

Introduction

Food and Famine Futures, Past and Present

The future is already here—it's just not very evenly distributed.

—William Gibson (1999)

For me, speculative fiction author William Gibson's quote evokes the dreams of a future of high technology: robots, "smart" homes, powerful personal gadgets, dinosaur-sized autonomous mechanical harvesters, and flying, self-driving cars. While the debates over the significance and implications of such technologies can veer into the abstract for those of us in the Minority World—a term coined by Bangladeshi artist Shahidul Alam (2008) to refer to the minority of the world's population living in the richest countries—they might seem positively irrelevant to the billions of the world's refugees, poor, violently oppressed, and disenfranchised.¹ The disconnect between technologies like these and the actual challenges facing the poor and the hungry might even strike some as a cruel joke.

However, the truth is that the future will be based not on the promises of whiz-bang technology, but on the more mundane features of the decisions our societies make about what we will do, how we will do it, and who will get to decide. That is, our future fates are based on our *institutions*. "Institutions," as a technical term, refers to the rules prevalent in a society. They are essentially about how we run our lives individually and collectively, and the many conscious, and unconscious, mechanics underneath the surface. Our ancestors would likely be just as shocked at these institutional foundations of our current societies as they would be at the tools and technology that support them. Institutions, in this way, are as much the stuff of sci-fi fantasy as bleeding-edge

plant breeding techniques and the Dick Tracy wrist-radio/watches some of us now wear on our wrists.

Despite the core functions that institutions embody, they are definitely not what first comes to mind for most people when they think of the *Matrix* trilogy. The Wachowskis' turn-of-the-twentieth-century cinematic series is remembered more as a lead-in to a new age of computer-augmented special-effects action and elaborately choreographed martial arts set pieces. For some (me excluded) it is remembered as disappointing and artistically unsuccessful. Rarely appreciated is that the series undermined some of the typical tropes of Hollywood and contemporary capitalist society more broadly. The *Matrix* movies are some of the few films that are fundamentally about institutions, and not just about the “good” and “bad” people in them. This is an important distinction, as changes in institutions are fundamental to the core story of this book: how the food security policies of Belo Horizonte, Brazil, show us how we may begin to end hunger.

The plot of *The Matrix* and its sequels revolves around a dystopian future where humans have been completely subjugated by sentient machines. The human race, save for a small resistance, are trapped in a virtual reality simulating late-twentieth-century earth. In order to keep humans docile and amenable to the deception, there are multiple “systems of control.” These extend beyond the virtual Matrix and into schemes-within-schemes by the oppressive Machines. Importantly, the Machines have contingencies deployed such that those humans who “wake up” from the Matrix, or try to do so, end up playing into a larger cycle designed to control human rebels in the real world, channeling otherwise unpredictable human tendencies into a repeated pattern of rebellion, defeat, and reinsertion into new versions of the system of control the Matrix represents. All that said, over the course of the movies, we learn that the Machines are not necessarily villains. They, too, are trying—and have a right—to survive.

So while Western popular culture has long focused on individual choice and the characteristics of singular “bad guys” and “good guys,” the Wachowskis' trilogy puts these choices in the context of people's (and machines') interactions with institutions—that is to say, of their interactions with the underlying mechanics of social behavior. As used by social scientists, the term “institutions” is used to group together the *norms*, *rules*, and *values* behind our actions and reactions. There are numerous examples of institutions at work in our everyday lives, from our conceptions of a nuclear family to how to behave in public, how we

drive (or don't), and the natures of our schools and workplaces. These structures map out a lot of our actions so that we don't have to think consciously about our behavior every moment and in every social situation. For a broad range of institutions, we have internalized their dictates to the extent that we rarely question or even notice them.

This is not to say that the written and unwritten rules of institutions don't change. They can gradually evolve, or be changed rapidly as individuals and groups resist, ignore, or enforce any particular set of institutions. To illustrate, let's briefly consider the institution of marriage. The meaning of marriage has changed fairly significantly over the past decades and centuries, particularly in the Minority World. The expectations and practices built around the putative superiority husbands hold over their wives have thankfully declined in many places, increasingly (if fitfully) replaced by a sense of the romantic joining of equals. The increasing acceptance of same-sex marriages aligns well with this latter sense, but clashes with some of the rules, norms, and values understood as traditional (and either unchanged or unchangeable) by others. At the same time, many common elements extend across differing understandings of marriage. Some broad, but not universal, norms for marriage include assumptions of sexual fidelity, co-habitation, and co-parenting children. Any one of these need not hold for a particular marriage, but just as for any other rulebook or tradition, such differences are widely recognized as varying from mainstream expectations (regardless of whether those expectations are thought to be positive, negative, or neutral).

This book, however, is precisely about positive deviations from the norm: changing the rulebooks around food from where they are now to where we need them to be if we are to end hunger. Referring to just such a gap, one of the peer reviewers for an article by geographer Jesse Ribot suggested that "the institutions, processes and forums that could enable the fundamental changes you call for do not yet exist." Ribot responded:

They do exist in some places at some times for some people. . . . If we, as analysts or activists, insist on requiring that all interventions enable democracy, and we insist this demand be enforced, we may help force the hand of practice. . . . I do not want to act or be in a world that does not try. Democracy is an ongoing struggle. It is not a state to be arrived at. It will come and go in degrees. Trying is the struggle that produces emancipatory moments—however ephemeral they may be. The fleeting joy and creativity of freedom seem worth it. (2014: 698)

Important institutions, such as nation-states, human rights, public education, and gender equality, have never been instantly and evenly

distributed worldwide. They all started as an idea among a smaller number of people that went on to influence and shape billions. It is the same with hunger, where the future institutions we need are in many ways already here, if in imperfect forms.

ACTIVE OPTIMISM

Não sou otimista babaca, mas otimista ativo.

—Herbert de Souza, quoted in Helvecia (1994)

This quote from the late Brazilian sociologist Herbert “Betinho” de Souza came to my attention in one of the first analyses of the food policies of the city of Belo Horizonte, Brazil (BH)—the subject of this book and the site of a set of important and “futuristic” institutions (figure 1). In this analysis by Adriana Aranha, a former BH administrator, she quotes Betinho’s statement that “I’m not some stupid optimist.” Rather, he assured us, “I’m an active optimist.”

Aranha used the quote to begin her master’s thesis analyzing Belo Horizonte’s programs, which she had helped shape and implement over the previous years. I happen to like it, too. Betinho gets at the most fundamental element of ending hunger: an activist optimism that demands we take on the notion that hunger *can* be ended. In the vein of Betinho, this book sets out to show that active optimists can bring about a future without hunger, by respecting, improving, and more evenly spreading the institutions to make it possible.

In the United States, it sometimes feels like active optimism—insisting on not only the possibility of change but also its urgent necessity—is taken to be synonymous with being a self-righteous ass.² Our politics and philosophies are often shrunk down to the idea that our only power lays in our consumption choices—buying our way to a more just and sustainable world—without acknowledging that, among other things, this literally defines away the power of the poorest to change the system. In elevating the consumer to fill or replace the role of citizen, it relegates citizenship—not just voting, but organizing, protesting, resisting, and agitating—to the margins. Achieving change becomes the responsibility of the comfortable, who as a matter of course question neither the basis of their comfort nor whether changing their consumption patterns represents change enough.

Indeed, “and next we’ll solve world hunger” has long been used to take know-it-all down a peg: “We’ll do what you say, right after we do *this thing that is effectively impossible.*” Such fatalism, matched with



FIGURE 1. View of the lookout in the Mangabeiras neighborhood in Belo Horizonte, Minas Gerais, Brazil, ©bcorreabh / Adobe Stock 2017.

images past and present of starvation around the world, has fixed the idea that hunger and starvation are inevitable and insoluble. I won't try to convince you that this idea is bandied about to justify continued hunger in and of itself. But neither will I rationalize the deprivation and repression that exist alongside food surpluses. Rather, without being cynical, a rational analysis of current food policy and the history of its development and distribution must consider how such notions have often been applied. We must recognize that the stories we tell ourselves often circulate not because they are true, but because they are useful in maintaining political systems that many of us would otherwise question.

Indeed, any rational analysis of policies and possibilities, whether of food systems or more broadly, must consider questions of epistemology, or the nature of knowing. How do I know what I think I know? If what I think I know is wrong, what does that mean for what the "correct" policies and processes might be? And if there are errors or incompleteness around what I thought I knew, why? *Cui bono?* Who benefits from this?

Obviously, this is not the place for a complete survey of the field of epistemology. But a broad appreciation of the importance and implications of its concepts is vital. Food policies, as we will see, have too often been based on things that we think we know but that don't hold up

under scrutiny. So when we engage in a careful examination of the big picture, we often cut against the stories broadcasted across mainstream media and transmitted even by many a researcher who should know better. We are led to the necessity, then, of grappling with epistemology. Only then can we figure out how to reconcile what we believed we knew about food, what conflicting sources tell us, and what we may be called on to know tomorrow.

So how do we know what we think we know? This is a harder question to answer than it appears. We “know,” for instance, that we will need 70–100% more food in the next several decades—a number cited by many top scholarly journals, news sites, and prominent officials (Cribb 2010; Jackson 2015; Ray et al. 2013). But political economist Tim Wise shows that the projections such estimates are based on were never meant to be taken as predictions of what ought to happen, or what has to happen; in the case of the upper-end projection of 100%, it is not even clear where it originally came from (2013, 3).³ With regards to the low-end projection of 70%, the authors of the report that originally derived it have themselves advised against citing it as a projection of what we will need for the future (Alexandratos and Bruinsma 2012, 7). Beyond that, they updated their estimate from a 70% increase to just 60%.⁴ They also figure, however, that we are on track to meet that increase (Wise 2013, 4–6). While it is quite likely such production would continue to incur serious costs to our environment, we also already have the means to mitigate or avoid these costs. We could be forgiven for thinking that this was a controversial or disproven idea, however, as many experts have breathlessly repeated the need for a whole new (technology-focused) paradigm.

If these basic interpretations are incorrect or incomplete, what might that mean for our proposed solutions? What might that mean for our model of how the world works? And who benefits—*Cui bono?*—from a model that overestimates how much food we need while underplaying the potential of reducing food waste and changing diets, and dismisses as wistful thinking the possibility of political changes to make our food systems more fair and equitable? The historical roots of these misconceptions and misinterpretations, in fact, are deeply embedded in the histories of food, agriculture, and science alike.

HOW MALTHUS EARNED HIS MEALS

The ideas of the English political economist Thomas Malthus have been immensely influential since the publication of his *Essay on the Principle*

of *Population* in 1798. His writings about population and food not only profoundly affected social sciences such as economics and political science but also were pivotal in the development of evolutionary biology and ecology.

Malthus proposed that human populations will grow exponentially with time, while food production will rise only linearly. Under these conditions, the amount of food available per individual will constantly decline, until some individuals, without food, starve and die. With the poor and starving an everyday sight in late Georgian England, and with massive riches accumulating to the few through burgeoning international trade and the Industrial Revolution, Malthus derived a brutally elegant application of his theory.

The reason the poor are poor and stay poor, he reasoned, is because the amount of food in society can only increase so fast, outpaced by the constancy of the “passion between the sexes” that lead the poor to produce more offspring than they can feed. After all, if several children of a poor family survive, and each produces several surviving children of their own, then even the poorest couple will end up with dozens of descendants who do not have the means to take care of themselves, much less pass on resources to their children. Giving the poor more resources directly, however, will do nothing to improve things in his view. With more resources, poor couples will simply have more children than they otherwise would have, who themselves will have yet more children, leading to exponential growth that always surpasses the (hypothesized) linear growth in food supply. Thus, the resources of the poor will always be stretched by more mouths to feed than can be supported.

What is one to do? “Nothing” is one of Malthus’s answers that has stuck with us ever since. “Nothing” was an option long before Malthus, of course, but his calculations established it as a scientific “fact.” Now, thanks to him, we “know” that if you give the poor resources, they will simply end up right back in poverty where they started, by way of the passions of exponential growth. To help the poor then is, in fact, to hurt them, and so the ratchet of the “survival of the fittest” must be endured to whittle away “excess” people. The overbreeding poor lack the industriousness and self-control to pull themselves out of their miserable circumstances.

Life as we know it, however, limits Malthus’s applicability. First, a simple observation. There is no necessary condition by which food rises linearly while populations increase exponentially. The reality of human systems, in fact, is that our food supplies have variously decreased,

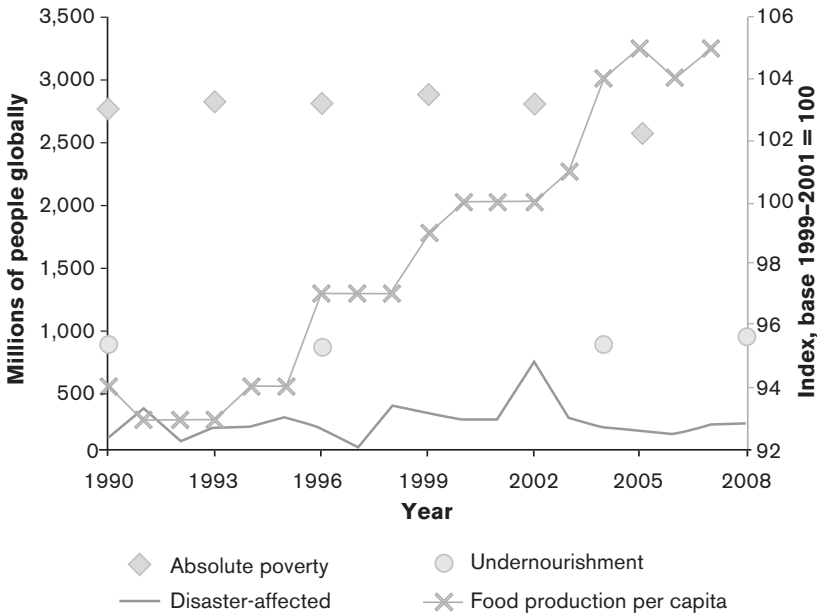


FIGURE 2. Different food security proxy indicators paint different pictures. Undernourishment is far greater than just those affected by disasters but much less than those living in absolute poverty. And none of those measures show the improvement over time that food availability measures do. Data sources: Absolute poverty (<\$2/person per day): (Chen and Ravallion 2008); Undernourishment: (FAO 2009a); Disaster-affected populations: (International Federation of the Red Cross and Red Crescent Societies, various years). Gross food production per capita (base 1999–2001 = 100) (FAO 2009b). Food production series to be read against right-hand vertical axis; all other series against left-hand vertical axis. Unfortunately, no comparable series are available for micronutrient malnutrition or for perceptions-based measures.

From C. B. Barrett. 2010. “Measuring Food Insecurity.” *Science* 327(5967): 825–28. Reprinted with permission from AAAS.

increased linearly, and increased exponentially, depending on the time period and scale at which one looks.⁵ Importantly, per capita food availability, or how much food is theoretically available in the world for each person, has often kept pace with or even outpaced population growth (see figure 2). This means that at times food supply has grown *faster* than human population. So the facts refute Malthus’s modest proposal in multiple ways.

It behooves us, then, to further explore the implications of Malthus’s model. We asked, *Cui bono?*—Who benefits? Setting aside the debate of whether the poor produce their own failures as a class—they don’t—

clearly Malthus's argument weighs heavily in favor of those who already have most of the resources. If giving poor people food, perversely, only hurts poor people, then governments and the society at large bear an ethical obligation to avoid exacerbating the condition of the poor with well-meaning "help." Of course, that is also a roundabout argument for benefiting the wealthy elite, who might otherwise be legally and morally obliged to give aid to the poor and marginalized, whether through higher taxes paid to the government to support those at the bottom, increased "charity," or higher wages to their employees. This "side effect" of Malthus's reasoning needs to be moved back to front and center.

The idea that Malthus's propositions were neither the inevitable result of "science" nor necessarily of any help to the poor does not just stem from many decades of hindsight. Malthus's *Essay* was in fact an entry into an ongoing debate with French political scientist and mathematician Marquis de Condorcet. Condorcet maintained that overpopulation "would be solved by reasoned human action: through increases in productivity, through better conservation and prevention of waste, and through education (especially female education) which would contribute to reducing the birth rate" (Sen 1994).

While famines brought on by a combination of weather events and British policies led to the deaths of millions of Indians in the last decades of the nineteenth century, British officials based arguments against distributing food to them on Malthusian logic. That British policies resulted in food being shipped away from places where people were already starving did little to compel rethinking these policies, nor did criticism from a number of prominent figures of the time, including the statistician and pioneer of modern nursing Florence Nightingale (Davis 2001). Yet despite the supposed superior scientific basis of British policies, at least one contemporary economic historian documented "thirty-one serious famines in 120 years of British rule against only seventeen recorded famines in the entire previous two millennia" (Walford 1878, as cited by Davis 2001, 287).

Why the difference? The answer is found in part in historical counterexamples. Political ecologist Mike Davis describes "moral economies" wherein societal traditions buffered the effects of extreme weather events through systems of mutual obligation, allowing better distribution of food during times of scarcity. He also notes the "famine defense in depth" that Chinese officials deployed in response to the withering drought of 1743–1744, averting "mass mortality from either starvation or disease" (Davis 2001, 280). The officials succeeded in averting famine

not by growing more food or by the (ineffective and inhumane) Malthusian logic of starving the poor until their numbers decreased, but through a combination of local stockpiling and holding local officials accountable for food security. In short, it was long known how to combat famine: take the direction opposite to that of British imperial policy. But even beyond Davis's well-researched examples, we needn't depart far from Malthus's original formulation to question it. There is at least one obvious flaw to his observations about the poor, or rather, with regards to his inattention to the non-poor. We need ask again, *Cui bono?*

If we were to take it as a general rule that food increases linearly and population increases exponentially, should it not also be true that the wealthy, who have ample food and resources at their disposal, should respond by also having more children, such that they too would become poor? Would not their similarly uncontrollable passion lead to multiple descendants who constantly divide their antecedents' wealth into ever-dwindling piles? This is, after all, the plain implication of Malthus's theory, which has been applied to everything from plants, bacteria, and nonhuman animals to the poor. Yet we do not commonly see the assumption that the rich will overbreed until they are poor, with starving to death the only way to limit their numbers or spur them to self-control. What an odd quirk, then, that of all the living things on earth, it should be rich humans—and *only* rich humans—who do not obey the conditions of Malthus's theory.

It turns out, of course, that Malthus was wrong in a number of his assumptions. As Sen (1994) points out, part of the debate between Malthus and Condorcet centered about how much "reasoned human action" might allow for the control of population growth. Malthus was convinced that nothing but poverty and the inability to obtain enough of the "necessaries" of life would stop people from raising the largest of families. Even that, he thought, might not be enough. In short, Malthus concluded, Condorcet's faith in reasoned human action was entirely misplaced. No, in order to control population, and therefore hunger and misery, as people outgrew the linear ability of the land to feed them, you "could not [depend on] voluntary decisions of the people involved," Sen summarizes. Nor could it happen through "acting from a position of strength and economic security." Rather, "it must come from overriding their preferences through the compulsions of economic necessity" (Sen 1994).

A telling precept behind Malthusian thinking is the idea that there are too many of "them" (Harvey 1974; Sen 1994). That is, when thinking

about the effects of people overpopulating their food source, the “people” who are the object of analysis tend to be those in some other country, community, or social class than those conducting the analysis. Geographer David Harvey argues that this is no coincidence. In fact, he points out, Malthus explicitly argued that his ideas did not apply to the wealthier class, who by all Malthusian logic should also breed themselves out of wealth, house, and home. Thus we see that Malthus essentially proposes that there are two types of humans: the rich and the poor, also known as “us” and “them.” “We” can wisely govern our resources and population through policies that are collaborative and rely on “reasoned human action.” “They,” however, will need their reproduction to be controlled more coercively, or even through directly repressive means.⁶

It is clear that such an attitude benefits the rich and, to a large extent, the middle class in each society, as well as the residents of the industrialized societies of the Minority World. Garrett Hardin’s classic (1968) thought experiment of the “tragedy of the commons” draws on a logical structure similar to Malthus’s views. Indeed, in a lesser-known article “Lifeboat Ethics: The Case against Helping the Poor,” Hardin (1974) explicitly argues that we may not be able to “save” all of the world’s people given the limited resources of our biosphere (the “lifeboat” of the title). Given that *we* must choose whom to save and whom to let perish in the sea of poverty around us, he admonishes the reader not to give in to soft-hearted liberal ideals: they will merely lead to overloading the lifeboat and drowning us all. Similarly, we should not capitulate to characterizations of historical misfortunes and inequalities that might imply “we” do not deserve to be in the boat by ourselves in the first place, because such noble thoughts are nonetheless misguided and, again, lead to disaster for all involved.

But a funny thing happened on the way to the lifeboat. Hardin explicitly organizes his thinking around “we.” “We” have to make these tough decisions. “We” need to get over our ethics and deny “our” resources to those who would simply keep reproducing, as “we cannot safely divide the wealth equitably among all peoples so long as people reproduce at different rates.” The problematic immigrants and peoples of the Majority World that he advocates excluding are assumed not to be “us,” even if “they” may comprise a significant part of his readership. We could hardly ask for a better demonstration of the relevance of *cui bono*, and a certain perverse Panglossianism, laid bare in what could be faithfully rephrased as, “It just so happens that my logic says ‘we’ get to live, and

‘they’ get to starve and die.” How fortunate (or unfortunate depending on the vantage point) that such “logical” reasoning benefits “us” and dooms “them,” but those are the breaks in this, the best of all possible worlds.

We might better apply what I call *we bono* to this sort of motivated reasoning. That is to say, we might suppose that the more a chain of reasoning places burdens or costs on others, or maintains or improves a beneficial status quo for the reasoner, the more likely the reasoning is incomplete or incorrect. Beware, then, any approach to thinking about the problems of the world that requires nothing of you and puts blame or responsibility on others, as a matter of first principle. While there are no doubt problems for which we bear no responsibility, it is all too easy and too tempting to assume this is also true of problems for which we clearly have the capability to improve things.

EIGHT SIMPLE RULES FOR UNDERSTANDING GLOBAL FOOD SYSTEMS

So what we believe—expediently or not—has profound effects on notions of reality and the interventions we subsequently propose. *We bono* reasoning, for one, is refuted by more than logical inference. The facts on the ground, based on evidence out of the heart of scientific practice, also refuse to cooperate. In fact, in a self-conscious parallel to Frances Moore Lappé and Joseph Collins’s narrative of how they came to write the indispensable *World Hunger: 10 Myths*, my own exploration of these issues has led me to eight basic propositions about global food systems. These refute not only *we bono*, but many of the most basic assumptions about the nature of the crisis held by even the most conscientious of reformers.

1. *There is more than enough food in the world to feed everyone full, healthy diets*

The suggested average daily intake of calories is about 2,300 calories per person per day (USHHS and USDA 2015). Since 2010, humanity has steadily consumed an estimated average of nearly 2,900 calories of food per person per day (FAO 2009b/2016). This is the amount of calories available *after* food loss due to waste and conversion to livestock is taken into account. It has been estimated that 10–50% of total global food production is lost along the production and consumption chains (data and analysis to date have not been adequate to resolve the lack of

a consensus estimate; Parfitt, Barthel, and Macnaughton 2010). A further 1,200 calories per person per day are lost on the net from the conversion of crop plant matter to livestock: we feed animals about 1,700 calories per person per day and gain back about 500 calories from their products (Smil 2000, in Lundqvist, de Fraiture, and Molden 2008).

There are various possible arguments to justify some degree of livestock cultivation and meat eating, including the thesis that, in some cases, integrated crop-livestock systems see the highest possible environmental efficiency. It is also true that a number of people around the world depend on animal protein in ways that, culturally or logistically, are not easily replaced. At the same time, we must remember that the inefficient practice of feeding livestock food that theoretically could have been grown for humans takes place mostly in the heavily industrialized Minority World, particularly in the United States and the European Union. Countries of the Minority World also purchase a disproportionate tonnage of livestock products produced in the Majority World, such as the beef raised in Brazil and the soy raised there to feed cattle throughout the world. And overconsumption of meat, particularly industrially produced meat, is ultimately harmful to the health of those eating it. Put simply, there are viable arguments for producing and eating some meat. But there are practically no scientifically and ethically defensible arguments for the *amount* of meat eaten by an increasing number of people in the world, given the environmental harms, ethical mistreatment of animals, likely morbidities in consumers, and the inefficiency of feeding our crops to domestic animals (whom we then eat). Whatever their merits in general terms, the pro-meat arguments practically all fail as justifications for an expanding model of industrial-scale meat production and consumption.

It may be heroic to assume that we can produce major changes in dietary and waste trends. It would, at the same time, be irrational to focus on producing more food without dramatically upping our efforts to avoid wasting it. It is a simple matter of thermodynamics—the basic physics of the universe—that it is more efficient to use what you have already produced and waste less of it than it is to increase production and continue with the same degree of waste. This is true even if we recycle that waste. To put it in stark relief, imagine a situation where one in every two houses built in a town burned down before anyone ever lived in them. Imagine the town also meanwhile suffered a lack of affordable housing. Does it make more sense to invest our always-limited resources in building more houses and accepting half of them as so much expensive

kindling? Or would it be better to invest the majority of our effort in reducing the proportion of houses that burn down, even if that is hard, but not impossible, to do?

Long story short, per person food production in the world has been consistently increasing for decades, at a faster rate than the increases in the total population of people in the world. If large-scale insufficiency in food were a root cause of global hunger, then we should have expected to see much more progress in—if not the eradication of—hunger over the past sixty years. It is simply not viable to argue that “ending world hunger” has to do with increasing the total amount of food in the world. To paraphrase the noted Dread Pirate Roberts, most of the time those who say differently are trying to sell you something (and in this case, literally so).

2. There is more than enough food in most countries for all citizens of those countries to have full and healthy diets

There is a more sophisticated position on “solving” world hunger that starts from a recognition that food security is most affected by what food is available to individuals in their specific contexts, not how much food there is in the world. On its own, this contention is self-evident. That the average U.S. consumer has access to around 3,639 calories per day (FAO 2009b/2016) does nothing to provide income, human rights, or indeed food itself to a poor farmer in India, Haiti, Uganda, or any one of thousands of places facing serious food insecurity. Absolute calories even do little to alleviate the burden on the over 11 million Americans who live in households characterized as having very low food security or the additional 30 million who live in households that are characterized as having “merely” *low* food security (Coleman-Jensen et al. 2016, 6–9).⁷ And although trade does alter how much food is available in each country, only 12–17% of food crosses international borders between production and consumption⁸

Data collected by economist Lisa Smith and colleagues (2000) indicated that around 78% of malnourished children in the 1990s lived in countries with “food energy surpluses.” In fact, even sub-Saharan Africa had enough food as a region to provide 100–110% of “dietary sufficiency” for its population between 1991 and 2015, despite the fact that it is often put forward as the foremost case where “we” need to produce more food. In terms of individual countries, data from forty sub-Saharan

countries and territories for the years 2014–2016 showed that thirty-two of them had dietary energy sufficiencies of 100% or more (FAO 2009b/2016).⁹ Even more surprisingly, India—which has an estimated 2,400 calories per person per day available within its borders—has one of the highest rates of child malnutrition in the world and is home to 195 million people suffering from food insecurity. To put this in perspective, the entire continent of Africa has an estimated 232 million food insecure people, 220 million of whom live in sub-Saharan Africa (FAO 2015a, Annex 1; FAO 2009b/2016).

If we compare regions, rather than country to continent, Southern Asia's 281 million food insecure individuals certainly merit at least as much concern as the 220 million people living this way in sub-Saharan Africa. But one might suspect that Africa continues to bear the brunt of the world's attention *because* it is an area where food availability hovers closer to the line in terms of being sufficient, in the aggregate, to feed its populace. The dominant narrative that focuses on production and the notion that solving hunger is about producing calories only works when there is not an abundance of calories available. In fact, you may see India touted as one of the success stories of the agricultural changes of the past six decades, the so-called Green Revolution that allowed India to “overcome [its] own monumental hunger problems” (Paarlberg 2010). The fact that one of the centers of the Green Revolution still suffers from profound hunger makes it far less attractive as a focus of discussion than Africa, where many countries and regions do indeed see low agricultural productivity, soil problems, and food insecurity occurring together.

The point here is not to say that food production, food availability, and food security share no relationship. Clearly that is false. But I hope this book impresses upon you that in the world as it actually exists today, concentrating on how much food is being produced and how we can produce more is in most cases the wrong focus entirely. As a practical matter, increased production is not necessary in many cases, and in virtually no cases would it be enough on its own. What I will argue, and what we will revisit in the coming chapters, is that by and large the same critiques do not equally apply to several alternate approaches, particularly those focusing on the full suite of human rights, including autonomy and sovereignty. These approaches should occupy the highest place in our priorities, with food production taking less—not none!—of our attention and resources.

3. If dietary changes and food waste are reasonably addressed, we already have enough food to feed a future projected population of 9–10 billion people

This is another statement that is empirically well supported but, of course, complex in its details and implications. The possibility itself can be painted as idly wistful—sure, we could solve our problems if these things were true. (And if wishes were wings, then everyone could fly.) Given that clearly evaluating, and reevaluating, our own beliefs and conclusions is a critical part of scientific practice, we need to admit upfront that changing diets and decreasing food waste are not easy or inevitably successful tasks.¹⁰

But who said that any part of solving world hunger was going to be easy? Assuredly, making more food, distributing it more fairly, ensuring human rights, and decreasing the environmental damage of our food and agriculture system are all very tall orders. So “Is it easy?” shouldn’t be one of our primary standards of evaluation. There simply are no easy choices here. The far more reasonable questions “Is it possible? Is it feasible?” actually require a considerable bit of analysis. Yet very few analyses to date have seriously compared the feasibility of addressing our problems by “doubling down” on our current industrial food system, as opposed to taking alternate approaches such as supporting the right to food and addressing diet and waste.

Now, to the assertion itself. The human population is projected to reach between 9.2 and 10.2 billion people in 2050 and 11.2 billion by 2100. The recommended daily calorie intake of 2,300 calories per person per day, mentioned above, is actually a rough average. There is significant variation around this average based on health, age, activity level, and in the case of women, whether they are pregnant or nursing. Additionally, about a quarter of the world is currently under the age of fifteen, and 12% are sixty years or older, two groups that usually need fewer calories (USHSS and USDA 2015; population figures from UNDESA 2015). At the same time, we have a current dietary energy supply of approximately 2,903 calories per person per day for seven and a quarter billion people (FAO 2015b). On that basis, with no changes to current systems whatsoever, we would in fact have enough food on a calorie basis for approximately 9.14 billion people, slightly below the lower bounds of the projections for 2050. In other words, we very nearly produce enough food for the population of 2050, even with no changes to diet or waste.

Such a result can be taken any of several ways. One point of view might see this as little consolation, as global incomes are projected to continue increasing, and historically, consumption of meat has increased fairly consistently with income. (Meaning that food production will fall even farther short because of the higher resource requirements of meat-intensive diets.) From a different perspective, it shows the immense potential we already have to address the problems of hunger, climate change, and loss of natural habitat to agriculture without significant changes to productivity. For example, according to a 2014 study by ecologists David Tilman and Michael Clark, “There would be no net increase in food production emissions if by 2050 the global diet had become the average of the Mediterranean, pescetarian and vegetarian diets.” Further, they estimate that the projected increase in food-related greenhouse gas (GHGs) emissions—from the current 2.27 gigaton CO₂ carbon equivalents per year of food-related emissions to 4.1 gigaton per year in 2050—could be reduced by half a gigaton if only 50% of all crop and food wastage were addressed. This is comparable to removing over a quarter of the world total of emissions from transportation in 2010.

Tilman and Clark’s paper is somewhat unique in taking the possibility of large-scale changes to diet and waste seriously. (Though they, too, wonder about the feasibility of such changes.) Their study projects the demands on land use, and the corresponding GHG emissions, if the historical relationships among incomes, meat intensity, and processed diets remain on course. Generally speaking, meat is not terribly food or energy efficient, with ruminants—cows and sheep—being the least energy efficient and most GHG-intensive. In one way, the 1,200 calories lost in this process is not as bad as it may seem. According to geographer Vaclav Smil (2000), the edible crops harvested each year are equivalent to 4,600 calories per person per day. The FAO (2012) estimates that in 2010, this number was 5,359. So we are “only” losing around a quarter of potential calories. On the other hand, 1,200 calories per person per day lost is 41% of the total average global availability of 2,903 calories per person per day. We could have nearly 50% more calories available if we did not feed edible crops to livestock. And alongside the calories lost to animal production, we have around 1,400 calories per person per day lost to waste: 600 calories lost between crop harvest and processing and 800 calories lost while distributing food to markets around the world and lost to household waste (Lundqvist, de Fraiture, and Molden 2008).¹¹ In summary, a reasonable estimate of waste combined with conversion to

livestock would be that a total of 2,600 calories per person per day is lost from the food system.

As optimistic as I may be about the possibilities of change, let me be clear. I am not proposing that we can convert everyone to diets with no meat or that we can recover 100% of waste. But if we go back to our previous calculations—that today’s food supply (after waste and conversion to livestock) could feed approximately 9.1 billion people—what would it take to feed 9.7 billion people (the median estimate for 2050) or 11.2 billion (the median estimate for 2100)? For 9.7 billion people we would need almost 6% more calories in the food system (or equivalently, we would need to recover around 170 calories per person out of the 2,600 calories per person per day lost to livestock conversion and waste). For 11.2 billion people, we would need to recover 650 calories per person per day—or 25% of 2,600 calories per person per day.¹²

These figures, of course, include a large number of assumptions and say nothing about how food is distributed. After all, making the recommended average of 2,300 calories per person per day available worldwide would obviously not be enough, as we presently have 2,903 calories per person per day alongside between 790 million and 2 billion hungry and food insecure people in the world. But there remains an important takeaway. Addressing the issues of unequal food distribution and making some reasonable dietary changes around meat and food waste seem at least as feasible as calls to increase food production by 60–70%.¹³ And it is important to remember that proposals focusing on production to address future food needs and ignoring the need to address waste and diet or treating them as secondary are proposals that by definition suggest forging ahead while ignoring avoidable losses of something like 55% of the food supply. Said plainly, “production-first” or “production-only” approaches are absurd in the extreme.

4. Taking the population growth estimates as a given “bakes in” continued oppression of women and rules out effective improvements in gender equality and rights¹⁴

We would be hopelessly remiss in our discussion about population if we did not spend a moment reviewing the underlying meaning of the population projections for the next thirty-five to sixty-five years. A significant part of the decrease in population growth rates, where they have occurred, have been tied to increased gender equality and increased access to reproductive control by women alongside the political rights

to exercise reproductive (and other) choices (Cuberes and Teignier-Baqué 2011). It turns out that many women would choose to have fewer children if they were able to assert the right to choose, had access to the means to exercise that right, and were not under the threat of blatant or subtle retribution from male partners or society at large.

The literature here is ample. In a 2014 study, economist Nava Ashraf and her colleagues found that women in Zambia who were given access to contraception when their husbands were present were less likely to use it and over 25% more likely to give birth in the next year. At the same time, women who were able to covertly use birth control were less likely to conceive, but had lower reported well-being, possibly due to “detrimental consequences for the conjugal value of their marriage” (i.e., real or perceived distrust or disappointment around the deception and failure to conceive). Given that a 25% decrease in Zambia’s fertility rate would take it from the world’s seventh to the thirty-second highest fertility rate (U.S. CIA 2016), this is not at all insignificant. The average estimated prevalence of “unmet need” for modern contraception in sub-Saharan Africa as a whole is 32% (Westoff 2006, 51). Given the physical and mental risks and costs of unwanted pregnancies, empowering women such that their use of contraceptives not only matches their own desires but also permits such programs to be openly engaged in is of clear and compelling importance. This is true not only with respect to women’s own rights and well-being, but also for its relevance to population and consumption questions.

The practical significance of these issues represents one of the most compelling examples of the necessity of *political ecology*, a transdisciplinary field that argues that no understanding of ecology is complete without understanding social power and politics (Robbins 2012). For example, projecting population size would seem to epitomize hard-nosed, objective, and neutral science, yielding estimates based on detailed models and empirical observation of human behavior and trends. At the same time, assuming population growth based on current trends also necessarily assumes flagging or halted progress in advancing women’s rights and access to reproductive control. Such computations are in fact *not* neutral with respect to people’s actual lives, because they assume a given level of continued oppression: “Sustainability without justice is simply sustained injustice” (Whittaker 2012).

To put it in the starkest relief, one may imagine a U.S. social scientist in the early 1850s estimating how many slaves there would be in 1900. Or another scientist, extrapolating in the early 1960s how many women

would experience marital rape fifty years later, incorporating the parsimonious assumption that it would not or should not be viewed as a crime (which, from the point of view of most U.S. law at the time, it was not). As much as these scientists might “simply” be projecting based on the dominant trends of their time, they would also be “simply” baking the injustices of the time into the proverbial cake. Political ecologists would maintain that at the very minimum, the assumption of continued injustice be made explicit, for example, by prefacing their “neutral” projections with the caveat “assuming we do not address racial or gender inequalities.” Arguably, as a responsible and ethical citizen, a scientist might further take the step of emphasizing that such injustices should and must be addressed, every and any time they make mention of such estimates.¹⁵

5. During a typical famine or drought, there is usually enough food regionally or nationally to prevent widespread hunger and starvation

One might detect a developing theme. In examining drought and famines, one finds that in many, if not most cases, enough food to prevent the crisis was available even within national borders. The mechanisms that turn a drought—or any other event that disrupts the regular production, utilization, and supply channels—into a famine are in fact routinely *political*. Or said more rigorously, they are simultaneously political and biogeophysical. There are multiple mechanisms by which a group that is “at risk” actually ends up suffering from a famine. These include the environment in which they live and changes in weather, climate, and the productivity of the land, alongside factors such as the distribution of land and resources, the quality of each to which different people have access, and the rights of different groups to emergency support or redistribution. Correspondingly, one of the primary causes of famine is war, which dramatically disrupts systems of rights, distribution, and access. But with regards to the simplistic and widespread Malthusian notion that famine represents the convergence of too many people and not enough food, the idea has been thoroughly debunked as the general and default mechanism.

The Nobel Prize-winning economist Amartya Sen (1981, 1) began his seminal work with the oft-quoted line, “Starvation is the characteristic of some people not *having* enough food to eat. It is not the characteristic of there *being* not enough to eat. While the latter can be a cause

of the former, it is but one of many *possible* causes” (emphasis in the original). Sen went on to establish that a lack of available food was not the ultimate cause of starvation in many specific cases of famine.

Two decades later, Mike Davis pointed out in *Late Victorian Holo-causts* that between the years 1876 and 1900, several waves of famine likely led to the deaths of between thirty and fifty million people in India, China, and Brazil; numbers amounting to some of the greatest tragedies ever recorded. The sheer scale of these events, and their evident preventability, led Davis to argue that the label “holocaust” was no hyperbole. “Absolute scarcity, except perhaps in Ethiopia in 1889,” writes Davis (2001, 11), “was never the issue.” Research and narratives around other famines have often reached similar conclusions. Though debates continue about many specific cases, most scholars have found that policy choices and sociopolitical power are consistently factors quite capable of dramatically worsening, alleviating, or even bypassing famine (Mukergee 2014; Ó Gráda 2009; Sen 1981).

Davis further argues that the declines in people’s access to food during emergency and famine conditions between 1876 and 1900 can be tied to the forcible conversion of many national economies to the supposedly “open” and “free-market” world system of capitalism. Policies based on the harshest of Malthusian socioeconomic assumptions often weakened or destroyed preexisting systems where cultural traditions (i.e., “moral economies”) had previously obligated those with more food to help the potentially starving during times of want, or where government action had been more responsive to domestic demands than international financial markets. The banal generalities of “market logic” led to newly built railroads shipping food out of hungry communities to people who could pay a better price for it. It led to colonial authorities pushing the indigenous residents into work camps in the belief that the hungry needed to *earn* their right to live. That workers were thereby put into slavery-like conditions, working for demonstrably inadequate food rations while living in camps that created breeding grounds for rampant disease, was conveniently ignored.

In short, policies from foreign and domestic elites, often justified with calls to scientific understanding, turned difficult circumstances into holocaust. More recently, economic historian Cormac Ó Gráda (2009) quoted Liu Shaoqi, a Chinese leader during the mid-twentieth-century Great Leap Forward, that China’s disastrous famine was “three parts nature and seven parts man,” referring to the dominant role sociocultural factors have even when natural factors such as drought and flooding prevail.

Ó Gráda (2009, 82) notes that a famine-free world depends on “improved governance and peace; it is as simple—or difficult—as that.”

But one rarely hears the far-from-catchy slogan “Feed the world through improved governance institutions,” however much it better encapsulates the truth of the matter than, say, the idea that the farmers of Middle America have the responsibility to “feed the world.” As of this writing, the idea that moving towards better institutions is a viable way forward may appear particularly laughable, given the dismaying state of politics in the United States. But, as we will examine throughout this book, this view is not only unwarrantedly cynical, but also represents an abdication of our actual ability to demand and create better institutions throughout the world.

6. In part because we are not reasonably addressing diet and waste, we now have approximately equal numbers of people who are consuming unhealthily large amounts of certain foods and people who are unable to access enough food. More confusing yet, sometimes these people are one and the same

The World Health Organization estimates that there are approximately 600 million obese people in the world (WHO 2015).¹⁶ Estimates put the size of the world’s undernourished population at around 800 million, with maximum estimates reaching 2 to 2.5 billion (FAO 2015a; Hicel 2016). The numbers of people who are overweight or suffering from micronutrient deficiencies are meanwhile each in the 1–2 billion range. The WHO further observes that

it is not uncommon to find undernutrition and obesity co-existing within the same country, the same community and the same household. . . . Children in low- and middle-income countries are more vulnerable to inadequate prenatal, infant, and young child nutrition. At the same time, these children are exposed to high-fat, high-sugar, high-salt, energy-dense, and micronutrient-poor foods, which tend to be lower in cost but also lower in nutrient quality. These dietary patterns, in conjunction with lower levels of physical activity, result in sharp increases in childhood obesity while undernutrition issues remain unsolved. (WHO 2015)

That is, it is possible for a household, or even an individual, to quite literally embody the title of food system scholar Raj Patel’s (2008) book, *Stuffed and Starved*.

Both problems are serious. Overweight and obesity are thought to cause 3.4 million deaths per year (around 6.1% of all deaths) (WHO

2014). Poor nutrition is thought to cause 3.1 million deaths in children under age five each year alone, nearly half of all children's deaths, and 5.5% of total deaths (Black et al. 2013). Such avoidable mortality in a world of sufficient food is a form of what has been called *structural violence*. The tragic results arise out the way the system is currently set up, and not merely specific singular actions by individuals or states (Graham and Boyle 2002). As such, it is both harder to viscerally understand the problem and to gather momentum and resources to resolve it. Humans, as a social species, have evolved both biologically and culturally to solve problems, and to find the causes for phenomena that affect our lives. But when the phenomena are caused by a diversity of inter-related causes and cannot be traced to an individual cause or person, it is more difficult—but not impossible—for us to understand and act on the problem. So while we are certainly not all equally responsible for the state of our food systems today, we all bear some level of complicity in the structural violence of our sociopolitical systems, which create wealth and opportunity for some and restrict access and opportunity for others, simply by dint of the accident of the time and location of birth.

The co-occurrence of obesity and malnutrition is an excellent example of structural violence. Although each health problem appears a failing of individuals—poor dietary decisions, no exercise, a failure of will—science concludes such individualist explanations are insufficient (Guthman 2011). The fact is that most of us make very similar decisions in particular situations and circumstances. That is to say, institutions have very strong effects on how we behave. In the case of public health, the methods for studying such patterns are marshaled together as the “social determinants of health.”

At bottom, it is neither reasonable nor rigorous to ascribe malnutrition to personal choice, or even lack of education, in places where someone might have to work twice as hard to get access to the same diversity and quality of food as others who are more fortunate. If individual will undergirded food choices, we wouldn't see repeated patterns of increasing obesity around the world. Thus with the exception of a lucky few who are born into the right combination of wealth, place, and culture, we are caught up in institutions that push all of us towards problematic and unhealthy patterns. And these patterns are not a coincidence: they are quite profitable for some people. There are enormous economic incentives aimed at making sugar, salt, and fat relatively cheap. There are few commercial incentives to promote and sell fresher, unprocessed

food. These dynamics, plus the vast size and influence of many food and agriculture companies and the common co-occurrence of sufficient food and hunger, belie the idea of simplistic “market solutions.”

History demonstrates food gravitates to those who can pay for it, rather than who need it, including even those who grow it. Mike Davis and others have found that railroads to isolated rural areas have often shipped food out of colonized areas experiencing hunger. The hungry often have no money to manifest effective demand.¹⁷ At the same time, large swaths of the grocery aisle are actually underpriced. Most costs to public health and the environment are not included in food prices, meaning that it is simply impossible for there to be an “efficient” market for food, much less one that is socially just. Heavily processed food—potato chips, breakfast cereals, fast food, and the like—are artificially cheap compared to the health, social, and environmental costs they wreak, allowing large food companies, processors, and restaurants to make money by selling them with most of their true costs hidden. So unhealthy food, produced in ways that cost more than their total revenue value in environmental terms, is sold at artificially low prices, making it more affordable than healthier choices (FAO 2015c; Simon 2006). All the while, consumers are not just eating unhealthy food, but throwing away almost half of it, *because* it is cheap. Correspondingly, food producers around the world often are pinned to prices that are too low to live on, and are often stuck growing only a small number of “commodity crops,” making them, too, dependent on purchasing cheap food despite being food producers. Thus, a system that both stuffs and starves communities rolls on, reinforcing its contradictions to the benefit of the very few and the harm of the many.

7. Farmers and rural laborers make up most of the world's hungry—but helping them produce more food will not necessarily make them less hungry

In an enduring and tragic irony, most of the world's hungry people are located in landscapes dedicated to food production (IFAD 2010, 46–47). There are a number of reasons why. Farmers often receive very low prices for what they produce. The costs for inputs such as seeds, labor, land, fertility sources, and pest control are increasing. Production can be low and unstable. A declining proportion of the money spent on food is making it back to farmers (rather than going to processors, retailers, etc.). The investment many governments have made in improving urban

life has failed to be matched by investment in rural areas. Rural areas suffer collapsing infrastructure, education, electricity, and socioeconomic opportunity. Economic programs pushed by the world's wealthier countries on those less economically powerful over the past five decades have often required governments to further decrease their support of such public goods, particularly in rural areas, under "structural adjustment" programs and other elements of what has been called the "Washington Consensus" approach to international development (Weis 2007).

The focus on replacing government support with private development has been a disaster for many farmers around the world, and not just in poorer countries. Even in the immensely prosperous United States, the median income from agricultural activities in rural areas is negative for farm households (Prager 2016a, 2016b). Although food-producing households have long had "mixed" economic strategies (i.e., on-farm and off-farm work), worldwide these households have been obligated to depend more on jobs outside of agriculture in order to make ends meet (van der Ploeg 2008). In other words, one of the world's most fundamentally necessary jobs—producing food—often does not pay enough on its own to be a viable occupation.

8. The majority of the decrease in hunger over the past forty years has not come from increased food production, yield, or availability. Our best estimates are that less than 20% of the decrease in hunger since 1970 is due to the contribution of the increase in the number of calories available

There are a variety of proposals addressing how to change the fortunes of rural residents. An exceedingly common one is to increase how much each farmer can produce, particularly in regions that are thought to be failing to produce up to their full potential. While aiding farmers in areas with low productivity is surely an important task, a focus on producing more first and foremost is neither in line with the evidence about the most important levers in decreasing hunger, nor often a path destined for success.

A growing scientific literature over the past forty years has pointed to increasing gender equality, particularly in education, and providing access to clean water and basic sanitation as fundamental to improving food security. In what is likely the most comprehensive assessment of changes in food security in the Majority World over the past four decades, development economists Lisa Smith and Lawrence Haddad (2015)

found that clean water and sanitation were responsible for nearly 40% of the reduction in child malnutrition between 1970 and 2010.¹⁸ Female secondary school enrollment and gender equality accounted for 28% of the reduction, (increased) food supply for a bit over 18%, and dietary diversity 15%. In other words, less than 20% of the decline in hunger came from increased food production, yield, or availability.

Further, when women and girls have better access to education, political rights, and equal access to agricultural inputs, they tend to improve farm productivity; increase the proportion of resources spent on food security for the household, particularly for children; and often improve environmental practices locally (Agarwal 2009, 2015). However, at the same time it is important to avoid turning such a pattern of improvement into a special responsibility for women to improve all things food, or conversely, to treat rights for women and girls simply as a tool to supposedly improve society. Working for gender equality is both worthy in itself and likely to improve multiple other factors in overall quality of life. Similarly, improved access to clean water and improved sanitation increases health, directly through disease control, and indirectly through a greater ability to absorb and retain nutrients. Sanitation also improves the ability of producers to work to their capacity, increases the basic socioeconomic security necessary to invest in diversification and new or more sustainable practices, and substantially improves child health (Chambers and von Medeazza 2013).¹⁹

In contrast to these public goods, which are unlikely to be sufficiently provided for by private concerns (Karnani 2011; Rocha 2007), placing productivity first may have mixed results. For one, focusing on increasing how much each farmer can produce is self-contradictory, or at least self-limiting, in one important sense. If all of the poor farmers of the world increased the amount they were producing in the near future, we would quickly see a “treadmill of productivity” (which is discussed in the next chapter). That is, as every farmer succeeded in producing more, the price of what they were selling would decline, all else being equal. And farmers with higher productivity elsewhere have in fact already suffered from their own “success.” For example, the United States has lost four million farmers in the past five decades—with many farms going under and those remaining consolidating into fewer larger farms as a result.²⁰ Each remaining farm still has an incentive to produce far more. As the margin (how much profit they make on each individual unit of production) decreases, most farmers aim to make up the gap by increasing production further still.

A reasonable rejoinder would point out that this is an abstract worry. We are not actually in “danger” of simultaneously increasing yields for all of the world’s poor or “underproducing” farmers. However, it remains no reason to accept a productivity-focused approach to improving producer well-being. As we will review in the next chapter, the so-called Green Revolution of the 1960s and ’70s saw dramatic increases in productivity for many farmers, with results that in retrospect were, at best, mixed in terms of well-being for the world’s farmers (Patel 2013). Many farmers who were already better off in property and resources were able to take advantage of these new technologies and approaches, increase their productivity, and prosper, relatively speaking. At the same time, many smaller and poorer farmers either saw lesser benefits or did not benefit at all, and were even driven further into poverty. So we clearly have a precedent that a productivity-first approach may make the wrong difference.

Let me make myself clear. I am not saying that producing enough food should never be a concern. Nor am I saying that it is not a prerequisite for food security. Production is part of the foundation for the structure of universal food security and food sovereignty. What I am saying is that as a practical matter, our contemporary food problems are not, in the main, due to insufficient production. More importantly, solutions that focus first or mostly on production are far less likely to improve what we ultimately care about—food security, human dignity, and well-being—than interventions that focus primarily on the full suite of basic human rights.

CONCLUDING REMARKS ABOUT A BEGINNING

These eight points are aimed at illustrating that there are few, if any, “automatic” solutions to the problems facing us in our food and agriculture systems. We cannot simply say “Produce more and everyone will benefit.” We cannot just say “If we had fewer people, those who are the worse off would be better off.” Indeed, even for the most important approaches—those fostering gender equality, education, and access to basic goods such as clean water and improved sanitation—the benefits are not automatic. From place to place, it depends on how we support such interventions. Just passing a law saying girls have the right, or obligation, to attend as much school as boys is not synonymous with fulfilling the right or obligation. Making women equal in law does not make it so in custom. And changing customs, which does happen, does not take place in the same way, or have the same effects, everywhere.

Insofar as the best solutions for ending hunger everywhere in the world, once and for all, are different from secondary (but important) tools such as increasing productivity, it is because they deal with institutions. Institutions, as I have emphasized, are big, nearly invisible, perniciously influential, and hard to change. But they do, in fact, change, whether through gradual evolution or intentional action. In fact, they are *always* changing. Where this happens as a result of deliberate action, whether that is changing a family rule or founding a country, what makes the difference is who gets to decide what these changes might look like, and who goes along with the change or resists it. I have spent this introduction attempting to underline the vital importance of thinking about how we think, and about how we know what we *think* we know.

It is, for instance, within our reach to end hunger in the world. It likely has been within our reach for a while now. But the challenges we must surmount to achieve this are fundamentally, essentially, institutional. We have designed neither our national nor international systems to accomplish food security and end hunger. In fact, we, as individual nations and international organizations, have chosen to give higher priority to other objectives, whether this be trade and the freedoms of multinational corporations, notions of “modernity” and “progress” that minimize the role of agriculture, or adherence to certain convictions about the role of government and the place and capacity of the private sector. We now have international philanthrocapitalism (think Bill Gates or Richard Branson) in place of international institutions with enforcement capacity. We have embraced charity covering the damage of the status quo over changes of discernible impact. Yet few of us have directly had a say in these choices. Our “embrace” of our changing institutions has been born of reluctance, detachment, false hope, or a feeling of impotence. We, the greater population of the world, have not been informed of or offered multiple alternatives, and we largely have not been asked to directly participate in reforming national and international governance systems that can minimize or eliminate structural violence.

Yet there is no reason we cannot imagine and pursue these possibilities. All new institutions may appear impossible, until seemingly suddenly, there they are. Think on the end of apartheid in South Africa, the end of U.S. slavery, the global rise of representative democracy, the end of many monarchies and colonial empires, the right to vote for women and minorities, and the implementation of the National Health Service in Britain or (tenuously at the time of this writing) the Affordable Health Care Act in the United States. All of these are one part of institutional

changes of various means and magnitudes. But each of them also actually only acted as the change in the “visible” rulebook, while the improvements that came after them were a manifestation of changes in social pressure, attitude, culture, and institutions. The significant turning points above represent only middle points in continuing changes in how we decide how we will govern ourselves.

Just as it is hard, but not impossible, to break from traditions and to establish new ones, institutions change every day. Those who have already amassed or inherited great influence upon these institutions may have a head start on most of us. At the same time, our institutions determine how and when they might exercise their power and privilege. We can set up new systems of accountability. We can build the institutions for universal food security.

Sounds utopian, you say? Well, of course it is. At the same time, the dream is not for “utopia”—which literally means “no-place,” as pointed out by Thomas Prugh and coauthors in their 2000 book *The Local Politics of Global Sustainability*. In it, Prugh and his colleagues analyzed how a “utopia” was too stultifying and static a vision for how a better world can be constituted. Utopia, they say, imagines arriving at a better world like it is a given, unchanging location, instead of the necessary act of continuously creating a better world, which involves processes for learning, adapting, and changing in response to growing knowledge and shifting circumstances. Thus, Prugh and colleagues argue, we need envision the necessity of a fuller democracy that, by its very inclusiveness and participatory nature, is capable of generating better and more just institutions for all.

This is no mere optimism or faith, but hope paired with evidence. We see thousands, even millions of innovations in institutions around the world. We see new frameworks and modes of thought about food security and hunger (Carlson and Chappell 2015). We see countries such as Brazil achieving notable successes and dramatic steps forward, albeit inevitably incomplete and, without continuing activity by citizens, possibly impermanent. So I don’t aim to convince you that we can reach the end of the path, whether unchanging utopia or Prugh et al.’s continuously adapting “genotopia.” Rather I hope to convince you that each of us can help our societies take the next step, and, once taken, the one that follows, and so on. Maybe these steps won’t take us all the way to the utopian or genotopian “end.” But as acts of active optimism, each small step potentially represents the liberation of millions from hunger, and an increase in their, and our, ability to work together to scale the final hills.

The case of Belo Horizonte, the Brazilian city that is at the forefront of food security innovations and the focus of this book, is not one of unmitigated success. It does not “prove” that we can get to the end of world hunger. Innovations are at one and the same time incremental and revolutionary. The Wright brothers’ historic first flight in Kitty Hawk showed that human flight was possible, opening the way for hobby-kit aircraft, commercial airliners, supersonic jets, and the space shuttle. What it emphatically did not show was that controlled human flight in a heavier-than-air craft could only happen on barrier islands, along the Atlantic Ocean, on Thursday mornings, in winter, at a maximum of seven miles per hour. Their flights required a lot of people to (re)think what they knew, how they knew it, and how to gauge new possibilities and a world that might be built. Understanding the research that came before them was key to the Wright brothers’ success, and understanding what they did and how they changed what we thought we knew was key to human flight thereafter.

We owe ourselves and our food futures nothing less than the kinds of good examples we see today in fighting, lessening, and ending hunger. We have the materials, the technology, and the possibilities. We need only the will and willingness to struggle for the change to today’s institutions, to learn from yesterday’s research and today’s innovations, and to stand up to entrenched interests and institutions that are not yet willing or able to change. But change always happens. The difference lies only in who has input into what that change means and who it helps—or fails to help—to achieve a better life.

Hunger is still needlessly common. In chapter 2, I will review the details and evolution of frameworks for analyzing hunger, from the Malthusianist productivism I have rebuked here, through Amartya Sen’s Nobel Prize–winning contributions, to nutrition economist Cecilia Rocha’s “Five A’s of Food Security,” to current discussions of food sovereignty and food justice. Those very familiar with these discourses may wish to skip this chapter, though it may be helpful to skim as my somewhat idiosyncratic approach to these frameworks will help guide us as we proceed through the rest of the book.

As we will learn in chapter 3, Belo Horizonte (BH) has been home to one of the world’s most successful food security programs since 1993. Infant malnutrition and mortality have been cut by more than 50%. Fruit and vegetable consumption has gone up. BH’s comprehensive approach targeted, and made progress in, food security in high-risk populations, increased food access citywide, and used city pro-

grams to support local agriculture and improve farmer livelihoods. In the process, Belo Horizonte has invented and reinvented many food security institutions. These institutions draw on past analyses and efforts, but also show glimpses of how a future without hunger may be possible. Chapter 3 presents a review of how food security analysis and proposed solutions developed and changed in Brazil between World War I and 1993, when BH's food programs began. I next present a detailed narrative account of how the innovative food security policies of BH came to be conceived of and implemented, particularly in terms of the Food Security Secretariat's origin out of an analysis closely paralleling the Five A's framework, followed by an analysis of why some of BH's programs have been incredibly successful and others less so.

In chapter 4, I address the gap in explanations of *how* BH came to put its ambitious policy agenda into place: what allows institutional change to happen? I will introduce the "multiple streams approach" (MSA) to policy analysis, pioneered by political scientist John Kingdon in his book *Agendas, Alternatives, and Public Policies* (2010).²¹ Using this framework, and based on archival evidence and original interviews, I will elaborate upon the origins of BH's programs. I will explore how the programs came to be, out of the confluence of public attention to the problem of food security, the presence of innovative policy ideas to address food security, and the politics of the moment that supported the implementation of these policies. This includes an explanation of the concepts of "policy windows" and "policy entrepreneurship," and how they played into BH's programming. Lastly, I will discuss some of the larger implications and limits of BH's Secretariat.

In chapter 5 I will discuss how BH's food system planners defined support for small farmers as an objective, and how those logistics tie into farmers' and planners' shared understanding of the role agriculture played in promoting—or eroding—biodiversity in the Atlantic rainforest surrounding BH. Specifically, BH's planners saw such projects in "Support for Production and Commercialization" as a way to (a) lower the cost of fresh fruits and vegetables for urban consumers; (b) provide small, local family farmers with higher prices for their produce; (c) create a model for one way to address the rapid urbanization of Brazil and the pressures this places on cities' resources; and (d) support more ecological and environmentally friendly practices in the biodiverse regions around the city. The chapter continues to draw on my experiences in BH since 2003, particularly interviews and field research conducted between

2004 and 2013 in city offices and across the farms and forest fragments in the surrounding countryside. It presents my findings regarding the economic livelihoods and practices on area farms, the sociopolitical context and effects of BH's programs, and the potential effects of BH on biodiversity in the local rainforest. Finally, the chapter connects BH's case with broader socioeconomic theory and the current state of evidence around the pressures facing the world's smallholder farmers. What, after all, are the economic and environmental opportunities represented by supporting smallholder farmers?

Finally, chapter 6 summarizes the policy lessons of the book with regards to BH's successes, failures, and limits. It explores the value of applying critical, dialectic thought and academic theory in helping us understand the programs' creation, development, triumphs, and limitations. I will also extrapolate from BH's successes and Brazil's Fome Zero (Zero Hunger) programs to offer tentative recommendations on how to translate these experiences into beginning to end hunger and environmentally destructive agriculture in the United States and elsewhere. Within the MSA framework, and out of my own experiences in the U.S. food movement over the past fifteen years as both an academic and a policy advocate, I will further show how the lessons of BH can help in breaking down the U.S. food system into matters of public will ("problems"), political calculation ("politics"), and technical policy solutions ("policies").

As observed by the political economist Judith Tandler, and reiterated by one of my mentors, Cecilia Rocha, there is an imbalance in the literature favoring analyses of negative policy experiences over positive ones, leading to faulty models and prescriptions (Tandler 1997, in Rocha 2009). "Despite many limitations," Rocha writes, "there have been some important advances in the area of food and nutrition security policy in Brazil in recent years which deserve attention. Other parts of the world may want to consider what lessons can be derived from this experience, its challenges and successes" (2009, 63).

In this book I aim to contribute to that objective, not just to consider what lessons have been learned, but to envision how these can be used to help efforts elsewhere to pivot toward next steps to end all hunger. Such a vision may seem daft, or even, to some, dangerous. But it is presented in the spirit of the great systems thinker Donella Meadows, whose work has been instrumental in my own intellectual development. Meadows (1996) wrote that "vision has an astonishing power to open the mind to possibilities I would never see in a mood of cynicism. Vision

widens my choices, shows me creative new directions. It helps me see good-news stories, pockets of reality that could be seeds of a wider vision. I see what I should support; I get ideas for action.”

The devil in is the details, of course, but vision and action are the necessary means by which we will be able to shape a future defined by universal food sovereignty, food security, and food justice.