '5.3 million farmers with knowledge of ISFM,' and '1.86 million farmers using ISFM.' But there is no accounting for what technologies they are actually employing and what benefit accrues to those farmers."

When asked, AGRA officials will not acknowledge that they have failed to significantly improve the productivity or welfare of large numbers of farmers. Instead, AGRA officials adopt misleading terminology about the number of farmers "reached" without defining what that means. AGRA's leadership brags that "through its national and system level activities, we directly reached 11 million farmers and indirectly reached 26 million farmers. This achievement significantly outstripped our initial targets to reach 30 million smallholder households, which were considered ambitious."[33]

"Reaching" 37 million farmers, some "indirectly," obfuscates the data showing that AGRA and the Green Revolution have fallen far short of the goals of doubling productivity and incomes and halving hunger for 30 million farming households. AGRA's current leadership

[32] AGRA, "Our Impact,"
[33] AGRA, *Life of Strategy Report*, 41.

and major donors seem to be continuing to cover their failures in verbal smokescreens. A recent report on Mastercard Foundation's $350 million youth employment initiative through AGRA says the goal is to "reach 10 million unemployed and underemployed young people, and transition 1.5 million of them 'into dignified and fulfilling work.'"[34] AGRA's progress report credits the program with "reaching" 1.7 million young people two years into the five-year initiative. Dignified and fulfilling work? They report 162,000 young people "enabled in work."[35] There is little explanation of the euphemism "enabled in work." There is no clear data to show how many of those people got jobs that could be reasonably described as "dignified and fulfilling work." Those young people may be participating in some sort of job-training, but there is no evidence they have work.[36] Such reporting betrays a continued lack of accountability to AGRA's own objectives.

Conclusion

These findings serve to amplify those in my 2020 assessment that AGRA and the Green Revolution campaign it has championed have failed. CAADP's more rigorous biennial assessments on progress toward a much wider set of agricultural development benchmarks confirm these shortcomings. The continental program conceded that the data show that not a single African country has met all of its 2025 targets and most lag far behind in making progress toward inclusive agricultural transformation to achieve reductions in poverty and hunger.[37]

CAADP called for a dramatic expansion in government spending on agriculture to 10% of government budgets. After an initial surge in funding, progress toward that goal has slowed. It would be easy to blame the disappointing results I document in this assessment on a lack of investment. To be sure, most governments have failed to provide the funding required to reduce poverty and hunger through agricultural development. But many governments, particularly in AGRA countries, are spending large shares of their scarce public resources on agriculture. This assessment highlights the extent to which that money continues to be invested in unproductive Green Revolution programs that are failing to

[34] AGRA, "Youth Entrepreneurship for the Future of Food and Agriculture: FAQs," accessed July 8, 2026, https://agra.org/yeffa/faqs/.
[35] AGRA (@agra_africa), "More than 1.7 Million Young People Reached through #YEFFA. From Entrepreneurship and Innovation to Value Addition, Young People across Africa Are Building Businesses, Creating Jobs, and Shaping the Future of Food Systems," Instagram, June 24, 2026, https://www.instagram.com/agra_africa/p/DZ9_ojBiA59/.
[36] When I asked AGRA for clarification, the response I got was that "enabled in work" referred to "youth who have moved beyond initial engagement," an "intermediate stage" on a pathway to meaningful work. As such, it is not a measurable outcome for young people in the YEFFA program who have achieved "dignified and fulfilling work."
[37] Paul Guthiga, Greenwell Matchaya, Joel Okwir, and Augustin Wambo Yamdjeu, "Fourth CAADP Biennial Review Brief: COMESA" (ReSAKSS, 2025), https://doi.org/10.54067/caadpfbr/Comesa.

produce results. AGRA now pays lip service to low-input approaches such as agroecology, but their core policy and systems initiatives continue to foster the development of input markets and industrialized agricultural practices.

AGRA and its primary donors, led by the Gates Foundation, have continued to ignore evidence of the African Green Revolution's failures. That evidence shows that the initiative's core "theory of change" is flawed at every step in "catalyzing a farming revolution in Africa."

- **AGRA and the Green Revolution would transform agriculture for 30 million smallholder households:** It is unclear how many farmers were impacted.
- **High-yield seeds and synthetic fertilizers would be adopted by the majority of smallholders in Africa:** Adoption rates are low, benefit wealthier farmers, and are only widely adopted by smallholders when they are offered expensive subsidies.
- **Those inputs would double yields on priority food crops:** Yield growth has been slow even for maize and even for those farmers who adopt the technology package. More broadly, staple crop yields have grown more slowly than before AGRA.
- **Increased production would give farmers a surplus they could sell on the market, doubling their incomes:** Small yield gains hardly pay for more expensive inputs. Many farmers end up in debt.
- **Those sales, combined with increased food production, would result in a dramatic reduction in rural poverty and food insecurity:** Hunger has soared 58% in AGRA countries since AGRA was launched, and nutritional diversity has declined as crop diversity has eroded.

The Green Revolution for Africa has failed at every step of its ambitious theory of change. But Green Revolution proponents seem unwilling to reconsider their core theory. Absent any persuasive evidence of impact, AGRA simply reiterates its faith in the Green Revolution dogma. As they wrote in their 2022 Life of Strategy report:

"We have seen that AGRA's approach is catalytic. The signs of impact that we have seen along the long and slow path towards transformation should be taken seriously. We know that systems change is a long and slow process, and farmers' behaviour change is not guaranteed. However, **the specific evidence we have of AGRA's impact on increasing incomes, food security, and resilience should be taken as signifiers that our model does work."**[38]

[38] AGRA, *Life of Strategy Report*, 42. Emphasis my own.

AGRA officials declined to respond to my detailed set of questions about whether, in fact, the removal of "Green revolution" from AGRA's name represents any significant reconsideration of its core strategies. (My unanswered questions are in Appendix 1.)

When AGRA rebranded, I commented that without its "Green Revolution" AGRA literally stands for nothing. In fact, it is difficult to discern any coherent "theory of change" in AGRA 3.0 under its new leadership. Core funding for Green Revolution promotion to smallholder farmers has largely dried up. That leaves AGRA with restricted project funding for a youth-employment initiative funded by Mastercard, which seems to be floundering, and some country-specific projects on reducing post-harvest losses funded by the Green Climate Fund. It remains to be seen if the Gates Foundation, by far AGRA's largest historical donor, will continue to support the organization going forward.

The only candid admission about the failures of the Green Revolution for Africa came from former president Agnes Kalibata, interviewed in 2025 by Devex as she stepped down from her role at AGRA. "Part of why we [AGRA] rebranded was that the Green Revolution ship has sailed," she told Devex. "We can't continue pursuing what's not working for others." [39]

Saying the Green Revolution ship has sailed suggests that Africa again missed the boat by failing to take the opportunity to have its own Green Revolution, with new seeds and strategies to catalyze a productivity revolution. In fact, the Green Revolution ship had sailed long before Bill and Melinda Gates held out the false hope that its basic technology package, which caused such negative long-term consequences in India and other countries where it took hold, could be salvaged from its own watery grave and repurposed for Africa. As I summarized elsewhere, the first Green Revolution was far more comprehensive than the current campaign in Africa, and it was far less successful than its proponents claim.[40]

The Green Revolution for Africa saw only small tech upgrades in improved seeds. Many important features were omitted, such as local irrigation schemes, which were probably the most important contributor to increased food production. Under Kalibata's leadership, and with massive funding from philanthropic and bilateral donors, AGRA did not miss that Green Revolution boat. It herded African governments and their hungry farmers onto it for a 20-year voyage that leaves them shipwrecked on a continent-sized island that is now less

[39] Tania Karas, "Beyond the Green Revolution: How AGRA Evolved under Agnes Kalibata," *Devex*, February 26, 2025, https://www.devex.com/news/beyond-the-green-revolution-how-agra-evolved-under-agnes-kalibata-109499. Full interview text held in project workspace.

[40] Wise and Jomo Kwame Sundaram, "Another False Start in Africa Sold with Green Revolution Myths," Inter Press Agency, April 20, 2021, https://www.ipsnews.net/2021/04/another-false-start-africa-sold-green-revolution-myths/.

capable of feeding itself than it was before the multi-billion-dollar Green Revolution set sail.

The data presented in this paper only confirms how deeply flawed the Green Revolution theory of change remains. It should serve as a wake-up call to donors and governments that Africa needs its own agricultural revolution, and the transformation can be led by the continent's resilient small-scale farmers. The majority of Africans still make their living in agriculture, and those farmers still grow the majority of the food consumed on the continent. And they produce nearly all the food consumed within small-scale farming communities, which suffer high levels of poverty and food insecurity.

They have effectively maintained their crops and farming practices despite the Green Revolution efforts to industrialize their farms and food systems. And, as I chronicled in my 2019 book *Eating Tomorrow,* they are showing every day that another agriculture is possible, one that embraces diversity – on farms, in diets, and in public policies – as the foundation for catalyzing the inclusive transformation of food systems that the Green Revolution promised.[41]

[41] Wise, *Eating Tomorrow: Agribusiness, Family Farmers, and the Battle for the Future of Food* (The New Press, 2019).

Appendix 1: Questions posed to AGRA

I posed the following questions to AGRA in June 2026. AGRA's communications department declined to answer any specific questions nor provide new impact data, instead referring me to its web site and to a forthcoming report.

1. Why did AGRA remove "green revolution" from its name, rebranding as just AGRA? In what way was AGRA seeking to distance itself from the Green Revolution strategies that were its core theory of change?
2. Is "sustainable intensification" through productivity gains still at the core of AGRA's theory of change? If so, what AGRA programs support that goal?
3. Assuming that is still a goal, is it to be achieved in significant part through the expanded farmer adoption of commercial seeds and synthetic fertilizers?
4. I now see virtually no mention of productivity goals on AGRA's web site or documents. Does AGRA have specific goals for productivity gains for small-scale farmers in its priority countries?
5. Both the Mathematica evaluation and AGRA's own 2022 Life of Strategy report call for greater monitoring and evaluation to assess impacts. Are there any recent outcome monitoring reports that document progress in raising productivity or reducing food insecurity, either for AGRA's 20 years of work or for the more recent AGRA 3.0 programs? Will Mathematica do a new evaluation that includes the current strategy?
6. There is also less mention of small-scale farmers in program descriptions. Does AGRA have a goal for how many farmers will be reached by AGRA's programs and how their yields, incomes, and food security will improve? When AGRA says it "reached" farmers, directly and indirectly, how is that defined? Are there any current or planned efforts to monitor and evaluate the impacts of that engagement?
7. The Mathematica evaluation as well as other internal and external assessments suggested that the Village-Based Advisor model was not sustainable and was unlikely to continue without donor support. How has AGRA addressed those concerns?
8. I know AGRA has been critical of some national input-subsidy programs, but also supportive of farmer incentives to purchase modern inputs. Can you clarify AGRA's position?

9. Given all the changes at AGRA in recent years, does AGRA now recognize that its previous incentives to grow maize, rice, and other commercial crops have contributed to the patterns of unsustainable land use and crop-shifting that I have documented in my previous research? If so, what changes has AGRA made to address those issues?

10. Perhaps the greatest disappointment regarding the impacts of AGRA and the larger Green Revolution campaign is the fact that the number of undernourished people in AGRA's focus counties has not been cut in half, it has increased by more than 50%. Recognizing that many factors cause hunger, what responsibility does AGRA take for the worsening of hunger? In what ways are AGRA's programs and strategies changing to address those shortcomings?

11. As AGRA readies a new five-year strategy, what changes can we expect to see to achieve better outcomes for smallholder farmers in Africa?

Appendix 2: Productivity and Land Use under AGRA, Three Periods

Following are: country progress reports for 18 years through 2024; three crop tables for: 18 years through 2024; AGRA's first 12 years through 2018; and the most recent six year period 2018-24, and a chart summarizing key yield data for all countries for those periods. All data on crop production, yields, and area harvested is derived from the FAO Statistical Database (FAOSTAT) series Crops and Livestock Products. These numbers encompass both official figures from agricultural ministries and imputed or otherwise estimated values from receiving agencies. Percentages (i.e., percent change and cropland allocation) are the author's calculations. The following points should be considered when interpreting these figures:

- Because of FAOSTAT's periodic, backward revisions to crop data, numbers on the earlier period of AGRA (2004–06 to 2016–18) sometimes differ slightly from those published in Wise 2020. In two cases, Tanzania and Uganda, acute revisions to 2018 production and area numbers distorted logical trendlines. Absent any explanation for such sharp changes, this year has been excluded for these two countries, as specified in table notes, to best capture the mid-AGRA trend as through 2016-17.
- Cropland allocation is a function of area harvested, not area planted. It represents the share of hectares harvested for a given crop as a percentage of each country's total harvested area for all crops, not just the crop categories in the table. It gives a sense of the relative importance of these crops within a given country.
- Figures expressing percentage change can appear excessive where baseline production of a crop in 2004-6 was very low. That can create misleadingly large percentage increases even when the crop remains relatively unimportant, as reflected in the cropland allocations. For example, Ethiopia's reported 13,288% increase in soybean production is high because production in 2004-6 was negligible. Expansion has been significant but the crop still covers just 1% of nationwide harvest area. A report of 0% indicates a share below 0.5%.
- The aggregate category "Yams and Sweet Potatoes" is not an official FAOSTAT category. It is the author's sum of production and area figures reported for the two crops; yield is the ratio between these sums, consistent with FAO methodology. Numbers for Malawi, Mozambique, Niger, Senegal (2004–2013), Uganda, and Zambia reflect only sweet potatoes due to absent yams data.
- Rice production tonnage refers to unmilled or "paddy rice," including husks.
- The Staple Yield Index was developed by the author to capture productivity changes across a basket of staple food crops. For most countries, the index is based on yields for maize, millet, sorghum and roots and tubers as a group, weighted by their relative importance based on harvested area. For countries in which other crops are major staples (e.g. wheat in Ethiopia, rice in Tanzania and Nigeria), the index is derived from yields for Total Cereals and Roots & Tubers. The same approach is used to calculate AGRA's Staple Yield Index. Because of inconsistencies in the reporting of Zambia's cassava yields, Yams & Sweet Potatoes are used instead of Roots & Tubers.

Appendix 2: Country Progress Reports

AGRA: Limited Signs of Green Revolution
% Change, Select Crops, 13 AGRA Countries
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	139%	71%	40%
Rice (Paddy)	190%	93%	51%
Wheat	159%	48%	76%
Millet	-27%	-12%	-17%
Sorghum	13%	9%	3%
Cereals, Total	79%	29%	39%
Cassava	68%	113%	-21%
Yams & Sw Potatoes	93%	92%	0%
Roots/Tubers, Total	79%	102%	-11%
Groundnuts	55%	73%	-10%
Soybeans	253%	183%	24%
Pulses, Total	114%	43%	50%
Staple Yield Index			25%
Total Cropland Expansion		46%	
Change in # of Undernourished		+58%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for cereals and roots/tubers. Some crops exclude countries for which data is unavailable; see appendix table.

Senegal
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	146%	97%	26%
Rice (Paddy)	572%	347%	51%
Wheat	-	-	-
Millet	143%	33%	85%
Sorghum	200%	71%	75%
Cereals, Total	233%	71%	96%
Cassava	416%	176%	81%
Yams & Sw Potatoes	704%	730%	-3%
Roots/Tubers, Total	478%	207%	79%
Groundnuts	175%	77%	56%
Soybeans	-	-	-
Pulses, Total	271%	50%	156%
Staple Yield Index			73%
Total Cropland Expansion		74%	
Change in # of Undernourished		-50%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Burkina Faso
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	163%	169%	-1%
Rice (Paddy)	417%	338%	16%
Wheat	-	-	-
Millet	-18%	-17%	-1%
Sorghum	27%	35%	-6%
Cereals, Total	52%	37%	11%
Cassava	182%	157%	10%
Yams & Sw Potatoes	64%	15%	37%
Roots/Tubers, Total	95%	127%	-16%
Groundnuts	172%	125%	20%
Soybeans	2182%	2737%	-16%
Pulses, Total	90%	87%	1%
Staple Yield Index			-3%
Total Cropland Expansion		70%	
Change in # of Undernourished		+25%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Ethiopia
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	223%	93%	65%
Rice (Paddy)	2372%	1377%	67%
Wheat	208%	61%	91%
Millet	158%	23%	112%
Sorghum	113%	16%	84%
Cereals, Total	166%	36%	95%
Cassava	-	-	-
Yams & Sw Potatoes	208%	8%	187%
Roots/Tubers, Total	344%	224%	36%
Groundnuts	355%	217%	43%
Soybeans	13288%	2108%	636%
Pulses, Total	142%	30%	87%
Staple Yield Index			93%
Total Cropland Expansion		46%	
Change in # of Undernourished		-11%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Data on rice for the pre-AGRA period is taken from Wise 2020, as it is currently missing from the FAOSTAT platform. Staple Yield Index is the sum of yield increases weighted by relative cropland area for cereals and roots/tubers.

Ghana
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	202%	74%	73%
Rice (Paddy)	471%	256%	60%
Wheat	-	-	-
Millet	32%	-23%	71%
Sorghum	43%	8%	32%
Cereals, Total	199%	62%	84%
Cassava	177%	37%	102%
Yams & Sw Potatoes	156%	59%	61%
Roots/Tubers, Total	152%	35%	87%
Groundnuts	41%	-18%	73%
Soybeans	-	-	-
Pulses, Total	202%	55%	95%
Staple Yield Index			77%
Total Cropland Expansion		23%	
Change in # of Undernourished		-16%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Kenya
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	30%	39%	-8%
Rice (Paddy)	298%	142%	60%
Wheat	-8%	-29%	30%
Millet	16%	2%	13%
Sorghum	61%	62%	-3%
Cereals, Total	30%	34%	-3%
Cassava	111%	40%	52%
Yams & Sw Potatoes	9%	-12%	23%
Roots/Tubers, Total	22%	47%	-17%
Groundnuts	-2%	9%	-12%
Soybeans	469%	367%	29%
Pulses, Total	114%	44%	50%
Staple Yield Index			-8%
Total Cropland Expansion		36%	
Change in # of Undernourished		+102%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Malawi
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	88%	6%	80%
Rice (Paddy)	112%	64%	31%
Wheat	-88%	-55%	-70%
Millet	133%	66%	40%
Sorghum	204%	66%	84%
Cereals, Total	91%	11%	75%
Cassava	147%	59%	56%
Yams & Sw Potatoes	-	-	-
Roots/Tubers, Total	241%	94%	76%
Groundnuts	152%	73%	45%
Soybeans	486%	251%	68%
Pulses, Total	170%	45%	86%
Staple Yield Index			78%
Total Cropland Expansion		39%	
Change in # of Undernourished		+61%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Mali
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	524%	319%	47%
Rice (Paddy)	218%	127%	41%
Wheat	406%	200%	85%
Millet	77%	53%	15%
Sorghum	131%	122%	2%
Cereals, Total	209%	114%	44%
Cassava	161%	178%	-7%
Yams & Sw Potatoes	282%	338%	-11%
Roots/Tubers, Total	241%	266%	-4%
Groundnuts	95%	89%	2%
Soybeans	905%	2682%	-64%
Pulses, Total	295%	130%	71%
Staple Yield Index			20%
Total Cropland Expansion		106%	
Change in # of Undernourished		+81%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Mozambique
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	101%	51%	36%
Rice (Paddy)	30%	-10%	52%
Wheat	89%	182%	-33%
Millet	4%	-24%	35%
Sorghum	-4%	-28%	30%
Cereals, Total	81%	29%	42%
Cassava	36%	-11%	50%
Yams & Sw Potatoes	-29%	1%	-30%
Roots/Tubers, Total	35%	-7%	44%
Groundnuts	124%	34%	69%
Soybeans	-	-	-
Pulses, Total	204%	80%	71%
Staple Yield Index			38%
Total Cropland Expansion		35%	
Change in # of Undernourished		+24%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Niger
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	457%	318%	52%
Rice (Paddy)	139%	131%	2%
Wheat	-17%	-56%	85%
Millet	38%	15%	21%
Sorghum	135%	46%	63%
Cereals, Total	64%	24%	32%
Cassava	728%	364%	79%
Yams & Sw Potatoes	368%	231%	44%
Roots/Tubers, Total	732%	362%	80%
Groundnuts	340%	211%	41%
Soybeans	-	-	-
Pulses, Total	362%	65%	185%
Staple Yield Index			36%
Total Cropland Expansion		44%	
Change in # of Undernourished		+36%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026. "-" signifies missing values.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Nigeria
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	89%	55%	22%
Rice (Paddy)	142%	81%	34%
Wheat	-38%	-60%	62%
Millet	-77%	-59%	-43%
Sorghum	-29%	-19%	-12%
Cereals, Total	10%	-1%	11%
Cassava	48%	178%	-47%
Yams & Sw Potatoes	79%	134%	-23%
Roots/Tubers, Total	69%	158%	-35%
Groundnuts	22%	58%	-23%
Soybeans	134%	94%	20%
Pulses, Total	50%	20%	25%
Staple Yield Index			-14%
Total Cropland Expansion		44%	
Change in # of Undernourished		+244%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for cereals and and roots/tubers.

Rwanda
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	465%	184%	98%
Rice (Paddy)	140%	148%	-3%
Wheat	-19%	-44%	44%
Millet	-7%	19%	-12%
Sorghum	-2%	-10%	9%
Cereals, Total	138%	60%	49%
Cassava	74%	-23%	126%
Yams & Sw Potatoes	63%	25%	31%
Roots/Tubers, Total	28%	-3%	31%
Groundnuts	44%	85%	-22%
Soybeans	45%	72%	-15%
Pulses, Total	93%	82%	7%
Staple Yield Index			50%
Total Cropland Expansion		25%	
Change in # of Undernourished		+17%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Tanzania
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	120%	57%	39%
Rice (Paddy)	243%	101%	70%
Wheat	-3%	68%	-43%
Millet	32%	-6%	40%
Sorghum	10%	0%	11%
Cereals, Total	125%	51%	49%
Cassava	105%	81%	13%
Yams & Sw Potatoes	36%	-41%	133%
Roots/Tubers, Total	80%	33%	36%
Groundnuts	134%	110%	10%
Soybeans	1554%	1110%	44%
Pulses, Total	102%	9%	86%
Staple Yield Index			46%
Total Cropland Expansion		46%	
Change in # of Undernourished		+20%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for cereals and roots/tubers.

Uganda
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	311%	186%	44%
Rice (Paddy)	136%	124%	6%
Wheat	56%	61%	-3%
Millet	-82%	-78%	-16%
Sorghum	-40%	8%	-44%
Cereals, Total	130%	80%	28%
Cassava	-65%	133%	-85%
Yams & Sw Potatoes	-52%	-56%	8%
Roots/Tubers, Total	-58%	16%	-64%
Groundnuts	-11%	66%	-46%
Soybeans	6%	44%	-26%
Pulses, Total	34%	1%	33%
Staple Yield Index			1%
Total Cropland Expansion		52%	
Change in # of Undernourished		+106%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers.

Zambia
Percent Change, Select Crops
2004–06 to 2022–24

	Production (MT/Year)	Area (Ha)	Yield (MT/Ha)
Maize	113%	88%	14%
Rice (Paddy)	236%	226%	-3%
Wheat	127%	86%	22%
Millet	-27%	-42%	23%
Sorghum	-62%	-60%	-11%
Cereals, Total	109%	73%	21%
Cassava	266%	76%	103%
Yams & Sw Potatoes	62%	106%	-18%
Roots/Tubers, Total	249%	80%	92%
Groundnuts	135%	142%	-4%
Soybeans	719%	884%	-16%
Pulses, Total	108%	110%	-2%
Staple Yield Index			12%
Total Cropland Expansion		95%	
Change in # of Undernourished		+33%	

Source: FAOSTAT, Crops Data & Food Security Indicators, http://fao.org/faostat/en/#data, accessed June 2026.
Note: Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and sweet potatoes.

Appendix 2: Full crop tables, three periods

AGRA at 20: Assessing Productivity and Land Use Trends

Production, Yield, and Harvested Area for Select Crops, 13 AGRA Countries and Senegal

Percent Change, Pre-AGRA (2004–06) to Post-AGRA (2022–24), and Average Cropland Allocation (2022–24)

		Maize	Rice	Wheat	Millet	Sorghum	Cereals	Cassava	Yams & Sw Potatoes	Roots & Tubers	Ground-nuts	Soybeans	Pulses	Staple Yield Index
Burkina Faso	**Production**	163%	417%	-	-18%	27%	52%	182%	64%	95%	172%	2182%	90%	-3%
	Yield	-1%	16%	-	-1%	-6%	11%	10%	37%	-16%	20%	-16%	1%	
	Area	169%	338%	-	-17%	35%	37%	157%	15%	127%	125%	2737%	87%	
	% Cropland	13%	2%	0%	12%	22%	49%	0%	0%	0%	8%	1%	19%	
Ethiopia	**Production**	223%	2372%	208%	158%	113%	166%	-	208%	344%	355%	13288%	142%	93%
	Yield	65%	67%	91%	112%	84%	95%	-	187%	36%	43%	636%	87%	
	Area	93%	1377%	61%	23%	16%	36%	-	8%	224%	217%	2108%	30%	
	% Cropland	19%	1%	12%	2%	9%	67%	0%	0%	2%	0%	1%	10%	
Ghana	**Production**	202%	471%	-	32%	43%	199%	177%	156%	152%	41%	-	202%	77%
	Yield	73%	60%	-	71%	32%	84%	102%	61%	87%	73%	-	95%	
	Area	74%	256%	-	-23%	8%	62%	37%	59%	35%	-18%	-	55%	
	% Cropland	16%	5%	0%	2%	4%	27%	13%	8%	24%	5%	2%	7%	
Kenya	**Production**	30%	298%	-8%	16%	61%	30%	111%	9%	22%	-2%	469%	114%	-8%
	Yield	-8%	60%	30%	13%	-3%	-3%	52%	23%	-17%	-12%	29%	50%	
	Area	39%	142%	-29%	2%	62%	34%	40%	-12%	47%	9%	367%	44%	
	% Cropland	36%	1%	2%	2%	3%	44%	1%	1%	6%	0%	0%	30%	
Malawi	**Production**	88%	112%	-88%	133%	204%	91%	147%	-	241%	152%	486%	170%	78%
	Yield	80%	31%	-70%	40%	84%	75%	56%	-	76%	45%	68%	86%	
	Area	6%	64%	-55%	66%	66%	11%	59%	-	94%	73%	251%	45%	
	% Cropland	36%	2%	0%	1%	2%	41%	5%	7%	14%	9%	5%	18%	
Mali	**Production**	524%	218%	406%	77%	131%	209%	161%	282%	241%	95%	905%	295%	20%
	Yield	47%	41%	85%	15%	2%	44%	-7%	-11%	-4%	2%	-64%	71%	
	Area	319%	127%	200%	53%	122%	114%	178%	338%	266%	89%	2682%	130%	
	% Cropland	17%	10%	0%	24%	19%	70%	0%	0%	1%	6%	0%	8%	
Mozambique	**Production**	101%	30%	89%	4%	-4%	81%	36%	-29%	35%	124%	-	204%	38%
	Yield	36%	52%	-33%	35%	30%	42%	50%	-30%	44%	69%	-	71%	
	Area	51%	-10%	182%	-24%	-28%	29%	-11%	1%	-7%	34%	-	80%	
	% Cropland	31%	4%	0%	0%	3%	39%	12%	1%	13%	6%	1%	23%	

		Maize	Rice	Wheat	Millet	Sorghum	Cereals	Cassava	Yams & Sw Potatoes	Roots & Tubers	Ground-nuts	Soybeans	Pulses	Staple Yield Index
Niger	**Production**	457%	139%	-17%	38%	135%	64%	728%	368%	732%	340%	-	362%	36%
	Yield	52%	2%	85%	21%	63%	32%	79%	44%	80%	41%	-	185%	
	Area	318%	131%	-56%	15%	46%	24%	364%	231%	362%	211%	-	65%	
	% Cropland	0%	0%	0%	38%	20%	58%	0%	0%	0%	6%	0%	32%	
Nigeria	**Production**	89%	142%	-38%	-77%	-29%	10%	48%	79%	69%	22%	134%	50%	-14%
	Yield	22%	34%	62%	-43%	-12%	11%	-47%	-23%	-35%	-23%	20%	25%	
	Area	55%	81%	-60%	-59%	-19%	-1%	178%	134%	158%	58%	94%	20%	
	% Cropland	9%	7%	0%	3%	9%	28%	16%	14%	33%	5%	2%	8%	
Rwanda	**Production**	465%	140%	-19%	-7%	-2%	138%	74%	63%	28%	44%	45%	93%	50%
	Yield	98%	-3%	44%	-12%	9%	49%	126%	31%	31%	-22%	-15%	7%	
	Area	184%	148%	-44%	19%	-10%	60%	-23%	25%	-3%	85%	72%	82%	
	% Cropland	15%	2%	1%	0%	8%	25%	4%	9%	20%	1%	3%	31%	
Tanzania	**Production**	120%	243%	-3%	32%	10%	125%	105%	36%	80%	134%	1554%	102%	46%
	Yield	39%	70%	-43%	40%	11%	49%	13%	133%	36%	10%	44%	86%	
	Area	57%	101%	68%	-6%	0%	51%	81%	-41%	33%	110%	1110%	9%	
	% Cropland	28%	8%	0%	2%	4%	43%	11%	2%	13%	5%	0%	9%	
Uganda	**Production**	311%	136%	56%	-82%	-40%	130%	-65%	-52%	-58%	-11%	6%	34%	1%
	Yield	44%	6%	-3%	-16%	-44%	28%	-85%	8%	-64%	-46%	-26%	33%	
	Area	186%	124%	61%	-78%	8%	80%	133%	-56%	16%	66%	44%	1%	
	% Cropland	22%	2%	0%	1%	3%	28%	9%	3%	12%	4%	2%	10%	
Zambia	**Production**	113%	236%	127%	-27%	-62%	109%	266%	62%	249%	135%	719%	108%	12%
	Yield	14%	-3%	22%	23%	-11%	21%	103%	-18%	92%	-4%	-16%	-2%	
	Area	88%	226%	86%	-42%	-60%	73%	76%	106%	80%	142%	884%	110%	
	% Cropland	40%	1%	1%	1%	0%	44%	12%	2%	14%	9%	13%	7%	
AGRA Total	**Production**	139%	190%	159%	-27%	13%	79%	68%	93%	79%	55%	253%	114%	25%
	Yield	40%	51%	76%	-17%	3%	39%	-21%	0%	-11%	-10%	24%	50%	
	Area	71%	93%	48%	-12%	9%	29%	113%	92%	102%	73%	183%	43%	
	% Cropland	16%	5%	1%	7%	9%	41%	9%	6%	17%	5%	1%	13%	
Senegal	**Production**	146%	572%	-	143%	200%	233%	416%	704%	478%	175%	-	271%	73%
	Yield	26%	51%	-	85%	75%	96%	81%	-3%	79%	56%	-	156%	
	Area	97%	347%	-	33%	71%	71%	176%	730%	207%	77%	-	50%	
	% Cropland	7%	10%	0%	25%	7%	49%	2%	0%	3%	32%	0%	8%	

Source: Author's calculations from FAOSTAT Crops Data, http://fao.org/faostat/en/#data/QCL, accessed June 2026. **Units:** Production in MT, Yield in MT/Ha, Area in Ha.
Note: "-" signifies missing values. Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers. (Exception: Ethiopia, Nigeria, Tanzania, and AGRA Total are weighted sums of total cereals plus roots/tubers.) Due to unreliable cassava reporting, Zambia's calculation uses sweet potatoes as a proxy for roots/tubers.

Early AGRA: Assessing Productivity and Land Use Trends

Production, Yield, and Harvested Area for Select Crops, 13 AGRA Countries and Senegal

Percent Change, Pre-AGRA (2004–06) to Mid-AGRA (2016–18), and Average Cropland Allocation (2016–18)

		Maize	Rice	Wheat	Millet	Sorghum	Cereals	Cassava	Yams & Sw Potatoes	Roots & Tubers	Ground-nuts	Soybeans	Pulses	Staple Yield Index
Burkina Faso	**Production**	125%	276%	-	-12%	11%	35%	250%	0%	32%	74%	311%	51%	-10%
	Yield	0%	9%	-	-14%	-13%	1%	8%	-1%	-28%	6%	-18%	2%	
	Area	128%	239%	-	2%	27%	34%	226%	-3%	81%	64%	422%	49%	
	% Cropland	12%	2%	0%	16%	23%	54%	0%	0%	0%	7%	0%	17%	
Ethiopia	**Production**	178%	1276%	145%	151%	172%	143%	-	411%	379%	399%	12254%	142%	79%
	Yield	53%	49%	73%	93%	88%	80%	-	246%	43%	71%	744%	62%	
	Area	79%	828%	42%	31%	45%	34%	-	46%	233%	190%	1670%	49%	
	% Cropland	18%	0%	10%	3%	11%	65%	0%	0%	3%	0%	0%	11%	
Ghana	**Production**	72%	180%	-	2%	-14%	67%	99%	90%	84%	4%	-	141%	45%
	Yield	34%	49%	-	27%	10%	44%	63%	44%	57%	43%	-	69%	
	Area	28%	90%	-	-19%	-23%	15%	22%	32%	17%	-27%	-	42%	
	% Cropland	13%	3%	0%	2%	3%	22%	13%	7%	23%	5%	1%	7%	
Kenya	**Production**	20%	67%	-34%	-2%	28%	16%	40%	19%	-4%	-23%	10%	106%	-12%
	Yield	-11%	0%	-26%	4%	-18%	-11%	32%	34%	-19%	20%	16%	62%	
	Area	34%	64%	-10%	-4%	54%	30%	7%	-10%	18%	-30%	-5%	28%	
	% Cropland	38%	0%	2%	2%	4%	47%	1%	1%	5%	0%	0%	29%	
Malawi	**Production**	57%	74%	-58%	42%	104%	58%	103%	-	154%	102%	259%	135%	49%
	Yield	51%	38%	26%	6%	33%	47%	38%	-	51%	23%	49%	78%	
	Area	6%	27%	-67%	34%	53%	9%	47%	-	68%	64%	138%	32%	
	% Cropland	39%	1%	0%	1%	2%	44%	5%	6%	13%	9%	4%	17%	
Mali	**Production**	457%	219%	336%	58%	108%	185%	116%	367%	283%	63%	266%	245%	18%
	Yield	70%	42%	162%	3%	-1%	44%	-8%	-5%	-1%	-3%	-69%	51%	
	Area	223%	126%	86%	53%	105%	96%	131%	397%	298%	65%	1073%	128%	
	% Cropland	14%	11%	0%	26%	19%	71%	0%	1%	1%	5%	0%	9%	
Mozambique	**Production**	13%	14%	161%	35%	-20%	11%	-17%	-26%	-15%	42%	-	84%	11%
	Yield	9%	17%	-3%	28%	16%	13%	9%	-3%	10%	7%	-	39%	
	Area	1%	-2%	171%	-1%	-32%	-4%	-25%	-22%	-24%	30%	-	33%	
	% Cropland	27%	5%	0%	1%	4%	37%	12%	1%	14%	7%	1%	22%	

		Maize	Rice	Wheat	Millet	Sorghum	Cereals	Cassava	Yams & Sw Potatoes	Roots & Tubers	Ground-nuts	Soybeans	Pulses	Staple Yield Index
Niger	**Production**	341%	69%	-17%	50%	141%	72%	130%	92%	179%	248%	-	275%	
	Yield	52%	19%	56%	26%	58%	33%	43%	47%	60%	29%	-	132%	37%
	Area	234%	42%	-44%	20%	53%	30%	61%	29%	74%	170%	-	64%	
	% Cropland	0%	0%	0%	39%	21%	60%	0%	0%	0%	5%	0%	32%	
Nigeria	**Production**	72%	120%	16%	-77%	-23%	5%	48%	48%	54%	28%	76%	37%	
	Yield	1%	42%	33%	-38%	-1%	8%	-19%	-15%	-16%	-23%	-5%	17%	-3%
	Area	72%	55%	-11%	-63%	-22%	-3%	83%	74%	83%	66%	85%	18%	
	% Cropland	11%	7%	0%	3%	10%	32%	12%	12%	27%	6%	2%	9%	
Rwanda	**Production**	328%	95%	-41%	10%	-19%	87%	34%	29%	6%	81%	-1%	94%	
	Yield	75%	-20%	21%	-43%	-2%	30%	64%	15%	10%	-19%	-21%	25%	28%
	Area	146%	144%	-51%	101%	-17%	44%	-17%	13%	-4%	121%	28%	56%	
	% Cropland	15%	2%	1%	1%	8%	26%	5%	9%	22%	2%	3%	30%	
Tanzania	**Production**	72%	157%	-32%	31%	7%	78%	-14%	227%	35%	98%	125%	106%	
	Yield	31%	42%	-50%	32%	4%	34%	-24%	128%	8%	-13%	25%	64%	28%
	Area	30%	80%	36%	0%	4%	32%	16%	43%	26%	127%	89%	26%	
	% Cropland	25%	8%	0%	2%	5%	40%	7%	5%	13%	6%	0%	11%	
Uganda	**Production**	122%	41%	40%	-74%	-35%	46%	-38%	-32%	-43%	13%	-67%	54%	
	Yield	30%	10%	-8%	-11%	-26%	8%	-81%	-3%	-62%	-33%	-50%	146%	-20%
	Area	73%	38%	52%	-71%	-13%	41%	230%	-31%	50%	68%	-34%	-37%	
	% Cropland	19%	2%	0%	2%	3%	29%	17%	5%	23%	5%	1%	8%	
Zambia	**Production**	153%	143%	49%	-19%	-31%	137%	231%	124%	220%	129%	437%	85%	
	Yield	18%	-3%	7%	-3%	-14%	21%	454%	4%	296%	-10%	18%	-6%	*16%*
	Area	114%	138%	38%	-17%	-23%	96%	-43%	117%	-21%	155%	381%	98%	
	% Cropland	49%	1%	1%	2%	1%	54%	4%	2%	7%	10%	7%	7%	
AGRA Total	**Production**	97%	144%	106%	-26%	19%	58%	45%	65%	55%	44%	132%	94%	
	Yield	28%	49%	54%	-19%	9%	30%	-6%	5%	-1%	-15%	13%	44%	22%
	Area	54%	64%	34%	-9%	9%	22%	54%	58%	56%	69%	106%	34%	
	% Cropland	16%	4%	1%	9%	10%	43%	7%	6%	15%	5%	1%	14%	
Senegal	**Production**	32%	372%	-	73%	80%	120%	136%	364%	180%	105%	-	93%	
	Yield	-20%	37%	-	40%	22%	46%	45%	0%	52%	31%	-	120%	28%
	Area	67%	245%	-	26%	46%	51%	57%	362%	75%	55%	-	-9%	
	% Cropland	7%	9%	0%	28%	7%	52%	2%	0%	2%	33%	0%	6%	

Source: Author's calculations from FAOSTAT Crops Data, http://fao.org/faostat/en/#data/QCL, accessed June 2026. **Units:** Production in MT, Yield in MT/Ha, Area in Ha.
Note: "-" signifies missing values. Tanzania (all crops) and Uganda (maize and roots/tubers) exclude 2018 on account of suspiciously large discrepancies between current and past FAO data. Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers. (Exception: Ethiopia, Nigeria, Tanzania, and AGRA Total are weighted sums of total cereals plus roots/tubers.) Due to unreliable cassava reporting, Zambia's calculation uses sweet potatoes as a proxy for roots/tubers.

Late AGRA: Assessing Productivity and Land Use Trends

Production, Yield, and Harvested Area for Select Crops, 13 AGRA Countries and Senegal

Percent Change, Mid-AGRA (2016–18) to Post-AGRA (2022–24), and Average Cropland Allocation (2022–24)

		Maize	Rice	Wheat	Millet	Sorghum	Cereals	Cassava	Yams & Sw Potatoes	Roots & Tubers	Ground-nuts	Soybeans	Pulses	Staple Yield Index
Burkina Faso	**Production**	17%	37%	-	-8%	15%	12%	-19%	64%	48%	57%	455%	25%	7%
	Yield	-1%	6%	-	14%	8%	10%	2%	38%	17%	14%	2%	-1%	
	Area	18%	29%	-	-18%	6%	3%	-21%	18%	26%	37%	444%	26%	
	% Cropland	13%	2%	0%	12%	22%	49%	0%	0%	0%	8%	1%	19%	
Ethiopia	**Production**	16%	80%	26%	3%	-22%	10%	-	-40%	-7%	-9%	8%	0%	8%
	Yield	8%	12%	10%	10%	-2%	8%	-	-17%	-5%	-17%	-13%	16%	
	Area	8%	59%	14%	-6%	-20%	1%	-	-26%	-3%	9%	25%	-13%	
	% Cropland	19%	1%	12%	2%	9%	67%	0%	0%	2%	0%	1%	10%	
Ghana	**Production**	76%	104%	-	29%	67%	79%	39%	35%	37%	36%	60%	25%	23%
	Yield	29%	7%	-	34%	20%	28%	23%	12%	19%	21%	11%	15%	
	Area	37%	88%	-	-5%	40%	41%	13%	20%	15%	12%	44%	9%	
	% Cropland	16%	5%	0%	2%	4%	27%	13%	8%	24%	5%	2%	7%	
Kenya	**Production**	8%	138%	38%	18%	25%	13%	51%	-9%	27%	28%	416%	4%	5%
	Yield	4%	60%	75%	8%	18%	9%	16%	-8%	2%	-26%	11%	-8%	
	Area	4%	47%	-22%	6%	6%	3%	30%	-2%	24%	56%	393%	13%	
	% Cropland	36%	1%	2%	2%	3%	44%	1%	1%	6%	0%	0%	30%	
Malawi	**Production**	20%	22%	-70%	64%	49%	21%	21%	48%	34%	25%	63%	15%	20%
	Yield	20%	-4%	-76%	33%	38%	18%	13%	22%	17%	18%	12%	4%	
	Area	0%	29%	39%	24%	9%	2%	8%	21%	15%	6%	47%	10%	
	% Cropland	36%	2%	0%	1%	2%	41%	5%	7%	14%	9%	5%	18%	
Mali	**Production**	12%	0%	16%	12%	11%	8%	21%	-18%	-11%	20%	175%	14%	2%
	Yield	-13%	-1%	-29%	12%	2%	0%	0%	-7%	-3%	5%	19%	13%	
	Area	29%	0%	62%	0%	8%	9%	20%	-12%	-8%	14%	137%	1%	
	% Cropland	17%	10%	0%	24%	19%	70%	0%	0%	1%	6%	0%	8%	
Mozambique	**Production**	77%	14%	-28%	-23%	20%	64%	64%	-5%	58%	58%	63%	65%	25%
	Yield	24%	30%	-31%	5%	12%	25%	37%	-29%	30%	58%	-5%	23%	
	Area	49%	-8%	4%	-23%	7%	35%	19%	30%	21%	3%	65%	36%	
	% Cropland	31%	4%	0%	0%	3%	39%	12%	1%	13%	6%	1%	23%	

		Maize	Rice	Wheat	Millet	Sorghum	Cereals	Cassava	Yams & Sw Potatoes	Roots & Tubers	Ground-nuts	Soybeans	Pulses	Staple Yield Index
Niger	**Production**	26%	42%	0%	-8%	-2%	-5%	259%	143%	199%	27%	-	23%	-1%
	Yield	0%	-14%	19%	-3%	3%	0%	25%	-2%	13%	9%	-	23%	
	Area	25%	63%	-22%	-4%	-5%	-4%	188%	156%	166%	15%	-	0%	
	% Cropland	0%	0%	0%	38%	20%	58%	0%	0%	0%	6%	0%	32%	
Nigeria	**Production**	10%	10%	-46%	3%	-7%	5%	0%	21%	10%	-4%	33%	10%	-11%
	Yield	21%	-5%	22%	-8%	-11%	2%	-34%	-10%	-22%	0%	27%	7%	
	Area	-10%	16%	-55%	12%	3%	2%	52%	34%	41%	-5%	5%	2%	
	% Cropland	9%	7%	0%	3%	9%	28%	16%	14%	33%	5%	2%	8%	
Rwanda	**Production**	32%	23%	37%	-15%	20%	28%	30%	27%	21%	-20%	46%	0%	16%
	Yield	13%	21%	19%	55%	11%	15%	38%	14%	19%	-3%	8%	-15%	
	Area	16%	2%	15%	-41%	8%	11%	-7%	11%	1%	-17%	35%	17%	
	% Cropland	15%	2%	1%	0%	8%	25%	4%	9%	20%	1%	3%	31%	
Tanzania	**Production**	28%	33%	43%	1%	3%	27%	139%	-58%	33%	18%	635%	-2%	14%
	Yield	6%	20%	14%	6%	7%	11%	49%	2%	25%	27%	15%	13%	
	Area	21%	12%	24%	-5%	-4%	15%	57%	-59%	6%	-7%	540%	-14%	
	% Cropland	28%	8%	0%	2%	4%	43%	11%	2%	13%	5%	0%	9%	
Uganda	**Production**	85%	68%	11%	-29%	-7%	57%	-42%	-29%	-26%	-21%	222%	-13%	2%
	Yield	10%	-4%	5%	-5%	-24%	19%	-18%	11%	-5%	-20%	46%	-46%	
	Area	66%	62%	6%	-26%	24%	28%	-29%	-37%	-23%	-1%	120%	62%	
	% Cropland	22%	2%	0%	1%	3%	28%	9%	3%	12%	4%	2%	10%	
Zambia	**Production**	-16%	38%	52%	-9%	-45%	-12%	11%	-28%	9%	3%	52%	13%	-4%
	Yield	-4%	-1%	13%	26%	2%	0%	-63%	-21%	-51%	7%	-29%	5%	
	Area	-12%	37%	35%	-30%	-48%	-12%	207%	-5%	129%	-5%	105%	6%	
	% Cropland	40%	1%	1%	1%	0%	44%	12%	2%	14%	9%	13%	7%	
AGRA Total	**Production**	21%	19%	26%	-1%	-5%	14%	16%	17%	16%	8%	52%	11%	2%
	Yield	9%	1%	14%	2%	-5%	8%	-16%	-4%	-10%	5%	10%	4%	
	Area	11%	18%	11%	-3%	0%	6%	38%	22%	29%	2%	38%	7%	
	% Cropland	16%	5%	1%	7%	9%	41%	9%	6%	17%	5%	1%	13%	
Senegal	**Production**	86%	42%	-	40%	66%	51%	119%	73%	107%	34%	-	92%	37%
	Yield	58%	10%	-	32%	44%	34%	25%	-4%	18%	19%	-	16%	
	Area	18%	29%	-	6%	17%	13%	76%	80%	76%	15%	-	65%	
	% Cropland	7%	10%	0%	25%	7%	49%	2%	0%	3%	32%	0%	8%	

Source: Author's calculations from FAOSTAT Crops Data, http://fao.org/faostat/en/#data/QCL, accessed June 2026. **Units:** Production in MT, Yield in MT/Ha, Area in Ha.
Note: "-" signifies missing values. Tanzania (all crops) and Uganda (maize and roots/tubers) exclude 2018 on account of suspiciously large discrepancies between current and past FAO data. Staple Yield Index is the sum of yield increases weighted by relative cropland area for maize, millet, sorghum, and roots/tubers. (Exception: Ethiopia, Nigeria, Tanzania, and AGRA Total are weighted sums of total cereals plus roots/tubers.) Due to unreliable cassava reporting, Zambia's calculation uses sweet potatoes as a proxy for roots/tubers.

Productivity Gains in Select Staple Crops: AGRA and Senegal

% Growth in Yields for Select Staple Crops

2004–06, 2016–18, 2022–24, and Annualized

		2004–06 / 2016–18	Ann.	2016–18 / 2022–24	Ann.	2004–06 / 2022–24	Ann.
AGRA Total	Maize	28%	2.1%	9%	1.5%	40%	1.9%
	Millet	-19%	-1.7%	2%	0.4%	-17%	-1.0%
	Sorghum	9%	0.7%	-5%	-0.9%	3%	0.2%
	Cereals, Total	30%	2.2%	8%	1.2%	39%	1.9%
	Roots/Tubers, Total	-1%	-0.1%	-10%	-1.8%	-11%	-0.7%
	Staple Yield Index	**22%**	**1.7%**	**2%**	**0.4%**	**25%**	**1.2%**
Senegal	Maize	-20%	-1.8%	58%	7.9%	26%	1.3%
	Millet	40%	2.8%	32%	4.7%	85%	3.5%
	Sorghum	22%	1.6%	44%	6.2%	75%	3.2%
	Cereals, Total	46%	3.2%	34%	4.9%	96%	3.8%
	Roots/Tubers, Total	52%	3.5%	18%	2.8%	79%	3.3%
	Staple Yield Index	**28%**	**2.1%**	**37%**	**5.4%**	**73%**	**3.1%**
Burkina Faso	Maize	0%	0.0%	-1%	-0.2%	-1%	0.0%
	Millet	-14%	-1.2%	14%	2.2%	-1%	-0.1%
	Sorghum	-13%	-1.1%	8%	1.3%	-6%	-0.3%
	Cereals, Total	1%	0.1%	10%	1.6%	11%	0.6%
	Roots/Tubers, Total	-28%	-2.7%	17%	2.6%	-16%	-1.0%
	Staple Yield Index	**-10%**	**-0.9%**	**7%**	**1.2%**	**-3%**	**-0.2%**
Ethiopia	Maize	53%	3.6%	8%	1.3%	65%	2.8%
	Millet	93%	5.6%	10%	1.6%	112%	4.3%
	Sorghum	88%	5.4%	-2%	-0.3%	84%	3.5%
	Cereals, Total	80%	5.0%	8%	1.3%	95%	3.8%
	Roots/Tubers, Total	43%	3.0%	-5%	-0.8%	36%	1.7%
	Staple Yield Index	**79%**	**5.0%**	**8%**	**1.3%**	**93%**	**3.7%**
Ghana	Maize	34%	2.5%	29%	4.3%	73%	3.1%
	Millet	27%	2.0%	34%	5.0%	71%	3.0%
	Sorghum	10%	0.8%	20%	3.0%	32%	1.6%
	Cereals, Total	44%	3.1%	28%	4.1%	84%	3.4%
	Roots/Tubers, Total	57%	3.9%	19%	2.9%	87%	3.5%
	Staple Yield Index	**45%**	**3.1%**	**23%**	**3.5%**	**77%**	**3.2%**
Kenya	Maize	-11%	-0.9%	4%	0.6%	-8%	-0.4%
	Millet	4%	0.3%	8%	1.3%	13%	0.7%
	Sorghum	-18%	-1.6%	18%	2.8%	-3%	-0.2%
	Cereals, Total	-11%	-1.0%	9%	1.5%	-3%	-0.2%
	Roots/Tubers, Total	-19%	-1.7%	2%	0.3%	-17%	-1.0%
	Staple Yield Index	**-12%**	**-1.0%**	**5%**	**0.7%**	**-8%**	**-0.4%**
Malawi	Maize	51%	3.5%	20%	3.0%	80%	3.3%
	Millet	6%	0.5%	33%	4.9%	40%	1.9%
	Sorghum	33%	2.4%	38%	5.5%	84%	3.4%
	Cereals, Total	47%	3.3%	18%	2.9%	75%	3.1%
	Roots/Tubers, Total	51%	3.5%	17%	2.6%	76%	3.2%
	Staple Yield Index	**49%**	**3.4%**	**20%**	**3.1%**	**78%**	**3.3%**
Mali	Maize	70%	4.5%	-13%	-2.3%	47%	2.2%
	Millet	3%	0.3%	12%	1.8%	15%	0.8%
	Sorghum	-1%	-0.1%	2%	0.4%	2%	0.1%
	Cereals, Total	44%	3.1%	0%	-0.1%	44%	2.0%
	Roots/Tubers, Total	-1%	-0.1%	-3%	-0.5%	-4%	-0.3%
	Staple Yield Index	**18%**	**1.4%**	**2%**	**0.3%**	**20%**	**1.0%**
Mozambique	Maize	9%	0.8%	24%	3.7%	36%	1.7%
	Millet	28%	2.1%	5%	0.9%	35%	1.7%
	Sorghum	16%	1.2%	12%	1.9%	30%	1.4%
	Cereals, Total	13%	1.0%	25%	3.8%	42%	2.0%
	Roots/Tubers, Total	10%	0.8%	30%	4.5%	44%	2.0%
	Staple Yield Index	**11%**	**0.8%**	**25%**	**3.8%**	**38%**	**1.8%**
Niger	Maize	52%	3.6%	0%	0.0%	52%	2.4%
	Millet	26%	1.9%	-3%	-0.6%	21%	1.1%
	Sorghum	58%	3.9%	3%	0.5%	63%	2.7%
	Cereals, Total	33%	2.4%	0%	-0.1%	32%	1.6%
	Roots/Tubers, Total	60%	4.0%	13%	2.1%	80%	3.3%
	Staple Yield Index	**37%**	**2.7%**	**-1%**	**-0.2%**	**36%**	**1.7%**
Nigeria	Maize	1%	0.1%	21%	3.2%	22%	1.1%
	Millet	-38%	-4.0%	-8%	-1.4%	-43%	-3.1%
	Sorghum	-1%	-0.1%	-11%	-1.8%	-12%	-0.7%
	Cereals, Total	8%	0.7%	2%	0.4%	11%	0.6%
	Roots/Tubers, Total	-16%	-1.4%	-22%	-4.1%	-35%	-2.3%
	Staple Yield Index	**-3%**	**-0.2%**	**-11%**	**-1.9%**	**-14%**	**-0.8%**
Rwanda	Maize	75%	4.8%	13%	2.1%	98%	3.9%
	Millet	-43%	-4.6%	55%	7.5%	-12%	-0.7%
	Sorghum	-2%	-0.1%	11%	1.8%	9%	0.5%
	Cereals, Total	30%	2.2%	15%	2.3%	49%	2.3%
	Roots/Tubers, Total	10%	0.8%	19%	3.0%	31%	1.5%
	Staple Yield Index	**28%**	**2.1%**	**16%**	**2.5%**	**50%**	**2.3%**
Tanzania	Maize	31%	2.3%	6%	1.0%	39%	1.9%
	Millet	32%	2.3%	6%	1.0%	40%	1.9%
	Sorghum	4%	0.3%	7%	1.1%	11%	0.6%
	Cereals, Total	34%	2.5%	11%	1.7%	49%	2.2%
	Roots/Tubers, Total	8%	0.7%	25%	3.8%	36%	1.7%
	Staple Yield Index	**28%**	**2.1%**	**14%**	**2.2%**	**46%**	**2.1%**
Uganda	Maize	30%	2.2%	10%	1.6%	44%	2.0%
	Millet	-11%	-1.0%	-5%	-0.8%	-16%	-0.9%
	Sorghum	-26%	-2.5%	-24%	-4.6%	-44%	-3.2%
	Cereals, Total	8%	0.6%	19%	2.9%	28%	1.4%
	Roots/Tubers, Total	-62%	-7.7%	-5%	-0.9%	-64%	-5.5%
	Staple Yield Index	**-20%**	**-1.8%**	**2%**	**0.3%**	**1%**	**0.1%**
Zambia	Maize	18%	1.4%	-4%	-0.6%	14%	0.7%
	Millet	-3%	-0.2%	26%	3.9%	23%	1.1%
	Sorghum	-14%	-1.2%	2%	0.4%	-11%	-0.7%
	Cereals, Total	21%	1.6%	0%	0.1%	21%	1.1%
	Sweet Potatoes	4%	0.3%	-21%	-3.9%	-18%	-1.1%
	Staple Yield Index	**16%**	**1.3%**	**-4%**	**-0.6%**	**12%**	**0.7%**

Source: FAOSTAT Crops Data, https://www.fao.org/faostat/en/#data/QCL, accessed June 2026.
Unit: MT/Ha

Note: Tanzania (all crops) and Uganda (maize and roots/tubers) exclude 2018 on account of suspiciously large discrepancies between current and past FAO data. Due to unreliable cassava reporting, Zambia's Staple Yield Index calculations use sweet potatoes—the other main root/tuber grown—as a proxy for said category.