

# FOOD AND US: POVERTY, POLICIES, AND POLITICS

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This Convocation Lecture is about food and the ways that it connects to people, especially the poor who deal with hunger. Agriculture, which encompasses the broader terrain of production, distribution, and services, deals with food issues at their core: land must be cultivated, plants and animals must be bred, and medicinal plants and useful fibers must be harvested so that humans can live. Without agriculture, life can be neither lived nor sustained. On a global scale, more than one-third of the human population works in agriculture one way or another, producing vegetables, oil, fruits, meats, eggs, milk, cereals, and others.

Agriculture is part of knowledge systems everywhere in the world, connected with both informal and formal education systems. This knowledge system is so large that several academic branches have emerged, including agronomy, agricultural science, and agricultural engineering. Specialized universities study agriculture in different parts of the world, including this location where I speak today. I began my academic career as an economic historian of the nineteenth century: the understanding of Yoruba

agriculture formed an integral part of my PhD thesis and subsequent publications.

Historians must understand agriculture. Five thousand years ago, Africa passed through an agricultural revolution that transformed the continent, bringing it out of the Late Stone Age and into the Neolithic era. It laid the foundation of its great civilizations, empires, kingdoms, and cities. This great revolution ushered in a long period of sedentary civilization. African societies were able to build cities and institutions, and they succeeded in creating empires and kingdoms (including Egypt, Aksum, Kush, Oyo, Benin, and Mali). In Egypt, farming was recorded as far back as the end of the Paleolithic age, continuing into the predynastic period more than 10,000 years ago. They relied on the seasonal flooding of the River Nile to plant and consume grains like barley and wheat, and they grew flax and papyrus as industrial crops. In the Sahel, sorghum had become domesticated 7,000 years ago, creating food surpluses that transformed societies. Years later, shifting cultivation took root as a dominant practice in most parts of Africa. Pastoralism developed in several parts of the continent, with varying mobility patterns that allowed pastoralists to survive in different kinds of environments, including the harsher ones.

Five thousand years later, the continent is struggling to feed itself, and that inability to produce and store sufficient food for Africans is the driving force of this lecture. This topic allows us to talk about multiple issues connected to the policies and politics of agriculture and the nation-state.

Agriculture is shaped by politics at various levels. It involves land resources and their allocations, policies that set incentives to produce things like food or raw materials for export, labor recruitment for the agricultural sector — from all the forms

of dependency labor in the past to the poor workers of the present — and mechanization. Weather has an influence, requiring the ability to work with its vagaries when science and technologies fall short. Land is a big factor; the rich continue to displace the poor, pushing them further out into the margins of society.

Poverty, land, and agriculture are inter-related, and this lecture will critically interrogate them in the Nigerian-cum-African context. Let me begin with a polemic statement: many African governments have not done enough to provide food security for Africans. This failure is partly due to their negligence of the land's politics. Many examples illustrate the desperate conditions Africans are facing, and some can be drawn from Nigeria.

In August 2016, a man broke into his neighbor's apartment in Abuja to steal a pot of rice and stew to feed his family. That same year, also in Abuja, a school teacher was beaten black and blue because he stole food. That November, foreign and local media reported that a fifteen-year-old was lynched in Lagos for stealing food. A woman in Ekiti was caught stealing a pot of amala, claiming that she had to feed her children. In September 2018, there was another report of a woman thoroughly beaten for stealing a pot of food from the fire. There are many other cases between 2016 and now that I could mention. Even if some of them were exaggerations, you get the point: there is hunger in the land that has to do with food in the physical and the abstract senses.

Given Nigeria's vast resources, we should be neither hungry nor poor, but the state of poverty in Nigeria has reached incredible heights. People have been poor, and they are getting poorer, hungrier, and more desperate. Deprivation has robbed so many Nigerians of their dignity that food has acquired a larger-

than-life status in the social consciousness. Our political metaphors and measures of civic participation are connected to food: stomach infrastructure, "dìbò, kí ẹ seḅẹ" (vote, and get to make a pot of stew), "jeun soke". Corruption itself is the act of "eating or swallowing money." At some point, we must understand that keeping the poor populace hungry is a deliberate political strategy to make them easier to manipulate.

The interconnections between food, policies, and politics affect people and their nations. The government has perpetuated poverty and hunger through land policies that have stripped people of productive agency. However, there are solutions that involve the imbrication of efforts from the government and the universities, and both can empower society at large.

Food has generated much conversation around itself: its production and consumption, its contents and nutrients, its spiritual and religious dimensions, its impact on security and the political stability of nations, and its definitive index of poverty. Let's begin with the conversation around food and its connections to people and development.

**PART A**  
**JESUS CHRIST, KARL MARX, AND FOOD:**  
**CONVERSATIONS ON FOOD AND HUMANITY**

The Universal Declaration of Human Rights Article 25 Section 1 states that a right to eat is inherent to every human.<sup>1</sup> Food is vital to human life, and it has significant cultural value. Throughout history, eating has been a major source of community and social interactions. Many religions center their rituals around harvests and times that celebrate the continuation of life. Food's importance and the religious, spiritual conversations around it have been with us since the Stone Age. Two divine figures — the religious and the secular — illustrate the relevance of this conversation, showing how food connects with our beings, our histories, our policies, and our politics.

Jesus' Last Supper is one of the most famous examples of a religious meal. During the last supper, Jesus encouraged his disciples to appreciate the bread and wine they drank as his own flesh and blood. This moment created the tradition of communion, where eating bread and drinking wine is ritually symbolic of becoming closer to Jesus. The practice of communion also reminds Christians that food is a sacred subsistence of life that only comes from the grace of God.<sup>2</sup> Theologians may say that the main message in the Last Supper was not about physical food; it was only used as a symbol for more spiritual connections between God and man. In that sense, food becomes both a necessity and a

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<sup>1</sup> The United Nations, *Universal Declaration of Human Rights*, 1948.

<sup>2</sup> Luke 22:19-20 (English Standard Version (ESV)).

metaphor. The Last Supper is indeed a good example of a religious meal. Also, notice the concern of the Bible that physical hunger must be assuaged first because man cannot serve God in hunger: the feeding of the 5,000 (Matthew 14: 14-21), the feeding of the 4,000 (Matthew 15: 32-38), the appointment of seven deacons to oversee the distribution of food to the needy in the early church (Acts 6:1-7). A classic example in the Old Testament is the feeding of Israelites with manna and quail (Gen. 16: 1-19).

In the Bible, food is thematic: God continually provides for his people. God provides manna for his children fleeing Israel to show He supports their plight.<sup>3</sup> Hunger is portrayed as God's way of humbling His people. Eating gives his followers an opportunity to praise him. Food's sacred nature is included in the status of gluttony, a sin. Food is a necessary condition of life, in which God provides for his people, but they must continue to treat it as sacred.

Although food is sacred in the Bible, Jesus also says "man shall not live by bread alone".<sup>4</sup> Food is necessary for life, but the teachings of Jesus are also necessary for humans. Jesus emphasizes that even though animals can live by consuming food alone, men are higher beings that require further subsistence. He meant that humans also require a spiritual connection with God. This connection is not a luxury that is only available to the wealthy; Jesus sees it as a necessity for all human beings. Rituals such as communion allow food to serve as a spiritual tool. As a foundation for life, food is also a spiritual necessity. Without food, an individual cannot pursue a relationship with God, making food

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<sup>3</sup> Exodus 16 (New International Version (NIV)).

<sup>4</sup> Matthew 4:4 (English Standard Version (ESV)).

security an important component of Christian religion. In contexts where hunger is not an issue, the spiritual comes before the material. But where hunger is a problem, the material obstacle is first dealt with before spiritual issues are addressed.

Karl Marx, a religious critic, negated this statement with his claim that "man shall live by bread alone." This quote is best understood within Marx's framework of dialectical materialism. Like Jesus, Marx acknowledged that men were different from animals. Jesus thought that this was a spiritual difference, but Marx viewed the difference as more practical.<sup>5</sup> While animals adapt to survive in their environment, men require tools. For example, a bear's thick fur coat may help it survive in the winter, but man must make a blanket. To Marx, this dependence on tools meant that humans were inherently materialists.<sup>6</sup> He interpreted human history as the explanation of how these tools and goods were produced and distributed.

Marx saw society based on the division of labor involving producers and consumers. These distribution relationships lead to different social relationships, which is especially true for food, the most basic human good.<sup>7</sup> Social relationships established by

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<sup>5</sup> Oliver Brett, *A Defense of Liberty* (New York and London: G. P. Putnam's Sons, 1921).

<sup>6</sup> John Bellamy Foster, "Marx's Theory of Metabolic Rift: Classical Foundations for Environmental Sociology," *American Journal of Sociology* 105, no. 2 (1999): 366-405.

<sup>7</sup> H. P. Adams, "Karl Marx in His Earlier Writings," *The Journal of Philosophy* 38, no. 7 (1941): 188.

distribution ultimately drive the consuming class to get the most possible work from the producing class. This conflict creates what Marx called a class struggle, and he viewed class struggle as the driving agent in historical change.<sup>8</sup>

Marx agreed with Jesus that humans require more than food for fulfillment. But he did not see spirituality as the missing component. Marx described religion as the “opium of the people,” something to distract and soothe the working class from the oppression of the consuming class.<sup>9</sup> He thought that humans served a higher purpose than animals, but that purpose was expressed through their labor. As a system of production, capitalism forced lower classes to sell their labor for food. Their ability to use their labor at their own will, which would have defined their humanity, was lost in that transaction.<sup>10</sup>

Marx argued that exploitation of the lower class would continue as production became more efficient, and eventually, fewer laborers would be needed. The higher supply of laborers relative to demand would lead to a "starving wage" — the few laborers who found employment would not make enough money to sustain themselves, but they would have more than the

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<sup>8</sup> Mark Tilzey, "Reintegrating Economy, Society, and Environment for Cooperative Futures: Polanyi, Marx, and Food Sovereignty," *Journal of Rural Studies* 53, (2017): 317-334.

<sup>9</sup> Karl Marx and Joseph J. O'Malley, *Critique of Hegel's 'Philosophy of Right'* (Cambridge: Cambridge University Press, 1970).

<sup>10</sup> Victor Cathrein, *Socialism: Its Theoretical Basis and Practical Application* (N.Y: Benziger, 1904).

unemployed. Marx used arguments such as the "starving wage" and the selling of labor to agitate for lower-class rebellion. But his arguments are based off the materialist idea that men cannot live solely on jobs or religion, but only through the tangible substance of food. He equates the distribution of food with the distribution of power and life.<sup>11</sup>

From religious and secular perspectives, food is foundational for life. Jesus saw food as essential for a religious relationship. Marx saw food as necessary to regulate the class relationships defining history on Earth. In both perspectives, humans cannot achieve much more than animals when they are burdened with starvation.

Abraham Maslow was another philosopher who argued for the importance of food. Maslow created the pyramid model ordering man's hierarchy of needs. At the bottom of the pyramid, he put the basic needs of food, shelter, and water. On top of this foundation, he placed safety, love and belonging, esteem, and then self-actualization.<sup>12</sup> Jesus and Marx had different ideas of what self-actualization looked like, but both perspectives agreed that food was a necessary condition for it.

Karl Marx said "hunger is hunger; but the hunger that is satisfied by cooked meat eaten with a knife and fork differs from hunger that devours raw meat with the help of hands, nails and

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<sup>11</sup> John Bellamy Foster, "Marx as a Food Theorist," *Monthly Review* 68, no. 7 (2016): 1.

<sup>12</sup> Abraham Maslow and Karen J. Lewis, "Maslow's hierarchy of needs," *Salenger Incorporated* 14 (1987): 987.

teeth.”<sup>13</sup> A right to food is included in the International Declaration of Human Rights because food not only provides life but is also the key to human dignity. Humans require food to move beyond their animal nature and work towards achieving any higher purpose.

The traditional Yoruba adherence to food as a religious and sociological necessity is underscored in Ifá literature. In its exposition of ẹbọ (sacrifice) in the Yoruba belief system, Odù Òwónrín Méjì tells the myth of a farmer: in spite of his generous offerings to the gods and the ancestral spirits, the prognostication remained negative. The farmer went back to the diviners, and Ifa revealed that any sacrifice failing to put food in human mouths was an exercise in futility. It would never work, regardless of how many gods were appeased. And so, the esè Ifá concludes:<sup>14</sup>

Njẹ kín l'á n bọ n'Ífẹ.  
Ẹnuu wọṅ.  
Ẹnuu wọṅ l'á n bọ n'Ífẹ,  
Ẹnuu wọṅ.  
Mo fín'gbá,  
Mo f'áwo.  
Ẹnuu wọṅ kò mọ lè rí mi bá jà.  
Ẹnuu wọṅ.  
Mo wálé,

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<sup>13</sup> Karl Marx, *Grundrisse* (London: Penguin, 1973), 92.

<sup>14</sup> Wande Abimbola, *Ijinle Ohun Enu Ifa, Apa Kiini* (Glassgow: Wm. Collins, Sons and Co.), 74-75.

Mo wánà.  
Ènuu wọ̀n.  
Ènuu wọ̀n kò mò lè rí mi bá jà.  
Ènuu wọ̀n.

(I ask, therefore, what do we offer sacrifice to in Ifẹ?  
It's their mouths.  
It's their mouths we offer sacrifice to in Ifẹ,  
It's their mouths.  
I gave to the calabash,  
And I gave to the bowl.  
It's their mouths.  
Their mouths can no longer mount warfare against me.  
Their mouths.  
I searched at home,  
I searched on the pathway.  
Their mouths.  
Their mouths can no longer mount warfare against me.  
Their mouths).

These conversations have continued throughout human history, linking land and production with food and politics. The humanities have been an integral part of this conversation over years.

**PART B**  
**THE CRITICAL ROLE OF THE HUMANITIES IN**  
**AGRICULTURE: GENERALIZABLE SKILLS AND**  
**RELEVANT INSIGHTS**

The Food and Agricultural Organization of the United Nations estimated the prevalence of hunger in Sub-Saharan Africa to be about 22.7% in 2016. This was an increase from 20.8% in 2015.<sup>15</sup> High rates of hunger pressure governments to increase agricultural productivity, and about 70% of people in Africa depend economically on the agricultural sector. The health of this single sector is indicative of a nation's economic growth.<sup>16</sup> Given the pressing issue of hunger and the importance of the industry, African nations must invest in agricultural development.

Government investment in agricultural development typically translates into investment in agricultural technology—a key avenue for this development is university research. African research studying the continent's unique environment, barriers to

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<sup>15</sup> Food and Agricultural Organization of the United Nations, “The Number of People Suffering from Undernutrition in Sub-Saharan Africa has Increased,” News, November 16, 2017, <http://www.fao.org/africa/news/detail-news/en/c/1062907/>.

<sup>16</sup> Jeffery Gettleman, “Loss of Fertile Land Fuels ‘Looming Crisis’ Across Africa,” *The New York Times*, July 30, 2017, <https://www.nytimes.com/2017/07/29/world/africa/africa-climate-change-kenya-land-disputes.html> .

agriculture, and crop varieties has increased in recent years.<sup>17</sup> The African university has been brought to the center stage for agricultural innovation.

Agribusiness is another avenue for national investment in agriculture. Nations pour money into agribusiness, hoping to improve agriculture, and universities play a key role. They study applied economics in the field of agriculture, including investment and production strategies. Agricultural technology and business are both necessary for agricultural development, but many barriers to agriculture find their roots in neither science nor business.

National agricultural development does not occur in a vacuum. It takes place in the context of the global food system. In most African nations, the agricultural sector depends on the exportation of cash crops, and exporting countries are affected by the economic health of importing countries. When there is a global market crash, such as that of 2008, countries depending on cash crops suffer and see an increase in hunger.<sup>18</sup> The global food system drives a cycle of international dependence and poverty. Exporting nations cannot all afford imported food, and they also export their much-needed domestically grown food. Even nations that are

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<sup>17</sup> John Butler-Adam and Academy of Science of South Africa, Pretoria, South Africa, "More Scientific Thinking Needed to Feed Society: The NSTF Tackles Hunger," *South African Journal of Science* 112, no. 7/8 (2016): 1.

<sup>18</sup> The United Nations, "Food," Global Issues, accessed August 31, 2018, <http://www.un.org/en/sections/issues-depth/food/>.

agriculturally capable of feeding themselves starve because of their role in the global food system.<sup>19</sup>

The global food system is built on the foundations of agribusiness and agricultural science. Products are sold for the highest global prices and produced in the largest quantities possible using modern science. Meanwhile, increasing numbers of people starve. A different perspective is required to design agriculture for humanity's best benefit, and the largest barriers to successful agriculture have their roots in the humanities.<sup>20</sup> The humanities can inspire, promote, and implement the development and application of agricultural research. University programs that bridge the humanities and agricultural sciences can produce innovative solutions to widespread agricultural failure.

Agriculture allowed for the specialization of labor in early societies. This meant that other professions could develop alongside farming, allowing for more complex society structures. This foundation allowed education, art, and culture to exist. Every culture is influenced by its agricultural system. The relationship between agriculture and culture is deep — new research has found that dietary patterns can influence the genetic makeup of

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<sup>19</sup> Russell L. Lamb, "Food Crops, Exports, and the Short-Run Policy Response of Agriculture in Africa," *Agricultural Economics* 22, no. 3 (2000): 271-298.

<sup>20</sup> Connie Weil, "Food and Agriculture in the Liberal Arts," *Professional Geographer* 36 no. 2 (1984): 243-44.

populations.<sup>21</sup> Agriculture has immense value and power as the foundation of society. However, university agricultural programs focus primarily on two areas: agribusiness and agricultural sciences. Business and science are both important for the development of agriculture, but neither field is equipped to address the full consequences of agricultural decisions.

University agricultural programs omit the human face of agriculture. The structure of the global food network creates a world where some people are left hungry while others have plenty of food to spare. The humanities can call attention to these injustices, advocating for agricultural reform. One such humanities-based perspective is food democracy, the idea of a global food system where everyone can access information about the food they are eating, shaping their food systems to benefit humanity.<sup>22</sup> The idea of a food democracy is relevant to urban areas and industrialized nations that are the largest consumers of imported food. It also applies to rural farmers who lack the political agency, access to information, and physical resources to shape the agricultural structure of their nation.

There are several ways that communities have worked towards food democracy. Urban communities can form local

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<sup>21</sup> Michael J. O'Brien and Kevin N. Laland, "Genes, Culture, and Agriculture: An example of human niche construction," *Current Anthropology* 53 no. 4 (2012): 434-70.

<sup>22</sup> Alana Mann, "Food Democracy: why eating is unavoidably political," *The Conversation*, August 4th, 2015, <https://theconversation.com/food-democracy-why-eating-is-unavoidably-political-43474> .

farming programs, which have successfully educated communities about agriculture, the environment, and global food systems.<sup>23</sup> Companies can hold local conventions on agriculture and the humanities that focus on sustainability and human welfare in the context of agricultural business.<sup>24</sup> Universities can function as the infrastructure for collaboration between the humanities and agriculture by creating specific agricultural programs that collaborate with the humanities. Some agricultural humanities programs at universities are highly formal classes, with specialized faculty members. Others are more informal, and they may involve volunteer community farms.<sup>25</sup>

Universities may also support communities and businesses solving agricultural problems through the humanities. For example, Ahmadu Bello University in Nigeria facilitated a collaboration between a private watershed company and university research in agriculture and the humanities.<sup>26</sup> This

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<sup>23</sup> David W. McIvor and James Hale, "Urban Agriculture and the Prospects for Deep Democracy," *Agriculture and Human Values* 32, no. 4 (2015): 727-741.

<sup>24</sup> Weil, "Food and Agriculture in the Liberal Arts."

<sup>25</sup> Levi David Gardner, "Down on the Farm: A Qualitative Study of Sustainable Agriculture and Food Systems Education at Liberal Arts Colleges and Universities," PhD diss., Michigan State University, Community, Agriculture, Recreation and Resource Studies, 2012.

<sup>26</sup> John W. Groninger, "Building Watershed Management Capacity in Nigeria: Expanding the Role of Agriculture Colleges," *Journal of*

collaboration highlighted the critical role of watersheds in agriculture, and it considered the political, social, and economic barriers to their sustainable use. Collaboration between agriculture and humanities can take a variety of forms, creating tangible solutions through humanistic perspectives.

### **Generalizable Skills of the Humanities**

The humanities can aid agricultural development through generalizable skills and practical information—this includes developing a humanistic perspective, providing comprehensive critical analysis, and fostering creativity. The humanities, by definition, study the work of humanity. They offer a humanistic perspective that bases evaluations on the intrinsic value of human life.<sup>27</sup> The humanities have different perspectives different from those offered by Agribusiness and Agricultural Technology.

Agribusiness investigates how to make the most money. Agricultural technology seeks the highest outputs. Agriculture through the humanities seeks to appreciate food, land, and agriculture for the beauty and meaning they offer to the human experience. This perspective humanizes agriculture, cultivating respect for food and land. Humanism is also consistent with African philosophies, such as that of Ubuntu. It advocates for agricultural worth because of the value it adds to the community.

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*Contemporary Water Research & Education* 158, no. 1 (2016): 78-84.

<sup>27</sup> O'Brien and Laland, "Genes, Culture, and Agriculture: An example of human niche construction," 2012.

The humanities provide comprehensive critical analysis for complex issues.<sup>28</sup> This is accomplished through definitions and analysis of knowledge in epistemology. Epistemology, the philosophical study of what qualifies as knowledge, can be critical to scientific development. Epistemology developed the scientific method and the idea of peer review, two practices vital to the development of modern science. Conversations in epistemology debunk faulty science and promote fast advancement in agriculture; strong epistemic foundations are critical to the development of agricultural research.

In African universities, Western epistemic foundations should not be taken for granted. The scientific method and academic processes of journals developed within Western contexts.<sup>29</sup> The question of whether this methodology is relevant to Africa is vital to the development of all science, including agricultural sciences. African epistemologies must include decolonial thinking, African science that takes initiatives to

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<sup>28</sup> Svend Larsen, Susan Bassnett, Naomi Segal, Mads Thomsen, Jan Baetens, Patrizia Lombardo, and Theo D'haen, "No Future without Humanities: Literary Perspectives," *Humanities* 4, no. 1 (2015): 131-148.

<sup>29</sup> Michael Lambert and University of KwaZulu-Natal, "On Rainbows and Butterflies: The Classics, the Humanities and Africa," *Acta Classica* 57, (2014): 1-15.

differentiate itself from Western practices and to incorporate African values.<sup>30</sup>

Creativity is another skill that the humanities offer. Through literature and art, the humanities are able to imagine possibilities beyond the current capabilities of science. These dreams inspire scientific research and invention. Science needs abstract creative ideas from the humanities to pursue technological advancement.<sup>31</sup> Unique problems in African agriculture range from environmental challenges and extreme population growth to significant political barriers. These limitations on development require the boundless creativity of the arts.

### **The Humanities' Relevant Insights for Agriculture**

The humanities provide the rhetoric to advocate for agricultural reform. Rhetoric eloquently describes agriculture's extensive consequences for humanity. The current global agricultural system includes populations suffering from chronic malnutrition. Science tells us that chronic malnutrition in children leads to stunted growth, which inhibits physical, mental and emotional development. The negative consequences even show

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<sup>30</sup> Shannon Morreira, "Steps Towards Decolonial Higher Education in Southern Africa? Epistemic Disobedience in the Humanities," *Journal of Asian and African Studies* 52, no. 3 (2017): 287-301.

<sup>31</sup> Mae Jemison, "Teach Arts and Sciences Together," filmed February 2002 at TED2002 in Monterey, CA, video, 21:19, [https://www.ted.com/talks/mae\\_jemison\\_on\\_teaching\\_arts\\_and\\_sciences\\_together](https://www.ted.com/talks/mae_jemison_on_teaching_arts_and_sciences_together) .

signs of intergenerational damage.<sup>32</sup> The humanities contextualize this scientific research for social justice.

The Universal Declaration of Human Rights was created through a collaboration of humanitarian and political forces. Article twenty-five, section one, states that every human being has the right to an adequate standard of living. Because of malnutrition's negative effects, food is included as a universal human right.<sup>33</sup> The declaration of rights is a piece of international law that can serve as a catalyst for future agricultural reform. Historically, humanitarian rhetoric has facilitated agricultural development — a prime example is Gandhi's peace rhetoric in India. Gandhi's ideas about non-violence and sustainable development encouraged widespread, regenerative agricultural reform in rural areas.<sup>34</sup>

The humanities cultivate an appreciation for the intrinsic value of agriculture across cultures. Agriculture is the foundation of culture, and the cultural significance of food and land is globally diverse. The humanities investigate the cultural significance of food, land, and agriculture around the world. Traditional

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<sup>32</sup> E. Susser, J. B. Kirkbride, B. T. Heijmans, J. K. Kresovich, L. H. Lumey, and A. D. Stein, "Maternal Prenatal Nutrition and Health in Grandchildren and Subsequent Generations," *Annual Review of Anthropology* 41, (2012): 577-610.

<sup>33</sup> The United Nations, Universal Declaration of Human Rights, 1948, Print.

<sup>34</sup> S. Annamalai, "Gandhi's Philosophy Led to Regenerative Agriculture," *The Hindu*, November 24, 2015.

economics treats natural resources as a commodity, ignoring the effects that the use of these resources have on the human and natural environments. Agriculture's intrinsic value bridges the gap between economic thinking and human and environmental dignity.<sup>35</sup>

The humanities can express the inherent value of agriculture through various religious and philosophical perspectives, allowing the intrinsic value of land to be communicated and understood anywhere in the world using local religious values. The intrinsic value of agriculture includes the conservation of local food culture, development of sustainable agricultural practices, and human justice in agricultural work and distribution. Agricultural interventions that draw on these values can establish a common goal for sustainable agricultural development.<sup>36</sup> Intervention programs in Africa can unite cultural groups through common values to achieve sustainable agricultural development. One example is Jane Goodall's Roots and Shoots program in Eastern Africa, an interdisciplinary educational program that encourages children to become active in their communities, especially regarding environmental and social issues.

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<sup>35</sup> David Orr, "Biological Diversity, Agriculture, and the Liberal Arts," *Conservation Biology* 5, no. 3 (1991): 268-270.

<sup>36</sup> Lawrence S. Hamilton, Helen F. Takeuchi, and East-West Center, *Ethics, Religion and Biodiversity: Relations between Conservation and Cultural Values* (Cambridge: White Horse, 1993).

These efforts focus on the intrinsic value of nature; they have been shown to successfully cultivate ideas of sustainability.<sup>37</sup>

The humanities also provide agricultural insight through history. The saying "those who cannot remember the past are condemned to repeat it" applies strongly to agricultural development. Africa's current agricultural industry is shaped by its rich and diverse history. Understanding larger historical patterns, such as colonialism and neoliberalism, is necessary to understand and restructure the global agricultural network. International efforts to fix Africa's failing agricultural industry, such as the structural adjustment programs, have failed.<sup>38</sup> Historians can analyze the past to learn from these mistakes and communicate successful patterns of agricultural development. For example, historians can analyze the Green Revolution to understand what led to the significant agricultural boom in Asia and South America. Through analysis, Africa can apply these techniques to its own agricultural development.<sup>39</sup>

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<sup>37</sup> Sander Jacobs, Nicolas Dendoncker, Berta Martín-López, David Nicholas Barton, Erik Gomez-Baggethun, Fanny Boeraeve, Francesca L. McGrath *et al.*, "A New Valuation School: Integrating Diverse Values of Nature in Resource and Land Use Decisions," *Ecosystem Services* 22 (2016): 213-220.

<sup>38</sup> Ivy Drafor, Glen Filson, and Ellen W. Goddard, "Cereal Producers and the Structural Adjustment Programme (SAP) in Ghana: A welfare analysis of the first decade of SAP," *Development Southern Africa* 17, no. 4 (2000): 489-499.

<sup>39</sup> H. Charles, J. Godfray, John R. Beddington, Ian R. Crute, Lawrence Haddad, David Lawrence, James F. Muir, Jules Pretty,

The humanities also provide ethical perspectives for agricultural development. The first layer of ethics in agriculture considers how agriculture directly affects human life. The current global food system perpetuates hunger and poverty. Ethical arguments from modern philosophers, such as Peter Singer, argue that it is not ethical for humanity to allow this system to continue causing suffering without intervention.<sup>40</sup> Ethical arguments supersede the rhetoric of business or politics to advocate for humanitarian relief — the implications of these ethical arguments include increased land rights for farmers and investment in agricultural programs. Ethical critics of hunger advocate for international action through humanitarian efforts and urgent African investment in agricultural research and development.

Cultural rights are another layer of ethics in agriculture. The Banjul Charter states the rights of peoples as having dignity worthy of protection.<sup>41</sup> The current global food system frequently violates these rights by disrupting various aspects of local cultures, including culinary traditions. Culinary multiculturalism is a policy adopted by nations depending on high amounts of imported,

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Sherman Robinson, Sandy M. Thomas, and Camilla Toulmin, "Food Security: The Challenge of Feeding 9 Billion People," *Science* 327, no. 5967 (2010): 812-818.

<sup>40</sup> Peter Singer, *The Life You Can Save: How to do your part to end world poverty* (New York: Random House Incorporated, 2010).

<sup>41</sup> U. O. Umozurike, "The African Charter on Human and Peoples' Rights," *American Journal of International Law* 77 (October 1983): 902.

processed food. This system combines with tourism to commodify indigenous foods, making them unaffordable for their original communities.<sup>42</sup> This leads to malnutrition, and the culinary staples of individual cultures are denied to their own peoples.<sup>43</sup> Another example of the relationship between agriculture and the rights of peoples is in the Niger Delta, where extraction of oil violates rights by destroying the environment and limiting agricultural production.<sup>44</sup> Agriculture and business are working in these examples, but ethical perspectives bring attention to their injustices.

Ethics also play a role in agriculture through bioengineering. Bioengineering modifies the genetic makeup of plants and animals, potentially helping or harming humans. Philosophical arguments can explore the possibilities of GM crops, and the humanities can consider the implications of bioengineering for animal rights. For example, the book *Oryx and Crake* describes a science fiction world in which chickens are genetically modified

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<sup>42</sup> Alison Misselhorn and Sheryl L. Hendriks, "A Systematic Review of Sub-National Food Insecurity Research in South Africa: Missed opportunities for policy insights," *PLoS One* 12 no. 8 (2017): e0182399.

<sup>43</sup> Sam Grey and Lenore Newman, "Beyond Culinary Colonialism: indigenous food sovereignty, liberal multiculturalism, and the control of gastronomic capital," *Agriculture and Human Values* (2018): 1-14.

<sup>44</sup> Abosede Omowumi Babatunde, "Environmental Insecurity and Poverty in the Niger Delta: A case of Ilaje," *African Conflict and Peacebuilding Review* 7 no. 2 (2017): 36-59.

to the point where they are reduced to chicken breasts. This work of literature explores the ethics of the extreme limits of genetic engineering.<sup>45</sup> The humanities give inspiration to what science can and should do, but they also discuss what science should not be permitted to do.<sup>46</sup>

The humanities are key to overcoming global boundaries that stand in the way of sustainable agriculture. The most prominent boundaries are political. The dynamics of agriculture in the global food system are dependent on global politics. The process of receiving food aid, including much-needed GM seeds that increase agricultural productivity, is political. Western nations have political and economic agendas that may or may not contribute to African humanitarian efforts based on politics.<sup>47</sup> Another political issue affecting agriculture is land grabbing, the general term for foreign purchases of African land to extract resources. This process destroys the African nation's economy and environment, but land policy and global politics have failed to

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<sup>45</sup> Samantha Noll, "Broiler Chickens and a Critique of the Epistemic Foundations of Animal Modification," *Journal of Agricultural and Environmental Ethics* 26, no. 1 (2013): 273-280.

<sup>46</sup> Cathy N. Davidson and David Theo Goldberg, "A Manifesto for the Humanities in a Technological Age," *Chronicle of Higher Education* 50, no. 23 (2004): B7.

<sup>47</sup> Jennifer Clapp, *Hunger in the Balance: The New Politics of International Food Aid*, 1st ed. (Ithaca: Cornell University Press, 1963; 2012).

intervene.<sup>48</sup> There are also national political barriers to investing in a nation's agriculture. Agricultural investment requires political inertia to gain national funding, which can be difficult in the face of other expenses, such as health care, infrastructure development, industry development, and war.

The humanities can ease socio-cultural tensions that interfere with agriculture — the best example of this is the racial tension in Zimbabwe and South Africa. Agriculture is in crisis in both of these nations because of the historical developments of colonialism and governmental failure to redistribute land effectively.<sup>49</sup> The humanities can provide a careful analysis of sociocultural conditions to identify points of tension, and they can provide the peace rhetoric to ease them. Another example of sociocultural tensions hindering agriculture comes from the Niger Delta. Resource extraction by Shell Oil is a case of neocolonialism causing significant ethnic tensions as different groups fight over land rights.<sup>50</sup> These fights and the resource extraction disrupt agricultural potential.

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<sup>48</sup> Saturnino M. Borras Jr and Jennifer C. Franco, "Global Land Grabbing and Trajectories of Agrarian Change: A Preliminary Analysis," *Journal of Agrarian Change* 12, no. 1 (2012): 34-59.

<sup>49</sup> Nhlanhla C. Mbatha, "How to Understand, Evaluate and Influence Efficient Progress in South Africa's Land Reform Process: A Typology from Historical Lessons from Selected Sub-Saharan African Countries," *South African Journal of Economic and Management Sciences* 20, no. 1 (2017): e1-e13.

<sup>50</sup> Babatunde, "Environmental Insecurity and Poverty in the Niger Delta: A case of Ilaje."

Conflict's destructive effects on agriculture is made evident by the Boko Haram insurgency in Nigeria. The government's efforts to defend itself against the Boko Haram, while somewhat effective, have resulted in mass destruction of agriculture.<sup>51</sup> Conflict destroys human resources and tools that agriculture needs to thrive, and it absorbs capital that could be invested into agriculture. Understanding the relationships between different socio-cultural groups increases the agricultural productivity of nations. This includes an analysis of poverty, urban/rural populations, gender, and race relations.

<sup>52</sup> Through sociology, peace and conflict studies, and international relations, the humanities can ease these tensions that act as barriers to agriculture.

The humanities help agriculture by addressing grassroots factors limiting agricultural development. Factors such as a lack of education can act on an individual level while influencing national and global production. Individuals require basic literacy and numeracy skills to learn agricultural techniques. Literacy facilitates the communication of agricultural knowledge, and literate populations can share best practices, communicate with each other, and coordinate access to resources.

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<sup>51</sup> Henry Kam Kah, "'Boko Haram is Losing, but so is Food Production': conflict and food insecurity in Nigeria and Cameroon," *Africa Development* 42, no. 3 (2017): 177-196.

<sup>52</sup> Christopher D. Murakami, Mary K. Hendrickson, and Marcelle A. Siegel, "Sociocultural Tensions and Wicked Problems in Sustainable Agriculture Education," *Agriculture and Human Values* 34, no. 3 (2017): 591-606.

Another hindering factor is the role of women in agriculture. Women in most African nations have the primary role in agricultural processes, while men have the primary role in agricultural decision making. This gap between those doing the work and those making the decisions leads to inefficiency. Furthermore, excluding women from decisions in agriculture excludes half of a nation's great minds. Programs that increase the role of women in agriculture have increased local agricultural production.<sup>53</sup> The humanities help with the application of agriculture at the local level by providing cultural and linguistic insights. Some populations may be isolated by language, requiring specialized translations. These communities may also require cultural translation, accommodating different perspectives on gender roles and work culture. Cultural knowledge of an area can improve the implementation of agricultural techniques and technology. Such insights take into account the significance of land, diet, and religion in agricultural development.

The humanities provide generalizable skills and specific insights into the field of agriculture. Solving the African food crisis through agricultural development requires the active participation of communities, universities, companies, and governments. Universities can serve as infrastructure for these groups, gaining insight from the liberal arts in agriculture. The result of such a collaboration is better agricultural research, sustainable agricultural practices, deconstructed socio-political barriers, effective agricultural investment, and a humanistic approach to

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<sup>53</sup> Rachel Bezner Kerr, Emmanuel Chilanga, Hanson Nyantakyi-Frimpong, Isaac Luginaah, and Esther Lupafya, "Integrated Agriculture Programs to Address Malnutrition in Northern Malawi," *BMC Public Health* 16, no. 1 (2016): 1197.

agriculture. Through university collaborations between agriculture and the humanities, the idea of food democracy and the dream of a humanitarian global food system can be pursued.

## PART C

### THE AFRICAN FOOD CRISIS: CONNECTIONS BETWEEN LAND, AGRICULTURE AND DEVELOPMENT

According to the United Nations' Food and Agriculture Organization (FAO), about 10.7% of the world's population is chronically hungry. That is 815 million out of the 7.6 billion people who inhabit the world.<sup>54</sup> This number is about two-and-a-half times the population of the entire United States.<sup>55</sup> The United Nations states that "hunger and malnutrition are in fact the number one risk to health worldwide — greater than AIDS, malaria and tuberculosis combined."<sup>56</sup>

Despite national campaigns against hunger and intervention programs from the United Nations and the exponentially increasing number of non-governmental

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<sup>54</sup> Food and Agriculture Organization, "The State of Food Security and Nutrition in the World 2017" (Rome: The United Nations, 2017), accessed August 30, 2018, <http://www.fao.org/state-of-food-security-nutrition/en/>.

<sup>55</sup> "United States Population," World Population Review, last modified June 18, 2018, <http://worldpopulationreview.com/countries/united-states-population/>.

<sup>56</sup> "Hunger," World Food Programme, accessed August 30, 2018, <https://www.wfp.org/hunger%20>.

organizations (NGOs), this number continues to grow.<sup>57</sup> There was an increase of about 11 million hungry people from 2016 to 2017 alone.<sup>58</sup> Out of the current 815 million hungry people in the world, about 233 million live in Sub-Saharan Africa (SSA): this is the second-largest population of hungry people in the world after Asia. Asia has the largest population of chronically hungry people, but SSA has a higher prevalence of hunger. Sub-Saharan Africa also has had the least regional progress in hunger reduction when compared to Asia or Latin America.<sup>59</sup>

Many nations tried to repair their stunted economies through Structural Adjustment Programs (SAPs) recommended by the World Bank in the 1980's. The limited, brief success of these programs was followed by a steady decline in African agriculture.<sup>60</sup> Although 60% of Africa's economy is agriculture, agricultural policy has been largely unaddressed by African governments.<sup>61</sup>

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<sup>57</sup> Food and Agriculture Organization, "The State of Food Security and Nutrition in the World 2017."

<sup>58</sup> Food Security Information Network, "Global Report on Food Crises 2018" (World Food Programme, 2018).

<sup>59</sup> "Africa Hunger Facts," Hunger Notes, last modified August 16, 2016, <https://www.worldhunger.org/africa-hunger-poverty-facts/>.

<sup>60</sup> Bert Meertens, "Agricultural Performance in Tanzania Under Structural Adjustment Programs: Is it really so Positive?," *Agriculture and Human Values* 17, no. 4 (2000): 333-346.

Economic failure is reflected in the poverty of SSA: a groundbreaking 41% of people in the region live in extreme poverty, earning less than \$1.90 a day.<sup>62</sup> Africa's exponential population growth, high prevalence of hunger, and historical failure to sufficiently increase agricultural production makes it a critical region for intervention.

### **Defining Hunger**

Hunger is a complex issue with multiple definitions. Hunger statistics can fluctuate significantly, depending on how an organization defines it. I will use three terms to define a population's inability to obtain food: food security, hunger, and famine.

Food security describes the ability of families to access the nutritious food that they need to live healthy lives. It requires access to this food without economic, social, or physical barriers. Hunger is a more general term, describing the physiological sensation resulting from a lack of food security. The term famine describes widespread death in an area due to hunger.<sup>63</sup> During famines, most people do not die from hunger directly, but from

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<sup>61</sup> "Africa," Global Issues, The United Nations, accessed August 30, 2018, <http://www.un.org/en/sections/issues-depth/africa/index.html>.

<sup>62</sup> "Africa," The United Nations.

<sup>63</sup> Vicky Hallett, "What's the Difference Between Famine and Hunger? A Food FAQ," *NPR*, June 13, 2017, <https://www.npr.org/sections/goatsandsoda/2017/06/13/532277316/what-s-the-difference-between-famine-and-hunger-a-food-faq> .

disease. One of the effects of undernutrition and malnutrition is a weakened immune system.<sup>64</sup>

Data about food security often uses nutritional statistics, although nutrition is also a complex variable that can be misinterpreted or overgeneralized. For example, an article titled "Calories Count" in *National Geographic* represented hunger on a map of the world that labeled the average number of calories consumed in each nation.<sup>65</sup> The article stated that the average adult needed about 2,300 calories per day. The suggestion that calorie intake indicates nutritional health makes Tanzania's average intake of 2,120 calories seem like a minor deficit. At the same time, United Nations data states that over 35% of children in Tanzania face compromised development due to poor nutrition.<sup>66</sup> The UN statistic describes nutrition's impact on health more accurately than the National Geographic article. The *National Geographic* article does not provide data to account for nutrient deficiencies, while the UN data provides a more meaningful representation.

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<sup>64</sup> Ibid.

<sup>65</sup> Kelsey Nowakowski, "Calories Count", *National Geographic Society* Vol. 232, October 16, 2017.

<sup>66</sup> "10 Facts About Hunger in Tanzania," World Food Programme, last modified May 13, 2016, <https://www.wfp.org/stories/10-facts-about-hunger-tanzania> .

## Theoretical Foundations of Population Sustainability

The key to solving the African food crisis lies in understanding the problem's various dimensions. It may seem simple, as if there is not enough food to feed everyone. The reality is that the world produces enough food per year to feed a population of 10 billion people.<sup>67</sup> Solving the African food crisis is not a function of dividing the amount of food in the world by the entire population. It is a multidimensional issue with roots in patterns of history, global economics, agriculture, and sociology. Solutions will require collaboration and innovation.

Global food patterns are influenced by population and food production. Global population growth is increasing; this growth strains important resources such as food, land, and water. There are two different perspectives on the relationship between population and food production. One of them is the Malthusian theory. Malthus was an English scholar whose 1798 theory observed that human population growth is exponential, while the increase in human food production was arithmetic. He asserted that the mathematical result of these relationships meant populations would outgrow their food supplies, resulting in an event he described as a Malthusian catastrophe, massive deaths reducing the population to a level that could be supported by the food supply.<sup>68</sup>

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<sup>67</sup> "There is Enough Food to Feed the World," Oxfam Canada, accessed August 30, 2018, <https://www.oxfam.ca/there-enough-food-feed-world>.

A second perspective was introduced in 1965, by Ester Boserup. She was a Danish and French economist who challenged Malthusian theory, arguing against the necessity of catastrophe. She noticed an explosion of technological innovation in her lifetime, leading her to argue that technology could be the factor that averts Malthusian catastrophes. She did not deny resource limitations, but she argued that technology could overcome them.<sup>69</sup> Both theories have limitations. Boserup is correct that agricultural intensification and technological development can increase crop production, but socio-political constraints have not made these technological resources available globally. There are also environmental limitations to how much agriculture can be intensified.<sup>70</sup>

The problem with both Boserupian and Malthusian theories is that they predict famine when the world is unable to produce the amount of food it requires. Agriculture and population are not the only factors that avert a Malthusian catastrophe — the current issue is not that the world does not have

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<sup>68</sup> T. R. Malthus, *An Essay on the Principle of Population; Or, A View of its Past and Present Effects on Human Happiness; with an Inquiry into our Prospects Respecting the Future Removal Or Mitigation of the Evils which it Occasions* [first edition of 1798] (London: Pickering, 1986).

<sup>69</sup> Ester Boserup, "The Condition of Agricultural Growth," *The Economics of Agrarian Change under Population Pressure* (London: Allan and Urwin, 1965).

<sup>70</sup> Derek D. Headey and T. S. Jayne, "Adaptation to Land Constraints: Is Africa Different?", *Food Policy* 48, (2014): 18-33.

enough food, but that it is not equally distributed. Historical, economic, environmental and sociological factors contribute to the African food crisis. These factors can be organized into two conceptual models. First, a layered model to conceptualize points for intervention in the food crisis. Second, a triangular model of land, agriculture, and development. These models provide an introduction to the complexities of the food crisis in Africa and critical points for intervention.

### **Historical Context of Agriculture in Africa**

The two largest barriers for Africa's agricultural industry are its environment and history of colonialism. Pre-colonial Africa had a plethora of agricultural systems, ranging from nomadic practices to large-scale agriculture. The selection of crops varied throughout regions based on culture and climate. For example, Northern African diets are traditionally based on wheat. Central African cuisine focuses on the consumption of roots, tubers, and plantains. Southern Africa mainly consumes maize. Dietary patterns also vary between different nations and cultural groups. The problem with dietary diversity is that the continent cannot optimize growth of a single crop, like Asia has done with rice.<sup>71</sup>

Other environmental factors affecting Africa's agricultural production include tropical temperatures, low water availability, and poor soil composition. Two thirds of Africa's arable land has

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<sup>71</sup> Ibid.

low fertility and is vulnerable to erosion.<sup>72</sup> Arable land is also concentrated in certain regions, affecting population patterns. Sixty percent of arable land is concentrated in only seven nations.<sup>73</sup> Land limitations contribute to Northern Africa's population density, with a sparser population in SSA. This diverse Africa, full of variable dietary and agricultural patterns, is the context in which colonial agriculture developed.

Traditional agriculture was based on community needs and environmental restrictions. Colonial agriculture was designed to provide cash crops for Europe. Colonial powers organized small farms to guarantee a steady supply of export crops, investing in infrastructure based on exportation needs instead of sustainability and community needs. These institutions of colonial agriculture were inherited by African nations after their independence, transferred to the ownership of the state. For a few decades after independence, states owned most of the farms and exercised tight control over crop prices. They were still exporting crops, but they ensured that enough was available for their own people and that these crops would be affordable. This over-regulation caused market decline and economic crisis.<sup>74</sup>

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<sup>72</sup> John Cleland and Kazuyo Machiyama, "The Challenges Posed by Demographic Change in Sub-Saharan Africa: A Concise Overview: Challenges Posed by Demographic Change in Sub-Saharan Africa," *Population and Development Review* 43, (2017): 264-286.

<sup>73</sup> New Partnerships for Africa's Development, "Agriculture in Africa" (Johannesburg: African Union, 2013), accessed on August 31, 2018, <http://www.nepad.org/resource/nepad-agency-2013-annual-report-0> .

Nations sank into tremendous debt, and they were forced to accept structural adjustment programs (SAPs) proposed by the World Bank. The programs forced these nations to accept loans, pull out of the agricultural sector, and loosen their control over prices. The result transferred agriculture to the private sector. However, poor farmers were unable to compete with international prices. Agriculture was a risky investment, for environmental and political reasons, and farmers had difficulty attracting investors. Without financial support, they could not acquire the resources or technology necessary to intensify agricultural production and provide for their nations' growing populations.<sup>75</sup>

An analysis of the effect of SAPs on cereal production in Ghana reveals their failure. People in Ghana spend around 69% of their income on food, so food prices are the most important economic factor affecting the Ghanaian standard of living. The Ghana SAP allowed for free trade of cereal with fewer price controls and export restrictions. The program helped the cereal farmers who could access the market. But it hurt the consumers in Ghana, and most food was sold at high prices internationally. The result was a net economic loss for Ghana's economy. A currency devaluation followed, which reflected the loss. Some people argue that the SAPs helped farmers in Ghana sell their excess cereal, but 90% of farmers in Ghana are subsistence farmers; their excess

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<sup>74</sup> Meertens, "Agricultural Performance in Tanzania Under Structural Adjustment Programs: Is it really so Positive?"

<sup>75</sup> Thomas S. Jayne, David Mather, and Elliot Mghenyi, "Principal challenges confronting smallholder agriculture in sub-Saharan Africa," *World development* 38, no. 10 (2010): 1384-1398.

cereal is used for personal consumption.<sup>76</sup> This is just one example of SAPs hurting Africa's agricultural industry.

New strategies to protect small farmers emerged with programs from the Pan African Farmers Organization (PAFO), aimed to support small-time African agriculture.<sup>77</sup> However, these organizations have largely been ineffective at providing information, capital, or policy changes. Africa's agricultural industry has been unable to keep up with its growing population. Successful farmers cannot capitalize on their investments, due to poor infrastructure. This infrastructure was also inherited from colonial times, with poorly maintained roads and railways that were not planned for sustainability. It prevents farmers from accessing the global economy, and the local economy cannot give them fair returns on their investment. The agricultural industry has become more productive in Africa, but it is unable to keep up with the continent's growing needs.<sup>78</sup>

The global food crisis intensified when food prices began rising in the early 2000s. Prices climaxed in 2008, with a sharp

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<sup>76</sup> Ivy Drafor, Glen Filson, and Ellen W. Goddard, "Cereal producers and the structural adjustment programme (SAP) in Ghana: A welfare analysis of the first decade of SAP," *Development Southern Africa* 17, no. 4 (2000): 489-499.

<sup>77</sup> "Mission PAFO," Mission, PAFO, last modified September 14, 2017, <http://pafo-africa.org/spip.php?article26>.

<sup>78</sup> Jayne, Mather, and Mghenyi, "Principal challenges confronting smallholder agriculture in sub-Saharan Africa."

increase due to a global economic recession. The price spike meant that poorer nations were unable to purchase the food they needed, creating famines. This revealed the new global food market's power to devastate impoverished nations. In response to this crisis, the United Nations created a high-level task force for food security in 2008.<sup>79</sup> It marked the beginning of the United Nations as a key factor in international collaboration to reduce hunger.

The UN has continued to prioritize food security, making it the second pillar in its Sustainable Development Goals to “end hunger, achieve food security and improved nutrition and promote sustainable agriculture”.<sup>80</sup> The Zero Hunger Challenge was based on this goal, launched in 2012 and aimed to eliminate hunger by 2030.<sup>81</sup> It is a lofty goal, especially with its 2030 deadline. The UN's previous development goal program, the Millennium Development Goals, began in 2000, with an end goal of 2015. The first goal was to eradicate extreme poverty and hunger, and the UN touts the MDGs as history's greatest coordinated global effort to reduce hunger. But the amount of people experiencing chronic hunger has continued to increase. The 2018 UN report on hunger attributes this increase to conflict and environmental issues.<sup>82</sup>

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<sup>79</sup> “Food,” Global Issues, The United Nations, accessed August 31, 2018, <http://www.un.org/en/sections/issues-depth/food/>.

<sup>80</sup> “Sustainable Development Knowledge Platform,” The United Nations, accessed August 31, 2018, <https://sustainabledevelopment.un.org/?menu=1300>.

<sup>81</sup> “Zero Hunger Challenge,” The United Nations, accessed August 31, 2018, <http://www.un.org/en/zerohunger/challenge.shtml>.

Historically, the UN has spent much of its budget for hunger reduction on food aid. This is unsustainable because it does not encourage the growth of agriculture or the reduction of poverty.<sup>83</sup> Food aid is frequently unable to reach its destination due to conflict, political barriers, or inadequate infrastructure. Much food aid spoils before reaching its destination, due to logistical and infrastructural storage issues.<sup>84</sup> When food aid does reach its destination, it is often distributed unfairly, or it is insufficient for the population.

Foreign aid reduces the ability of local organizations and governments to provide for their people, weakening the local aid infrastructures in existence. Food aid is not the only UN initiative to reduce hunger; their humanitarian efforts have many other pieces. Several branches of the UN, and other global organizations, collaborate to reduce hunger internationally. These organizations include the World Food Program, the World Bank, the FAO, and the IFAD.

The most recent food crisis is the famine in Southern Sudan. Conflict, poverty, and geographical barriers prevent food

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<sup>82</sup> Food Security Information Network, “Global Report on Food Crises 2018.”

<sup>83</sup> Mukhtar Diriye, Abdirizak Nur, and Abdullahi Khalif, "Food Aid and the Challenge of Food Security in Africa," *Development* 56, no. 3 (2013): 396-403.

<sup>84</sup> Esther Ndichu, “Hunger isn’t a food issue. It’s a logistics issue,” filmed September 2015 at TED@UPS, video, 11:41, [https://www.ted.com/talks/esther\\_ndichu\\_hunger\\_isn\\_t\\_a\\_food\\_issue\\_it\\_s\\_a\\_logistics\\_issue#t-1564](https://www.ted.com/talks/esther_ndichu_hunger_isn_t_a_food_issue_it_s_a_logistics_issue#t-1564).

aid from reaching critical regions, and it is likely that the famine will continue.<sup>85</sup> Donations to the United Nations for humanitarian aid are reliable but insufficient. In February 2017, the UN Secretary General warned that a million people would fall into famine unless \$4.4 billion could be raised by March 20 of that year. The United States, historically the largest donor to the UN, donated \$277 million. Altogether, the UN raised less than a tenth of its goal by the end of March, falling short by billions of dollars.<sup>86</sup> Ambitious goals and underfunding have been a recurring pattern for the United Nations.

With its limited resources, the UN cannot bring sufficient famine relief to areas such as Southern Sudan. Sustainable solutions require coordination between governments and well-funded, well-analyzed solutions. The new wave of humanitarianism, aimed to reduce the global effects of poverty, has seen limited success. The future of hunger in Africa cannot depend on UN humanitarian aid, which has made small but insufficient progress. Instead, the cycle of hunger in Africa must be addressed. Africa's environmental and colonial history has set the agricultural

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<sup>85</sup> Joanne Lu, "'Unimaginable' Suffering in Southern Sudan. Is There Any Hope?," *NPR*, July 5, 2018, <https://www.npr.org/sections/goatsandsoda/2018/07/05/620184859/unimaginable-suffering-in-south-sudan-is-there-any-hope> .

<sup>86</sup> Somini Sengupta, "U.N.'s Famine Appeal Is Billions Shy of Goal," *The New York Times*, March 23, 2017, <https://www.nytimes.com/2017/03/23/world/africa/un-famine-nigeria-somalia-south-sudan-yemen.html>.

economy up for failure. The dynamics of the modern global economy perpetuate that position.

## The Modern Global Food Network

The economic patterns of colonialism depended on colonies exporting raw materials. These resources, crops, and minerals were sent to Europe or the Americas for processing, which distorted Africa's economy. Despite the transition of these colonies to sovereign nations, colonialism's global economic patterns continue. Neocolonialism describes the economic and political influence that Western nations wield over their former colonies. Neocolonialism's most obvious presence in Africa is the economic dependence on exports.

Crops grown for export do not offer reliable economic returns.<sup>87</sup> African governments create short-term policies to support high-demand export crops, neglecting investment in long-term resources and policies for staple crops.<sup>88</sup> The 2008 global market crash and subsequent food shortages were a manifestation of this larger pattern. Much of Africa's food security depends on the exportation of cash crops to purchase imported food. This leaves the future of hunger in Africa vulnerable to fluctuations in the global market.

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<sup>87</sup> Russell L. Lamb, "Food crops, exports, and the short-run policy response of agriculture in Africa," *Agricultural Economics* 22, no. 3 (2000): 271-298.

<sup>88</sup> *Ibid.*

Neocolonialism's patterns and the modern global economic network are rooted in the philosophy of neoliberalism, which is often described as extreme capitalism. It is the idea that the global markets should be completely unrestrained, with little government regulation. Neoliberalism's application means that poorer nations cannot protect themselves from corporate influence or unfair prices.<sup>89</sup> Neoliberalism has created the "global factory," benefitting some regions to the detriment of others. This idea of a global factory describes the separation of economic activities within a country, outsourcing some activity to other countries with lower costs. The global factory means that Western corporations can influence the economies and politics of African nations.<sup>90</sup>

Ellen Gustafson analyzed the global food economy in a TED talk. She argued that global health epidemics of both obesity and hunger are "two sides of the same coin". Gustafson explained that the global factory and its global food network encourages the creation of processed food. She analyzed two effects of this development. First, importing food to create processed food makes healthy food more expensive for Americans. Processed food replacing locally grown food causes obesity and malnutrition, because micronutrients have been replaced by fatty calories. In African nations, food exportation leads to economic dependence

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<sup>89</sup> Lawrence Busch, "Can fairy tales come true? The surprising story of neoliberalism and world agriculture," *Sociologia Ruralis* 50, no. 4 (2010): 331-351.

<sup>90</sup> Philip McMichael, "A food regime analysis of the 'world food crisis'," *Agriculture and human values* 26, no. 4 (2009): 281.

and famine. Gustafson proposes focusing on locally sourced foods and sustainable, socially, and nutritiously conscious farming methodologies to address both issues.<sup>91</sup>

Food waste is another similarity between developing and developed nations. Both sides of the global food network waste significant amounts of food every year, for different reasons. The high affluence of developed nations means that more food is wasted at an individual level, thrown away by sellers or consumers instead of farmers. In Africa, the largest causes of food waste are transportation and storage.<sup>92</sup> Underdeveloped infrastructure can make food transport take longer than necessary, causing food to spoil. Food storage facilities are often insufficient because of low capital investment and lack of advanced technological skill.<sup>93</sup> Most transported food in Africa, including food aid, spoils in either transport or storage. The United Nations recognizes food waste's

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<sup>91</sup> Ellen Gustafson, "Obesity + Hunger = One Global Food Issue," filmed May 2010 at TEDxEast, video, 9:23, [https://www.ted.com/talks/ellen\\_gustafson\\_obesity\\_hunger\\_1\\_global\\_food\\_issue](https://www.ted.com/talks/ellen_gustafson_obesity_hunger_1_global_food_issue).

<sup>92</sup> H. Charles, J. Godfray, John R. Beddington, Ian R. Crute, Lawrence Haddad, David Lawrence, James F. Muir, Jules Pretty, Sherman Robinson, Sandy M. Thomas, and Camilla Toulmin, "Food Security: The Challenge of Feeding 9 Billion People," *Science* 327, no. 5967 (2010): 812-818.

<sup>93</sup> Ndichu, "Hunger isn't a food issue. It's a logistics issue".

role in the global food crisis, and their Zero Hunger Challenge includes a goal of "zero food waste" from all countries.<sup>94</sup>

Africa's role in the global economy means that regions with low agricultural productivity can import food to combat famine, but this is only true if the imports are food aid, or if they are affordable.<sup>95</sup> In reality, food aid is not a sustainable solution for agricultural deficits. Imported food is almost never affordable for individuals living in poverty. Neoliberal arguments expect the market to use Africa's human resources and provide jobs, and that the market will invest in agricultural productivity to meet local demand. These patterns might happen eventually, but the market would need time to adjust. The cost of waiting is human suffering from hunger and poverty. This human cost is too great to delay while the global economy equalizes; the government must take action.<sup>96</sup>

There is variation between nations, but about 80% of farms in Africa are less than two hectares.<sup>97</sup> Most of Africa's agricultural sector is based on small farmers, and economists have found that most large-scale global poverty reduction begins with the success of small farmers. Some scholars advocate for large, privatized

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<sup>94</sup> "Zero Hunger Challenge," The United Nations.

<sup>95</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>96</sup> *Ibid.*

<sup>97</sup> New Partnerships for Africa's Development, "Agriculture in Africa."

farms to increase the agricultural productivity of African nations. They base their arguments on the "yield gap" between current African agricultural production and what it could produce theoretically. This deficit exists because small farmers lack resources and access to the global market.<sup>98</sup> Moving agricultural production towards large commercial farms might increase production, but it might not help the local economy.<sup>99</sup>

Africa's history and unique role in the global marketplace explain its place in the global food chain and the problems that it entails. Malnutrition's cost on society is about 3.5 trillion dollars a year for the global economy.<sup>100</sup> Hunger is increasing globally. While Latin America and Asia have improved their agricultural production, a perfect storm of variables has contributed to Africa's agricultural decline since the 1970s. The Green Revolution increased Latin America's and Asia's ability to feed their people, but Africa's agricultural sector just reached the productivity level

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<sup>98</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>99</sup> Thomas S. Jayne, David Mather, and Elliot Mghenyi, "Principal challenges confronting smallholder agriculture in sub-Saharan Africa."

<sup>100</sup> "Understanding the True Cost of Malnutrition," Zero Hunger, The United Nations, accessed August 31, 2018, <http://www.fao.org/zhc/detail-events/en/c/238389/>.

it had in 1961.<sup>101</sup> This lack of productivity causes mass human suffering and perpetuates poverty, and it hurts the global economy.

## Where is Africa's Green Revolution?

The Green Revolution improved the agricultural and economic networks of Asia and Latin America, but no such sustainable change has taken place in Africa. African nations gained their independence in the 1960s and continuing through the 1970s. These new nations had economies and governments that were traumatized by a history of colonialism. Extreme poverty plagues areas in both Asia and Latin America; like Africa, parts of Asia and Latin America were also subject to colonialism.

Asia saw explosive population growth and limitations on land. Latin America had intense environmental challenges due to its climate. But both regions have been much more successful at increasing agricultural production.<sup>102</sup> This success stems from the widespread use of fertilizer, improved seeds, techniques improving crop yields and nutritional content, and the Green Revolution.<sup>103</sup> The question remains: where is Africa's Green Revolution?

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<sup>101</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>102</sup> *Ibid.*

<sup>103</sup> Bernard Vanlauwe, André Bationo, J. Chianu, Ken E. Giller, Roel Merckx, U. Mkwunye, Omo Ohiokpehai *et. al.*, "Integrated soil fertility management: operational definition and consequences for implementation and dissemination," *Outlook on Agriculture* 39, no. 1 (2010): 17-24.

Although Latin America, Asia, and Africa were all affected by European colonialism, each region experienced colonialism differently. Africa experienced the most extensive colonialism with the latest independence; Africa's economy and political institutions absorbed the most trauma. Slave trade took place almost exclusively from Africa, further damaging these systems. Asian and Latin American nations also became independent in economies that were different from the globalized economy that Africa entered. Historically, Asia was able to capitalize on the "global factory" to use its human capital as an income source. Both Latin America and Asia had stronger infrastructure systems and political foundations for economic development. Africa faced the challenges of many landlocked countries, fighting over transportation, resources, and sovereignty, while many Asian countries were able to focus on development.

The global context of the Green Revolution is not the same as the current economic climate for Africa. In African nations, agriculture for internal use is not as profitable as exporting cash crops or using land for biofuel.<sup>104</sup> The economy is also dependent on advanced fertilizers imported from Asia, leaving the agricultural industry vulnerable to shortcomings when prices rise.<sup>105</sup> While the Green Revolution was able to improve the productivity of small farms, most agricultural improvement in Africa has come from large private farms. The increased

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<sup>104</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>105</sup> McMichael, "A food regime analysis of the 'world food crisis'".

productivity is mainly used for exported products instead of benefitting small farmers. The result is a net loss in the economy, instead of improvement.<sup>106</sup>

Africa also faces unique environmental challenges from regions that benefited from the Green Revolution. Increasing population puts strains on arable land. Poor management and unsustainable farming have caused soil degradation in Africa's already challenging environment. Global climate change has increased challenges such as extreme temperatures, natural disasters, and water scarcity. Africa also faces disease epidemics, such as HIV, that were not present in the conditions of the Green Revolution. Poorer educational infrastructure also limits opportunities for positive agricultural practices and economic growth.<sup>107</sup>

One key to the Green Revolution's success in Asia was the genetic modification of rice. GM rice was more productive, disease resistant, and water-efficient. It was integral to the region's improved agricultural production. Further research has developed innovations such as golden rice, genetically designed to improve regional nutrition. The problem is that rice was easily spread across Asia, where rice is a staple food, but Africa has more of a diverse diet across the continent. Different regional preferences for tubers, maize, or plantains make the genetic modification of a

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<sup>106</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>107</sup> Vanlauwe, *et. al.*, "Integrated soil fertility management: operational definition and consequences for implementation and dissemination."

single crop less productive as a solution for productivity or nutrition.<sup>108</sup>

Despite these differences, an analysis of the Green Revolution provides insight into how Africa can achieve agricultural success. The Alliance for a Green Revolution in Africa (AGRA) has declared that Africa should learn from the Green Revolution in Latin America and Asia while addressing Africa's unique challenges.<sup>109</sup> Following the Green Revolution's lead, Africa should pursue agricultural growth through investments in the productivity of small farms. This requires a varied approach. Improving the productivity of these farms requires better circulation of information. It requires capital for these farmers to invest in new technologies and inputs. Research on African crops and agricultural techniques is required to improve agriculture in Africa's unique environmental conditions.<sup>110</sup>

## **Agricultural Policy in African Nations**

Overcoming Africa's agricultural industry problems requires government intervention. Governments must protect

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<sup>108</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>109</sup> Vanlauwe, *et. al.*, "Integrated soil fertility management: operational definition and consequences for implementation and dissemination."

<sup>110</sup> John Butler-Adam and Academy of Science of South Africa, Pretoria, South Africa, "More Scientific Thinking Needed to Feed Society: The NSTF Tackles Hunger," *South African Journal of Science* 112, no. Number 7/8 (2016): 1.

African nations from global market crashes. However, too much government involvement can stunt economic growth. The SAPs often removed too much of the government's control over the economy; sudden withdrawal caused agricultural failure and economic shock. One example is the SAPs that hurt the cereal industry in Ghana.<sup>111</sup> Another is the adoption of SAP in Tanzania.

In 1967, the Tanzanian government began intensely regulating its economy. The nation's debt continued to grow, and Tanzania adopted economic reforms in 1991, following the World Bank's recommendations. Part of these economic reforms involved the withdrawal of agricultural subsidies, the removal of price controls, devaluation of the shilling, and reduction of import tariffs. The economy improved during the first five years of SAP implementation, but then it consistently declined. One reason for the SAP's failure in Tanzania was agricultural neglect and inflation of crop inputs.<sup>112</sup> There must be a balance between government support for agriculture and access to a free global food market.

Another obstacle for African agriculture is a failure to address "land grabbing". Land grabbing is an umbrella term for transactions where African land is purchased by foreign parties. In 2009, the World Bank reported that about 45 million hectares of land underwent international negotiation, and seventy percent of

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<sup>111</sup> Drafor, *et. al.*, "Cereal producers and the Structural Adjustment Programme (SAP) in Ghana".

<sup>112</sup> Meertens, "Agricultural Performance in Tanzania Under Structural Adjustment Programs: Is it really so Positive?"

this land was in Africa.<sup>113</sup> Land grabbing is an example of neocolonialism, because foreign nations use this land to extract resources. Its role in agricultural development is controversial. Supporters say that the privatization of large farms allows for foreign investment in Africa; foreign companies have better access to capital, technology, and information. Foreign plantations could provide jobs and increase agricultural productivity, providing more domestic food and economic growth. Opponents of land grabbing counter that large foreign farms usually produce export crops, meaning that they do not increase domestic food supplies or sustainably reduce poverty.<sup>114</sup>

The land grabbing debate extends well beyond the agricultural sector. Foreign investors have three large categories of land use: food, non-food, and biofuel. Foreign investments in food usually grow crops for export. Non-food uses can include tourism, production, or mineral extraction. And biofuel production involves mining for natural gas or oil. Resource extraction not only uses the land in a non-agricultural way but also causes environmental damage that reduces the total amount of arable land.<sup>115</sup> Statistics about land grabbing are difficult to attain, because

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<sup>113</sup> Ruth Hall, "Land grabbing in Southern Africa: the many faces of the investor rush," *Review of African Political Economy* 38, no. 128 (2011): 193-214.

<sup>114</sup> F. Lisk, "'Land Grabbing' Or Harnessing of Development Potential in Agriculture? East Asia's Land-Based Investments in Africa," *Pacific Review* 26, no. 5 (2013): 563-587.

<sup>115</sup> Hall, "Land grabbing in Southern Africa: the many faces of the investor rush".

purchases are often over-aggregated or under-reported, but international pressure to switch to biofuels has undoubtedly increased this pattern.<sup>116</sup> Biofuel projects have the potential to boost the economy and provide jobs in Africa, although they often fail to live up to this promise. One example is biofuel investment in Mozambique — their biofuel industry did not meet the domestic sales targets or job quotas that foreign companies initially promised.<sup>117</sup>

Land grabbing describes various foreign transactions that usually take place between two parties, a foreign entity and the domestic government. Many nations in Africa do not have well-documented land ownership claims, or the land is disputed. Land grabs often involve the government taking land that is already used or owned by citizens and giving it to foreign investors. This disenfranchises farmers, taking away the land that they have. It also causes civil unrest and discourages small farmers from investing too much capital in their land. They are hesitant because their land is vulnerable to government seizure.<sup>118</sup> These land grabs are often advertised to foreign investors as a way to increase agricultural productivity and solve the global food crisis. More often, it is cheap land sold by African elites to investors with no intention of domestic agriculture; the land taken by foreign

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<sup>116</sup> Ibid.

<sup>117</sup> Ibid.

<sup>118</sup> Saturnino M. Borras Jr and Jennifer C. Franco, "Global land grabbing and trajectories of agrarian change: A preliminary analysis," *Journal of agrarian change* 12, no. 1 (2012): 34-59.

investors is primarily used for non-food or biofuel purposes. When it is used for agricultural purposes, it is almost always used for export products. Land is taken away from citizens who are not able to enforce their property rights due to educational, monetary or political constraints.<sup>119</sup>

An example of the ill-effect of land grabbing, even in the agricultural sector, is South Korea's investment in Madagascar. South Korea bought large tracts of land for rice and biofuels, and the purchase was supposed to create jobs for the people of Madagascar and improve agricultural productivity.<sup>120</sup> The South Korean company making the investment planned to rent 3.2 million hectares of the nation's land. The Madagascar government initially agreed. Riots caused the next president to cancel the deal, describing it as "neo-colonialism".<sup>121</sup> Land grabs can negatively affect the politics and economy of a nation.<sup>122</sup>

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<sup>119</sup> Hall, "Land grabbing in Southern Africa: the many faces of the investor rush."

<sup>120</sup> Vivienne Walt, "The Breadbasket of South Korea: Madagascar," *Time*, November 23, 2008, <http://content.time.com/time/world/article/0,8599,1861145,00.html>.

<sup>121</sup> Sebastien Berger, "Madagascar's New Leader Cancels Korean Land Deal," *The Telegraph*, March 18, 2009, <https://www.telegraph.co.uk/news/worldnews/africaandindianocean/madagascar/5012961/Madagascars-new-leader-cancels-Korean-land-deal.html>.

Land distribution is another agricultural policy issue. Land distribution in Africa is an issue because of its colonial past, when land was controlled by the European minority. Farms were controlled by the white minority, instead of the black majority. Preventing black Africans from owning farms crippled the economy and kept the rural poor impoverished.<sup>123</sup> In August 2018, U.S. President Donald Trump issued statements about land reform in South Africa, claiming that land was being taken from white farmers unfairly.<sup>124</sup> South African land reform became a topic of international conversation. Trump echoed the view of many who are ignorant of Africa's history. In South Africa, the black majority of farmers currently own less than 4% of land, and the rest is owned by the white minority.<sup>125</sup> After the end of apartheid,

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<sup>122</sup> Hall, "Land grabbing in Southern Africa: the many faces of the investor rush."

<sup>123</sup> Henry Bernstein, "Commercial Agriculture in South Africa since 1994: 'Natural, Simply Capitalism'," *Journal of agrarian change* 13, no. 1 (2013): 23-46.

<sup>124</sup> Colin Dwyer, "Here's the Story Behind That Trump Tweet on South Africa—And Why It Sparked Outrage," *NPR*, August 23, 2018, <https://www.npr.org/2018/08/23/641181345/heres-the-story-behind-that-trump-tweet-on-south-africa-and-why-it-sparked-outra#reform>.

<sup>125</sup> Rural Development and Land Reform, "Land Audit Report" (Republic of South Africa, 2017), accessed August 31, 2018, <http://www.ruraldevelopment.gov.za/publications/land-audit-report/file/6126>.

one of the major tenets of reconciliation was the redistribution of this land — this process is vital to provide economic opportunity for black South Africans and retribution in their nation. But it has been under much debate and has largely failed to occur.<sup>126</sup> South Africa's government feels continual pressure to redistribute land and improve the nation's agricultural sector.

Land reform is necessary, but it has the potential to hurt the economy if it is not well managed. South Africa's opponents of land reform point to Zimbabwe, where Mugabe launched land reforms in 2000 that redistributed about 23 million acres. This reform chased about 4,000 white farm owners from property that they originally took from Africans. The land was supposed to be redistributed to black, poor, and landless citizens of the nation. However, Mugabe gave much of this land to his political allies. The new owners knew little about commercial farming,<sup>127</sup> and agricultural production declined by about 60% in one year. The result was economic collapse and food shortages that led large numbers of people to flee Zimbabwe.<sup>128</sup>

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<sup>126</sup> Berstein, "Commercial Agriculture in South Africa since 1994: 'Natural, Simply Capitalism'".

<sup>127</sup> Kevin Sieff, "Zimbabwe's White Farmers Find Their Services in Demand Again," *The Guardian*, September 25, 2015, <https://www.theguardian.com/world/2015/sep/25/zimbabwe-land-reforms-mugabe-white-farmers>.

<sup>128</sup> "Mugabe's Land Reform Cost Zimbabwe \$17 Billion: Economists," *News* 24, May 12, 2018,

South Africa will certainly learn from Zimbabwe's mistakes, but this precedent encourages national hesitation over widespread land reform. Small-scale farming is integral to a nation's food security and economic success. South Africa's land distribution situation adds another layer to that challenge: land must not only be distributed to small farmers, it also cannot be segregated. The question of land reform remains a challenge. The policy encouraging white farmers to sell their land voluntarily has largely failed — black Africans have lacked the capital to make purchases, and white farmers have been uncooperative.<sup>129</sup> The next solution could involve unpaid seizure of land, similar to Zimbabwe. This is problematic because nations that do not respect property rights are not places with substantial foreign investment. Land that has already been redistributed in South Africa is mainly abandoned or under-productive. Solving this problem will take innovation and collaboration between the people of South Africa and the government.

African agriculture is often the global factory's bottom rung. Too many African farms are based on exports or non-food use. African governments have not provided enough policy incentives for agriculture. Policies implemented for SAPs, land grabs, and redistribution have largely failed. The most productive

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<https://www.news24.com/Africa/Zimbabwe/mugabes-land-reform-costs-zimbabwe-17-billion-economists-20180512>.

<sup>129</sup> Nhlanhla C. Mbatha, "How to Understand, Evaluate and Influence Efficient Progress in South Africa's Land Reform Process: A Typology from Historical Lessons from Selected Sub-Saharan African Countries," *South African Journal of Economic and Management Sciences* 20, no. 1 (2017): e1-e13.

farms are owned by foreign powers increasing their own profits. The result is a cycle of poverty and famine, and the philosophy of neoliberalism will continue this process. Intense government intervention can have negative economic effects, as it did in Tanzania and Zimbabwe. But the SAPs proved that sudden government withdrawal can also cause economic decline. Government policy for African agriculture should apply “limited yet appropriate government intervention.”<sup>130</sup> Governments must pursue a bottom-up approach to collaborate with rural poor areas. Nations must redistribute land, as well as the capital and knowledge to manage it. Governments must invest in infrastructure, so these small farmers can store and transport their products nationally and regionally.<sup>131</sup> Extensive and informed government planning, with detailed implementation, will support the development of the agricultural sector.

## Environmental Factors

Two environmental issues affecting Africa’s agriculture are desertification and global climate change. Soil degradation, resource depletion, and global warming are causing desertification, transforming arable land into desert. The UN reports that about 12 million hectares of arable land are lost each year due to

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<sup>130</sup> Butler-Adam, "More Scientific Thinking Needed to Feed Society: The NSTF Tackles Hunger".

<sup>131</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

desertification. Twenty million tons of grain could be grown in that space.<sup>132</sup> Desertification is linked with land grabs; foreign nations use African land for biofuels and cash crops while neglecting the soil. It is also tied to the management of large farms, which are more likely to contribute to soil degradation, regardless of whether they are owned by local or foreign entities.<sup>133</sup> Large farms plant the same crops each year, using monocultures that are likely to disrupt the micronutrients, organic carbon, and bulk density of the soil.<sup>134</sup> Such processes contribute to desertification. In Africa, the scale of desertification is so widespread that it can be seen with satellite imagery.<sup>135</sup>

Another significant cause of desertification is climate change. Global climate change is the result of human carbon

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<sup>132</sup> “Desertification: The people whose land is turning to dust,” *BBC News*, November 12, 2015, accessed August 31, 2018, <https://www.bbc.com/news/world-africa-34790661>.

<sup>133</sup> Maru Shete, Marcel Rutten, George C. Schoneveld, and Eylachew Zewude, “Land-use changes by large-scale plantations and their effects on soil organic carbon, micronutrients and bulk density: empirical evidence from Ethiopia,” *Agriculture and Human Values* 33, no. 3 (2016): 689-704.

<sup>134</sup> *Ibid.*

<sup>135</sup> Jeffrey Gettleman, “Loss of Fertile Land Fuels ‘Looming Crisis’ Across Africa,” *The New York Times*, July 29, 2017, <https://www.nytimes.com/2017/07/29/world/africa/africa-climate-change-kenya-land-disputes.html>.

emissions affecting the Earth's atmosphere. Climate change has many implications for our environment. The most notorious one is rising temperatures. Climate change also causes extreme weather, such as natural disasters, drought, and rising sea levels. The global food network contributes to global warming through international transportation. Africa has low levels of carbon emissions — in some years, less than entire countries such as the US or China. However, the environment of Africa is heavily affected by climate change from global emissions.<sup>136</sup>

Africa is already home to some of the highest temperatures and lowest levels of rainfall in the world. Climate change increases these temperatures and reduces rainfall. This increases the prevalence of disease while decreasing agricultural productivity. It also makes African lands more vulnerable to natural disasters. It is difficult for African farmers to create long-term plans for water sustainability when water patterns are becoming more unpredictable. Climate change contributes to desertification by making land hostile to plants. Without the growth of plants, soil is more vulnerable to erosion, eventually becoming unusable for agriculture.<sup>137</sup>

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<sup>136</sup> “Fossil Fuels Emissions from Africa,” Regional, Emissions, Carbon Dioxide Information Analysis Center, accessed August 31, 2018, [http://cdiac.ess-dive.lbl.gov/trends/emis/tre\\_afr.html](http://cdiac.ess-dive.lbl.gov/trends/emis/tre_afr.html).

<sup>137</sup> Alvaro Calzadilla, Tingju Zhu, Katrin Rehdanz, Richard SJ Tol, and Claudia Ringler, "Economy wide impacts of climate change on agriculture in Sub-Saharan Africa," *Ecological Economics* 93 (2013): 150-165.

Environmental issues are an important piece of the food crisis puzzle in Africa. International forces must continue to fight climate change by lowering carbon emissions. But lowering emissions will be a process that takes several years, because of political and economic barriers. In the meantime, African agriculture can benefit from technology. Desertification means that agricultural intensification is a better solution to food crisis than expansion.<sup>138</sup> This agricultural intensification will require more technology and research than many rural farmers can currently access. The government should commit to environmentally conscious agricultural practices and make investments in agricultural research.

## **Agricultural Technology**

Agricultural intensification is required to feed Africa's population and combat its environmental challenges. This requires technological advancements, and agricultural technology is historically predictive of national development.<sup>139</sup> Extreme conditions from climate change can be addressed with genetically modified crops, but there are barriers to this sort of progress. Africa's colonial history stunted its economic development, and economic development is both the input and output of agricultural

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<sup>138</sup> Ibid.

<sup>139</sup> Patrick Ziltener and Hans-Peter Mueller, "The Weight of the Past: Traditional Agriculture, Socio-political Differentiation and Modern Development in Africa and Asia: A Cross-National Analysis," *International Journal of Comparative Sociology* 48, no. 5 (2007): 371-415.

growth. Small farmers need technology to manage their land so it is productive and sustainable. And technology requires both information and capital. In areas of extreme poverty, these are both difficult to obtain. The government can promote productive and sustainable farming through investment in small-scale agriculture.

I have mentioned two examples of agricultural technology the government can invest in. The first is better storage, to preserve food that is already available. Poor storage technology affects the food market in Africa on multiple levels. Farmers cannot preserve their food long enough to sell it. And the food aid that is meant to help when this happens also spoils easily. The net result is excessive food waste from a lack of cold storage facilities.<sup>140</sup> The second example is soil management technology. Integrated soil fertility management (ISFM) is a technique to improve agricultural production and the environmental conditions of soil. It requires information and transportation infrastructure along with technical capabilities. Governments should work on the research and distribution of agricultural technology. Research in genetically modified crops and fertilizer has the potential to increase crop production exponentially.<sup>141</sup>

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<sup>140</sup> Ndichu, "Hunger isn't a food issue. It's a logistics issue."

<sup>141</sup> Vanlauwe, *et. al.*, "Integrated soil fertility management: operational definition and consequences for implementation and dissemination."

Animal husbandry is another area in which improved technology is needed. As the population of Africa increases, so does the affluent population, and growing urban affluence brings greater demands for meat. This is sometimes portrayed as environmentally unsustainable, because meat takes significantly more resources, water, and feed to produce. In many cases, the production of meat can be an inefficient use of resources.<sup>142</sup> However, many animals are grass-fed or are grazed on land that is already arable—meat can correct the nutritional deficiencies that many undernourished individuals in Africa suffer from.<sup>143</sup> Meat can be produced sustainably, but farmers need technology to be more efficient. In areas such as rural Zambia, farmers lack disease prevention and insemination technology for cattle. The result is low productivity and greater potential for human disease.<sup>144</sup>

Technology is an integral part of agricultural and economic development, but nations must invest mindfully. Development can limit the distribution and application of technologies that the government invests in. Agricultural technology is categorized into high-maintenance and low-maintenance technology. In the Green

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<sup>142</sup> Cleland and Machiyama, "The Challenges Posed by Demographic Change in Sub-Saharan Africa: A Concise Overview."

<sup>143</sup> Charles, *et. al.*, "Food Security: The Challenge of Feeding 9 Billion People."

<sup>144</sup> Chisoni Mumba, Barbara Häsler, John B. Muma, Musso Munyeme, Doreen Chilolo Sitali, Eystein Skjerve, and Karl M. Rich, "Practices of traditional beef farmers in their production and marketing of cattle in Zambia," *Tropical Animal Health and Production* 50, no. 1 (2018): 49-62.

Revolution, low-maintenance technology was successful because of its relatively easy distribution. Both fertilizer and GM seeds can be integrated into the farmer's existing work, rather than requiring new techniques or additional labor. High-maintenance technology, such as irrigation systems or insemination technology, requires regular capital or labor investment. Case studies show that when continued capital or labor is required to maintain new agricultural technologies in poor areas, they will not be maintained.<sup>145</sup> Poor rural farmers who need to increase agricultural productivity cannot afford to take risks with new technologies.<sup>146</sup> African nations must make investments that focus on the research and distribution of low-maintenance technology.

## Food Distribution and Sociology

I have discussed the idea of improving national agricultural production. In general, this can be done by improving the economic situation of rural farmers. However, food distribution has complex patterns within individual nations that extend beyond the contested land ownership seen in Zimbabwe and South Africa.

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<sup>145</sup> Jordi Comas, David Connor, Mohamed El Moctar Isselmou, Luciano Mateos, and Helena Gómez-Macpherson, "Why has small-scale irrigation not responded to expectations with traditional subsistence farmers along the Senegal River in Mauritania?," *Agricultural Systems* 110 (2012): 152-161.

<sup>146</sup> Cleland and Machiyama, "The Challenges Posed by Demographic Change in Sub-Saharan Africa: A Concise Overview: Challenges Posed by Demographic Change in Sub-Saharan Africa."

Post-production distribution varies depending on population, class, geography, and gender.

Africa has the highest rate of population growth as a continent.<sup>147</sup> In 1950, the people of Africa made up about 7% of the world. In 2050, they will be about 22%. This is despite the rest of the world's exponential population growth. Population growth puts additional pressure on the already high constraints of Africa's agricultural sector. It must not only catch up to feed Africa's current population, but increase to feed her future population. A sufficient domestic food supply is necessary for equal distribution. Population growth accompanies sociological changes in society, and these can be barriers to food distribution—especially geographical changes, the growth of a middle class, and an increasing young population.<sup>148</sup>

The urban population has been neglected thus far in this lecture. Africa's urban growth is expected to increase by about three-fold from 2015 to 2050, while the rural population is predicted to increase by only 58% over same period.<sup>149</sup> Population growth is highly concentrated in cities, which provide unique

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<sup>147</sup> "Population," Global Issues, The United Nations, accessed August 31, 2018, <http://www.un.org/en/sections/issues-depth/population/>.

<sup>148</sup> Cleland and Machiyama, "The Challenges Posed by Demographic Change in Sub-Saharan Africa: A Concise Overview: Challenges Posed by Demographic Change in Sub-Saharan Africa."

<sup>149</sup> Ibid.

challenges to hunger. Urbanization is associated with economic shifts to non-agricultural jobs. But this market does not exist in many African cities, resulting in large unemployed populations. And these urban poor cannot support themselves with subsistence agriculture.<sup>150</sup>

Cities pose the challenge of the "urban food desert." A food desert is an impoverished area in a city that experiences food insecurity. There may be a lack of supermarkets, or the existing food infrastructure is too far away or too expensive. The urban poor resort to eating a large amount of processed or other cheap, carbohydrate-rich foods, resulting in malnutrition. An analysis of urban planning in Uganda found that food infrastructure is rarely a factor in urban planning.<sup>151</sup> A lack of supermarkets usually creates a demand for informal food markets that are harder to accommodate in urban planning. Their pricing and taxation are also difficult to control. The urban poor are unlikely to receive national food aid in African nations. Food aid through systems like food stamps are impractical because poor infrastructure and informal markets.

Another issue, related to food security and the urban poor, is the growth of the middle class. The African Development Bank has identified the growth of the middle class as essential for Africa's

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<sup>150</sup> Jonathan Crush and Jane Battersby, *Rapid Urbanisation, Urban Food Deserts and Food Security in Africa*, 1st 2017 ed (Cham: Springer Verlag, 2016).

<sup>151</sup> Ibid.

economic growth.<sup>152</sup> The middle class is expected to purchase more consumer products and services, providing jobs that lift the poorer class out of poverty. In Africa, the middle class is a very diverse category that includes those living just above the poverty line and those making a comfortable living. The international poverty line is about two dollars a day; individuals living just above this line are defined as the vulnerable middle class. This vulnerable middle class makes up about 60% of Africa's middle class. It does not act as a middle class 'should' act, living very close to poverty and lacking the middle class' expected economic activity or political engagement.<sup>153</sup>

A topic of debate is whether the middle class will demand local or imported food. The vulnerable urban middle class is one of the fastest growing groups, which affects national economies. To promote food security and sustainable environmental and economic development, this class must purchase locally grown foods; imported foods leave them vulnerable to fluctuations in global markets. The middle class purchases more meat and produce than the poorer class, giving them more influence over the food market. Analysts have found that the vulnerable urban middle class is not more likely to purchase imported processed food than the urban poor — there is not an innate preference for the market

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<sup>152</sup> David Tschirley, Thomas Reardon, Michael Dolislager, and Jason Snyder, "The rise of a middle class in East and Southern Africa: Implications for food system transformation," *Journal of International Development* 27, no. 5 (2015): 628-646.

<sup>153</sup> *Ibid.*, 2015.

to focus solely on imported food.<sup>154</sup> Middle class growth is compatible with sustainable food networks. Governments must get involved in mindful urban planning and consider food infrastructure to avoid urban food deserts.

Gender is another demographic factor contributing to unequal food distribution. Women in many African nations do not have equal educational opportunities, land rights, or access to resources. In rural areas, women managing farms are likely to be less productive than men for these reasons. They are less likely to have capital or invest it in land, because of uncertain land rights. They are less likely to have information about agricultural techniques because of exclusion and a lack of education.<sup>155</sup> Women in agriculture are less likely to share information due to social and political restrictions. Families in urban areas, led by single mothers, are twice as likely to have issues with food security because women do not have fair employment opportunities.<sup>156</sup> Programs such as African Women in Agriculture Research and Development (AWARD) are necessary for gender inclusion and better agricultural information and resources for women.<sup>157</sup>

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<sup>154</sup> Ibid., 2015.

<sup>155</sup> Ruth Oniang'o, "Women are still the key in agriculture and food security in Africa," *South African Journal of Clinical Nutrition* 18, no. 2 (2005): 150-154.

<sup>156</sup> Crush and Battersby, *Rapid Urbanisation, Urban Food Deserts and Food Security in Africa*.

Increasing fertility rates in African nations also affects women in the economy. Women are less likely to find employment in areas with high fertility rates, because they are needed to raise children. Children may be able to work, but they are less productive until they reach maturity. These children also require education and healthcare to grow into healthy adults that can contribute to the economy.<sup>158</sup> Nations should invest in family planning education for sustainable development; this is especially important in urban areas where resources and employment are limited.

Agriculture investment must focus on more than improving productivity. The equal distribution of food must also be emphasized, which can be done through economic policies that improve the condition of the middle class, especially in urban areas. It must include solutions for the unique challenges of urban areas, and it must increase women's rights to land, employment, and education. Working towards economic and environmental sustainability will allow African nations to consume less imported food and increase their ability to access local food. The result means more independence from global food markets and less vulnerability to market crashes and famine.

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<sup>157</sup> "Women in Agriculture," *Africa Research Bulletin: Economic, Financial and Technical Series* 49, no. 10 (2012): 19743B-19743C.

<sup>158</sup> Cleland and Machiyama, "The Challenges Posed by Demographic Change in Sub-Saharan Africa: A Concise Overview."

## Nutrition and Society

Undernutrition is a type of malnutrition where an individual does not consume enough daily calories over time. Individuals who suffer from malnutrition are consuming the right number of calories that their body needs, but they are not getting the micronutrients they need. Micronutrients include vitamins and minerals such as zinc, copper, and B12. Malnutrition often occurs when agricultural or economic limitations lead to a diet that is mostly carbohydrates.<sup>159</sup> Malnutrition, like undernutrition, poses serious health problems, and these various definitions of hunger must be considered when evaluating global data. Data based on caloric intakes alone provides an incomplete picture of food insecurity's effects. Both malnutrition and undernutrition have negative impacts that go beyond starvation.

Malnutrition's effects are extensive, including diseases such as pellagra, scurvy, and anemia. Malnutrition also prevents individuals and communities from defending themselves against diseases. Malnourished populations are more vulnerable to HIV, malaria, and cholera. Malnutrition is a significant factor in about half the deaths of children in SSA.<sup>160</sup> A poor maternal diet during

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<sup>159</sup> Justus Ochieng, Victor Afari-Sefa, Daniel Karanja, Radegunda Kessy, Srinivasulu Rajendran, and Silvest Samali, "How promoting consumption of traditional African vegetables affects household nutrition security in Tanzania," *Renewable Agriculture and Food Systems* 33, no. 2 (2018): 105-115.

<sup>160</sup> Roy J. Hillocks, "Farming for balanced nutrition: an agricultural approach to addressing micronutrient deficiency among the

pregnancy, indicated by a low birth weight, causes delayed child development. Africa is noted to have a low birth weight rate of about 14%, getting as high as 24% in Senegal.<sup>161</sup> Compromised early development makes children more vulnerable to delays or permanent damage to their physical and developmental health. Breast milk production that is also compromised by malnutrition can worsen these delays.

Growth that is compromised by nutritional deficiencies is called “stunted” growth, which is a well-known phenomenon in biology and public health. Stunted growth means that hunger is not a temporary state but a trauma that impacts lifelong development. It not only affects the lives of individuals and families, it also has a cost on society. Recall the figure that I gave earlier on malnutrition’s cost to society, about 3.5 trillion dollars a year.<sup>162</sup> Healthcare for stunted children and the economic loss caused by their poor health contributes to this cost significantly. Stunted growth degrades the quality of a nation’s human capital. The large youth population is one of Africa’s greatest untapped potentials, and maintaining the quality of this human capital

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vulnerable poor in Africa," *African Journal of Food, Agriculture, Nutrition and Development* 11, no. 2 (2011).

<sup>161</sup> “Low Birth Rate,” Health Situation Analysis, African Health Observatory, accessed August 31, 2018, [http://www.aho.afro.who.int/profiles\\_information/index.php/AFRO:Low\\_birth\\_weight](http://www.aho.afro.who.int/profiles_information/index.php/AFRO:Low_birth_weight).

<sup>162</sup> “Understanding the True Cost of Malnutrition,” The United Nations.

should be the top priority of nations. Public policy must fight malnutrition to promote economic development.

Epigenetics is a growing field of biology studying how the environment affects an individual's genetic expression. An individual's DNA, or genotype, stays the same throughout their life. Yet DNA has alleles, or multiple traits for different phenotypes, physical genetic expressions. The dominant allele in DNA is usually expressed while the recessive allele stays dormant. Recessive alleles are prevented from forming the proteins needed for expression because they are surrounded by a methyl group that acts as a cushion, keeping the recessive trait from being expressed. Epigenetics has found that environmental factors such as hunger can cause demethylation of DNA, expressing genes that were previously unexpressed.<sup>163</sup>

There is a wide variety of causes and effects to this process, many of which are under intense debate, but epigenetics has found conclusive evidence that malnutrition causes altered gene expression. This establishes that stunting not only impacts a child's physical development at time of malnutrition, it also alters lifelong development.<sup>164</sup> There is evidence that the effects of epigenetics are intergenerational, meaning that the child of a malnourished

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<sup>163</sup> "DNA Methylation," What is Epigenetics, accessed August 31, 2018, <https://www.whatisepigenetics.com/dna-methylation/>.

<sup>164</sup> E. Susser, J. B. Kirkbride, B. T. Heijmans, J. K. Kresovich, L. H. Lumey, and A. D. Stein, "Maternal Prenatal Nutrition and Health in Grandchildren and Subsequent Generations," *Annual Review of Anthropology* 41, (2012): 577-610.

individual may experience stunting even if they receive proper nutrition.<sup>165</sup> Malnutrition is a type of trauma, causing peak levels of stress hormones, cortisol and impacting demethylation. Trauma can also be intergenerationally transmitted through psychological processes in families and communities.<sup>166</sup> Epigenetic and psychological mechanisms are just examples of how malnutrition can negatively affect individuals and communities.

A common intervention to combat the epigenetic and physical consequences of malnutrition is the use of nutritional supplements. These nutritional supplements are often given out by organizations such as the UN, containing the correct macro and micronutrients that an individual requires. They are prescribed like medicine to individuals who are sick or children who are malnourished, and they have been found effective in getting children and sick individuals back on track to a healthy life. One innovative nutritional supplement is called Plumpy'Nut, which has been on the news as an innovative solution for providing food

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<sup>165</sup> Lucia L. Lam, Eldon Emberly, Hunter B. Fraser, Sarah M. Neumann, Edith Chen, Gregory E. Miller, and Michael S. Kobor, "Factors Underlying Variable DNA Methylation in a Human Community Cohort," *Proceedings of the National Academy of Sciences of the United States of America* 109, Supplement 2 (2012): 17253-17260.

<sup>166</sup> Gregory E. Miller, Edith Chen, and Karen J. Parker, "Psychological Stress in Childhood and Susceptibility to the Chronic Diseases of Aging: Moving Toward a Model of Behavioral and Biological Mechanisms," *Psychological Bulletin* 137, no. 6 (2011): 959-997.

aid. It does not expire easily and is very rich in nutritional content.<sup>167</sup> Issues with nutritional supplements are their unsustainable model as well as the tendency for families to share them. Plumpy'Nut has been criticized for its bland taste and incompatibility with local cultures; promoting diverse agriculture is a better long-term nutritional intervention.<sup>168</sup>

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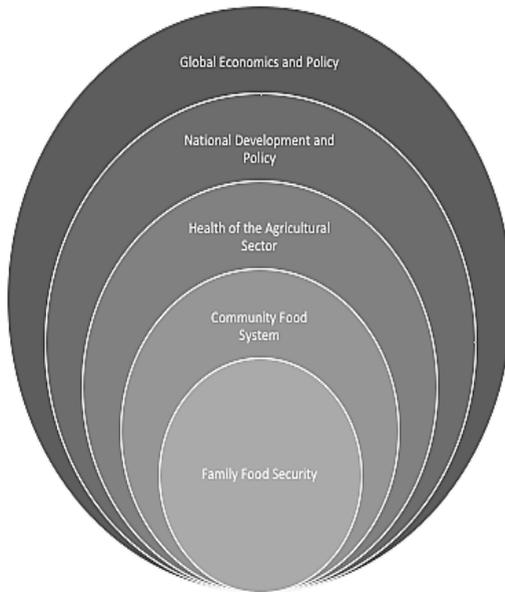
<sup>167</sup> Kate Klonick, "Peanut Paste Saves Starving African Children," *ABC News*, October 1, 2016, <https://abcnews.go.com/Health/story?id=2497593&page=1>.

<sup>168</sup> Ochieng, *et. al.*, "How promoting consumption of traditional African vegetables affects household nutrition security in Tanzania," 2018.

## PART D

### POSSIBLE INTERVENTIONS

This lecture has described some of the complexities of the African food crisis. There is no one direct cause, but a combination of factors layered on top of each other. The following model visually represents how factors trickle down to influence individual families. Global factors, such as the global economy and international policy, contribute to national food shortages. National economies and land policies affect the health of the agricultural sector. The agricultural sector influences community food shortages through poor productivity and inflation. Community factors, such as job availability, infrastructure, and wealth distribution affect family food security. Each layer of influence has problematic aspects contributing to Africa's food shortage.



*Figure 1: Visual model of the layered factors which influence food security in Africa.*

There is no single cause of Africa’s food crisis; it developed over time through complex historical and economic circumstances. And a layered problem requires a layered solution. The solution should apply interventions on macroscopic and microscopic levels. Many creative, innovative solutions have been proposed to create sustainable change in African food systems. Here are a few recommendations that scholars and international policymakers have proposed.

## *Global Interventions*

Global interventions in the African food system usually originate with the United Nations. It is not a perfect organization, but the UN has facilitated international communication and collaboration. Many Pan-African organizations, such as PAFO, also invite the innovation and collaboration of multiple nations. For global interventions that would aid in solving the African food crisis, I have four main recommendations. First, an international entity must hold nations accountable for their commitment to hunger. At present, no entity measures nations' commitment to hunger reduction. Creating a scale that ranks nations by their commitment to hunger reduction would provide humanitarian groups with the necessary information to make effective investments. Such a scale would include factors such as national policies towards hunger reduction and relative amounts of money spent on hunger reduction. Food or money donated to nations that actively implement plans towards hunger reduction would be spent more efficiently.<sup>169</sup>

My second recommendation is for continued work to reduce global emissions. Carbon emissions are the primary factor in global warming, which has had and will continue to have significant impacts on African agriculture. This is a global concern — the negative effects of climate change are global, and the large majority of carbon emissions aren't coming from Africa. My third recommendation is for more sustainable global trade solutions,

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<sup>169</sup> Te Lintelo, Dolf JH, Lawrence J. Haddad, Jennifer Leavy, and Rajith Lakshman, "Measuring the commitment to reduce hunger: A hunger reduction commitment index," *Food Policy* 44 (2014): 115-128.

such as limits on how much food can be exported from countries in a food crisis. Finally, international intervention should invest education and capital in the African economy, especially for the livelihood of small farmers.

### *National Interventions*

National policy is difficult and slow to change. Nations in Africa are challenged with a heterogeneity of ethnicity, religion, and class, which cause conflict when combined with inequality. It is tempting for nations to focus on export crops to make more money immediately. But dependency on exports leaves an economy vulnerable to global fluctuations, which has grave consequences. In Africa, poverty leaves individuals unable to purchase imported food, and all the exported food has been sold for profit. I recommend that governments support national agricultural policies encouraging small farmers and limiting cash crops. Agricultural policy should also include environmental protections, equal land distribution, and limits on foreign land grabs. Governments must invest in agricultural research; each nation has unique environmental conditions and crops that require information sharing for best practices. Governments must also pursue gender reform by investing in women's education and property rights. Finally, they must invest in education to promote better economic growth and the implementation of best agricultural practices.

### *Community and Family Interventions*

Many different community intervention programs have been successfully implemented to aid in times of food crisis. The most widely known is the use of micro-credit, small loans that

enable small businesses or farmers to get started. These loans allow farmers to purchase seeds or agricultural technology, increasing their productivity.<sup>170</sup> Micro-credit is often organized in a community setting, where an existing community organization can regulate the partitioning of this capital. Another proposed intervention is to provide free food at schools.<sup>171</sup> This would allow children to get the nutrition and education that they need, although it requires either NGO or government funding, which is not always available.

Community involvement is a critical component of food security interventions. In Africa, different communities within nations have distinct values and religions. Communities often value the insight of elders, and they want to work together to do what is best for the community. Promoting shared traditional values and stories can help promote food sustainability — African religious values often focus on respecting the Earth and providing for the community, promoting eco-friendly practices.<sup>172</sup> Traditional medicine that includes food may help promote a more diverse diet. Instead of teaching nutrition and healthy eating

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<sup>170</sup> Rosemary E. Isoto, Abdoul G. Sam, and David S. Kraybill, "Uninsured Health Shocks and Agricultural Productivity among Rural Households: The Mitigating Role of Micro-credit," *The Journal of Development Studies* 53, no. 12 (2017): 2050-2066.

<sup>171</sup> Josette Sheeran, "Ending Hunger Now," filmed July 2011 at TEDGlobal 2011, video, 19:03, [https://www.ted.com/talks/josette\\_sheeran\\_ending\\_hunger\\_now](https://www.ted.com/talks/josette_sheeran_ending_hunger_now).

<sup>172</sup> "Traditional Beliefs Promote Sustainability in West Africa," *Science Daily*, March 4, 2015, <https://www.sciencedaily.com/releases/2015/03/150304110252.htm>.

through imported foods, interventions must focus on the available, traditional crops that provide the required micronutrients.<sup>173</sup>

The education of women is another important piece of intervention. Educating women early, especially on economic and health matters, allows them to be educated mothers. Educated women are more likely to use birth control, allowing them to control population growth and offering them more economic opportunities. Educating women would allow single-mother households to access economic opportunity and escape food insecurity. Mothers are often in charge of their children's eating patterns, and their nutritional health affects the development of their children in the womb and while breastfeeding. The World Health Organization estimates that around 800,000 lives could be saved globally each year through consistent breastfeeding, showing the powerful effects of educating mothers on best health practices.<sup>174</sup>

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<sup>173</sup> Monica Samuel Chipungahelo, "Knowledge sharing strategies on traditional vegetables for supporting food security in Kilosa District, Tanzania," *Library Review* 64, no. 3 (2015): 229-247.

<sup>174</sup> "Increasing Breastfeeding Could Save 800,000 Children and US \$300 Billion Every Year," Maternal, Newborn, Child and Adolescent Health, World Health Organization, accessed August 31, 2018, [http://www.who.int/maternal\\_child\\_adolescent/news\\_events/news/2016/exclusiv\\_e-breastfeeding/en/](http://www.who.int/maternal_child_adolescent/news_events/news/2016/exclusiv_e-breastfeeding/en/).

## PART E

### LAND, AGRICULTURE AND DEVELOPMENT

This lecture has described the complexities of the African food crisis. In the preceding Part D, I offer a layered model for understanding the roots of the food crisis. As a conclusion, I offer a second model for understanding the complexities of the food crisis, through the connecting themes of land, agriculture, and development. This second model is useful for policymakers to pinpoint policy intervention areas.

Development affects the land of Africa through the creation of cities and infrastructure. At times, this physical development requires deforestation and alters the arability of the land. Development due to human population growth continues to affect the land through pollution and land use. Modern development also includes increased use of cars, which contributes to climate change. Economic development determines how the land will be used, affected by global trade networks and physical infrastructure. The development of nations also affects agricultural development, because it changes the economic climate in which agriculture is practiced. Increased development increases the education, capital, technology, and infrastructure that farmers need to be successful. Globalization of economic development also changes what farmers grow as they are incentivized to produce more cash crops.

Agriculture plays a key role in development; it provides the basis of development. Agriculture can be the key to a nation's entrance into the global marketplace. It can also provide massive amounts of jobs. Successful, small-scale agriculture allows for the

creation of the middle class, which creates a market for people with expendable income and helps the economy. Sometimes, agriculture can be unsustainable, through poor soil management or intensive monoculture. This can affect the quality of the land for generations.

Finally, the land of Africa plays a significant role in the triangle. Africa has diverse geography, and a nation's agriculture and development are related to the land it claims. Land influences development by affecting what resources are available. Geographical barriers, such as deserts, mountains, and bodies of water can be sources of tourism as well as barriers to infrastructure. The climate, soil quality, and water availability of land also changes what agricultural technologies and crops will be successful.

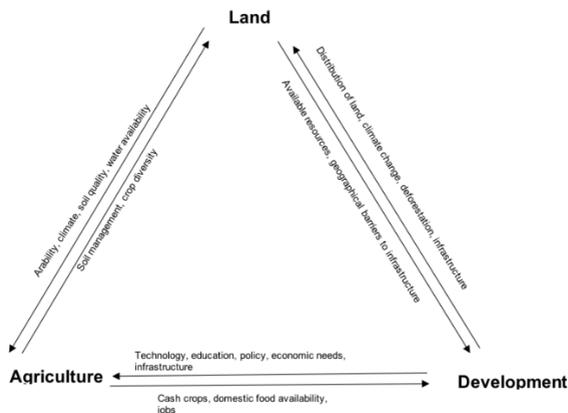


Figure 2: Relationship between Land, Agriculture and Development

Addressing the African food crisis requires the synergy of experts from every discipline and level of authority. Interventions must focus on protecting land, improving agriculture, and supporting development. Nations must pursue food security through poverty reduction, small-scale agricultural growth, and environmental consciousness. Policy must be created to shield African agriculture from the demands of the global economy. International food security efforts should hold nations more accountable for their commitment to hunger reduction, encouraging them to pursue much more sustainable interventions than food aid. Investment in the economy and education of African nations will aid with the crisis, and so will global efforts to reduce the use of fossil fuels. Women's empowerment movements that work to secure land rights will also play a significant role in the solution.

To feed its growing population, Africa must produce significantly more food, or the global food networks must see significant change. Despite the old Malthusian prediction that we will reach the human carrying capacity of the planet, examples such as the Green Revolution show that human ingenuity can overcome resource limitations. Africa can eliminate hunger through careful and sustainable planning, collaboration, and innovation.

## PART F

### WHAT THE UNIVERSITIES CAN DO

In the last year, Nigeria released data showing it has made significant progress towards reducing hunger. From 2017 to 2018 alone, the number of people living in food insecurity decreased from 4.7 to 2.3 million people. But recent conflict in the northeast has put new pressure on the food production and distribution system, and the number of people lacking food security is predicted to rise to 2.9 million by September 2018.<sup>175</sup> About 11 million children under five in Nigeria are estimated to be stunted in their development.<sup>176</sup> Poverty plays a prominent role; about 70% of people in Nigeria live below the global poverty line.<sup>177</sup>

Nigeria's position in the global economy contributes to ongoing poverty and food insecurity. The role of oil contributes to the nation's environmental and economic problems. Agriculture is the largest economic sector in Nigeria, but it depends on exports. Food security relies on imported rice and domestic cassava as staple crops — fluctuations in the price of imported rice contributes to food insecurity.<sup>178</sup> Strains on resources, environmental destruction, and enduring poverty

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<sup>175</sup> “Nigeria,” Countries, Food and Agricultural Organization of the United Nations, accessed September 6, 2018, <http://www.fao.org/emergencies/countries/detail/en/c/213439>.

<sup>176</sup> “The Situation,” Nigeria, UNICEF, accessed September 6, 2018, <https://www.unicef.org/nigeria/nutrition.html>.

<sup>177</sup> “Country Resources,” Nigeria, Food Security Portal, accessed September 6, 2018, <http://www.foodsecurityportal.org/nigeria/resources>.

<sup>178</sup> “Nigeria,” Food and Agricultural Organization of the United Nations.

created an environment for ongoing conflicts that destroy agriculture and infrastructure, causing trauma to the national food system. These are some of the complex environmental, economic, and political forces that influence the food crisis in Nigeria.

Nigeria's food crisis requires careful study. Resources are limited, so intervention must be targeted and effective. Universities provide the infrastructure for discussion and collaboration on these important issues. They use articulate arguments to persuade leaders to take informed action on pressing issues. Nigerian agricultural universities provide the vital research that governments require for action.

I have four recommendations for the university to fulfil its role as the facilitator of solutions. First, universities must actively seek diverse perspectives. A fair representation of voices is required for peace and stability. Universities must not fall victim to bias, whether it be religious, political, ethnic, or gender-based. Inclusion must be more than simple non-discriminatory policies. Universities must actively recruit diverse scholars. This is especially important for gender representation; universities should collaborate with women's agricultural organizations such as AWARD and NiWARD to encourage women in agricultural research. Universities should also pursue active participation in intra-regional organizations that focus on agriculture. Organizations such as PAFO allow for universities to collaborate across borders for the benefit of regions.

My second recommendation for the university is focused research with practical applications. Universities should produce agricultural research that is relevant to government decisions. The university should study the roots of the food crisis, including political and economic barriers to food security. Agricultural

research should take inspiration from the Green Revolution, which was able to improve agricultural production in Latin America and Asia through improved fertilizer and genetically modified crops. These two technologies were cheap and easy for farmers to receive and incorporate. Research should focus on the development of similar low-maintenance technologies specific to Nigeria's climate. The impact on genetically modified crops must be fully understood and made known to the public. Research must also seek to understand and prepare for climate change. It should investigate the impacts of climate change on Nigeria, creating technology to adapt to future problems. Agricultural research extends into meat production, which can be a valuable food source. It also has the potential to be environmentally unsustainable, and universities must define sustainable animal husbandry and provide resources for the sector to be profitable. And agricultural research must focus on food waste in Nigeria. This waste not only takes food away from the hungry, it also makes agriculture less profitable. Practical solutions must be found to improve food storage and infrastructure.

My third recommendation is for the university to be a political advocate for small-scale agriculture. Small-scale agriculture has historically been the foundation for national economic success. Nigeria's dependence on the global market to export cash crops and import food threatens its food security. The university should advocate for policies that discourage exportation or foreign exploitation. Scholars must encourage policies that protect the rights of small farmers, including women's land rights. And the university must advocate for investment in agricultural infrastructure, taking the form of better information sharing systems and physical transportation systems. Special attention

should be paid to urban planning and sustainable agriculture, as Nigerian cities continue to grow.

Fourth, the university should provide free and accessible information to the community. This can be through online information, library access, or outreach programs. The university can direct its research on interventions to help small farmers. It may also promote collaboration through different institutions in the community. For example, the university may coordinate small farms providing food for schools. This would promote child nutrition while guaranteeing markets for farmers. The university should promote agricultural and environmental sustainability through collaboration with local leaders. Community education must include best practices for agriculture and food preservation. Special attention should be paid to nutritional education, which may include researching and promoting local crops that provide essential micronutrients. It may also include maternal education about breastfeeding and child nutrition. Another important community intervention could include switching dietary patterns from imported rice to domestically grown cassava.

Nigerian Agricultural Universities are vital to progress against the food crisis. The last year's decrease in food insecurity shows that universities *can* provide the key research and advocacy for agriculture. But the challenges posed by continued conflict, economic dependency, and environmental disaster require aggressive research and intervention. Through inclusion, research, political advocacy, and community education, agricultural universities can be the center of the solution.

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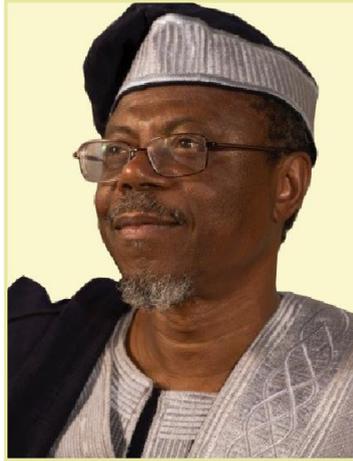
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## LECTURER'S BIOGRAPHY



Toyin Falola, Ph.D., is the Jacob and Frances Sanger Mossiker Chair in the Humanities and University Distinguished Teaching Professor at the University of Texas at Austin, and most recently the Kluge Chair of the Countries and Culture of the South, the Library of Congress in Washington DC. He is a celebrated author, editor, writer, poet, academic leader, organizer, teacher, Pan-Africanist, and a visionary of extraordinary grace, talent and accomplishments. An author and editor of over one hundred and sixty books on Africa and the African Diaspora, he has been invited to speak in all continents, and in over sixty countries, and widely proclaimed as Africa's preeminent historian and one of the major intellectuals of our time. Many of his books have received awards, defined various fields, and inspired the

writings of various critical works. He manages six distinguished scholarly monograph series, and serves on the board of over twenty journals.

A global icon in African Studies, Toyin Falola has received eleven honorary doctorates: Doctor of Humane Letters from Lincoln University, Doctor of Humanities from Monmouth University, Doctor of Humane Letters from City University of New York, Staten Island, D. Litt. from Lead City University, D. Litt. Adekunle Ajasin University, D. ED. from Tai Solarin University of Education (Nigeria), D. Litt. from the University of Jos, D. Litt. from Redeemer's University, D. Litt from Olabisi Onabanjo University, D. Litt. from Caleb University, and D. Litt. from McPherson University.

His lifetime career awards include the Nigerian Diaspora Academic Prize, the Cheikh Anta Diop Award, the Amistad Award, and the SIRAS Award for Outstanding Contribution to African Studies, Africana Studies Distinguished Global Scholar Lifetime Achievement Award, Fellow of the Nigerian Academy of Letters, Fellow of the Historical Society of Nigeria, and The Distinguished Africanist Award.

An annual international conference has been named after him, TOFAC (Toyin Falola Annual Conference on Africa and the African Diaspora) which meets every July in a major African university. The Association of Third World Studies has named its annual best book award after him as the Toyin Falola Prize for the best book on Africa. His memoir, *A Mouth Sweeter Than Salt*,

captures his childhood, while another memoir, *Counting the Tiger's Teeth*, covers his years as a teenager.

For his contributions to the study of Africa, his students and colleagues have presented him with a set of five *Festschriften*, two edited by Adebayo Oyebo, *The Transformation of Nigeria: Essays in Honor of Toyin Falola* and *The Foundations of Nigeria: Essays in Honor of Toyin Falola*, one by Akin Ogundiran, *Precolonial Nigeria: Essays in Honor of Toyin Falola*, and yet another by Nana Amposah, *Beyond the Boundaries: Toyin Falola and the Art of Genre-Bending*. *Toyin Falola: The Man, Mask and Muse* presents bio-critical studies of his works in over a thousand pages.

Two full-length books by Abdul Bangura examine his contributions to pedagogy: *Toyin Falola and African Epistemologies*; and *Falolaism: The Epistemologies and Methodologies of Africana Knowledge*.

Professor Falola has received various awards and honors in various parts of the world. At the University of Texas at Austin, he received the Jean Holloway Award for Teaching Excellence, The Texas Exes Teaching Award, the Chancellor's Council Outstanding Teaching Award, Outstanding Graduate Teaching Award, and the Career Research Excellence Award. His life time career awards are over two dozens, including three Yoruba chieftaincy titles, most notably the *Bobapitan* of Ibadanland.

He served as the Chair of the ASA Herskovits Prize for the best book on Africa, the chair of the Martin Klein Book prize for the best book on African history (American Historical

Association), and committee member of the Joel Gregory Prize for the Canadian Association of African Studies. He once served as the Vice President of the International Scientific Committee, UNESCO Slave Route Project, President of the African Studies Association and President of the Nigerian Studies Association. He is the current President of the Consortium of Pan-African University Press.