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ACHIEVING FOOD SECURITY IN AFRICA: WHAT PROSPECTS LIE AHEAD?

Challenges and Opportunities

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Africa has strong prospects for achieving food security within a generation—provided its leadership effectively mobilizes domestic and foreign funds, drives strategic investments, and strengthens institutions that incentivize smallholders and other stakeholders to invest in resilient, high-productivity agriculture amid accelerating climate change.

This is undoubtedly a tall order. However, the time is now to seize the golden opportunity of regional market integration through the African Continental Free Trade Area (AfCFTA) as a catalyst for sustainable and inclusive agricultural transformation. Such a transformation can create powerful linkages across the economy, thereby fostering job-generating growth, particularly for youth, women and other marginalized groups.

African leadership stands at a crossroads: harness the continent's vast potential—including its human capital—or continue with business as usual, risking a devastating human toll. While the challenges are substantial, successful experiences of market integration elsewhere suggest that transforming agriculture and agrifood remains a "low hanging fruit."

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INTRODUCTION: SCOPE AND ORGANIZATION

Africa is a diverse continent comprising 54 countries, spanning a broad economic spectrum from low to high-income categories.[1] As of January 2025, 22 countries are classified as low-income countries (LICs), with 17 listed as fragile and conflict-affected states (FCS) (World Bank, 2025). Additionally, 23 countries fall into the lower-middle-income category, and Africa is home to 12 of the world's fastest-growing economies projected for 2024.[2] The continent's two highest-income countries in 2023 are island economies: Seychelles, with a GNI per capita of USD 16,940, and Mauritius, at USD 11,530. In contrast, sub-Saharan Africa's (SSA) average GNI per capita stands at USD 1,642, with the lowest-income countries averaging USD 769 (WDI, Atlas method, current USD).

Agriculture remains a crucial sector, contributing between 12 and 23% of GDP, depending on the country. In sub-Saharan Africa, agriculture is predominantly rainfed, with significant irrigation structures only in North Africa. As economies develop, the downstream stages of primary agriculture—agrifood and agribusiness—become increasingly important.[3] In the context of climate change, precipitation patterns and water management play a defining role in shaping agrifood development and, consequently, food security. Africa's diversity extends beyond economics to historical legacies, regional dynamics, and socio-economic partnerships, all of which influence its agricultural development.

This policy paper takes a developmental perspective, focusing on key factors that influence Africa's ability—or inability—to achieve a fundamental milestone of progress: ensuring food security. Specifically, Section I of this paper will assess the current state of hunger and food security in Africa. Section II will clarify various popular concepts of food security and their relevance for policy formulation and implementation. Section III will examine key aspects of Africa's agriculture,[4] including major agroecological zones, contributions to GDP, growth and productivity trends since 2000, and critical resource base features, particularly in the context of climate change. The downstream agrifood and agribusiness sectors will also be considered where relevant. Section IV will identify three major trends shaping both the challenges and opportunities in African agriculture and agrifood. Section V will explore two contrasting scenarios—one optimistic, the other pessimistic—to assess the continent's prospects. In a post-pandemic world marked by continuous crises and geopolitical fragmentation, predicting the future is impossible. However, by identifying key forces, leadership and stakeholders can take strategic action to advance food security.

1. World Bank Country income groupings, GNI/cap. USD, FY 2025: Low: less than1,145; Lower-middle: 1,146-4,515; Upper middle: 4,516-14,005; High: greater than 14,005.

2. These are (% growth rate in descending order): Niger (12.8%); Senegal (8.8%); Rwanda (7.5%); DRC (6.5%); Côte d'Ivoire (6.5%); Ethiopia (6.4%); Benin (6%); Uganda (6%); Guinea (5.8%); Guinea-Bissau (5.6%); Tanzania (5.5%); and Liberia (5.4%) (reddit, Africa). Chart by Alexander Onukwe/Semafor. https://www.reddit.com/r/Africa/comments/19dhssa/the_10_predicted_highest_growth_economies_in/
These countries are included in the categories of low and lower-middle income countries.

3. Agribusiness is estimated to contribute to SSA's GDP by 17% and to 52% of its employment (IFC, 2023).

4. For the purposes of this paper, he term "agriculture" refers to primary agriculture and agrifood/agribusiness.

I. STATE OF HUNGER AND FOOD INSECURITY IN AFRICA.

Chronic hunger and food insecurity remain at crisis levels in 21st century Africa. The continent is not on track to achieve Sustainable Development Goal (SDG) 2, the United Nations' goal of zero hunger by 2030, despite steady improvements between 2000 and 2010. Millions of Africans have yet to "escape hunger and premature death" (Fogel, 2004).

As of 2023, an estimated 20.4 % of Africa's population (approximately 298.4 million people) suffers from chronic hunger, compared to 8.1% in Asia, 6.2% in Latin America and the Caribbean, and 7.3% in Oceania (FAO et al., 2024). Following the Covid-19 pandemic, the prevalence of undernourishment (PoU) in Africa has been rising, with moderate to severe food insecurity affecting 58% of Africans—nearly double the global average. In 2022, an estimated 868 million Africans experienced moderate or severe food insecurity, with 342 million classified as severely food insecure. The crisis is particularly severe in Central, Eastern and Western Africa.

Beyond hunger, micronutrient deficiencies and health problems among vulnerable groups present alarming long-term consequences, particularly for cognitive development, productivity, and health resilience, especially in children under five. As of 2022 (unless stated otherwise):

- 13.9% of newborns had low birth weight (2020)
- 44.3 % of infants benefit from exclusive breastfeeding[5] (2021)
- 30% of children under five were stunted (low height-for-age)
- 6.8% were wasted (low weight for height)
- 4.9% were overweight
- 38.9% of women (15-49 years old) were anemic (2019).

The affordability of a healthy diet remains a significant challenge, with approximately 78% of Africans (around one billion people) unable to afford nutritious food in 2021, far exceeding the global average of 42%. The average cost of a healthy diet rose 5.6% from 2020 to 2021, even before the Russia-Ukraine war (February 24, 2022) exacerbated food price volatility. Looking ahead, projections indicate that 582 million people will be chronically undernourished by 2030, with more than half residing in Africa.

II. DIFFERENT CONCEPTS OF FOOD SECURITY AND WHY THEY MATTER

What Food Security Means at a Personal Level

For most individuals, being food secure means having the ability to buy or otherwise obtain the foods we want and need to maintain a healthy and active life. It also means having the assurance that this access is stable, regardless of economic downturns or crises, because of sufficient purchasing power, access to nutritious food, and a reliable safety net.

Typically, people focus on the price and quality of food, rarely concerning themselves with whether it is imported. However, during difficult times—whether due to economic downturns or violent

5. Exclusive breastfeeding has the single largest impact on a child's mortality as it provides the essential, irreplaceable nutrition for a child's growth and development. It serves as a child's first immunization and it also has a protective effect against obesity and certain non-communicable diseases (NCDs) later in life (WHO, UNICEF, 2014).

conflicts—any concern about our ability to afford or access food constitutes food insecurity, even if temporary. Food security, therefore, exists on a spectrum ranging from no concern at all to constant worry about accessing adequate food.

What Food Security Means at National Levels: Three Key Concepts

At national level, governments often pursue food security through different policy approaches, including Food Self-Sufficiency (FSS) and Food Sovereignty (FSY).

1. Food Self-Sufficiency (FSS) refers to a country's ability to produce all the food it consumes, particularly staple foods, without relying on imports.
2. Food Sovereignty (FSY) is defined as "the rights of peoples to healthy and culturally appropriate foods produced through ecologically sound and sustainable methods, and their right to defend their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations" (Declaration of Nyéléni, 2007).

Both concepts hold strong nationalistic appeal, yet they do not address key aspects such as the adequacy, nutritional quality, price stability, and affordability of food—both in times of stability and of crisis. In contrast, the holistic concept of food security (FSH, as defined by the FAO) does not favor a specific method of achieving food security. In contrast, FSS and FSY are political-economic approaches that emphasize trade protectionism, isolationism, and independence from multi-national corporations and foreign markets.

(Diagram 1 provides an overview of food security's key dimensions, including its main concepts, pillars, goals, and policies.)

The holistic concept of food security (FSH)

Unlike FSS and FSY, the FAO's holistic concept of Food Security (FSH) defines it as:

"A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life."

Also referred to as Food and Nutrition Security (FNS), this multidimensional approach requires the simultaneous fulfillment of four key dimensions:

1. Availability – Ensuring sufficient food supply.
2. Access – Guaranteeing purchasing power for consumers.
3. Utilization – Providing nutritionally adequate food.
4. Stability – Maintaining stable and affordable food prices over time.

Compared to FSS and FSY, the holistic concept of FSH presents a more comprehensive approach. In today's turbulent world, marked by geo-political tensions and violent conflicts, concerns about dependence on foreign trade are understandable. However, achieving comprehensive food security is far more complex than focusing on staple crops and reducing food imports at any cost. Food security is multidimensional—it requires both short- and long-term strategies, quantitative and qualitative improvements, and the recognition that food is both a private and public good. Many African governments, both north and south of the Sahara, have embraced and pursued FSS and FSY, yet they have neither fully achieved these goals nor achieved FSH.

FSS does not equate to FSH: The State of Hunger and Food Insecurity in Post-Pandemic Africa

A review titled "The Political Economy of Food Self-Sufficiency Policies and Food Security in African Countries" (Bouët et al., Jan 2025) found that "food self-sufficiency is neither a necessary nor a sufficient condition for achieving all the dimensions of food security. Food security is a multidimensional concept, and only two dimensions—availability and utilization—seem to be affected by food self-sufficiency in Africa."[6] In fact, Africa has fallen short in all four dimensions of food security, as highlighted by its evaluation in terms of:

1. Availability: This refers to the number of calories per capita per day versus the minimum dietary energy requirement (MDER) per day (2000 calories) and the average dietary energy requirement (ADER) of 2500 calories. From 2010 to 2019, half of African countries fell below ADER.
2. Access: This is measured by the PoU. Between the 2000-10 and 2010-20 periods, PoU increased from 15% to 20% of the population.
3. Utilization: This involves (i) the number of children under five years old who are stunted. Between 2000-10 and 2010-19, the rates decreased from 40% to 33% but this is still the highest rate in the world. (ii) Another important indicator is the prevalence of anemia among women of reproductive age (age 15-49), which remained high, around 40 % from 2000 to 2019.
4. Stability: This dimension is reflected in the average growth rate of the consumer price index between the 2000-10 and 2010-20 periods. Africa remains the region most vulnerable to shocks compared to other regions. Except for Senegal, the volatility levels (2000-19) in the eight focus countries were higher than the African average. During the 2010-2020 period, food price variations ranged from 2% (lowest in Senegal) to 12% (highest in Nigeria).

Causal links between FSS and FSH are complex not uni-directional: Is promoting food self-sufficiency in basic food commodities always misguided? No, as demonstrated by a few highly performing yet vastly different economies.

Mauritius, an island economy and one of Africa's best-performing nations, imports most of its staples, such as rice, flour, and vegetable oils, but promotes self-sufficiency in fresh tropical vegetables and fruits. War-torn Taiwan, China, under General Chiang Kai Shek's leadership,[7] implemented a highly acclaimed land reform (1949-53) (Shen, 1970), which laid the foundation for a successful transformation of its agriculture, industry, and overall economy (Tsakok, 2011). Today, Taiwan, China, is recognized as one of the four Asian Tigers.[8]

In some cases, concern about FSS is entirely irrelevant, as seen in Singapore. This high-income city-state, with a GNI per capita of USD 70,590 (2023, Atlas Method) and a high Human Capital Development Index, is food secure despite not being food self-sufficient. Singapore imports its food from around the world (World Bank, July 2024).

The European Union (EU), now comprising 27 members, pursued FSS for decades. Its founding members—Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany—rebuilt war-

6. While many of its estimates are Africa-wide, this review selected eight focus countries: Ghana, Kenya, Mozambique, Nigeria, Rwanda, Senegal, Tanzania, and Uganda for more detailed analyses. In North Africa, the governments of Morocco, Tunisia, Algeria, Libya, and Egypt have all been major proponents of food self-sufficiency as a strategy for achieving food security. Despite this, they are today major importers of wheat, considered a critical basic consumption item and millions are food insecure.

7. Chiang Kai Shek, born October 31, 1887, in Ningbo, China, died April 5, 1975, in Taipei, Taiwan. He was head of the Chinese Nationalist Government, in exile in Taiwan. He was a soldier, general and statesman.

8. The other three Asian Tigers are Singapore, Hong Kong and South Korea.

torn Europe through the Treaty of Rome (1957), which laid the foundation for the Common Market and the Common Agricultural Policy (fully operational in 1962). Their goal was not only to rebuild agriculture but also to revitalize industries and entire economies. By the late 1970s and early 1980s, the Common Market was overwhelmed by "mountains of butter and lakes of milk." By then, the EU had achieved a high level of food security.

The key developmental point here is not to endorse any particular socio-economic strategy or policy but to illustrate that the pursuit of food security is synonymous with nation-building through economy-wide transformation, often requiring the successful modernization of agriculture. Moreover, in economies where agriculture constitutes 10% or more of GDP, transforming agriculture and the agrifood sector is necessary but not sufficient. If even a well performing agricultural sector is inadequate on its own, then limiting the pursuit of food security to promoting basic staples is misguided—it is far too narrow.

III. SELECTED FEATURES OF AFRICA'S AGRICULTURE UNDER CLIMATE CHANGE[9]

Major Agroecological Zones (AEZs) Under the Threat of Climate Change

Africa is a vast continent with five broad AEZs:

1. Hot and dry desert, e.g., the Sahara, Kalahari.
2. Warm and semi-dry—semi-arid, e.g., the Sahel.
3. Warm, humid and sub humid—high rainfall areas e. g., the Congo Basin and coastal West Africa.
4. Cooler and humid—e.g., parts of East Africa.
5. Sub-tropical—distinct seasons with hot summers and cool, wet winters, e.g., the Mediterranean climate in Morocco and the Western Cape in South Africa.

Except for Zone 1, agriculture and livestock rearing occur across all these zones. The vast semi-arid areas, such as the Lake Chad Basin (LCB) and the Greater Horn of Africa (GHA),[10] are particularly vulnerable. In August 2024, climate change inflicted devastating floods and droughts in the LCB, which "damaged and destroyed hundreds and thousands of hectares of farmland, killed thousands of livestock, and rendered fishing unsafe for fishermen" (Lyammouri et al., December 2024). Meanwhile, climate change created ideal conditions for desert locust swarms[11] in the GHA (2018-21), devastating vegetation and worsening food insecurity for millions already suffering from violent conflicts. Climate models predict that desert locust outbreaks will become more frequent in the future (UNU-EHS, 2023).

The wetter Zones 3 and 4 receive more rainfall than Zone 2 but still suffer from rising temperatures, which increase the spread of pests and diseases and intensify extreme weather events that destroy homes and livelihoods. The rainy season in West and Central Africa usually runs from June into September, but in 2024, heavy rains continued into November, causing flooding in central and southern Chad, northern Cameroon, Guinea, Guinea-Bissau, central and southern Mali, southern Niger, northern Nigeria, Senegal, and northern Sierra Leone. Precipitation data compiled by the

9. As before, the term agriculture refers to primary agriculture and processed agriculture, agrifood or agroindustry.

10. The Greater Horn of Africa includes parts of Djibouti, Ethiopia, Eritrea, Kenya, Somali, South Sudan, Sudan and Uganda.

11. These locust swarms also spread eastward into Yemen, India, Pakistan and Iran (UNU EHS).

World Bank for these nine countries indicates that this is not an anomaly but part of a five-year trend of increased rainfall (African Center for Strategic Studies, December 2024).

Coastal zones are also affected. Sea levels in Africa are rising at 5 mm per year, above the global average of 3-4 mm per year, threatening Mauritius, Seychelles, and Madagascar. Meanwhile, 56% of coastlines in Benin, Côte d'Ivoire, Senegal and Togo are eroding, undermining the livelihoods of coastal populations.

The Mediterranean regions of Morocco and southwestern South Africa are experiencing declining precipitation, a trend expected to continue, according to the Intergovernmental Panel on Climate Change (IPCC). Across Africa, agricultural yields are low and growing at a slower rate than the global average, despite regional variations (Dabalen et al., September 2024). Under a worst-case climate scenario, mean agricultural yields are projected to decline further by mid-century:

- 13% in West and Central Africa
- 11% in North Africa
- 8% in East and Southern Africa (United Nations Climate Change, Oct. 2020).

Since African agriculture is primarily rainfed (except in Egypt), it is particularly vulnerable to water scarcity and variability. The impact of climate change makes it abundantly clear that water management and control are the lifeblood of agriculture. Without water, there is no life—but with climate change, both scarcity and overabundance of water threaten food production and livelihoods.[12]

Importance and Performance of Agriculture (since 2000) and Key Features of its Resource Base

Low and lower-middle income economies in Africa remain agriculture-based. Depending on the country, agriculture contributes 12%–23% of GDP,[13] employs up to 60% of the workforce, and is the major employer of youth (aged 15-24), who make up more than 30% of the labor force.[14]

Despite accelerating climate change, African agriculture has improved significantly compared to its precarious state in the 1980s when total factor productivity (TFP) growth stagnated.

- 1981-1990: TFP annual growth rate was 0.5 %.
- 1991-2000: Growth increased to 1.1 %.
- 2000-12: Growth accelerated to 2% per year.

However, these aggregate figures mask significant regional and national variations. Between 2008 and 2014, agriculture grew by an average of 2.6% per year, but 15 countries, including Ethiopia, Rwanda, Kenya, Tanzania, Lesotho, and Sierra Leone, achieved annual growth rates of 6% or higher. Other countries, such as Guinea, Nigeria, and South Africa, experienced negative growth (Jayne et al., December 2017).

Post Covid-19 and the Russian invasion of Ukraine in February 2022, economic growth stalled across Africa. This double shock reduced African agricultural labor productivity by 0.2% in 2022

12. The first significant warnings about climate change according to the IPCC (established in 1988) were issued in their first report, published in 1990. The sixth assessment report was finalized in March 2023.

13. In 2013, agriculture employed 65-70% of sub-Saharan Africa's labor force and contributed to 30-40% of GDP (World Bank, 2013).

14. Young people, 16-34 years of age, constitute almost 60% of the labor force in SSA. For the working age population, age 15-64, engaged in agriculture at least half of their work time, the average age ranges from 36-42 (Jayne et al., 2017).

(African Union and ECA, 2022). The resource base of African agriculture plays a crucial role in determining productivity performance. The key factors influencing this resource base include:

- Land: The notion of land abundance in Africa is a myth.[15] Land pressure continues to rise due to increasing demand from international and national companies, as well as urban-based medium- to large-scale farmers. The number of 5–100-hectare farms has been growing rapidly (Jayne et al., 2017), yet farms under 5 hectares still dominate, constituting about 90% of all farms in sub-Saharan Africa.

  With mounting pressure on land, fallow periods have shortened, accelerating land degradation and undermining soil fertility. Most farmers lack access to organic materials needed to improve soil composition (Jayne et al., December 2017). The Sahel is among the most affected regions, suffering from soil degradation caused by wind erosion, drought and declining rainfall, as well as anthropogenic factors, such as population growth, agricultural intensification, and overgrazing (Doso, 2014; European Union Library, 2022).

  However, research on Colombia and SSA by Heath and Binswanger (1996) suggests that land degradation is largely policy-induced, driven by policies that restrict access to land, favor large-scale farmers, and create land tenure insecurity for smallholders. According to the Boserup hypothesis, population density does not necessarily lead to land degradation—and evidence from Africa supports this.[16] The Boserup effect, combined with improved market access, can drive (i) more intensive land use; (ii) a shift from hand-hoe to plough; (iii) increased use of organic and inorganic fertilizers; (iv) adoption of integrated crop-livestock systems; (v) investment in land and irrigation facilities; (vi) higher agricultural labor use; and (vii) greater agricultural production per unit area. Thus, under a supportive policy framework that incentivizes smallholders to invest in soil fertility, land pressure does not have to lead to massive land degradation.

- Water: To address water scarcity and unreliability, SSA can tap into its abundant groundwater reserves, which remain largely underutilized. Currently, groundwater irrigation accounts for only 1% of irrigated agriculture in SSA, compared to 14% in Asia (Srivastava et al., August 2024). Overall, irrigated agriculture makes up just 3-5% of total agricultural land in SSA. (See Box 1: Ethiopia—Irrigable Potential and the Awash Basin for an example of the factors needed to properly utilize valuable water resources). Across Africa (including North Africa), only 13 million hectares of arable land are under irrigation, representing just 6% of total cultivated land, compared to 37% in Asia and 14% in Latin America. Two-thirds of Africa's irrigated land is concentrated in just five countries: Egypt, Madagascar, Morocco, South Africa and Sudan. According to FAO projections, by 2030, SSA's irrigable area could expand by up to 40 million hectares, particularly in Malawi, Ethiopia, Zambia, and Swaziland (D.I.E., 2017).

- Labor: The quality of smallholder labor—including nutrition, health, and education levels—is often underestimated as a key driver of labor productivity. Economic historian Robert Fogel highlighted the importance of nutrition, stating: "I have estimated that when labor input is adjusted for intensity (measured by calories), improved gross nutrition accounts for roughly 30

15. An estimated 91% of SSA's remaining arable land is concentrated in nine countries including Angola, the Democratic Republic of Congo, and Sudan, most of which are politically fragile states (Jayne et al, 2017).

16. For example, the rangelands of Tanzania and Botswana, the Machakos district of Kenya, and smallholder settlements in Zimbabwe illustrate different agricultural landscapes. In comparing the dense smallholder farming of the Machakos district, it becomes clear that dense population alone does not automatically lead to land degradation. In the degraded areas of Ethiopia, smallholders faced a very disincentivizing environment, which included limited rural infrastructure, poor access to domestic and international markets, limited non-farm or urban employment opportunities; and lack of tenure security (both ownership and usufruct rights) under the Haile Selassie and the communist Derg regime. Additionally, there was no access to improved agricultural technologies, including advanced soil management techniques.

per cent of the per capita growth in Britain between 1790-1980" (Fogel, 1993, 2004).[17] Other economic historians, such as Floud et al. (2011), have also argued that sustained improvements in nutrition, combined with the adoption of more productive technologies, were crucial factors in both the agricultural and industrial revolutions in the West. Beyond nutrition, gender disparities in agricultural productivity remain significant in Africa.[18] Studies show that female farmers face discrimination in access to productive inputs and are constrained by restrictive social norms and practices (Buehren, 2023). While women may not be the majority group in agricultural labor, they play a substantial role, contributing an estimated 40% of crop production in SSA (Palacios-Lopez et al., 2017).[19] Education levels are another critical factor. Most agricultural workers in SSA have not completed primary education, particularly women,[20] and secondary education remains limited across the region. This low level of literacy and education is increasingly problematic, as future agriculture will become more knowledge- and technology-intensive (Jayne et al., 2017).

IV. MAJOR TRENDS SHAPING CHALLENGES AND OPPORTUNITIES FOR AGRICULTURE

There are three major trends of crucial importance to African agriculture: (i) climate change, (ii) Africa's rapid population growth and urbanization, and (iii) rising land scarcity and widespread human-induced soil degradation in densely populated rural areas.

Climate Change, an Inexorable Global Force: The most significant megatrend affecting African agriculture is climate change, with the rate of temperature increase accelerating in recent years. Although Africa has contributed only an estimated 2-3% of global greenhouse gas (GHG) emissions[21] from industrial sources, it remains the most vulnerable continent to climate change (UN, 2006).

Africa is particularly vulnerable to climate change because agriculture remains a major contributor to its GDP, with most farming being rainfed. As a result, its agricultural productivity growth has declined by 34% since 1961 due to climate change. Additionally, widespread poverty weakens resilience, making it harder for communities to adapt.

In 2022, more than 110 million people were directly affected by climate-related hazards, resulting in 5,000 reported fatalities—48% due to drought and 43% due to flooding. Moreover, climate change, coupled with a rapidly deteriorating resource base, has intensified conflicts over scarce productive land, water and pastures. In particular, farmer-herder violence has escalated over the past decade or so, driven by growing competition for diminishing resources (World Meteorological Organization, September 2023).

Africa's Rapid Population Growth, Youth Bulge and Increasing Urbanization: Africa's population has surged from approximately 140 million in 1900 (9% of the global population) to an estimated 1.4 billion today, with projections reaching 2.5 billion by 2050—around 25% of the world's population

17.Robert William Fogel (July 01, 1926-June 11, 2013) was Nobel Laureate in 1993.

18. Large gender gaps in agricultural productivity for six countries in Sub-Saharan Africa are: Ethiopia (23 percent), Malawi (25 percent), Niger (19 percent), Nigeria (North: 4 percent, South: 24 percent), Tanzania (6 percent) and Uganda (13 percent). Recent women empowerment diagnostic reports in Nigeria and Democratic Republic of the Congo (DRC) reveal gender gaps of 30 percent and 11 percent respectively (World Bank, 2022; World Bank 2021). (AGRA Agriculture Status Report 2023)

19. Living Standards Measurement Survey data was gathered in six countries: Ethiopia, Malawi, Niger, Nigeria, Tanzania and Uganda, during 2009-2011. Together, these six countries make up roughly 40% of SSA population. (Palacios-Lopez et al, Feb 2017)

20. In 2005, secondary school enrollment in Sub-Saharan African countries averaged only about 30 percent, compared with 65 percent for developing countries worldwide, and close to 100 percent in East Asia. (Verspoor, et al, 2008)

21. GHG refers to Green House Gas.

(IMF, 2023). The continent's total fertility rate (TFR) remains high at around 4 births per woman,[22] compared to the global average of 2.2. More than half of the world's countries have a TFR below 2.1, the replacement rate. Notably, 60% of Africa's population is under 25 years old and by 2030, 42% of the world's youth will be African.

Africa's urbanization has accelerated at an annual growth rate of 3.5 %, with 60% of its population expected to be urban by 2050. Since 1990, the number of African cities[23] has more than doubled, from 3,300 to 7,600, adding 500 million urban residents. Africa's cities are not only the fastest growing in the world but also the youngest and most rapidly evolving (AfDB, April, 2022). Despite this rapid urbanization, Africa remains the only region where both the rural population and rural youth will continue to grow beyond 2050 (Jayne et al., 2017).

Rising Land Scarcity and Massive Soil Degradation: In over 40 SSA countries classified as land-constrained, the average smallholder farm size has decreased by 30%-40%. For example, in Kenya, Malawi, Mozambique and Zambia, at least 25% of smallholders now control less than half a hectare, approaching landlessness. The situation is even more severe in Ethiopia and in Rwanda.

As farm sizes shrink, many farmers respond by continuously cropping their fields without crop rotation, shortening fallow periods, and neglecting sustainable land management techniques. The Malabo Montpellier Panel (2014) reported that 65 % of SSA's arable land is already degraded, resulting in more than USD 68 million in annual income losses.

As Gordon Conway[24] highlighted, this burden falls primarily on poor smallholders: "The burdens caused by Africa's damaged soils are disproportionately carried out by the continent's resource-poor farmers." (IISD, Dec 2014). Moreover, the loss of micronutrients and soil organic matter cannot be fully offset by conventional inorganic fertilizers, meaning that smallholder crops grown in depleted soils fails to realize yield gains from plant genetic improvements (Jayne et al., 2017).

Challenges Facing SSA smallholders Amid These Trends: For decades, smallholder farmers in Africa have faced persistent challenges,[25] but the accelerating pace of climate change has turned these challenges existential. The compounding effects of the Covid-19 pandemic, the global supply disruptions of 2021, and the Russian invasion of Ukraine in 2022 further exacerbated an already fragile environment, leading to soaring food prices and market collapses.

The increasing unpredictability of rainfall—whether too much or too little—has further heightened the risks of rainfed agriculture. Given that smallholders make up 80% of SSA's farmers and 70% of its population, the systemic weaknesses they face make their farming even more precarious. These conditions include a lack of access to (i) irrigation facilities; (ii) research and extension services on climate-smart agricultural techniques; (iii) credit to finance production inputs such as improved seeds and inorganic fertilizers. The lack of enforceable tenure security (including usufruct rights) over their land undermines their ability to use it as collateral for raising credit; (iv) road and other

22. The TFR in Africa averaged 6.6 in 1980. In North Africa, the TFR dropped from an average of 6 to 3 during the same period.

23. There is no agreement on the population size necessary to constitute a city versus a town. The United Nations accepts whatever definitions countries use. The widely accepted concept is that cities have "bigger populations and are denser." To make inter-country comparisons, the World Bank proposes 50,000 inhabitants at least, with a density of 1,500 inhabitants or more per km2. for cities. For towns, population sizes range from at least 5000, with at least 300 per km2. The global breakdown between urban versus rural population (2023) is set out in WDI Urban population as % of total population. The % urban ranges from low levels of 15% in Burundi, and 23% in Ethiopia, to high levels of 91% in Gabon, and 75% in Algeria. The average for SSA is 43% (WDI, 2023).

24. Sir Gordon Conway (July 06, 1938-July 30, 2023) was Chair of the Malabo Montpellier Panel.

25. There is a long-standing and extensive body of literature on the trials and tribulations faced by smallholders in the low productivity agriculture of Africa. Recent examples from African professionals include Oyewole Babafemi (September, 2022) and Africa Agricultural Status Report 2023- Empowering Africa's Food System (AGRA, 2023).

marketing infrastructure, as well as the dissemination of timely market information; and (v) lucrative markets. In sum, smallholders operate in low-input, low-output systems. It is no surprise that "over 80% of smallholder farmers still produce at the subsistence level" (Oyewole, Sept 2022).

The high population pressure on their farms, including the need to productively and fully employ youth, further contributes to farm fragmentation and soil degradation. As a result, smallholders remain trapped in a vicious cycle of low productivity, poor nutrition, and precarious livelihoods. Other than their labor, they have virtually no control over the key factors that determine their land's productivity. Their main challenge is how to break out of this vicious cycle of interlocking constraints.

Broad Consensus on Challenges and the Need for a Sustainable Green Revolution (SGR): To break this vicious cycle, African smallholders urgently require sustained support. There is broad consensus among policy analysts and policy makers on the array of factors trapping smallholders in low productivity and high poverty. Addressing these challenges effectively should be and is a priority for African governments. Since its founding in 2006, the Alliance for a Green Revolution in Africa (AGRA),[26] whose mission is to transform African agriculture, has actively pursued this goal, as reflected in the following statement:

"AGRA has supported more than 400 projects, including efforts to develop and deliver better seeds, increase farm yields, improve soil fertility, upgrade storage facilities, improve market information systems, strengthen farmers' associations, expand access to credit for farmers and small suppliers, and advocate for national policies that benefit smallholder farmers (FARM[D]).

The major reasons why "Sub-Saharan Africa still struggles to achieve a sustainable Green Revolution, with cereal yields far below other regions" (Otsuka et al., January 2025), include the following:

A. Factors outside agriculture over which smallholders have virtually no control:

- Recurrent shocks like extreme weather events due to climate change, the Covid-19 pandemic, outbreaks of pests and diseases, supply chain disruptions, and violent conflicts.
- Chronic underinvestment at the macro level in public goods (e.g., electricity, road networks, marketing infrastructure, ICT) and services (e.g., agricultural research, extension, basic education, and training) that smallholders need to improve productivity, afford better nutrition, protect themselves, and sell profitably.

B. Factors within agriculture impacting on smallholders' ability and incentives to invest on- and off-farm:

- Secure land tenure rights, including usufruct rights, are either non-existent or non-enforceable. As AGRA (2023) clearly stated: "In many African countries, there are still complex issues around land ownership and rights emanating from matriarchal and patriarchal systems. Many African farmers do not have formal titles to their land, or insecure land tenure, which can lead to insecurity and inhibit investment in land."
- Huge reserves of untapped underground water and underdeveloped irrigation potential in SSA limit smallholders' access to and control over water, undermining their incentives to use inorganic fertilizers and improved inputs.

26. AGRA was founded in 2006 by a partnership between the Rockefeller Foundation and the Bill and Melinda Gates Foundation. Since then, its donorship base has expanded to include governments as well as international organizations. A team of mostly African professionals designs and carries out its programs.

- Smallholders have limited access to credit, which prevents them from investing in various stages of their operations, including post-harvest storage facilities that can reduce waste and add value to their primary production.

In sum, the challenges to be overcome are daunting, given the scale and multiplicity of interlocking constraints trapping smallholder households.

Three Problems Stand Out at the National Level—Poor Governance, Debt Distress, And Violent Conflicts: The co-existence of these three challenges makes overcoming the obstacles to promoting an SGR even more daunting.

First, despite some progress, poor governance remains widespread. According to the Mo Ibrahim Index of African Governance (2014-23), the 2023 score is 49.3 (out of 100). While there has been a slight improvement (+1.0) over the past ten years, one sobering finding is that there has been no progress since 2018, well before the post-Covid period of poly-crisis. Two underlying measures of governance—(i) security and rule of law, and (ii) participation, rights and inclusion—have deteriorated. However, two other measures—(a) foundations for economic opportunity; and (b) human rights—have improved (IIAG, 2024).

Second, the financial strength of low- and middle-income economies (LMICs) in Africa and elsewhere has worsened post-pandemic. Their total debt servicing costs (principal and interest payments) reached an all-time high of USD 1.4 trillion in 2023. Debt servicing costs (excluding China)[27] rose to a record USD 971.1 billion in 2023, more than double the levels of a decade ago. The debt burdens of the poorest countries—those that are IDA-eligible[28]—rose in 2023 to reach an average of 40.6 % of GNI (WBG, 2024). More than half of African countries are either in debt distress or at high risk of debt distress (ECA, 2024).

Third, twenty SSA states are listed as socially and institutionally fragile (8) and conflict-afflicted (12).[29] In 2023, eight of the worst humanitarian crises, out of 20 identified by the International Committee of the Red Cross (ICRC), exploded in fragile African countries (ECA, 2024). It is virtually impossible to undertake any lasting reforms under such unstable conditions, as long-term development requires, at a minimum, peace and political stability.

Unlocking Opportunities at the Regional Level Requires Sustained Country-Level Reform and Investment Commitment: In our rapidly fragmenting world, driven largely by geopolitical rivalries, increasing protectionism, and violent conflicts, Africa is fortunate to have a continent-wide market opportunity in the AfCFTA to exploit. The Africa Trade Centre states: "For Africa as a whole, intra-African trade would be about 34% higher with the AfCFTA implementation in 2045 as compared to a situation without AfCFTA" (2023 ECA Economic Assessment of the AfCFTA Agreement). ECA (2024) projects increases in intra-African trade in agrifood, industry, and services of 60%, 48% and 34% respectively.

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27. China holds more than 27% of the total debt stock of LMICs (WBG, 2024).

28. The IDA-eligible (at or below GNI/cap USD 1,335 in FY 2025) countries in SSA (2024) are: Benin, Burkina Faso; Burundi; Cameroon; Cabo Verde ; Central African Republic; Chad; Comoros; Congo, Democratic Republic of; Congo, Republic of ; Cote d'Ivoire; Eritrea; Eswatini ; Ethiopia; Gambia; Ghana; Guinea; Guinea-Bissau;; Lesotho; Liberia; Madagascar; Malawi; Mali; Mauritania; Mozambique; Niger; Nigeria ; Rwanda; Sao Tome and Principe ; Senegal; Sierra Leone; Somalia; South Sudan; Sudan; Tanzania; Togo; Uganda; Zambia; and Zimbabwe. (https://ida.worldbank.org/en/about/borrowing-countries. Updated Oct 2024) Some of these countries are eligible to borrow on blend terms (both IBDR and IDA, e.g., Cameroon, Ghana, Kenya, Nigeria, Senegal, and Zimbabwe.)

29. In FY 2025, the institutionally and socially fragile states in SSA are: Burundi; Chad; Comoros; Congo, Republic of; Eritrea; Guinea-Bissau; São Tomé and Príncipe; and Zimbabwe. The conflict-afflicted states are Burkina Faso; Cameroon; Central African Republic; Congo, Democratic Republic of; Ethiopia; Mali; Mozambique; Niger; Nigeria; Somalia; South Sudan; and Sudan. (https://thedocs.worldbank.org/en/doc/608a53dd83f21ef6712b5dfef050b00b-0090082023/original/FCSListFY24-final.pdf)

For these projections to materialize, ECA (2024) has identified nine policy levers that are key to unlocking the transformative power of AfCFTA. These comprehensive policy levers are:

1. Eliminating tariff and non-tariff barriers and restrictions on investment.
2. Improving the business climate and promoting competitiveness.
3. Removing supply-side constraints.
4. Promoting economic diversification and strengthening product value chains.
5. Ensuring a stable and growth-oriented macroeconomic policy environment.
6. Strengthening the capacity of the domestic private sector.
7. Ensuring good governance and capable institutions.
8. Building a strong financial sector to support intra-African trade and investment.
9. Aligning the social dimension with trade policy.

Taken together, these measures amount to reforming virtually all aspects of economic management in Africa. This in turn requires a fundamental shift in the political economy of economic strategy, going well beyond, but including, the dimensions of good governance specified in IIAG. A review of the strengths and weaknesses of regional market integration in the European Union (EU), the Association of Southeast Asian Nations (ASEAN), and Southern Common Market (MERCOSUR) shows that, though the three models are very different, the socio-economic benefits of market integration have been substantial (albeit to varying extents) and the policy changes required were also substantial (Tsakok, August, 2021). Their experiences show that trade, not protectionism and war, is the win-win strategy.

V. WHAT PROSPECTS LIE AHEAD FOR ACHIEVING FOOD SECURITY IN AFRICA? TWO POLAR SCENARIOS

Prospects for Overcoming Africa's Food Security Crisis—Insights from Other Crisis Episodes: Times of crisis have often served as moments of transformation, provided certain conditions are met. What are these conditions? In their extensive analyses of "critical junctures" (or periods of crisis) in countries and cultures worldwide, Acemoglu and Robinson (2012) argue that nations fail when they have extractive institutions. "Engines of prosperity," however, spring from inclusive institutions. Countries ruled by extractive institutions tend to extract income and wealth from one subset of society to benefit a different subset, concentrating economic and political power in the hands of a minority.

On the other hand, inclusive institutions serve the broader population. These institutions ensure "secure private property, an unbiased system of law, and the provision of public services that provides a level playing field in which people can exchange and contract."[30] Additionally, they emphasize the importance of "sufficiently strong and centralized states that can enforce law and order, private property rights, contracts, as well as deliver public services." In the words of Max Weber, the state should also hold the "monopoly of legitimate violence" in society.

30. On the prosperity increasing power of inclusive institutions, Acemoglu and Robinson also pointed out that these institutions promote inclusive markets, not free markets, that generate opportunities for all, and incentives for investing in two other engines of prosperity, technology and education.

In cases of successful agricultural transformation, visionary political leadership made the essential difference. A notable example is General Chiang Kai-shek in Taiwan, China (Till et al., 2024).[31] Similarly, Acemoglu and Robinson (2012) highlight political leadership as crucial, citing figures such as Seretse Kharma[32] of Botswana and the Meiji Restoration (1868-1889) in Japan.

The successful regional market integration in Europe, which led to the establishment of the European Union (1993), began with the formation of the European Coal and Steel Community (ECSC).[33] This initiative was spearheaded by six 'founding fathers': Robert Schuman (France), Jean Monet (France), Konrad Adenauer (Germany), Alcide de Gasperi (Italy), Paul-Henri Spaak (Belgium), and Josef Bech (Luxembourg). In a similar vein, ASEAN was founded on August 8, 1967, by the foreign ministers of Indonesia (Adam Malik), Malaysia (Tun Abdul Razak), the Philippines (Narciso R. Ramos), Singapore (S. Rajaratnam), and Thailand (Thanat Thoman). At a time when territorial disputes existed between Indonesia, Malaysia and the Philippines,[34] (ASEAN, 1992) and war raged in Vietnam (1955-1975), these foreign ministers chose collaboration, regional peace and stability, and trade over violent conflict (The Founding of ASEAN, 2024). Their decision was based on the belief that prosperity could only be achieved through peace and unity.

Optimistic Scenario—With Leadership and Institutional Assets, Transformation Is in the Wings: To the extent that Africa possesses these assets, leadership should prioritize mobilizing the necessary funds to invest in agriculture and agrifood systems, with the aim of promoting an inclusive and sustainable rural transformation that is resilient to climate change. This transformation will create powerful linkages that, in turn, contribute to economy-wide structural changes.

As previously discussed, fostering high-productivity and resilient agriculture (including agrifood) requires a range of public goods and services. These include basic infrastructure such as roads, marketing and communications, and energy services like electricity. A selective review of agriculture's substantial resource base reveals that there is much leadership can do to create incentives for better exploitation of this resource base. For example, the Awash Basin in Ethiopia illustrates the potential for irrigation expansion (see Box 1).

The African Development Bank (AfDB) has estimated Africa's infrastructure financing needs at around USD 170 billion year (Faye, 2022). Although many SSA countries are currently facing debt distress, this challenging situation does not necessarily preclude long-term investment. Ngozi Okonjo-Iweala[35] has urged African leaders to explore domestic avenues for funding investment.

There are several potential financial sources within Africa that could help fund agricultural and rural transformation. According to the Africa Sustainable Development Report (ASDR 2022), Africa lost

31. Chiang Kai-shek (Oct 31, 1887-April 05, 1975) was a Chinese politician, a general who was defeated by Mao Zedong's Red Army in October 1949, and fled to Taiwan, China in late 1949. As head of the Nationalist party—the Kuomingtang—he ruled Taiwan until 1975. A disciple of the revolutionary Sun Yat Sen, who is viewed as the father of modern China by both the Nationalist and Communist parties, he was the architect of Taiwan's successful land reform (1949-53) and subsequent agricultural transformation; and sustained economy-wide market-oriented and inclusive growth. He remains a controversial figure.

32.Sir Seretse Goitsebeng Maphiri Kharma (July 1, 1921-July 13, 1980), GCB, KBE, was a Motswana politician, and first president of Bostwana (1966-80).

33. In 1951, the Treaty of Paris established the ECSC; in 1957, the Treaty of Rome established the European Economic Community (EEC). The European Union was officially created by the Maastricht Treaty on February 2, 1992. It came into force on November 1, 1993.

34. The territorial dispute arose from a colonial legacy between Indonesia and the Philippines on the one hand, and between Indonesia and Malaysia on the other. Between Indonesia and Malaysia, it was called "Konfrontasi" (Confrontation) (ASEAN conception and Evolution by Thanat Khoman, September 1, 1992).

35. Ngozi Okonjo-Iweala has an illustrious career. She was appointed Director General of the World Trade Organization (WTO) in March 2021. In November 2024, she was re-appointed for a second term. (For more information, see Wikipedia, updated Feb 13, 2025)

about $89 billion to illicit financial outflows (IFFs),[36] highlighting a significant drain on potential resources. However, there are also African Sovereign Wealth Funds (SWFs), which amounted to USD 300 billion in 2020, that could be tapped for investments. Additionally, funds under impact investing[37] reached USD 2.3 trillion in assets under management in 2020 (Faye, 2022).

The ASDR 2020 emphasized that African governments must focus on mobilizing more domestic resources, as Africa's resource mobilization efforts lag behind other regions. In SSA, revenue as a proportion of GDP declined from 16.5% in 2019 to 15% in 2020, during the pandemic, but rebounded to 16.4 percent in 2021.[38] The average tax-to-GDP ratio in SSA is around 16%, which is lower than the average level of approximately 19% in Asia-Pacific developing countries.

Additionally, by improving the economic and business environment, African leadership can attract more foreign direct investment (FDI) and private domestic investment. However, 2024 proved to be a challenging year globally,[39] with FDI falling by 3% to USD 53 billion in Africa. (World Investment Report 2024).

Financing Needs for Africa's Food Security Are Vast, Requiring Global Cooperation and Innovative Financing Mechanisms: The optimistic scenario can fully materialize, provided that a substantial portion of the estimated financing needs is met. Will the global financial architecture be reformed within the next few years to effectively support the Global South? The estimates for Africa's climate change financing alone are USD 1.3 trillion, with another USD 1.2 trillion needed for other SDGs (G20 2023 report on MDB reform).[40] This is in stark contrast to the total official development assistance (ODA) of USD 211 billion in 2022.

Two innovative mechanisms are proposed: the Debt Relief for Climate Initiative (DRCI) and a Green Bank (GB). The DRCI swaps debt reduction funded by donors for investments in climate mitigation and adaptation to be undertaken by debtor countries in the Global South. To take advantage of this mechanism, Africa will need to prepare bankable (sound) mitigation and adaptation projects (Canuto et al., April 2024). The Green Bank would be a global public-private partnership, accepting private equity contributions from entities like multinationals and large corporations. Its public capital base would come from various public sources, including governments from both the Global North and South, the Loss and Damage Fund agreed upon at COP 27 (November 2022), donors, civil society, and international organizations (Ghanem, February 2023).

Pessimistic Scenario—The Leadership and Institutional Assets Falter: If one or more of these assets do not materialize in the near future, Africa can still achieve food security, but it is likely to take much longer. Even under the optimistic scenario, agricultural and economy-wide structural transformation takes at least two to three decades. It is a long march even under the best of circumstances. In the pessimistic scenario, economic management will be more or less "business as usual", whatever that means for different countries. Such management could focus on one of many pressing humanitarian and developmental issues for SSA. One such issue that requires urgent attention is Africa's youth bulge, which risks becoming not a demographic dividend but a disaster (Agbor et al., 2012). Agriculture remains the largest employer of young workers, accounting for 60% of total employment in 2021, the highest share globally (ILO brief, August 2024). The percentage

36. The main sources of IFFs are tax fraud, trade mis-invoicing, corruption, and money laundering (Economic Governance Report I, 2021).

37. Impact investing is an investment strategy that combines financial returns while also making a positive social impact. Impact investments can be made in different classes of assets, including stocks, bonds, microloans, and mutual funds.

38. By comparison, the tax/GDP ratio was nearly 20 % (2023) in Mauritius; in the Seychelles, it was around 24% (2024). IMF estimates that the tax potential of Mauritius is 25% of GDP and recommends it to use this potential. The tax gap is estimated at 5.6% of GDP (IMF, May 2024).

39. Globally, FDI fell by 2% to USD 1.3 trillion.

40. MDB: Multilateral Development Banks.

of youth in NEET (Not in Employment, Education or Training) in SSA has fallen from 9.5% pre-Covid (2019) to 8.5% in 2023, with major differences among countries. Youth unemployment rates slightly declined in Western and Central Africa but rose slightly in Eastern Africa and significantly in Southern Africa (ILO brief, August 2024).[41]

In South Africa, the youth (15-24) unemployment rate is estimated at 59.7% (WDI, 2023),[42] with women facing a higher unemployment rate than men. Effectively addressing this issue will strengthen food security. A key entry point is agriculture, which employs the bulk of the youth labor force. For youth, a particularly important institutional reform is to facilitate land access and clarify and enforce land tenure security (including usufruct) rights. For young people to make farming a long-term, rewarding source of livelihood, they need incentives, financial means and collateral to raise the funds essential for investment. This reform is not only critical for productivity but also for equity. As pointed out by Jayne et al. (December 2017), young people (15-35 years old) "are increasingly unable to inherit enough land to make farming a viable business." Furthermore, an increasing proportion of agricultural land is owned by medium farmers (5-100 hectares) who are urban-based or financed by non-farm sources. In countries like Ghana, Kenya, Malawi, and Zambia, medium farmers own 30-50% of total farmland.

As demonstrated in East Asia, agricultural growth within egalitarian land distribution patterns has a greater poverty-reducing impact, generating more powerful multiplier effects throughout the economy. The challenge for African agriculture is not just to generate high growth but to promote inclusive growth that creates jobs in both the agriculture and the broader non-farm economy.

It is well known that successfully transforming high-productivity agriculture sheds labor, but through multiplier effects, it promotes demand-pull for labor in the growing non-farm economy. High growth alone is not sufficient, as the experience during the commodity boom of 2004-14 shows. Poverty headcount in resource-rich countries rose, Gini coefficients across the region increased, and the number of poor people also rose (Cust et al., 2022).

To make agricultural growth more egalitarian, investments in agricultural research and extension, education, and training services must complement infrastructure investments, as agricultural production is increasingly knowledge intensive. More broadly, Africa must invest in expanding and improving the quality of secondary education. Secondary school enrollment in SSA was 30% in 2005, compared to 65% for all developing countries worldwide and 100% in East Asia (Verspoor et al., 2008).

41. Youth is 15-24 years old for ILO. For the ILOSTAT data base for youth labor market statistics, youth is 15-29 years of age.

42. The average youth unemployment for SSA is 10.1% (2023). There are substantial differences among countries.

CONCLUSION: WHAT ARE THE PROSPECTS?

More than half a century after independence from colonial rule,[43] achieving food security in Africa would be a transformative milestone for the millions still suffering from chronic hunger, poor health, and poverty. The prospects for success are strong, provided that continent-wide leadership and government administrations commit to fully implementing the AfCFTA. Any short-term revenue shortfalls incurred in the process are a small price to pay compared to the immense and lasting benefits of fully seizing this opportunity. Despite the challenges, investing in agriculture—its technologies, institutions, and people—offers a clear and attainable path forward.

Diagram 1: Food Security: Main Concepts, Pillars, Goals and Policies

PILLARS: / Concepts & Goals:	AVAILABILITY	ACCESS	UTILIZATION	STABILITY
Holistic Concept of Food Security (FSH)	✓	✓	✓	✓
Goal: Food Self-Sufficiency (FSS)	✓	✓	?	✓
Policies	Domestic producion, Import protection	Food assistance, Social safety net	?	Food stocks, Risk management tools, Disaster management
Goal: Food Sovereignty (FSY)	✓	✓	?	✓
Policies	Domestic pro-ducion, Control over ag policies, Import Protection	Food assistance, Social safety net	?	Food stocks, Risk management tools, Disaster management

43. Most African countries gained independence from the 1950s to mid-1970s or so, e.g., in North Africa: Morocco 1956; Tunisia, 1956; Algeria, 1962; in SSA: Ghana, 1957; Guinea, 1958, Madagascar, 1960; Somalia, 1960; Sudan, 1956; also in 1960 Benin, Botswana, Niger, Burkina Faso, Ivory Coast, Chad, Central African Republic, Congo, Gabon, Mauritania, Nigeria (1960-61); in 1975, Angola, Cape Verde, Comoros, Guinea-Bissau, Mozambique, Sao Tomé and Principe; Rwanda, 1962, Mauritius, 1968; Seychelles, 1976, Djibouti, 1977. A few countries had already achieved independence well before, e.g., Egypt 1922; South Africa 1931.

Box 1—Ethiopia: Irrigable potential and the Awash Basin—A cautionary tale

The irrigable potential of Ethiopia is significant, yet its agriculture remains predominantly rainfed and characterized by low productivity. Yields per hectare for major cereal crops remain below international levels. Despite being dominated by smallholders, the agricultural sector contributes approximately 35% of GDP, employs 73% of the labor force, and accounts for 78% of export earnings (Mekonnen et al., October 2024).

Ethiopia possesses abundant surface and groundwater resources, with an estimated 3.3 million hectares of potential irrigable land. Its 12 river basins hold substantial irrigable potential, yet only a fraction of this capacity is utilized. For instance, Kassa and Andualem (2020) estimate that less than 5% of total irrigated land is currently in use, while Haile (2015) suggests that only 10–12% of potential irrigable land is under production.

The Awash Basin is Ethiopia's most intensively irrigated area and is entirely contained within the country's borders. An estimated 77% of the irrigable area is cultivated; however, 20% of the land equipped for irrigation remains unused, leading to significant underutilization and wastage.

Several challenges hinder the efficient use of irrigation in the basin. Management issues are pervasive, with 96% of irrigation scheme managers, extension agents, and leaders of water users' associations (WUAs) unaware of total water withdrawals or season irrigation water requirements. Additionally, 14% of the surveyed irrigation schemes lack both traditional water committees and WUAs, and only 21% are organized into legally registered WUAs. Women's participation in decision-making is also limited, with only 58 out of 489 irrigation schemes having women committee members.

Maintenance of irrigation systems is critically underfunded. Many schemes lack a clear strategy for covering operation and maintenance costs, with nearly 40% of schemes collecting contributions only when the system fails, and 17% reporting no maintenance contributions at all. Furthermore, the number of actual beneficiaries often exceeds the planned capacity, exacerbating water scheduling problems, increasing conflicts among users, and leading to water theft. Beyond the irrigation systems themselves, several external factors limit their potential to enhance agricultural productivity and sustainability. These include inadequate infrastructure, such as road networks and electricity, as well as poor access to functioning markets for both inputs and outputs. In arid regions, the prevalence of malaria and harsh climatic conditions further constrain the expansion and effective use of irrigation systems.

The key takeaway is that the institutional framework governing irrigation systems plays a decisive role in their expansion, functionality, and long-term sustainability. Water availability and control are the lifeblood of agriculture, but merely having access to water resources is only the first step. Ensuring that farmers can effectively manage and utilize these resources is essential for achieving high-productivity agriculture. More broadly, the institutions that shape resource management and the incentives for their use are just as critical—if not more so—than the physical availability of resources in driving agricultural performance.

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