



26-4 As US Food Aid Retreats, Can BRICS+ and Biotechnology Fill the World's Food Security Gap?

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Cuts to development assistance and food aid by the United States and other advanced economies are creating a global vacuum just as climate change and conflict drive hunger upward, forcing many food-insecure developing economies to depend increasingly on themselves—and one another—to meet rising needs. Many of these countries will face this challenge without some of the most potent food security–boosting tools available: genetically edited organisms (GEOs) and genetically modified organisms (GMOs), CRISPR-based gene editing, and enabling technologies.¹

Nearly 2.5 billion people live in countries that either totally or partially ban GEO food crops, including roughly 1.4 billion in India alone.² Based on extensive reviews of the evidence, major scientific bodies—including the US National Academies of Sciences, the World Health Organization, the European Food Safety Authority, and the UK Royal Society—have concluded that genetically engineered crops approved for market release pose no greater inherent risk to human health than conventionally bred varieties. Recent changes in the European

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- 1 GMOs are organisms in which genetic material from a different species is inserted into the genome to introduce a desired trait (pest resistance, herbicide tolerance, enhanced nutritional qualities), producing a transgenic organism. CRISPR-based GEOs are organisms in which the organism's own DNA is edited to achieve similar ends without introducing foreign genetic material, often accelerating processes that would take decades or centuries with conventional breeding strategies. CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats, though the acronym is almost universally used, for self-evident reasons. The term “enabling technologies” refers to fertilizers, pesticides, microbial treatments, animal feed, and other agricultural inputs designed to maximize yield, pest resistance, and/or nutritive value when used alongside GMO or GEO crops and livestock. Except where indicated otherwise, this Policy Brief uses the term GEO to describe both GEOs and GMOs.
 - 2 Countries that ban GEO crops include Algeria, Austria, Azerbaijan, Belize, Bosnia & Herzegovina, Bhutan, Bulgaria, Croatia, Cyprus, Denmark, Ecuador, France, Germany, Greece, Hungary, India, Italy, the Kyrgyz Republic, Latvia, Lithuania, Luxembourg, Madagascar, Malta, Mexico, Moldova, the Netherlands, Norway, Peru, Poland, Russia, Saudi Arabia, Serbia, Slovenia, Switzerland, Turkey, the United Kingdom, Ukraine, and Venezuela (see <https://worldpopulationreview.com/country-rankings/countries-that-ban-gmos>).

Union's approach to gene-edited crops have reduced one source of hesitancy for developing-country regulators (losing access to key export markets), though significant regulatory and political barriers to wider adoption remain.

Public investment in agricultural innovation, including GEOs and enabling technologies, can help developing economies build more resilient food systems, increase their strategic autonomy, and create conditions that enable and scale private innovation. But the countries that need it most are the least able to pay for it.

As advanced economies retrench from food aid and agricultural development financing and countries with significant hunger lack the resources to self-finance, the BRICS+ economies³ could provide significant new resources to support open-source crop innovation, regionally adapted seed systems, and extension services for orphan crops⁴ and rainfed staples that dominate diets in food-insecure regions but have limited capacity to attract investment.

For the BRICS+, doing so would be both self-serving and strategic. These countries are home to over 40 percent of the world's undernourished people and already account for roughly 36 percent of global public agricultural research and development (R&D) spending. They have the agronomic know-how, institutional capacity, and geopolitical incentive to invest in technologies suited to tropical and low-input farming systems, with limited use of synthetic fertilizers, mechanization, and irrigation. Increasing support for agricultural R&D would serve three BRICS+ objectives:

- It would provide self-insurance against climate-driven yield volatility.
- It would help stabilize neighboring fragile states, whose food insecurity drives migration.
- It would demonstrate global stewardship at a moment when traditional development partners are withdrawing while not directly threatening the core interests of the United States or other advanced economies.

This Policy Brief is organized as follows. The first section documents the worsening food security outlook and the simultaneous retreat of advanced-economy support, underscoring why many developing economies can no longer rely on external donors or global markets. The second section describes actions the BRICS+ could take to improve food security. The last two sections make the case for an initiative led by the BRICS+.

THE SCALE OF WORLD HUNGER AND THE DECLINE IN FOOD AID

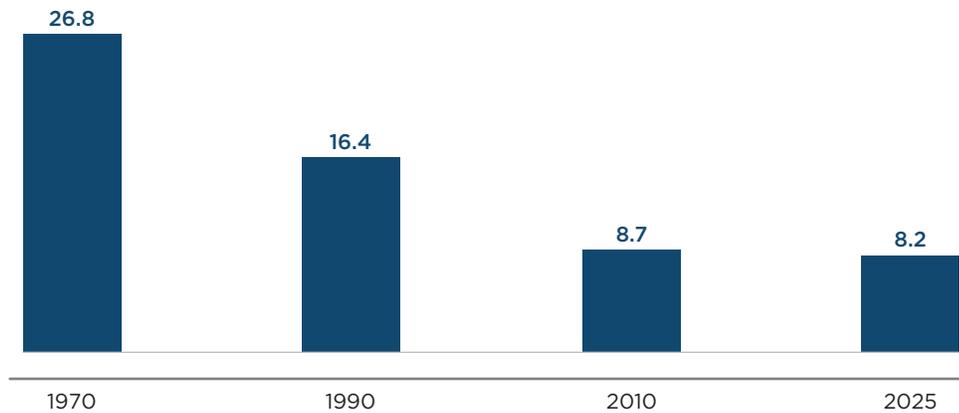
After decades of progress catalyzed by massive public investments in agricultural research on drought-tolerant, yield-improving technologies (the Green Revolution), and globalization-fueled economic growth in developing economies, the global economy made only marginal gains in reducing hunger since the Great

3 The BRICS+ are Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Iran, the United Arab Emirates, and Indonesia.

4 Orphan crops are regionally important staple or subsistence crops that receive little or no private R&D investment because they have limited global market potential. Often widely consumed in low-income and food-insecure regions, examples include cassava and teff.

Figure 1
Global prevalence of undernourishment, 1970–2025

percent of world population



Note: Undernourishment is defined as habitual food consumption that is insufficient to meet dietary energy needs for a normal, active, healthy life (about 1,800–1,900 kcal/day on average). Values for 1970 and 1990 are estimated (see online data replication files at piie.com).

Sources: Author's calculations based on FAO (2000) and FAO et al. (2025).

Recession (2007–09). Between 1990 and 2010, the share of the population that was undernourished nearly halved. In contrast, between 2010 and 2025, the share stayed roughly constant (figure 1). The causes are several: the COVID-19 pandemic and supply chain disruptions, the sharp rise in armed conflicts since 2014 (a consistent driver of acute hunger, see Hendrix and Brinkman 2013), and the mounting effects of climate change and extreme weather on food systems. The fight to feed the future is faltering, and it is set to get harder.

For decades, the United States was the world's largest source of foreign aid—in absolute, not per capita, terms—averaging \$51.4 billion a year from 1946 to 2023 (Council on Foreign Relations 2025). Nowhere was US primacy clearer than in emergency food aid. That the United States, with only 4 percent of the world's population (and roughly 11 percent of its arable land), provided over half of emergency food assistance in the early 21st century was a testament to the strength and dynamism of the US agricultural sector (GAO 2007).⁵

Historically, US emergency food assistance came in three main forms:

- in-kind food shipments, via the Food for Peace program, starting in the 1950s;
- cash or voucher-based funds, via the Emergency Food Security Program; and
- financial contributions to the World Food Programme (WFP), the UN agency tasked with providing food assistance worldwide. In 2024, the United States provided 45.6 percent of the WFP's funding—more than the next 28 country contributors combined (WFP 2024).

5 The United States was also a top provider of development assistance—concessional or grant-based financing provided to recipient-country governments and/or multilateral development institutions for the purpose of promoting longer-term economic development and welfare. Development assistance differs from humanitarian assistance, which provides short-term, life-saving resources (food, water, medicine and healthcare, etc.) in times of acute crisis.

The second Trump administration pulled back from the United States' traditional role as the breadbasket of the global food aid system and leading provider of development assistance. On his first day in office last year, President Donald J. Trump issued an executive order pausing all new foreign aid obligations, effectively freezing most forms of assistance. In the following months, his administration closed the US Agency for International Development (USAID), cutting its funding by 85 percent and its staff by nearly 95 percent and moving its remaining activities to the State Department.⁶ Although only around 3 percent of US development assistance tracked by the Organization for Economic Cooperation and Development (OECD) was dedicated to agricultural development in recent years, the massive scale of US development assistance meant that these cuts were significant.

US aid retrenchment is hurting multilateral efforts to combat hunger. Congressionally appropriated aid budgets remain relatively high, but the infrastructure for disbursing funds has been dismantled. Tens of thousands of metric tons (MT) of food aid have spoiled or are in danger of spoiling; in July 2025, the administration incinerated 500 MT of high-energy biscuits (often administered to children in crisis) in a warehouse in Dubai after they expired.⁷

US contributions to the WFP fell 53.7 percent in 2025, and total contributions were down 34.4 percent (table 1). Canada and South Korea increased their contributions significantly; most major donors retreated. Major European and Asian donors are under significant pressure from the Trump administration to increase defense spending and face challenging growth outlooks at home. At least in the short term, the global effort to combat hunger will therefore have to rely on a patchwork of smaller donors.

The need is substantial. Both the total number of undernourished people (546.1 million) and the 7.1 percent of the global population that is undernourished were at their lowest levels in recent history in 2017 (FAO 2026). During the COVID pandemic era (2020–22), hunger soared. Although the share of malnutrition fell after 2023, by 2024 the number of people whose nutritional needs were not being met was as large as it was in 2007.

The picture is even worse for acute hunger: people facing near-term catastrophe/starvation if relief is not forthcoming. In 2017, 124 million people faced those conditions. By 2025, that number had more than doubled to 319 million—nearly the population of the United States (figure 2). Virtually all of these people live in developing economies, and nearly 70 percent live in conflict-affected and fragile states (WFP 2025a).

The challenge to ensuring food security globally is twofold: Policymakers must ensure that harvests grow at least in proportion to population growth and that the bounty is adequately distributed. The most responsible way to do both is to make sure that yields—the amount harvested for a given area of land, usually

6 At the beginning of 2025, USAID had some 10,000 staff members working around the globe. On February 7, the administration announced it would retain roughly 600 essential staff. See “Trump Administration to Keep 611 USAID Essential Staff, Notice Says,” Reuters, February 7, 2025, <https://www.reuters.com/world/us/trump-administration-keep-611-usaid-essential-staff-notice-says-2025-02-07/>.

7 Matthew Lee, “US Says It Destroyed 500 Metric Tons of Expired Food Aid But It Won’t Affect Future Distribution,” ABC News, July 17, 2025, <https://apnews.com/article/emergency-food-aid-usaid-hunger-aefb584b52cc43e43e5552986363c387>.

Table 1
Contributions to the World Food Programme, 2024 and 2025

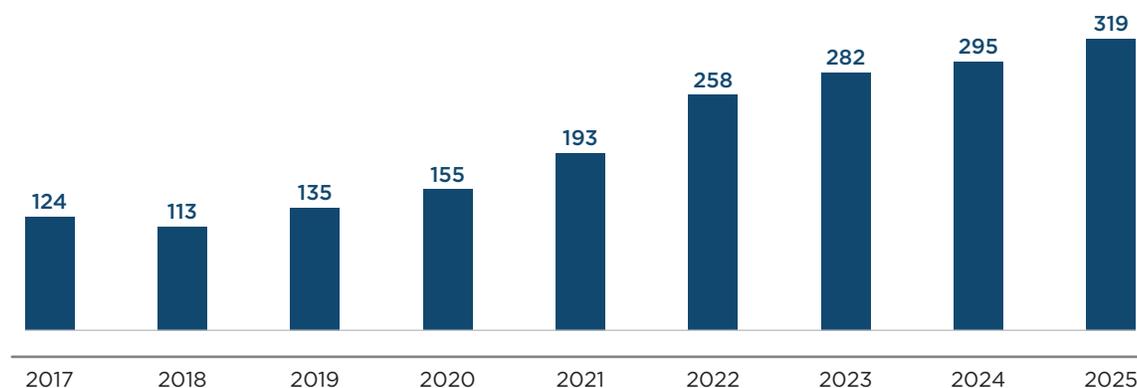
<i>Millions of dollars</i>			
Entity	2024	2025	Percent change
United States	4,447.5	2,059.5	-53.7
Germany	990.9	570.0	-42.5
United Kingdom	609.9	434.5	-28.8
European Commission	591.8	593.5	0.3
Private donors	335.6	295.2	-12.0
Pakistan	228.1	3.9	-98.3
South Korea	203.1	236.8	16.6
France	196.6	111.9	-43.1
Sweden	183.6	153.1	-16.7
Canada	166.8	234.4	40.5
Rest of world	1,805.1	1,705.2	-5.5
Total	9,759.1	6,398.0	-34.4

Note: Several top donors are not sovereign states. The total figure for 2024 includes \$335.6 million in private donations, \$135.1 million in donations from the UN Central Emergency Response Fund, and \$120.4 million from other UN funds.

Source: Author's calculations based on WFP (2024, 2025a, 2025b).

Figure 2
Size of global population facing acute hunger, 2017–25

millions of people



Sources: Author's calculations based on FSIN, GNAFC, and WFP (2018–25).

Table 2

Declines in yields for major staples in selected countries between 1991–93 and 2021–23 (percent)

Country	Decline	Country	Decline
Cabo Verde	94.4	Comoros	12.5
Trinidad and Tobago	71.1	Timor-Leste	11.1
Solomon Islands	60.6	Norway	10.2
The Gambia	35.9	Central African Republic	8.3
Zimbabwe	31.0	São Tomé and Príncipe	8.0
North Korea	28.9	Cameroon	5.4
Burundi	22.1	Guinea-Bissau	4.9
Jamaica	16.6	Chad	4.1
Somalia	14.0	Grenada	4.1
Eswatini	13.8	Switzerland	2.5

Source: FAO (2026).

expressed in kilograms per hectare—increase, rather than bringing additional land under cultivation.⁸

For the most part, yields have increased. Across the three most common staple grains—maize, rice, and wheat—country-level yields increased by an average rate of 65 percent between the early 1990s (1991–93) and the early 2020s (2021–23) (median growth was 45 percent). In many countries, however, yields for their most commonly consumed staples contracted, with yields lower (in some cases, significantly lower) now than they were at the end of the Cold War (table 2). Climate change is a culprit, but so are distortionary trade policies that curb private productivity-enhancing investment and in many cases (e.g., Democratic Republic of the Congo, Syria) armed conflict (Anderson 2022).

Global markets can provide a hedge against local crop failures, but only when trade remains reliable. With export bans and policy-driven disruptions increasingly common, the logic of self-insurance—hedging via increased domestic production and buffer stocks versus hedging via the market—has become stronger and more urgent (Posen 2025).

The 21st century has already experienced three waves of export bans on key food commodities: in 2007–08, in 2010–11, and a minor outbreak during the COVID pandemic and at the onset of the Russia-Ukraine war. Trade agreements are in principle an ex ante solution to supply disruptions, to the extent that they provide guarantees against supply disruptions. But examples abound of countries departing from their own commitments in times of crisis. India halted rice and

8 The longstanding position of the Food and Agriculture Organization has been that the international community should focus on yield growth, with limited, region-specific expansion of land under cultivation only in parts of Latin America and Sub-Saharan Africa (FAO 2009).

wheat exports to South Asian Free Trade Agreement partners in 2007/08, and Russia and Kazakhstan imposed export bans in 2010 and in the 2020s in contravention of commitments to the Eurasian Economic Union. Even as they are imposed in response to price spikes, policy-induced trade barriers—especially bans on grain export—account for a substantial share of observed price spikes during crisis years and significantly raise the fiscal and humanitarian costs of stabilizing food availability (Glauber, LaBorde, and Mamun 2024).

In 2026, both geopolitical risk and, especially, global trade policy uncertainty are elevated. Trade policy uncertainty in 2025 was higher than at any point in the past 40 years—even higher than during the COVID years and the supply chain vulnerabilities it revealed (Caldara and Iacoviello 2022). Now would be the wrong time to assume that global or regional markets and trade will continue to be a reliable source of implicit insurance against food shortages.

Accordingly, food-insecure developing economies will need to depend more heavily on themselves—and one another—to fight hunger. Many of these countries will do so without sufficient scale or domestic financial and human resources to fund public agricultural research, with or without GEOs.

Where will that research come from? Public sector investment in agricultural research is declining in advanced economies. The private sector focuses mostly on profitable crops and markets. To the extent that private investment will address global hunger, it will likely follow, rather than lead, public investment. Public sector funding is needed to absorb early-stage risks and help establish regulatory environments in which private investment can thrive (Pardey et al. 2016). Partnerships such as the Consultative Group for International Agricultural Research (CGIAR) expanded significantly in earlier decades; its funding has stagnated in real terms since 2014 (Lele and Goswami 2021). Research on rainfed crops—which still predominate in Sub-Saharan Africa and parts of Southeast Asia—and “orphan” local grains (grains with minimal trade potential) has long been sidelined (Abrams 2018).

STEPS BRICS+ COUNTRIES COULD TAKE TO MEET THE CHALLENGE

The world’s need for expanded investment in basic agricultural research is growing, especially to adapt modern technologies—from improved genetics to more efficient water and nutrient management—with a focus on the subsistence sector and in regionally consumed staples with limited commercial potential. Devoting research to these areas would help close yield gaps relative to advanced economies and major Global South food exporters, enhance climate resilience, and strengthen local food security. But these benefits can be realized only if developing economies reduce regulatory barriers to GEO crops and governments and nongovernmental organizations engage in sustained outreach about their benefits.

The components of such a push would be several.

Make large public investments in open-source agricultural R&D for orphan crops and local staples

Estimates by the Institute for Food Policy Research (Rosegrant, Sulser, and Wiebe 2022, Martin and Vos 2024) indicated that achieving the Sustainable Development Goal of reducing global hunger to 5 percent of the world’s population by 2030 would require an additional \$10.5 billion a year in public

investments in sustainable intensification (growing more on the same amount of land) and climate-smart agricultural technologies in developing economies. They assumed continued adoption and scaling up of advanced breeding and genetic-improvement technologies, including genome editing, genomics, and bioinformatics, as drivers of future productivity and climate resilience.

These projections are now out of date, as they predated the disruptions in development finance and global trade policy in 2025. Large reductions in official development assistance, rising food insecurity, and policy-driven disruptions to trade and agricultural supply chains will increase the costs of adopting technology, potentially raising the required annual investment to roughly \$20 billion a year, implying a cumulative financing gap of roughly \$100 billion by 2030.

For perspective, in 2022, total public agricultural R&D spending across all countries and domains—not just yield improvement in developing economies—was approximately \$49 billion (in 2017 purchasing power parity [PPP] dollars) (van Dijk et al. 2025). Meeting emerging needs would require increasing annual public agricultural R&D investment by nearly one-third over the next five years. Such spending would represent just a tiny fraction of the overall spending needed to address climate mitigation and adaptation.

Reform regulations to reap the benefits of GEOs and other advanced agricultural technologies

The returns to these investments will be greatest if they are accompanied by science-based regulatory reforms. Now is the time for GEO/bioengineering-hesitant developing economies to enact reforms that will allow them to take advantage of yield-improving, pest- and climate change-resilient agricultural technologies.

Policymakers cannot ignore GEO hesitancy. It reflects not only concerns about the safety of GEOs but also political and economic concerns about exposing the agricultural sector—which continues to employ a large share of the population in developing economies—to immediate and intense competition from competitors that have embraced GEOs.

To address these concerns, developing economies need to embrace the new technologies rather than try to protect themselves from them. Doing so could involve modernizing their biosafety and approval systems to align with best scientific practices, replacing discretionary review processes with risk-proportionate, science-based procedures that acknowledge the differential risks associated with transgenics and gene-edited organisms. This adjustment could include publishing transparent and predictable review timelines and, ideally, harmonizing standards with international ones, as embodied in the *Codex Alimentarius* and/or OECD guidelines (OECD 2023). These efforts could take advantage of initiatives such as the World Trade Organization's Standards and Trade Development Facility, which helps capacity-constrained countries comply with sanitary and phytosanitary regulatory requirements.

These reforms could be staged over a period of several years, to help build consumer and producer confidence. By beginning with crops for which consumer exposure is indirect, countries could concentrate on benefits that are large and visible while minimizing political risk in the form of consumer backlash,

protectionist attitudes, or protest. Doing so would mean focusing on feed crops like maize and sorghum and fiber and biofuel crops such as cotton, hemp, and switchgrass. These crops already dominate global markets for genetically modified varieties and do not involve direct human consumption.

Once these crops have been established, regulatory reform could then move on to edible crops. This process could begin with local staples and orphan crops such as teff (an African cereal), millet, and cowpea in pilot programs. These crops have perhaps the largest direct social benefit, because poor, food-insecure households in rural areas are most likely to depend on them (Popoola et al. 2022) and concerns about food security and sovereignty are high. Once confidence in GEO safety has been established, countries could introduce broader GEO food crops.

GEO hesitancy in developing economies is driven in part by the same dynamics that drive it in upper-income countries—namely, fears about health and safety intermingled with protectionism. But GEO-hesitant developing economies also have concerns about neocolonial domination by agribusiness interests in the Global North. Many of the most successful cases of GEO experimentation leading to wider adoption began with public-first pilot models to assuage food sovereignty fears, including India’s piloting of genetically modified (Bt) cotton and Nigeria’s piloting of genetically modified (Bt) cowpea.⁹ Starting with public, royalty-free GEOs is essential to build trust, demonstrate value, and protect small landowners and producers from intense and sudden competition from GEO imports.

These reforms are becoming more feasible as the European Union revises its regulatory approach to gene-edited crops. In 2025, it shifted toward a more risk-proportionate framework for so-called new genomic techniques, distinguishing certain low-risk gene-edited plants from transgenic GMOs. The step marked the most significant easing of Europe’s precautionary stance in two decades. Implementation details and member-state practices will determine how far this reform ultimately goes, but the direction of travel matters: By reducing the likelihood that gene-edited crops will face uniform restrictions or heightened traceability requirements, the European Union reduces one major source of market-access uncertainty for developing-country regulators.¹⁰

At the same time, the reemergence of discriminatory tariffs—with different rates for different trading partners—expands Europe’s policy latitude to address agricultural protection from more land-abundant exporters directly rather than through precautionary food safety regulation. Together, these shifts create space for a more science-based debate on GEOs and gene editing—one that can reduce the spillover effects of EU regulatory choices on poorer countries and allow developing economies to pursue yield-enhancing crop technologies with less fear of losing access to European markets.

9 Bt cotton and Bt cowpea are genetically modified to express *Bacillus thuringiensis*-derived proteins that are toxic to specific pests but harmless to humans and other organisms. They help reduce pre-harvest losses.

10 Cullen S. Hendrix, “Europe’s New Biotech Rules Could Buttress Global Food Security,” PIIE Realtime Economics, January 6, 2026, <https://www.piie.com/blogs/realtime-economics/2026/europes-new-biotech-rules-could-buttress-global-food-security>.

Launch strategic public communication and education campaigns around these lifesaving technologies

Deploying GEOs in food-insecure and GEO-hesitant settings requires not just changes to regulatory structures but also changes in producer, market intermediary, and consumer attitudes. Ultimately, success depends as much or more on social acceptance and producer confidence/familiarity than on enabling policy frameworks. Policymakers need to make the case for GEO crops by using pilot projects as opportunities not just for learning and genomic refinement but also for public engagement.

Bangladesh's experience with pest-resistant genetically modified (Bt) eggplant provides a template. Eggplant, which is widely consumed throughout Asia, is highly susceptible to fruit and shoot borers, moths that reduced Bangladeshi yields by up to 86 percent in the past (Shelton et al. 2019). The introduction of Bt eggplant increased yields by 20–51 percent, depending on the study and methodology; anecdotal evidence suggests that it also reduced input costs (Shelton et al. 2020; Ahmed et al. 2020).

Three elements of program design and outreach account for Bangladesh's success with Bt eggplant:

- Bangladesh's public research institute piloted the project with on-farm demonstration trials that invited in farmers on a rolling basis, gradually increasing participation and making farmers part of the program development process, increasing local sense of ownership.
- Bangladesh used national agencies and agricultural extension programs, rather than private sector advertising, to familiarize farmers, seed sellers, and food retailers with the benefits of Bt eggplant. Public messaging was central to shifting perceptions about the benefits of GEO crops as well as subtly making their adoption an act of civic mindedness.
- The government engaged in a science-based public outreach program that highlighted the benefits and national ownership of the project, which was key to assuaging consumer fears (Acevedo et al. 2023).

WHO PAYS FOR INVESTMENTS IN RESEARCH ON GENETICALLY ENGINEERED ORGANISMS?

Investments in public GEO research are much needed but unlikely to make anyone rich. These crops and markets are orphaned for a reason: The business case for investment is weak. At the global level, food security is a public good with private benefits that accrue mostly to people who could not otherwise pay for them. The marginal benefit of global food system resilience is highest for the most food-insecure and poor, who are by definition the least able to pay. A secure global food system is therefore possible only with significant publicly oriented (if not public) investment.

Public investment in agricultural research after World War II

During the post-World War II era (1945–80s), that public investment came from advanced economies and the Soviet Union, which supplied technology and inputs

to communist/socialist regimes and some nonaligned countries.¹¹ Support for the world's poor was a major front in the Cold War, as US policymakers became convinced that capitalist countries needed to demonstrate the ability to meet the needs of the poor lest more countries gravitate toward the Soviet Union.

During this period, publicly financed innovation led to major breakthroughs. American agronomist and Nobel Peace Prize winner Norman Borlaug developed the dwarf wheat strain credited with saving India from starvation, and the Indian scientist M.S. Swaminathan scaled it in a context of deep poverty, weak infrastructure, and significant ethnic and religious tensions. In China, Yuan Longping developed hybrid rice, an achievement that won him world food prizes and the Medal of the Republic, China's highest honorary medal. American horticulturalist Robert Chandler earned his spot on food security's Mount Rushmore by founding the International Rice Research Institute, which turned funding from American philanthropists and the Philippine government into a model for modern international agricultural research institutions.

By the end of the Cold War, high yields, depressed agricultural commodity prices, and the collapse of the wolf-at-the-door specter of Soviet influence led the advanced economies to begin shifting toward more emergency food aid, and investment in agricultural R&D declined in real terms. With the slashing of advanced economies' development assistance budgets, the world will need to look elsewhere for financial support and thought leadership.

An opportunity for the BRICS+

The rising need for agricultural research coupled with the retreat from leadership by the United States and other advanced economies present an opportunity for the BRICS+ to advance their own development goals while stepping into a global leadership role on an issue of vital importance to most developing economies.¹² The BRICS+ combine the need, know-how, capital, and—perhaps most scarce—strategic rationale to underwrite a massive increase in public agricultural R&D funding (table 3).

The BRICS+ are on the front lines of the fight against hunger and climate disruption. For decades, the financing gap for agricultural research in developing economies was filled largely by OECD donors and philanthropic institutions. For them, investment in crop technologies tailored to low-income contexts was always discretionary, reflecting a blend of humanitarian commitment and enlightened self-interest. In recent years, such arguments were increasingly framed around security and migration: One way to reduce future South-North migration pressures is to help ensure food and livelihood security in sending countries.

For the BRICS+, especially India, Ethiopia, Egypt, and South Africa, the stakes are more immediate and existential. Hunger and climate vulnerability are clear and present domestic challenges, not distant risks. Investment in climate-

11 The Soviet Union also played a more amorphous but nevertheless important role as the political-economic alternative that created pressure for the advanced economies of the West to address poverty in the developing world.

12 Argentina was slated to join in 2024 but withdrew its intent after US ally Javier Milei was elected president. Saudi Arabia's official position is that it is still considering the matter.

Table 3

The BRICS+ face significant hunger burdens but also account for almost 40 percent of global public agricultural R&D spending

Country	Percent of global undernourished population, 2022	Percent of global public agricultural R&D spending, 2022	Percent of global gross national income (PPP), 2024
Brazil	1.2	4.7	2.3
China	4.8	16.3	19.2
Egypt	1.3	1.1	1.1
Ethiopia	3.8	0.5	0.2
India	26.9	9.1	8.1
Indonesia	2.7	1.3	2.3
Iran	0.8	1.0	0.9
Russia	0.4	1.8	3.5
South Africa	0.7	0.5	0.5
United Arab Emirates	<2.5	<0.1	0.5
All BRICS	42.6	36.2	38.5

PPP = purchasing power parity

Note: No values were reported for China and Russia; the values shown were imputed assuming a prevalence of undernourishment in both countries of 2.5 percent.

Sources: Author's calculations based on World Bank (2025); van Dijk et al. (2025); Ritchie, Rosado, and Roser (2023).

resilient, regionally adapted crop research is therefore a form of self-insurance, not charity. And even once (and in part because) they secure their own food systems, the BRICS+ will remain much more likely destinations for migrants from neighboring low-income states, by virtue of geography and economic gravity. India has far more to gain from a food-secure Bangladesh or Myanmar than the United Kingdom does; the same is true of South Africa with respect to southern Africa or Egypt and Ethiopia with respect to the broader Horn of Africa. BRICS+ investments in agricultural development are not just a matter of principle; they are rooted in domestic need, concerns about regional spillovers (or lack thereof), and the geopolitical logic of stabilizing neighboring countries.

The BRICS+ also bring significant research expertise with a Global South orientation. Between 2000 and 2016, developing economies increased their share of global agricultural research spending from 40 percent to 60 percent, driven overwhelmingly by large increases in middle-income countries like China, India, and Brazil. Over this period, the share contributed by high-income countries declined from 58 to 40 percent (Ruane and Ramasamy 2023). Most of this research is dedicated to the agricultural realities—in terms of climate, soil conditions, and access to inputs and labor-saving technologies—of the tropics. It has yielded demonstrable successes. The Brazilian Agricultural Research Corporation (*Empresa Brasileira de Pesquisa Agropecuária* [EMBRAPA]) has

turned the *cerrado* (a vast ecoregion of tropical savanna in central Brazil) into one of the world's major breadbaskets (albeit while raising massive concerns about deforestation). India's agricultural research establishment is among the largest in the world, and China has emerged a leading generator of improved seed varieties, particularly for rice.

Several BRICS+ countries are already among the world's largest public investors in agricultural research, but these efforts remain largely national rather than coordinated, and they are oriented toward major traded staples:

- China engages widely with countries in Africa and Southeast Asia through training centers and demonstration and R&D farms (FAO 2015), but these interventions have focused mostly on widely traded staples, where private sector interest is already high, and are bilateral in nature.
- India remains home to one of the world's largest public agricultural research systems and has particular strengths in research on dryland agriculture. It played a central role in the first Green Revolution and has supported agricultural cooperation with parts of Africa and South Asia; most current investment remains domestically focused, however.
- Brazil has engaged in technical cooperation with African and Latin American partners, particularly around tropical soil-adapted technologies. These efforts have been limited in scale, however.¹³
- South Africa is relevant regionally in southern Africa.
- Russia's contributions are limited largely to its role as a major wheat and barley exporter.

The BRICS+ are thus active in public agricultural research, but programs are mostly bilateral and focused on widely traded staples and commercial-scale agriculture rather than orphan crops and subsistence techniques. Combining their efforts to address these gaps in existing financing and program focus would not just be a boon to global food security, it could also help these countries address some of their own challenges in cooperating among themselves.

Institutional vehicles for coordinating and financing these investments already exist. The BRICS Agricultural Research Platform, created in 2021, was founded as a virtual cooperation network to promote shared agricultural research and technology transfer. It has not been significantly capitalized, and it has not identified subsistence and/or orphan crop research as key priorities. The New Development Bank (NDB), a multilateral development bank financing infrastructure, sustainability, and development projects across emerging-market economies, could serve as the instrument for supporting multi-country research centers and competitive grant programs that could augment and provide additional capital for agricultural extension services, demonstration farms, and public messaging campaigns.

¹³ Inter-American Institute for Cooperation on Agriculture, "EMBRAPA, the Brazilian Cooperation Agency and IICA Take Key Step to Strengthen Cooperation between the Americas and Africa for Food Security and Sustainable Farming," March 20, 2025, <https://iica.int/en/press/news/embrapa-the-brazilian-cooperation-agency-and-iica-take-key-step-to-strengthen-cooperation-between-the-americas-and-africa-for-food-security-and-sustainable-farming/>.

The BRICS+ could conduct research both at home and abroad. Beneficiaries abroad are more likely to welcome public help from their fellow denizens of the Global South than from either private agribusiness interests or do-gooders from the Global North. The practical and food sovereignty benefits of Global South countries leading the charge are clear.

The BRICS+ will also need greater alignment in their regulatory approaches to GEOs. Standards across Brazil, China, India, Russia, and South Africa vary widely, creating friction for cross-border research collaboration, seed movement, and regional technology adoption. Brazil and China have moved toward streamlined, science-based approvals for gene-edited crops. In contrast, India retains a more restrictive, precautionary stance, and Russia continues to ban domestic GEO cultivation altogether, illustrating the regulatory divergence that needs to be bridged for a coordinated BRICS+ effort. A harmonized framework would significantly increase the scale and spillovers of any R&D initiative led by BRICS+.

Assuming a global leadership role in public agricultural R&D would offer the BRICS+ a rare point of entry that would not automatically provoke a showdown with Washington or Brussels. Attempts to diversify the international payments system or provide alternatives to Western financing models for infrastructure projects have been interpreted as threats to the West, particularly the United States. Addressing the food security challenges of the world's poorest people would not infringe on the interests of the advanced economies. Food security for those in need promotes resilience in global food systems and eases migration pressures. It provides the BRICS+ with a chance to exert leadership in ways that will win friends while not creating enemies.

The BRICS+ also have the least tangible but perhaps most important asset: something to prove on the global stage. For two decades, the BRICS+ have argued that the post-1945 world order no longer meets the needs or represents the interests of emerging-market economies and that Global South representation in global governance bodies does not reflect their changed economic, scientific, and diplomatic circumstances. In tackling this financing problem, the BRICS+ could announce their arrival as providers of global public goods, increasing their credibility and clout with their developing-country peers.

Stepping forward to address these financing gaps and enhance global food security—especially as traditional donors pull back—would not only meet urgent development needs. It would also mark the emergence of a new paradigm of South-South cooperation and constructive global leadership at a moment when the international system is fragmenting and the world needs credible stewards of global public goods. Detailed financing, governance, and regulatory design considerations fall outside the scope of this brief, but the conceptual architecture and political logic for an agricultural R&D initiative led by the BRICS+ are clear and actionable.

CONCLUSION

In the 20th century, public agricultural research—much of it funded by Western countries and staffed by Western agronomists—helped avert large-scale starvation in much of the developing world. For the last decade, however, global food security has been trending in the wrong direction, and advanced economies have receded from leadership. It is time for the major economies of the Global South to take the helm.

Scientific tools and yield-improving technologies are not lacking. What is missing is sufficient funding to apply them to rainfed crops and regional, often orphan staples, and a supportive regulatory environment in many developing economies.

The BRICS+ are well positioned to step in to fill these gaps. They combine the talent, resources, credibility with the Global South, and most importantly, need to solve their own hunger problems. Funding agriculture research would be an opportunity to invest in domestic and regional human capital, increase political stability, and demonstrate that the BRICS+ are capable of providing global leadership.

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