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Africa's Infrastructure-Led Growth Experiment Is Faltering. It Is Time to Focus on Agriculture.

David Ndii

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Carnegie Endowment for International Peace
Publications Department
1779 Massachusetts Avenue NW
Washington, DC 20036
P: + 1 202 483 7600
F: + 1 202 483 1840
CarnegieEndowment.org

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Summary

Over the past few decades, several low- and middle-income economies in Africa and elsewhere have sought to turbocharge growth by adopting an export-led economic model premised on heavy investments in infrastructure and building up domestic manufacturing capacity. But this strategy has often not produced the economic gains that have been promised for a variety of reasons. The continued emphasis on infrastructure investment fails to account for the fact that even those African countries that have invested a great deal in infrastructure continue to lag other countries in Asia (like Bangladesh) in key manufacturing sectors like textiles regardless of infrastructure quality. In addition, this approach overlooks the fact that African countries do not have the same comparative advantages as the Asian Tigers that perfected and popularized the export-led growth model: while those Asian countries had an abundance of low-wage labor, wages in Africa are typically higher than those of other countries at comparable development levels.

Instead of fixating on infrastructure, African countries should look to the experience of Latin American countries with similar resource endowments: a greater relative abundance of land than low-cost labor. As this experience shows, countries can make far more durable, sustainable economic gains by focusing on improving agricultural productivity with relatively low-cost improvements targeted at smallholder farmers for whom a boost in productivity would have the largest impact.

Introduction

It is now an article of faith in international development policy circles that inadequate infrastructure is the single most important constraint on economic growth in low-income countries today. This mantra is reflected in the multiplicity of global infrastructure-financing initiatives of which the Partnership for Global Infrastructure Investment (PGII), announced by the Group of Seven (G7) at the Leaders Summit in 2022, is just the latest example. The partnership's stated goal is to "mobilize \$600 billion by 2027 in global infrastructure investments."¹ China's Belt and Road Initiative and the European Union's (EU) Global Gateway are the two other notable ones.

Africa's recent experience challenges the infrastructure-led growth paradigm. Africa has been on an infrastructure-building drive for the better part of two decades, a policy trend predicated on research that appeared to suggest that the economic cost of Africa's infrastructure deficiency was around 2 percentage points of per capita gross domestic product (GDP) growth per year.² Mega-infrastructure projects including railways, power stations, state-of-the-art airports and seaports, impressive highways, and spectacular bridges have been, and continue to be, built at an unprecedented pace. Yet these investments have not turbocharged growth. On the contrary, a robust two-decade growth trajectory from the mid-1990s to the mid-2010s that expanded Africa's average incomes by 40 percent has petered out, and much of the continent was showing signs of debt distress even before the coronavirus pandemic struck.³

Understanding why this infrastructure binge has not spurred as much growth as expected and why such ventures are responsible for the incipient debt distress on the continent is imperative. Amid this failure to boost growth, the debt servicing outlays risk being an inordinate burden on African countries' public finances and their economies.

Rather than a scarcity of infrastructure, the real binding constraint on growth in Africa is low agricultural productivity, or the agricultural productivity gap. Small-scale farming dominates African agriculture. Smallholder agriculture is also very diverse, ranging from relatively prosperous, globally competitive commodity exporters to relatively land-rich but capital-poor semi-subsistence farmers who also constitute the bulk of the continent's poor. It is in this latter group that the highest potential for productivity growth is to be found. Simply put, Africa's economic takeoff is contingent on a pro-poor agricultural transformation. African leaders have been aware of this imperative for decades. But they have excelled at pronouncing lofty initiatives long on promises and short on action.

Closing Africa's agricultural productivity gap would require a fraction of the mostly commercial infrastructure financing that is already available, financing that is unlikely to be absorbed in light of the fiscal consolidation imperative caused by the incipient debt crisis. In fiscal year 2021, the International Monetary Fund approved bailouts for twenty-one African countries. These packages come with fiscal consolidation commitments that include deficit reduction targets, strict limits on nonconcessional external borrowing, and cutbacks on noncritical public expenditures.⁴

More fundamentally, there is a problematic misalignment between supply and demand at play. On the supply side, foreign lenders and investors seek big-ticket, preferably passive investments with low transaction costs such as sovereign bonds and derisked infrastructure projects. On the demand side, an agricultural transformation requires public goods, research and extension services (agricultural advisory services), and policy and institutional development interventions that address the pervasive market failures characteristic of agriculture.

If the new largesse is to help African countries build back better, African states and their benefactors will need to square this circle. The study of aid failure is replete with well-documented but seemingly unlearned lessons whose crux is precisely this institutional failure—the misalignment or incompatibility of incentives between development goals, on the one hand, and the organizational and private interests of aid intermediaries (such as international development finance organizations and recipient governments) on the other. Africa's faltering investment experiment with infrastructure is yet another cautionary tale.⁵

A Questionable Piece of Conventional Wisdom

Infrastructure investment has topped Africa's economic policy agenda for the last few decades.

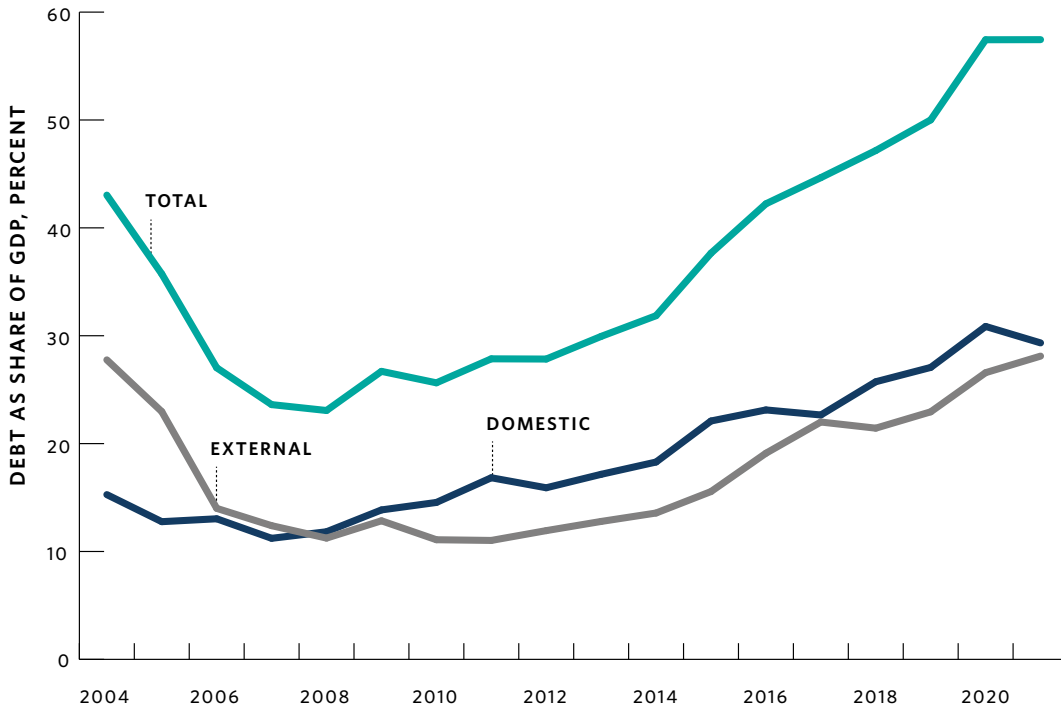
A Misguided Push for Infrastructure Investment

The drive for “infrastructure-led growth” was kicked off in earnest by a 2010 World Bank study that estimated the economic costs of Africa's infrastructure deficit to be 2.2 percentage points of per capita income growth per year.⁶ The study estimated that the investment required to bridge the gap would amount to about \$93 billion per year from 2010 to 2020, or nearly \$1 trillion cumulatively. Africa's infrastructure finance deficit quickly became a clarion call for financing anchored by the African Development Bank, a push that has sprouted several resource mobilization platforms such as the Infrastructure Consortium for Africa, Africa50, and the Programme for Infrastructure Development in Africa, among others. The continent's estimated investment needs for infrastructure have also become something of a moving target. The most recent figure puts the annual amount at between \$130 billion and \$170 billion, with a financing shortfall of roughly \$70 billion to more than \$100 billion.⁷

The clarion call coincided with an increase in the supply of external financing on account of the global liquidity glut occasioned by government stimulus spending in the wake of the 2007–2008 global financial crisis, the emergence of China as a major (and often preferred) source of development financing, and the counteroffers from Western countries that Chinese lending has prompted. The ensuing largesse has seen sub-Saharan Africa's public debt burden rise rapidly within a decade (see figure 1).⁸ This rising debt burden has wiped out the gains achieved by the Highly Indebted Poor Countries Initiative, and debt distress is once again stalking the subregion.

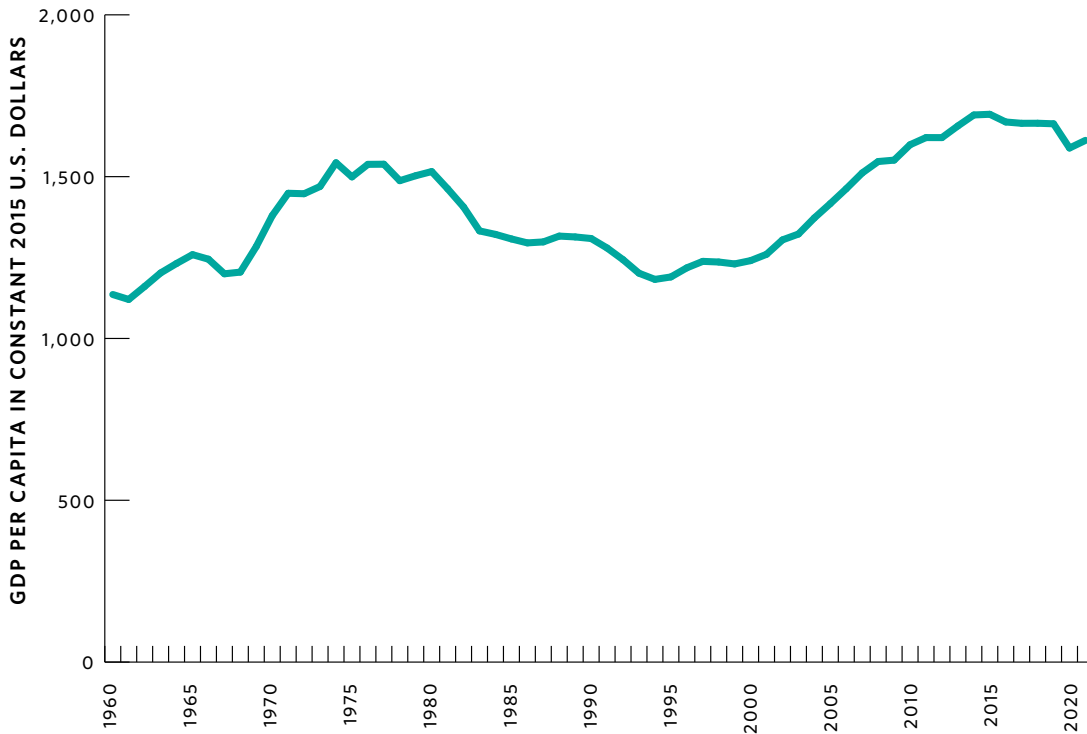
It is noteworthy that, at the time of the call for building infrastructure, Africa was experiencing a roughly two-decade-long economic expansion (1994–2014) heralded as “Africa Rising.” Per capita income increased nearly 40 percent after falling throughout the 1980s and early 1990s.⁹ But growth has fallen off since 2014, barely keeping pace with population growth (see figure 2).¹⁰

Figure 1. African Public Debt



Source: "Regional Economic Outlook," IMF, <https://data.imf.org/?sk=5778F645-51FB-4F37-A775-B8FECD6BC69B&sl=1461703341930>.

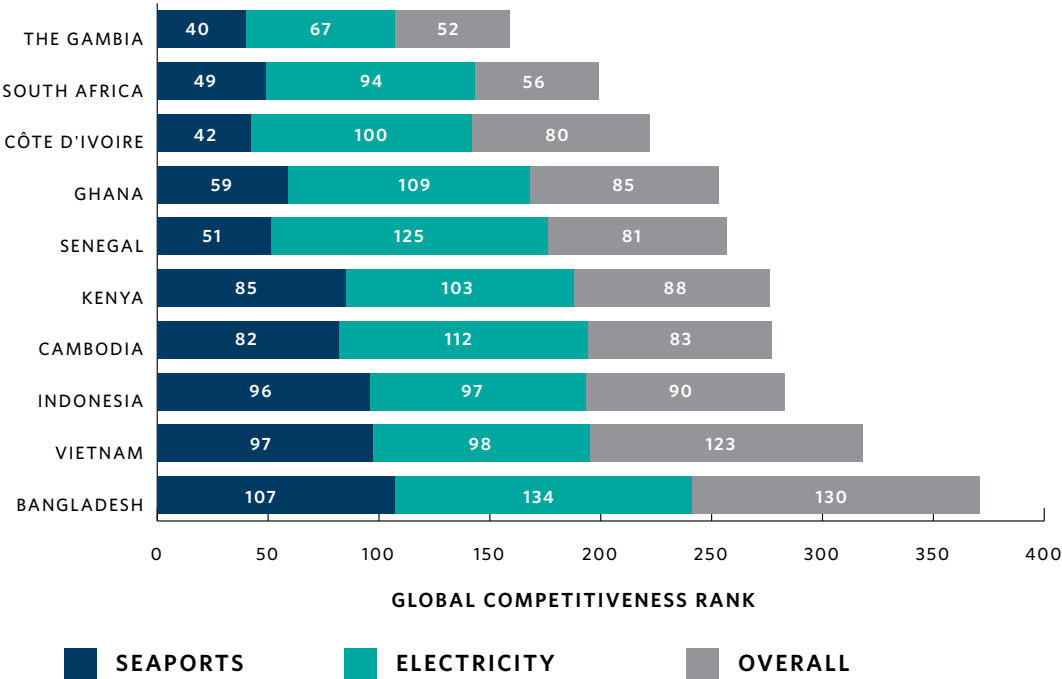
Figure 2. Economic Growth in Sub-Saharan Africa



Source: "GDP Per Capita (Constant 2015 US\$) - Sub-Saharan Africa," World Bank, 2020, <https://data.worldbank.org/indicator/NY.GDP.PCAP.KD?locations=ZG>.

The claim of infrastructure-constrained economic growth lacks a theoretical foundation or empirical evidence. Even cursory observations call it into question. Over the last three decades, a third wave of Asian countries—including Bangladesh, Cambodia, and Vietnam—have leapfrogged African countries in terms of per capita income using export-led manufacturing with similarly deficient infrastructure. Even as Africa’s infrastructure deficit was being discussed in the early 2010s, Bangladesh’s infrastructure was ranked 130 out of the 134 countries surveyed for the infrastructure rankings in the World Economic Forum’s Global Competitiveness Report (see figure 3).¹¹ Indonesia and Vietnam were also ranked near the bottom at 90 and 123, respectively, significantly below the rankings of African countries like the Gambia (53), South Africa (58), Senegal (81), Cote D’Ivoire (80), and Kenya (88). Reliable electricity and efficient seaports would seem to be important infrastructure for the labor-intensive manufacturing that has driven growth in these Asian countries. Bangladesh, which was already on its way to becoming an apparel export powerhouse was ranked dead last on electricity and well below all the African countries in the chart.

Figure 3. Infrastructure Rankings for Select African and Asian Countries



Source: World Economic Forum, “Global Competitiveness Report,” 2011, https://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2010-11.pdf.

Is the infrastructure investment drive responsible for Africa's debt crisis? Why has the massive push to invest in infrastructure failed to buttress growth? Is it too soon to tell how effective this policy has been, or is there already mounting evidence that the infrastructure-constrained growth thesis is flawed?

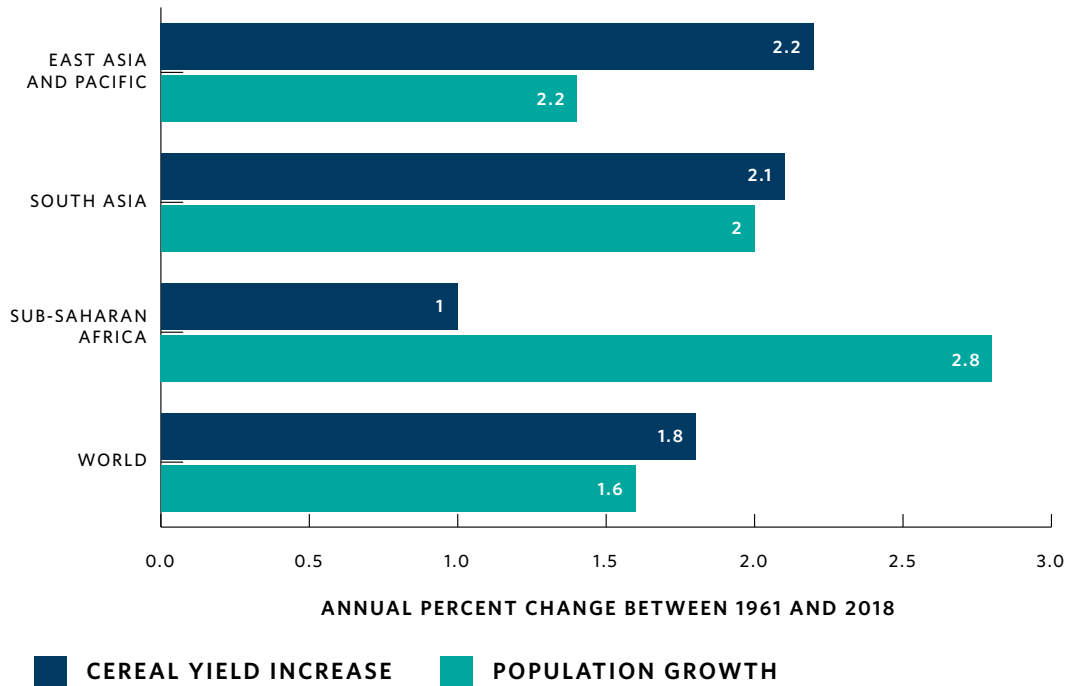
The Flaws of the Infrastructure-Fueled Growth Model

There is good reason to think that the infrastructure-led growth thesis is flawed. Africa is barely, if at all, converging with the rest of the world economically because of slow productivity growth in African economies, particularly in the agricultural sector (see figure 4 below). Agriculture accounts for a large share of most African economies (all non-oil-producing or mineral-rich countries) and is the primary or a leading secondary source of income for, on average, more than half, and up to 80 percent, of the populations even in oil-producing and mineral-rich countries. Because of this, low productivity is a drag on these countries' whole economies.¹² But the infrastructure-led growth paradigm has channeled debt finance into investments that have contributed little, if anything, to agricultural development. It is not evident that the infrastructure has crowded in the productive private sector investments on which the governments' ability to repay the debts is predicated. Investment has remained generally flat over the entire infrastructure investment drive even as the debt-to-GDP ratio has risen rapidly, as noted above. This suggests that, far from crowding in, the infrastructure drive may have crowded out private investment. This appears to be the case for foreign direct investment inflows, which has been trending downward from 3.1 percent of GDP in 2008 to 1.7 percent in 2020.

Policymakers should pay more attention to Africa's agricultural productivity gap. World cereal yields have increased nearly threefold since 1960, but Africa has only managed to increase its yields by 90 percent (see figure 5). Africa is the only region where population growth has outpaced cereal productivity (see figure 4). Africa ranks lowest globally in virtually every agricultural productivity indicator much more so than the nonfarm economy does. On the one hand, it is not evident that the infrastructure deficit is more binding on agriculture than it is on the rest of the economy. On the other, there is compelling theoretical and empirical evidence that the agricultural productivity gap is a manifestation of the structural economic factors that impede Africa's industrial competitiveness.

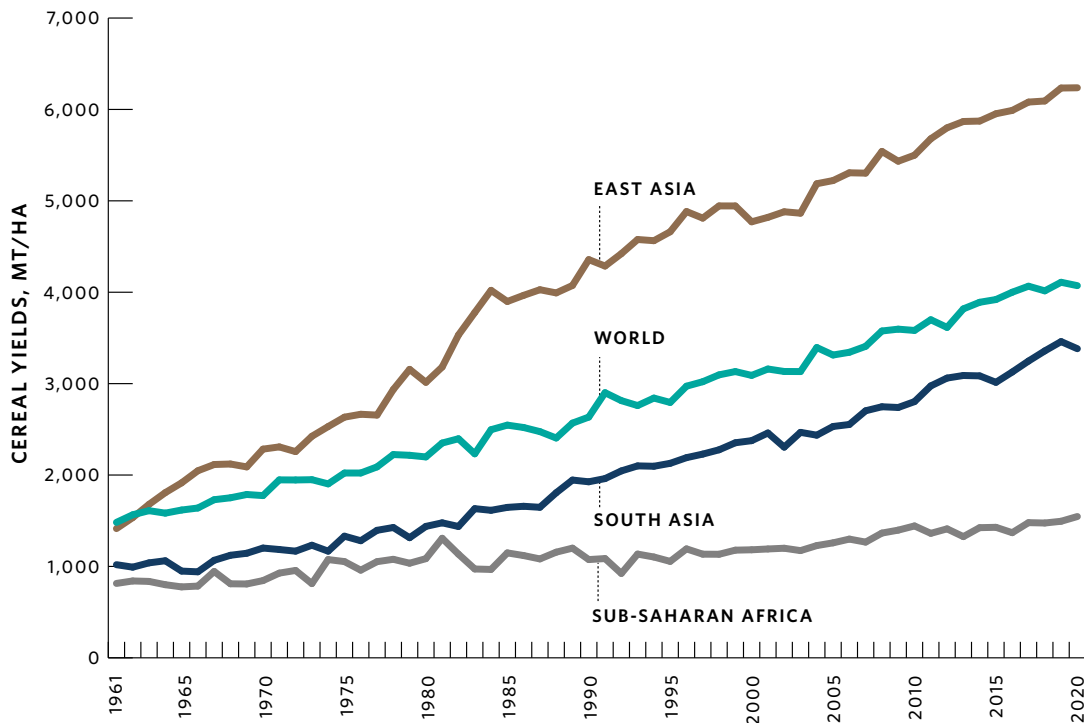
The imperative to spur an agricultural transformation has been at the forefront of Africa's development agenda for the last two decades. In 2003, African leaders adopted the framework for the Comprehensive African Agriculture Development Programme (CAADP), also known as the Maputo Declaration on Agriculture and Food Security.¹³ Its flagship commitment was to "the allocation of at least 10 percent of national budgetary resources to agriculture and rural development policy," according to one description.¹⁴ In 2013, the governments renewed this commitment in the Malabo Declaration on Accelerated Agricultural Growth. The World Bank echoed this imperative in a 2013 report called *Growing Africa: Unlocking the Potential of Agribusiness*.¹⁵ The report put African agribusiness front and center with a

Figure 4. Agricultural Productivity and Population Growth in Key Regions



Source: World Bank, World Development Indicators, <https://data.worldbank.org/indicator/AG.YLD.CREL.KG?locations=ZG-1W-8S-Z4> and <https://data.worldbank.org/indicator/SP.POP.GROW?locations=ZG-1W-8S-Z4>.

Figure 5. Cereal Yields Around the World



Source: World Bank, "Cereal Yield (kg per Hectare)," 2021, <https://data.worldbank.org/indicator/AG.YLD.CREL.KG?locations=ZG-8S-1W-Z4>; FAOSTAT, "Crops and Livestock Products," last updated April 26, 2022, <https://www.fao.org/faostat/en/#search/cereal%20yield>.

forecast projecting more than a threefold jump in Africa's food and beverage market from \$313 billion at the time to \$1 trillion by 2030. This, the report argued, required putting agriculture at the center of Africa's development agenda, given its importance for sustaining high growth rates, job creation, poverty reduction, and food security while safeguarding the continent's environment.¹⁶

In 2016, the African Development Bank followed up with "Feed Africa: Strategy for Agricultural Transformation in Africa 2016-2025" to accelerate the realization of the CAADP's goals. These plans contain policy interventions and investments designed to close Africa's agricultural productivity gap. Their findings are buttressed by empirical evidence showing that the transition from low- to middle-income status is underpinned by agricultural productivity growth. Analysis by the U.S. Agency for International Development cited a study that found that "a US\$1 increase in agricultural income generates an additional US\$0.30 to US\$3.30 in output in other sectors of the economy." For Africa, the size of the multiplier effect is estimated to be between 1.9 and 2.9.¹⁷ More generally, the impact of this "Green Revolution" recently has been estimated at \$83 trillion, an amount "equivalent to a year of current global GDP," and a cost of 17 percent of developing countries' per capita income growth between 1965 and 2010.¹⁸

To track progress given the decades of slow action on the CAADP, African heads of government mandated the African Union to publish a biannual progress review. According to the second review, published in 2019, hardly any countries were on track to meet the 10 percent budget commitment.¹⁹ The African Development Bank's scorecard does not look much better. The bank set itself a target of increasing land with improved water management from a 2015 baseline of 45,500 hectares per year to 47,800 hectares per year in 2019, a very modest increase of 2,300 hectares.²⁰ Instead, the figure fell by around 50 percent to 23,300 hectares. The report also set a target of increasing the number of farmers equipped with improved technology by an equally modest 30,000, from 600,000 to 630,000. It further aimed to raise financing for farm inputs from 600,000 to 1.7 million metric tonnes but could not find the data for 2019 to report. Of the bank's "High 5" thematic areas (agriculture, electricity, integration, industrialization, and quality of life), agriculture's share of the bank's lending was the lowest at 11.1 percent in 2019, just under half of the share of electricity (21.8 percent), the same as before the transformation strategy was unveiled.²¹

As Africa contemplates a response to the faltering infrastructure-focused strategy, it is this wide gap between lofty rhetoric and slow action on increasing agricultural productivity to which attention should turn.

Embracing the Mistaken Idea

The notion that economic activity needs infrastructure services needs no belaboring. Economies cannot function without energy, transportation, water, and sewage systems. The infrastructure-led growth proposition goes beyond this assertion. The World Bank study cited above contends that the infrastructure deficit is the bottleneck impeding Africa's economic takeoff. The proposition is buttressed by econometric estimates attributing at least half of Africa's growth between 1990 and 1995 to infrastructure.²² On this basis, its proponents proceed to calculate that accelerated infrastructure investment would boost Africa's per capita income growth by up to 2.6 percentage points per year. Consider the following example:

Across Africa, infrastructure contributed 99 basis points to per capita economic growth from 1990 to 2005, compared with 68 basis points for other structural policies. . . . *That contribution is almost entirely attributable to advances in the penetration of telecommunication services* [author's emphasis]. . . . Simulations suggest that if all African countries were to catch up with Mauritius (the regional leader in infrastructure) per capita growth in the region could increase by 2.2 percentage points. Catching up with the Republic of Korea would increase per capita growth by 2.6 percentage points a year.²³

It is noteworthy and alarming that the entire infrastructure-constrained growth proposition is predicated on the "penetration of telecommunication services." This penetration is entirely due to mobile phones. The mobile technology economy is estimated to have contributed 9 percent of Africa's GDP in 2019.²⁴ This large share of GDP is because mobile phones represent a multifaceted technological revolution that spans infrastructure (communication services), financial services, and consumer electronics. The GSM Association estimates that Europe's mobile economy share was 4.6 percent of GDP in 2020.²⁵ It is difficult to attribute this to the bridging of an infrastructure gap, given that Europe had nearly universal telephone services already. By way of comparison, the energy sector's share of GDP in non-oil-producing economies is in the order of 1 to 2 percent.²⁶ This makes the generalization of the impact of mobile technology on conventional infrastructure services that are only economic enablers rather dubious, if not outright disingenuous. Be that as it may, it is worthwhile to contemplate a simulation of the closing of the infrastructure gap by way of a thought experiment.

A Thought Experiment on Closing the Gap

Suppose that Kenyans were to wake up tomorrow and find that, while they were sleeping, the infrastructure gap between their country and South Korea had closed. The next thing would be to market the country aggressively and showcase the investment opportunities. What might those opportunities be?

Semiconductor manufacturing perhaps? Investors would be looking at the depth of engineering and other technical skills in the country, assets that Kenya does not have in abundance.²⁷ How about the apparel industry? Potential investors would discover that Kenya has had a modest apparel export industry since the early 1990s, one that currently employs roughly 50,000 workers.²⁸ Over the same period, Bangladesh has developed an apparel export industry that generated more than \$30 billion in export earnings on average in 2020 and 2021 and employs over 4 million workers, even as the country continues to be ranked below Kenya on infrastructure quality, according to the World Economic Forum's Global Competitiveness Report rankings.²⁹

Notably, the relative WEF rankings have not changed much, with Kenya (110) still landing four places above Bangladesh (114) in 2019 out of the 141 countries ranked.³⁰ Similarly, the Logistics Performance Index published by the World Bank, which combines both infrastructure quality and trade logistics efficiency, ranked Kenya (76) eleven places ahead of Bangladesh (87) out of 150 countries in 2007. In 2018, Kenya was up eight places to 68, while Bangladesh was down thirteen places to 100 out of the 160 countries ranked.³¹ Given these facts, the idea that an infrastructure gap between Kenya and Bangladesh explains the divergent trajectories of their apparel export industries is difficult to sustain.

What about business process outsourcing? Investors would be surprised that Kenya has been heralded as an emerging "Silicon Savannah" for around a decade or longer.³² This industry was expected to take off once the first fiber-optic cable was installed in 2010. Kenya was then ranked in the same peer group as India and the Philippines in terms of readiness in the sector, particularly in human resources. But for reasons that are still unclear, the industry sputtered briefly then stopped. Human resources seems an unlikely candidate seeing as the country has earned considerable notoriety as a leading hub for essay mills that sell terms papers to students.³³

Kenya's and Ethiopia's Faltering Infrastructure-Led Development Drive

Still, Kenya succumbed to the allure of infrastructure-led growth. In 2013, a newly elected Kenyan government unveiled a four-year investment plan to install 5,000 megawatts in power-generating capacity.³⁴ This would have been a nearly fourfold increase in its generation capacity from 1,800 megawatts to 6,800 megawatts. The national demand forecast at the time provided three scenarios in which the projected 6,800-megawatt requirement would

have been reached in 2024, 2027, and 2029 in the “high,” baseline, and “low” demand scenarios, respectively. Two years later, the country’s generation capacity had reached 2,800 megawatts against an actual demand requirement of only 1,900 megawatts, 17 percent below the national plan’s baseline forecast of 2,300 megawatts and a considerable surplus in generation capacity.

In the meantime, an updated forecast was projecting substantially slower demand growth up until 2037. The updated plan forecasted a requirement of 6,640 megawatts in 2037, just below the 6,800 megawatts the government was targeting. The 6,800-megawatt requirement would only come into play in the high-demand scenario and even then not until 2032. Electricity bills have increased sharply, reliability has deteriorated, and the distribution utility has gone into financial distress. Fortunately, a roughly 1,000-megawatt coal plant that was a key plank of the 5,000-megawatt plan was not built following a court challenge. If it had been built, the country’s excess capacity would be as much as 50 percent.³⁵

Meanwhile, Ethiopia’s 2019 National Electrification Program (NEP) 2.0 set a goal of universal access to electricity in 2025 and also sought to make the country a regional electricity hub. The plan projected growth from a generation capacity of 4,300 megawatts in 2017 to 9,000 megawatts in 2020 before further growth would vault the figure to more than 14,000 megawatts by 2025.³⁶ It projected demand to grow at 14.3 percent based on the targets and exports of its universal access plan. Curiously, though, the plan does not provide an electricity consumption baseline on which the demand growth is based. The latest published figures put Ethiopia’s electricity consumption at 95.9 kilowatt-hours per person in 2019, up from 22.8 kilowatt-hours per person in 2000, which works out to a growth rate of roughly 7.8 percent per year, or about the same as the country’s economic growth rate, which is the norm.³⁷ It seems, therefore, that in reality, Ethiopia could be projected to consume around 10,000 gigawatt-hours of electricity in 2018 (the baseline year for the NEP), a generation capacity requirement in the order of 2,200 megawatts, far less than the 4,300 megawatts cited in the NEP. That indicates that Ethiopia was very likely at about double its capacity requirement in 2018, the NEP’s baseline year. If these projections were to continue over time, it is likely that Ethiopia’s power-generating capacity would continue to markedly outstrip domestic demand for electricity.

Ethiopia’s infrastructure drive, boasting “one of the highest public investment rates in the world” according to the World Bank, boosted Ethiopia’s real GDP growth from 4.5 percent to 10.9 percent per year.³⁸ Remarkably, the World Bank’s accolades gloss over the fact that what it describes as homegrown “heterodox financing” consisting of “financial repression, an overvalued real exchange rate, and monetary [expansion]” are the antithesis of the Washington Consensus’s canon.³⁹

Ethiopia was banking on attracting labor-intensive, export-led manufacturing. The results are not encouraging. The country’s exports have declined from nearly 17 percent of GDP to around 7 percent over the last decade (2011–2020), the second-lowest figure in Africa

after Burundi.⁴⁰ This is unsurprising, seeing as the country's homegrown heterodoxy has an uncanny resemblance to the dirigiste policy regimes of the 1960s and 1970s. The unfolding civil strife in Ethiopia has overshadowed the economic origins of the political crisis that precipitated it.⁴¹

Can Export-Led Manufacturing Drive Africa's Development?

Export-led growth premised on infrastructure investment seeks to fuel an economic surge by leveraging relatively low labor costs to capture global manufacturing market share. Certain key kinds of infrastructure (digital, energy, and transportation) are thought to be needed to increase connectivity, help boost firm-level productivity, and allow a country to prioritize exports. But how well does this theory hold up in Africa?

A recent paper that posed this question concluded as follows:

Africa does not, in general, appear to be poised to embark on a manufacturing-led take-off, stepping into the shoes of emerging Asia. The results described in this paper confirm that lower-income Africa, including countries that have come to be thought of as leaders in development, has high manufacturing labor costs relative to GDP as well as high capital costs relative to low-income comparators. Labor in middle-income Africa is also very expensive relative to comparator middle income countries . . . We do not really understand the factors behind prices and costs, whether for industrial labor or, more generally, in terms of purchasing-power parity price levels, and why so many African countries appear to be costly relative to their income levels.⁴²

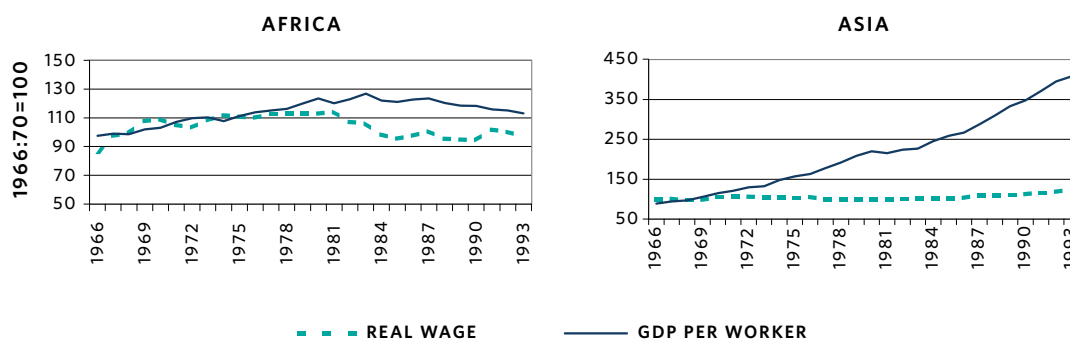
The authors cite previous work that had identified “a number of factors associated with higher, or lower, purchasing-power price levels,” but they fail to account for what they term the “Africa differential.”⁴³ This differential alludes to the fact that Africa's growth is found to be significantly lower than can be explained by economic variables that account for growth differences between other countries. A battery of variables capturing aspects of geography, history, and culture have not shed much light on the sources of this difference. This verdict on the Africa growth gap written two decades ago remains the state of play. “Some estimates have found the Africa dummy to be both large and significant [while] others eliminate it

though to an extent by transferring the puzzle elsewhere. Africa's slow growth is thus partly explicable in terms of particular variables which are globally important for the growth process, but which are low in Africa. This shifts the question to why they are low."⁴⁴

At the other end of the spectrum, the empirical evidence weighs heavily in favor of the idea that the income differences between the Asian Tigers and other developing countries is due to capital accumulation (as opposed to productivity growth.) Simply put, the Asian Tigers saved and invested more (see figure 6).⁴⁵ It is still unexplained why these countries had a higher propensity to save and invest than other similar countries. Various reasons have been put forth to explain this—including developmental states, benevolent autocrats, or even cultural reasons, but it remains unclear why providence would favor only this handful of countries.

Figure 6 shows the evolution of real wages and GDP in Africa and Asia from the 1960s to the 1990s.⁴⁶ In 1965, Asia's land productivity (in terms of output per hectare) was more than six times higher than in Africa, but labor productivity (in terms of output per worker) was only 10 percent higher (see table 1). This gap is explained by the fact that Africans were farming more land (6 hectares per worker on average) compared to Asian farmers (1 hectare per worker).⁴⁷ Even then, only 24 percent of Africa's land was being cultivated, compared to 83 percent of Asia's land. The productivity gap widened over the next three decades (from the mid-1960s to the mid-1990s), as Asia's land productivity increased 113 percent against 64 percent in Africa, thereby widening the productivity gap by 23 percent. Asia's labor productivity increased by 135 percent whereas Africa's grew by only 27 percent.

Figure 6. Wages and Productivity Growth in Asia and Africa



Source: Massoud Karshenas, "Agriculture and Economic Development in Sub-Saharan Africa and Asia," *Cambridge Journal of Economics* 25, no. 3 (2001): 315-342, https://www.iese.ac.mz/lib/saber/eaf_007.pdf.

Table 1. Agriculture Productivity in Africa and Asia

	Year	Africa	Asia
Labor/land ratio (population/hectare)	1965	198	1,024
	1994	319	1,358
Percentage of cultivated land	1965	24	83
Output/hectare (kilograms of wheat equivalent)	1965	484	3,112
	1994	794	6,629
	change (%)	64	113
Output/worker (kilograms of wheat equivalent)	1965	2,905	3,234
	1994	3,690	7,608
	change (%)	27	135
Manufacturing wage (U.S. dollars per annum)	1965-1970	861	433
	1975-1980	2,459	901
	1985-1990	2,506	2,037
Consumption wage (purchasing power parity in 1980 dollars)	1965-1970	162	107
	1975-1980	349	206
	1985-1990	494	509

Source: Adapted from Tables 4, 6, and 7 in Massoud Karshenas, "Agriculture and Economic Development in Sub-Saharan Africa and Asia," *Cambridge Journal of Economics* 25, no. 3 (2001): 315-342, https://www.iese.ac.mz/lib/saber/eaf_007.pdf

But perhaps the most instructive data is what has happened to wages. Africa's 1965 consumption wages measured in purchasing power terms were 51 percent higher than Asia's. By the mid-1970s, the gap had widened to 70 percent as Africa's wages rose 115 percent against Asia's 93 percent hike. Only in the late 1980s did Asia's wages catch up. Africa's manufacturing wages, meanwhile, were already twice as high as Asia's corresponding wages in the mid-1960s at \$72 per month. A decade later, African manufacturing wages had increased threefold, while Asia's had jumped twofold, with the effect that Africa's wages in the late 1970s were nearly three times as high as Asia's. Although Asia's wages have grown faster since, Africa's manufacturing wages were still 20 percent higher in the late 1980s.

What might account for these differences? Economist W. Arthur Lewis, in his 1954 seminal classic, *Economic Development With Unlimited Supplies of Labour*, framed the problem of economic development as how to "understand the process by which a community previously

saving 4 or 5 percent of its national income or less converts itself into an economy where voluntary saving is running at about 12 to 15 percent of national income or more.”⁴⁸ As intimated by the title, the Lewisian capital accumulation model turns on a reservoir of labor that is underemployed in a low-productivity subsistence economy such that the supply of labor at subsistence wages exceeds demand.⁴⁹ The introduction of a modern capitalist economic sector is able to attract the surplus labor at wages that are higher than prevailing subsistence wages but well below labor productivity. The modern capitalist economic sector invests the excess profits until the surplus labor is exhausted and the excess profits are arbitrated away by rising wages (see figure 6). Such a phenomenon has been observed most recently in China.⁵⁰

In the Lewisian model, labor is only considered surplus if the workers can be shifted from subsistence farming to another sector without curtailing economic output.⁵¹ Falling output would put upward pressure on food prices and in effect wages too. One study finds that food costs in West Africa are on average 30 to 40 percent higher than in countries with comparable GDP per capita elsewhere.⁵² To illustrate, price data collated by GlobalProductPrices.com show that retail prices of rice in low- and middle-income Asia in March 2022 ranged from \$0.68 per kilogram in India to \$0.97 in Vietnam, whereas it tended to cost more in African countries with prices ranging from \$1.13 in South Africa to \$1.68 in Ghana (with Nigeria being an outlier at \$2.55).⁵³ The Lewisian wage-productivity gap is very much evident in Asia, but not in Africa.

Consider that globally competitive wages for low-skill factory work have been in the order of around \$150 per month on average in recent years. A rough estimate of the monthly food staples consumption requirement for a family of four translates to around 14 percent of monthly wages in India and around 40 percent in Ghana.⁵⁴ From a time allocation perspective, needing to devote nearly half of one’s labor time for a staple is an inordinately high amount. Even with Africa’s low rice yields (about 1.5 metric tonnes per hectare), producing for the yearly needs of a four-person family (around 94 kilograms of rice per person or a total of 375 kilograms) requires no more than one quarter of a hectare and one month of one person’s labor.⁵⁵

Moreover, the wages for an industrial job also come with urban costs of living (rental housing, daily commuting, and utilities) that rural farm households don’t have. It is not difficult to see why the wages that would make it worthwhile to leave the farm for urban employment (reservation wages) would be considerably higher in Ghana than in India. These observations demonstrate that Africa’s relatively high wages are not as inexplicable as they have been said to be.

The Case for Agriculture-led Growth

There are at least three reasons why the case for agriculture-led growth is more compelling for African countries than their prevailing preoccupation with infrastructure and with growth models centered on export-led manufacturing.

First, Africa's low agricultural productivity means that returns on investment will be highest in agriculture. This low productivity, for the most part, reflects a lack of working capital (for buying intermediate inputs including “fertilizer, improved seeds, . . . and pesticides”) rather than fixed investment (in farm equipment, tree crops, and land improvements).⁵⁶ Africa's fertilizer consumption is estimated to be around 20 kilograms per hectare against a global average of roughly 140 kilograms per hectare.⁵⁷ The cost of bridging this 120-kilogram-per-hectare gap would be around \$16 billion per year (assuming a fertilizer cost of about \$600 per metric ton).⁵⁸

The returns on this investment are easy to demonstrate. Estimates suggest that closing the cereal productivity gap with South Asia would increase Africa's cereal output by 214 million metric tons, worth \$46 billion per year at 2019 (pre-pandemic) global cereal prices, equivalent to roughly one-sixth of the region's agricultural GDP (\$315 billion in 2020). Closing the gap with the world average would increase output by 294 million metric tons worth \$64 billion per year, equivalent to 30 percent of agricultural GDP.⁵⁹

Second, because of the predominance of semi-subsistence, small-scale agriculture in Africa, the problems of low agricultural productivity, poverty, and food insecurity are intertwined. If such assistance were properly targeted, governments would get the biggest bang for their buck in terms of productivity growth by helping poor farmers. The productivity difference between neighboring poor and nonpoor farmers with similar land endowments often reflects modest investments highlighted earlier such as shallow wells, a cow or two, or tree crops. Raising agricultural productivity would hit three birds with one stone—spurring growth, reducing poverty, and addressing hunger.

Third, virtually all of Africa's agricultural growth presently is from cultivating more land, rather than boosting productivity. The land under cereal production in Africa has increased by about 60 percent since 2000, compared to only around 10 percent worldwide.⁶⁰ New farmland is increasingly in ecologically valuable forests and rangelands and is also a cause of resource conflicts between farmers and pastoralists. Notably, Africa accounts for a significant percentage of global losses of forests over the last two decades, despite having less than 20 percent of the world's forests.⁶¹

The case for agriculture-led growth does not imply that Africa does not need infrastructure investment. Agriculture-led growth itself requires considerable investment in infrastructure. Consider irrigation. A study by the International Food Policy Research Institute estimated a decade ago that only around 3.5 percent of sub-Saharan Africa's cultivated land was

irrigated, compared to the global average of nearly 18 percent. The study reported that irrigation contributed 24.5 percent of the value of agricultural production in sub-Saharan African on average, which means that an irrigated hectare generates seven times the value of a rain-fed one on average.⁶² Many African farmers would be perplexed to hear that international experts have concluded that electricity is a bigger priority than water for irrigation.

But more so than infrastructure, agriculture-led growth requires public goods and services traditionally provided by governments, including (notably) research and extension services as well as policies and institutional development to address pervasive market failures. This imperative is recognized at the highest policy levels. After all, that is why African heads of state adopted the Maputo Declaration and the Malabo Declaration and tasked the African Union with publishing a biannual review on progress toward meeting the Maputo Declaration's 10 percent budget pledge. All of these moves are testaments to the stated importance of investment in agriculture, though progress on reaching these goals has repeatedly stalled.

The United Nations' Food and Agriculture Organization estimates that the thirteen countries they studied spent on average 6 percent of their budgets on agriculture and food resources between 2004 and 2018—short of the 10 percent goal.⁶³ This financing gap of 4 percentage points is significant but is also well within the resource capacities of multilateral development finance institutions like the World Bank, the African Development Bank, and the International Fund for Agricultural Development. This amount is just a fraction of the previous calls for \$130 billion to \$170 billion in infrastructure investment.⁶⁴ In 2018, the African Development Bank reported that infrastructure financing commitments had reached \$100 billion.⁶⁵

Will African Leaders Turn Words Into Actions?

The availability of private capital for infrastructure financing and Africa's improved access to international capital markets ought to have freed multilateral lenders to focus on poverty reduction (a task for which raising the productivity of the poor is perhaps the most critical imperative). Thus, the question that must be confronted is how and why the infrastructure agenda leapfrogged Africans' need for an agricultural transformation.

The reason could be because the global development community and African governments alike are much too enamored and preoccupied with Southeast Asia's model of growth fueled by low-cost manufacturing. But that export-led model is by no means the only viable development model. Latin America has plenty of countries rich in land and resources that have pursued agricultural export-led growth and achieved comparable income levels and

standards of living. It would be interesting to know how many of the African policymakers that are so fond of study tours to Thailand (with a 2020 per capita GDP of \$7,200) and Malaysia (\$10,400) have explored countries like Costa Rica (\$12,200), Chile (\$13,200), and Uruguay (\$15,400).⁶⁶

These relatively higher incomes have been achieved at relatively low levels of industrialization, comparable to sub-Saharan Africa, with a manufacturing share of GDP of 9 percent in Chile, 11 percent in Uruguay, and 14 percent in Costa Rica (whereas the measure for sub-Saharan Africa is 12 percent and is 25 percent for East Asia).⁶⁷ These Latin American countries also received higher ratings on human development than the Asian Tigers. The 2020 Human Development Index ranked Chile at 43 and Uruguay at 55, putting them both significantly higher than Malaysia (which tied with Costa Rica at 62); meanwhile Thailand (ranked 79) fell below Chile, Uruguay, and Costa Rica.⁶⁸

Notably, the Asian development model of export-led growth is generally held up as equitable, while Latin America tends to be associated with extreme inequality. This conventional wisdom is not borne out in the facts. The income share of the poorest 20 percent of the population is roughly the same in Chile (5.7), Uruguay (5.6), and Malaysia (5.8), while somewhat lower in Costa Rica at 4.3 percent and higher in Thailand at 7.5 percent. By comparison, the income share of Brazil's poorest 20 percent is 3.6 percent and South Africa's figure is 2.4 percent.⁶⁹ The per capita consumption of the bottom 40 percent of the population measured in terms of purchasing power parity (2011 U.S. dollars) in Chile (\$8.85) and Uruguay (\$10.66) is comparable to Malaysia's figure (\$10.98), and those of Costa Rica (\$7.16) and Thailand (\$7.29) are also similar. By comparison, these figures rank well above those of Brazil (\$5.71) and China (\$4.26).

To conclude, the Asian Tigers' export-led industrial takeoff is a reflection of the region's factor endowments, namely an abundance of labor relative to land. Conversely, Africa's relatively high wages compared to those of other destinations competing in the area of labor-intensive export manufacturing reflect the continent's factor endowments, namely abundant land relative to labor. This prognosis accords with the somewhat forgotten Lewisian labor supply model of economic takeoffs and is also consistent with the canonical factor endowments (Heckscher-Ohlin) theory of comparative advantage in international trade theory.⁷⁰ This perspective challenges the infrastructure-led growth paradigm that is all the rage now. It is no surprise that Africa's massive industry-focused infrastructure investment drive of the last two decades has precipitated debt distress rather than accelerated growth, given that the industry-focused investments, such as massive electric power projects, are not aligned with Africa's comparative advantage.

The factor endowments effect is compounded by Africa's low agricultural productivity, which makes food expensive and renders globally competitive low-skill wages unattractive compared to those for subsistence food production. It is difficult to see how Africa can engender competitiveness other than by a broad-based increase in agricultural productivity. Yet while African policymakers recognize this, they seem unable to resist the allure of industrial miracles.

The widely held view that the East Asian model is the silver bullet for economic transformation is also called into question by the successful agriculture-led transformations in Latin American countries whose factor endowments are similar to those of sub-Saharan Africa. African policymakers should embrace a more pragmatic stance on economic agenda setting along the lines of former Chinese leader Deng Xiaoping's famous dictum: "black cat or white cat, if it can catch mice, it's a good cat."⁷¹

About the Author

David Ndi is a Kenyan economist. He has worked as an economist for the World Bank, a policy adviser for the governments of Kenya and Rwanda, and a public finance expert on the Kenyan constitutional review process. He also co-founded and served as chief executive of the Institute of Economic Affairs, Kenya's first economics think tank. He holds a doctorate in economics from the University of Oxford and is a Rhodes Scholar and Eisenhower Fellow. In October 2022, he was appointed chairperson of the President's Council of Economic Advisors.

The piece was written while the author was an independent analyst, before they joined the Government of Kenya. The views represented herein are those of the author and do not necessarily reflect the views of Carnegie, its staff, or its trustees.

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