

Window of Opportunity

The previous chapter illustrated how a Guatemalan mother used food and feeding to intervene in systemic cruelty. This chapter also explores how people worked to transform the harmful structures they operated within. I describe a “window of opportunity” in the twentieth century when nutrition scientists sought to incorporate agroecology and small-scale farming techniques in their work. In the historia that I recount, the scientists were imagining ways to collaborate with Indigenous knowledges to create better food systems, with benefits for maternal nutrition in Guatemala and internationally.

In 2012, when the Guatemalan president Otto Pérez Molina and vice president Roxana Baldetti launched the Window of 1,000 Days intervention, evidence of an earlier desire to integrate nutrition and agroecology was entirely absent from the maternal health agenda. Instead, the intervention’s core technology was a polyethylene-lined sack filled with a corn-soy powder, produced from US surplus agriculture from mega-sized industrial farms and packaged thousands of miles away. The powder, with a shelf life of eighteen months at 80 degrees Fahrenheit and the ability to retain its micronutrient content for twelve months in the field (USAID 2017), was entirely divorced from Guatemalan seeds and soils. For the Pérez Molina government and its work with nutrition, community-based agricultural sovereignty was not an achievement but a threat. The promotion of local food had become the domain of food and environmental activists—not nutrition scientists.

Today American governments call for investment in nutrition in the thousand-day window as a means of producing a better future, and the prevailing model for “good nutrition” during this window is reliance on prenatal and lactation supplements and commodified foods. This chapter turns our attention away from the

body of the pregnant woman to instead provide *historias* of Guatemalan food systems and agroecological health. This is not a departure from the book's focus on maternal nutrition but a push to expand how we understand the relationship between health, agriculture, land, pregnancy, and the nourishment of community. The *historias* recounted in this chapter illuminate what went wrong with INCAP's utopian vision of nutrition, which was ultimately ill prepared to face the politics of its own practices of knowledge production. The hope in telling these *historias* is to cultivate a practice of science better able to respond to its own complicity in harm.

THE PACHALI FARM (2016)

The soda bottles were cut just below the neck, then attached onto large plastic tubes that had been sliced lengthwise and stuffed with soil. What resulted was a clean and contained planter bed for lettuce seeds. Rows of these beds had been placed side by side on a wooden platform built at waist height. It was ingenious, really. The elevation protected the growing leaves from pests and also made it easier to weed around them, as bending to the ground would cause backaches after not much time. It looked rather ridiculous with the lettuce sprouting from what appeared to be an extremely long bottle of coke, but the bottles increased the functionality of the design by making use of the discarded soda containers that quickly piled up in the countryside.

It was 2016, and I had traveled to a nondescript spot on a rural road roughly an hour outside of Guatemala City that was labeled by nothing but a small dot on the map, marking it as "Pachali." I was there, accompanied by the Guatemalan anthropologist Luisa Madrigal, to see what had become of the once-flourishing INCAP farm.

At the farm's entrance were two plastic containers once used for cooking oil that were now secured to a fencepost. A string tied to the lip of each container ran to a foot pedal on the ground. Stepping on the pedal would dispense soap from one container, or water from the other, the runoff collected in a bucket below. Mario, who cared for the grounds with his wife Sylvia, pointed out proudly that you could wash your hands without ever needing to touch anything, saving water and maximizing hygiene.

The farm was filled with dozens of clever inventions, like the hand-washing device or the soda-bottle irrigation system. Vegetables grew from tires painted white to cut the heat and hydroponic strawberries grew out of plastic bags suspended from wooden scaffolding. Sylvia picked a small yellow tomato from a vine growing along one of the posts and handed it to me. "You don't need to wash it. Don't worry. We don't use chemicals on anything here. It's all organic," she said proudly.

Being organic may have made the tomato safe for me, but this also made the produce precarious. Nearly all the leaves of the plants close to the ground were pock-marked with holes made by small predators. Most of the structures on the lot were in bad shape as well. Tattered strips of plastic covered the skeletons of long-abandoned

buildings. An aging sign at the entrance announced that we were at the Center for Teaching and Interchange of Knowledge. A loose corner curled over the mission statement, making it hard to read that the purpose of the farm was to “generate, adapt, and transfer eco-technologies through a participatory process that incentivizes, motivates, and promotes these technologies” (my translation from Spanish). I could make out that we were on INCAP’s property, but the farm’s other sponsors had faded into obscurity. Near an overgrown parking lot were the remains of a large greenhouse, its scaffolding broken and occupied by birds. The weeds around us grew strong, but most of the plants that should have been thriving were struggling.

As if sensing my concern, Mario offered an explanation: “The worms and fungus gravitate to us. Nothing for miles around is safe to eat so they all come here.” “The seeds are also affected,” Sylvia added, while she picked and shucked a bean pod. “We should have acres of crops to choose from when selecting the next generation of seeds to plant, but now we have just this small plot of land. It doesn’t take too many cycles to see the effects.” She held out the small black beans—showing me, I think, that the seeds were not as strong as they should be, though I didn’t know what to look for.

No expertise was necessary, however, to see how different this farm was from the adjacent land. “INCAP owns everything here,” Sylvia told me, gesturing outward, past the caretaker’s home where she and Mario had lived for many years. “But it is all leased to commercial producers.”

She pointed in the direction of a massive field in the process of being leveled, where workers mechanically cut into the ground, their hoes softening the dark dirt. Bags of chemical compost were piled high against two blue plastic tanks holding liquid fertilizer. Just beyond the stack of chemicals, I could see huge sheets of black plastic spreading out into the horizon, holes cut every few feet along it where the plants would grow. On the other side of the caretaker’s home, rows upon rows of potatoes grew leaves a deep, vibrant color of green.

“The land as far as you can see belongs to INCAP,” Sylvia said, gesturing toward the potatoes. “But we don’t really have anything to do with it.” The farms surrounding the plot she cared for were leased to corporations growing produce for export. Meanwhile, at the Center for Teaching and Interchange of Knowledge the produce was struggling. “It is hard to not feel that we’re fighting a losing battle,” Sylvia said, as she tenderly pulled a weed away from a strawberry.

NUTRITION AND AGRICULTURAL DEVELOPMENT

At the start of the 1960s, before teams of US psychologists were flown into Guatemala to study hunger, before these teams administered IQ tests to hundreds of Guatemalan children, before US anthropologists helped develop a culturally acceptable nutrient product to make these children’s brains grow bigger, before the Cervercería Centro Americana stepped in as the main distributor of this product, and before nutrition became associated for most everyone in the field of public

health with nutrients, Nevin Scrimshaw, the first director of INCAP, purchased forty-seven hectares in the mountains outside of Guatemala City on which to build an experimental farm.

Scrimshaw was a US food scientist with a PhD in biochemistry, an MD with a focus on obstetrics, and a lifelong interest in holistic sciences, including anthropology. He inaugurated INCAP on Guatemalan Independence Day in 1949 with what he later described as the “utopian” goals of using nutrition to make the world better (Scrimshaw 1974, ix). World War II had just ended, and INCAP advertised itself as a multicountry, cooperative effort to explore the basic science of nutrition to improve regional and international challenges of hunger. The UN-affiliated institute received funding from its member-countries and the Pan American Health Organization, as well as grants to carry out research and train local scholars from the Kellogg Foundation and the Rockefeller Foundation.

Some years later, Patty Engle, a child development specialist from the US who worked at INCAP from 1973 to 1978, reflected in a conversation with me that the institute’s scientists had been drawn to the idea that nutrition science would be key to lessening social inequality. Engle was driven by egalitarian principles and a “devotion to caring” instilled in her by her Quaker faith (Solomons and Allen 2012). She was one of many US scientists who worked at INCAP in the 1970s who have described their time at the institute to me as electrifying, finding their research exciting and urgent, with solid potential to make the world better.

Scrimshaw, who would go on to win the prestigious World Food Prize, became famous for his work on goiter, a thyroid condition that makes it difficult to swallow and breathe. Goiter, one of very few illnesses caused by malnutrition with a relatively easy cure, is treated with trace amounts of iodine, which can be cheaply added to salt. Scrimshaw had observed that the techniques to fortify salt in Europe and the US did not work on the moist salt of Central America. A new iodine compound he developed in the 1950s combined well with Guatemalan salt, quickly lessening what had once been a widespread health problem (but see Vrana 2023).

Scrimshaw had gotten lucky with the simplicity of the cure for iodine, but he was not really a magic-bullet thinker. He was a systems thinker, and from the beginning he was interested in how nutrition could be—and should be—tied to the work of producing food. The academic discipline of nutrition has clear imperial origins, emerging from a need to produce rations to keep sailors, soldiers, and laboring prisoners alive (see Carpenter 1994). But Scrimshaw saw nutrition as a diverse and interdisciplinary field, comprising scientists working cooperatively toward the shared goal of a “healthier and better nourished humanity,” as his student and collaborator Noel Solomons (2013, 278), who followed Scrimshaw to Guatemala, reflected on Scrimshaw’s death in 2013.

At INCAP, Scrimshaw had partnered with the Guatemalan pediatrician Moisés Béhar, whose theories of biological deficiency and colonialism I described in the book’s introduction. When they started the Pachali farm together in 1961,

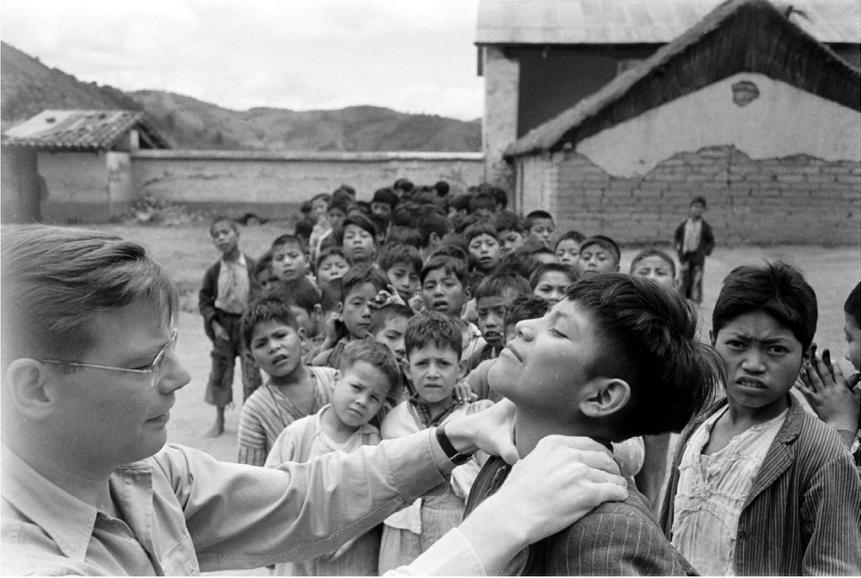


FIGURE 16. Dr. Nevin S. Scrimshaw of the Institute of Central America and Panama examining children in Guatemala for goiter. Photograph by Cornell Capa, 1953. Copyright © LIFE / Shutterstock.

the year Béhar took over the directorship of INCAP, one of their ideas was to investigate intelligent agrarian designs, not entirely unlike the soda bottle filtration system described at the opening of the chapter, that made pragmatic use of available resources. The farm's "interchange of knowledge" mission was envisioned as a way that scientists could learn from Guatemalan communities, especially Maya communities, who possessed a deep, intergenerational knowledge of agriculture, as seen in their practice of milpa cultivation.

The genius of the milpa system is far older than colonial time. *Milpa* loosely translates into English as "cornfield," but it also refers to a broader system of regenerative growth. For thousands of years, Maya people have engaged in swidden (also called "fire-to-fallow" or the more derogatory label "slash and burn") techniques of cyclical planting and harvesting to maintain rich soils while producing an ideal combination of food. Maize, beans, and squash, which grow synergistically in a milpa, were first cultivated in the Mesoamerican basin. A nutritionist can tell you that together these three plants make a complete protein, containing all of the essential amino acids humans need to survive and thrive. Scientists at the Guatemala City-based Center for Studies of Sensory Impairment, Aging and Metabolism have long shown in their research on vitamins A and D, riboflavin, zinc, and iron that Guatemala's traditional foods were superior for metabolic function to a "western" diet (e.g., Valdés-Ramos et al. 2001).

The K'iche' and Mam-Maya farmers I interviewed did not need the vocabulary of micro or macro nutrients to produce an abundant harvest. They spoke not in terms of protein and embodied fitness but interdependencies of labor and land. Growing good food, they told me, requires knowing when the rains will come, how to care for soils, discernment in selecting the right kernels to save for the coming year—and many more harvesting techniques that cannot easily be translated into an English language that did not evolve around the specificities of the milpa practice.

Béhar and Scrimshaw were fairly unusual among nutrition scientists of their time in arguing that aspects of industrialization in Guatemala had made people's lives worse, not better. A book they edited titled *Nutrition and Agricultural Development: Significance and Potential in the Tropics* (1976) made steps toward linking hunger to conquest. At a time when many policy makers framed cultural ignorance as the cause of hunger, they wrote of the harmful effects of colonialism on Indigenous diets. Scrimshaw prided his scientific work as being apolitical, but he was also interested in cultural complexities. Adding an agroecology wing to INCAP's work with nutrients was imagined to slow down the push for modernist improvement in order to embrace the many kinds of food systems expertise already in existence.

And yet, despite Béhar and Scrimshaw's good intentions, nutrition would be narrowed to a science of supplements and farming would be overtaken by the push for industrial agriculture. In the decades between INCAP's initiation of the Pachali farm and my tour through its now-archival ruins, attention to small-scale technologies that could support local food sovereignty would disappear from the institute's agenda—as well as from the agenda of the field of nutrition more broadly.

Instead, INCAP would become world-famous for its Longitudinal Study of Human Capital. This study of protein powder took place at roughly the same time that the scientists were exploring the interchange of knowledges. But whereas most nutrition scientists had dropped the theme of Indigenous agriculture from their research by the end of the twentieth century, the study of supplements continued to thrive. Researchers at INCAP in the 1960s and 1970s may have tried to integrate Indigenous ingenuity into their work, but they seemed unprepared for how nutrition science could be used as an agent of violence. Their critique of imperialism had not fully confronted the fact that imperialism in nutrition was not only a problem of the past, but something that carried on.

MONOCULTURAL CAPITALISM

The overthrow of Guatemalan president Jacobo Árbenz was a boon not only for the US-based owners of the United Fruit Company but also for the broader paradigm of monoculture farming and the monopoly corporations that would come to run these farms. As described in chapter 1, Árbenz had led a social and political land reform movement, helping small Guatemalan farmers gain land titles. After he was deposed, many of the farmers lost these titles and had no choice but to return to labor on plantations.

The coup against Árbenz in 1954 allowed for the intensification of Green Revolution technologies throughout Guatemala in the decades that followed. Globally, governments and philanthropic organizations such as the Rockefeller Foundation were funding research on high-yielding cereals, the genetic hybridization of seeds, and the production of synthetic fertilizers and pesticides. These were technologies that encouraged the mass production of crops for global markets, an entirely different model of food production from the milpa agriculture of the family farm in which different crops grew intertwined.

The backdrop to the development of seed and soil agrotechnologies in the 1960s and 1970s was a narrative that scientists had adopted about exploding population sizes in a geographic region they called “the developing world.” According to this narrative, poor women were having too many babies, and without scientific intervention to increase the food supply, these babies would grow up and devour everything, and the world would run out of food. Even left-leaning advocates fueled the narrative. “The global demand for foodstuffs is outrunning the productive capacity of the world’s farmers and fisherman,” warned the environmentalist Lester Brown (1976, 3) at a 1974 meeting convened in Guatemala City.

The Green Revolution seems deceptively named from today’s vantage, where “green” is associated with conservation and green technologies imply care for the earth (e.g., Green New Deal). Titled a *Green* Revolution to emphasize the contrast with the Soviet Communist Red Revolution, the Green Revolution promised to feed a hungry world through scientific innovation (Olsson 2017, 7). The industrial farming technologies it promoted focused on mass production of crops—not “green” environmental sustainability. In the second half of the twentieth century, US and European companies were arriving in Guatemala with seeds for produce that Guatemalans did not historically eat, such as cauliflower, cabbage, carrots, onions, and broccoli—all foods with a sizable export market (Fischer and Benson 2006). These vegetables were not adapted to Guatemalan ecologies, requiring heavy doses of fertilizers and insecticides to grow.

Green Revolution scientists positioned themselves as saviors, not aggressors. Yet the monoculture technologies they produced and marketed to alleviate global hunger wreaked havoc on Guatemala, supplanting the time-honored swidden system at the foundation of Indigenous life. Those involved claimed that monoculture agriculture would help “increase efficiency,” by which they meant that more food would be produced. In fact, this push to efficiency consolidated economic profit and political power (Patel 2013, 2). As Indigenous laborers were being worked to death by wealthy landowners (Oglesby 2013), the Green Revolution’s proponents were spreading a powerful rhetorical narrative that their technologies would successfully “feed the future.” In Guatemala, and elsewhere, the promise of magic-bullet solutions to the perils of hunger led municipal governments to embrace industrial agriculture, setting aside concerns for unjust landholder tenure and land redistribution.

The rise of agrochemicals in Guatemala through the twentieth century is a perfect storm of what Ruth Wilson Gilmore (2020) calls “racial capitalism,” referring

to how capital accumulation depends on and reproduces racial hierarchies. In Wilson Gilmore's (2020) words, "Capitalism requires inequality and racism ensures it." In Guatemala's highlands, Indigenous people are largely responsible for the everyday work of food cultivation: planting, weeding, watering, harvesting, and caring for the land. As soils became blanketed with the poisonous heavy metals used in monocrop production, it was Indigenous bodies that were forced to absorb the maladies of this poisoning: chronic headaches, rashes, gastritis, cancers, miscarriages, and birth defects. Capital accumulation was assisted by chemical accumulation, with the beneficiaries of capital separating themselves from the laborers who work the poisonous fields (see also Agard-Jones 2013; Grandia 2022). In theory, monocultures would provide food to feed the world and people would grow and thrive through better nutrition. In practice, the more profit the agrochemical corporations would make, the more Indigenous communities would be made to suffer.

At INCAP's twenty-fifth anniversary event in 1974, Scrimshaw and Béhar (1976, 4) noted that from the very beginning, a fundamental goal of INCAP was to create local capacity that would allow member countries "to determine and solve their own nutritional problems." They described the anniversary event, which brought over three hundred nutrition scientists to Guatemala, as a great opportunity for Euro-American scientists to get acquainted with Central American scientists and the innovative work they were undertaking.

Yet the project of lifting up Central American scientists was tempered by the dominance of US scientists during the meeting. The opening speaker, a US agricultural economist, characterized developing countries as "the world's principal unrealized potential for expanding food production," emphasizing that Guatemala was useful to the rest of the world because of how it might help with the project of "replenishing depleted global food reserves" (Scrimshaw and Béhar 1976, 4). Many of the talks critiqued the manual cultivation techniques commonly used on small-scale Guatemalan farms. "These relatively slow systems do not allow the use of technology as designed by the agricultural scientist," one set of speakers complained, praising the technologies of the Green Revolution for giving "the world new hope" (128–29). In hindsight the very goal to develop Guatemalan capacity in nutrition and agriculture worked to reinforce the belief, prevalent since times of conquest, that Guatemala's material resources were a "window of opportunity" for the global elite.

FROM UNITED FRUIT TO USAID

To explain how a focus on nutrients came to dominate the field of international nutrition, we need to return to the year that INCAP acquired the Pachali farm, 1961. One year into a war that would last for the next three decades, this was also the year that USAID set up a base in Guatemala City. Despite the success of the coup against Árbenz, which the United Fruit Company's US shareholders had helped facilitate, the company could not maintain its presence in Guatemala.

By the early 1970s, after a decade of financial losses, it pulled out of the country. The United Fruit Company's demise would not, however, signal the end of US influence. Instead, as United Fruit withdrew, USAID moved in.

USAID's predecessor, the International Cooperation Administration, had helped fund and direct the building of the Pan-American Highway in the 1950s, eventually connecting Alaska to the Panama Canal. At the time of writing, civic protests or landslides frequently block passage along the Guatemalan stretch of the highway, but on an uneventful day it can take a mere ten hours to travel across some of Central America's roughest terrain from Mexico to El Salvador—a huge advantage for companies exporting produce at risk of spoiling. USAID advertises itself as a “good neighbor,” whose interventions are motivated by the moral, economic, and political mission to help other countries. A website banner reads that US generosity in the countries where USAID operates “promotes a path to recipient self-reliance and resilience.” But it is telling that its initial work focused on enhancing commodity chains so that goods grown in Guatemala could be sold—at considerable profit for a few select US shareholders—throughout the world.

Today the headquarters of USAID in Guatemala City are a well-fenced fortress, requiring more security checks to visit than any other building I have ever entered. Phones, computers, and passport identification must be given to security at the metal detector at the building's entrance. Visitors can carry but a single field notebook and pencil—nothing electronic. Upon passing an initial screening, they are escorted by an armed guard to another unwelcoming checkpoint where another guard sits behind a barred window flanked by official photographs of the US president, vice president, and secretary of state.

The several visits I made between 2016 and 2019 gave me a chance to notice that while the lobby artwork spoke of peace, it was a militarized peace that valorized industrialization. One motivational poster announced, “La primera condición para la Paz es la voluntad de lograrlo” (The first condition of Peace is the will to achieve it), oddly framing peace as a matter of individual volition. Another poster showed images of snow peas, reporting that nontraditional vegetables “bring peace and development.” Magazines on the coffee table had titles such as “Guatemala Beyond Expectations” and “Guatemala: The Most Attractive Business Destination of All of Central America.” The peace and development advertised here was used to sell Guatemalan resources to global investors.

Just inside the lobby, visitors pass a huge triptych mural depicting the inauguration of USAID's Guatemala headquarters. The mural's four corners feature important national symbols from both countries, including the White House, the quetzal, and the US and Guatemalan flags flying side by side. In the center, a blond US farmer works with a man in Maya clothing to turn a large wheel bearing USAID's logo, which the Guatemalan artist Maugdo Vasquez described in publicity about the mural as the “gear of development.” President John F. Kennedy sits behind a podium on the left side of the mural, flanked by White men in suits and

ties. Maya farmers harvest produce on the right. Maya children sit studiously over textbooks at the bottom of the mural. Behind them is a crystal-clear lake set beneath volcanoes. Yet, rather than feature the Maya milpa system, the artist had drawn a scene of monoculture agriculture, each plot of land growing a distinct commercial product. The depiction of the farm is almost pretty. The colors are brilliant; the crops look healthy. But at one side of the mural, women wearing protective masks bend over boxes of produce that appear to be on a conveyor belt, while a vehicle in the background shows men unloading heavy bags of packaged fertilizers—a hint at how the promised interchange of knowledge between the US and Guatemala may be enticing but deadly.

Maya cultures in the mural are celebrated but only to a point. Ultimately, this vision of multicultural harmony leaves monocultural capitalism untouched.¹ The “gear of development” spins the country along a track in which Indigenous farmers grow plots of single-crop vegetables with the aid of US-produced chemicals and seeds. This vision of progress is one that rejects the time-honored milpa system of integrated crop production. USAID may speak of peace and economic development, but it is clear that this comes at a cost to many. As the sociologist Hannah Landecker summarizes the cycle, “It is striking that the changes in agriculture produce the deficiency diseases that drive the nutrition science that drives the supplementation theory that enables the continued production and promulgation of monocultured cheap foods” (pers. comm. 2023).

GARDEN OF THE AMERICAS

Beti Gonzalez, a K’iche’ Maya schoolteacher I met when doing my research on obesity, remembered when she was a young girl and would travel to her mother’s small plot in the fields outside of Xela’s city center. Generations ago, much of the regional land was managed collectively, but now families—even poor families like Beti’s—owned small individual plots. As the K’iche’ anthropologist and former mayor of Quetzaltenango, Rigoberto Quemé Chay (2020), explains this transition, the nineteenth-century Guatemalan government, in cooperation with the Catholic Church, forced its vision of landownership on communities in the vertiginous mountain terrain of western Guatemala. In the twentieth century, collective farming practices in the region had almost entirely disappeared, and most of the territory around Xela was divided into private plots.²

Xela is home to urban Maya elites who are chemists, doctors, or lawyers with advanced university degrees. These professional obligations notwithstanding, I regularly heard that every Maya person needed to maintain their connection to land—that Indigeneity in Guatemala was, in a fundamental way, associated with food production. Wealthy K’iche’ families—los Mejilla, los Coyoy, los Citalan, los Racancoj—control large tracts of land in the region, but even poor Indigenous households have tried to hold onto small plots on which to grow corn, broad or black beans, and

squash. Owning some land didn't make families rich, or even middle class. It simply helped ensure they had food of their own to eat each year.

Beti's best guess was that fewer than a quarter of Indigenous families in Xela own land today. Her own family had recently sold all 18 *cuerdas* of their father's property. Her parents were aging, and her siblings were worried about what would happen to the land after her father died. They decided it was safer to sell than navigate the complexities of Guatemala's inheritance law. Besides, they all worked city jobs, and none of them had the time or inclination to maintain the property.

Beti's father's land had become money in the bank, but her mother still owns her 1,500-square-meter plot where she carries out a routine that she can trace back to her great-great-grandparents. Sundays are for the church, but Saturdays are for the earth. In March, her family would sow maize that they would cut come November.³ First they would divide the land into sections that were five rows and four columns deep. In every place where they would eventually plant maize, they would make a mound of dirt—a small volcano that would protect the seedlings from the wind and rain as they grew. The Mexican ethnologist Margarita Warnholz Loch (2012), frequently cited in Guatemalan newspapers, says this about the process: "Maize is a human-cultural plant in the deepest sense of the term because it does not exist without the intelligent and timely intervention of human hands; it is not capable of reproducing itself. More than domestic, the corn plant is the creation of human labor. By cultivating maize, humankind is also cultivated."

Preparing the mounds for the kernels of maize is laborious, beginning long before people arrive at the fields. In their homes, families would save all their scraps of food: coffee grounds, eggshells, and vegetable peels. On Saturdays they would carry the scraps with them in buckets to fertilize the soil volcanoes. They would also bring sacks of *cal*—ground limestone, sold cheaply at city markets—and ash from their fires, which would neutralize the smell and help the foodscraps decompose faster. The *cal* had the added benefit of repelling animals like birds or rats that would eat the maize.

Years ago, Beti's mother built a pen for animals—at one point up to eight pigs and sixty chickens, both laying hens and hens to eat. On Saturdays, Beti and her mother would clean the cages, recycling the manure they collected into compost. They would spend the day with their hands in dirt, caring for the growing plants or eventually cutting them and collecting the harvest. In winter was the *raspa*—the time for cleaning away the weeds and letting the soil lie fallow. Often in January and February, there is no rain, so they would bring water by hand to keep the earth moist and allow the land to heal. For decades now, development experts have taught people in the community that swidden agriculture is harmful to the land and air, and it has mostly been abandoned. Only recently has there been talk of how the ash from the burning might be good for crops.

Beti's mother, whose house is at the edge of the city, has the fortune of living eight long blocks from her property—close enough that she can easily carry her

kitchen scraps. Like most people in Guatemala, she does not own a car. Still she had to stop keeping animals years ago because robbers would steal them, taking both the source of meat and the supply of fertilizer their excrement provided. Today no one in the region can maintain animals unless they happen to live on their land or are wealthy enough to hire someone to keep guard. Beti's mother had been resolved to not use chemical fertilizers, but her leftover food didn't always stretch far enough, and she has watched her friends and neighbors rely on the convenience of agrochemicals that come in easy-to-store plastic packaging and can be delivered at scale.

For now, the land produces enough maize to feed her family the corn tortillas, or *tamalitos*, that are customarily eaten with every meal, but its value is not only in the food. Five years earlier, Beti gave birth to a stillborn child, who was born close to the due date. For more than a year afterward Beti couldn't function, her body overwhelmed by the confluence of hormones and grief. To heal herself, she would go to her mother's land and sit, slowly taking the air of the fields into her lungs, watching the seasons change as time washed over her, in her words, like the afternoon rain. She does not blame anyone for her child's death. For her it is a medical mystery that is not to be solved, much like a sibling's facial paralysis or the stillborn death of a niece just a few years before. But she nonetheless worries about the chemicals in her city, wondering what they have done to the soil and her community.

Pesticides present a vexing problem for experimental science, given that the long duration between exposure and illness makes causality difficult to prove. But if experimental scientists have been hesitant to label agrochemicals as poisonous, many people in Guatemala's highlands confidently link synthetic chemicals to birth defects and cancer. Marketgoers will steer clear of produce from nearby Almolonga, a town known widely as "la Hortaliza de América," the Garden of the Americas (Alvizurez and Longo 2017). Almolonga produces carrots, celery, beets, spinach, and cabbage for export to Central America (the produce has been deemed too toxic for European and US markets; see also Galt 2014). Pesticide shops line Almolonga's main square, and farmers walk through the fields with spray buckets hooked to their backs at all times of day. Residents thank agrochemicals and God—evangelical churches have a strong presence in the area—for being able to produce up to five harvests in a year when twenty years ago they produced just two (see Goldín 2009). Yet the bounty comes at a significant cost.

Epidemiologists working in Almolonga have reported exceptionally high rates of stomach cancer and miscarriage since they began looking for anomalies in the 1990s (Arbona 1998; Goldín 1996). When I traveled to Almolonga regularly in 2008 and 2009, people were willing to talk with me about the high levels of toxins in their soils, but when I asked people about pesticides in 2016 and 2017, my questions were greeted with either silence or reassurance that everything was now fine, as if the empty plastic pesticide bottles floating in the rivers or stacked up

throughout the alleys of the town simply were not there. I didn't push this; I am not an investigative journalist and almost always adjust my line of inquiry if it makes people uncomfortable. In this case, the finding was not in people's expressed concern but in the fact that the topic had become taboo. After all, awareness of toxicity might not lead to a change in pesticide use but to market losses for their produce or to a decline in tourists who are drawn to the town's medicinal thermal baths that form from fissures in the volcanic earth.

Residents of Almolonga's neighboring communities who relied less on agricultural export markets or tourism remained quick to share their concerns about the chemicals. One farmer told me that the widespread use of insecticides had created superbugs that tore through plants grown without chemical protection. Another farmer had observed that the indiscriminate effects of synthetic toxins had killed desirable local predators that had previously protected the plants, throwing the ecological rhythm of the landscape off balance. Many who tried, and failed, to grow food without agrochemicals blamed the chemicals in adjacent plots for their failure. Bugs traveling through a sea of insecticide-covered plants would be drawn to their clean produce like bees to honey, they explained.

Whatever the cause, it was clear that many farmers were struggling. Some farmers told me that after pesticides had been introduced, plants could no longer grow without them. As seeds sprouted increasingly smaller and weaker plants, farmers would apply more pesticides. They reported that once the ecology of the farmland became accustomed to synthetic fertilizers it would take years of growing poor crops without these fertilizers to rejuvenate the soil—something most people could ill afford. Plants and farmers alike were caught in a loop, where the more chemicals they used, the more they needed. Today collapsing soils demand ever more agrochemicals and farmers across the country are sick with cancer and mysterious ailments. According to the Guatemalan economic theorist Bernardo López (2013), what was marketed by food scientists as a virtuous circle had become a vicious cycle.

López is thinking about agricultural cycles, but there are vicious cycles happening in reproductive health as well. The US and Guatemalan governments give nutrition supplements derived from the surplus of mass-produced produce to pregnant women who have deep expertise in plant cultivation. Governments, along with commercial industries that sell prenatal supplements for profit, tell women these supplements are crucial for their children's health. Meanwhile, to grow produce that can compete on global markets with mass-produced, monocultural agriculture, these same farming women will spray their gardens with pesticides and insecticides, whose heavy metals are rumored to have an impact on their own reproduction through cancers and cellular damage.

In summer 2017, I walked with Beti to her mother's farmland. As we drew close, she pointed out an experiment being run by a neighboring farmer who was trying to return to nonsynthetic techniques. The neighbor had traveled throughout

ditches in the regions collecting hundreds of plastic soda bottles, then placing them over the outside of each ear of maize in a protective sheath. The image reminded me of the same ingenuity seen at the Pachali farm: to keep the predators away, Beti's neighbor had covered the milpa in soda bottles as far as the eye could see.

A REVOLUTIONARY ACT (1980)

When I have asked scientists who worked at INCAP in the 1970s how the concern for agroecology and intercultural exchange that was present in Scrimshaw and Béhar's ambitions for nutrition disappeared from the institute's agenda, they told me a story about how once-utopian dreams were interrupted by the violence of war. As remembered by scientists who were present and as described in court documents, the story I have reassembled goes like this: Since first opening its doors, the Tuesday morning meeting at INCAP had become a weekly tradition. All staff members were required to attend, and most of the central auditorium's fifty-plus seats would be filled. Lead scientists would sit as far in the back as they could, using the meetings to proofread reports or catch up on articles they might have missed. Junior scientists would sit in the front, paying attention to the latest discussions of scientific findings and research advancements.

The tradition would be forever changed one June morning in 1980. The day began like any other summer day in Guatemala City, with cotton candy clouds lining the edges of the volcanoes on the city's horizon. Bob Klein, recruited from the US to INCAP to study the relationship between nutrition and cognition, spent this particular morning's meeting buried in reports. Klein had completed his PhD in psychology at the University of Minnesota and had carried out a recent Harvard fellowship in a cold Cambridge winter. In comparison, he thought Guatemala, with its blue skies and consistently perfect temperatures, was a paradise—though, given his research focused on malnutrition, he knew it was a paradise denied to many.⁴ As INCAP had become the face of nutrition science among international scientists, Guatemala had become known throughout the world for its high rates of malnutrition.

When the staff meeting that day was finally called to a close, Klein moved quickly to the door, his mind already on the mock trials and IQ tests that his research team would soon be carrying out. Then time stopped. A man in a stained white T-shirt stepped in front of him, blocking his exit by putting an assault rifle to his face. "Hands up! This is a revolutionary act!"

Klein remembered the man shouting this message at him as four or five other assailants entered the auditorium, easily taking control of the room. Armed conflict in Guatemala had been escalating rapidly, and stories of people who had gone missing ran in the news every day. In the coming months, entire villages would be destroyed and people everywhere would be seized by terror. But while Klein was very scared, he was also struck by an absurdity. Years later, he chuckled at this

point in telling me the story. “Hands up!” the assailant commanded him. But he couldn’t put his hands up because his hands were full of paperwork.

The men with the guns had paperwork too: a list with four names, Carlos (Pilo) Tejada, Samuelo Arévalo, Miguel Guzmán, and Richard Newman.

Confusion ensued after they called out for the four men. Arévalo and Guzmán were out of the country, leaving only Tejada, INCAP’s director at the time, and Newman, a high-level administrator, in the room. As the assailants blindfolded Tejada and Newman, they began to argue among themselves over what to do about the absences. Klein took advantage of the confusion to move toward the back of the auditorium. At the same time, Julisa Gallego moved toward the podium in the front.

Then a young secretary, Gallego would spend the next forty years working as a nutrition science administrator in Guatemala. Many credit her for saving their lives that day. Reflecting on the event, she told me with characteristic modesty that anyone in her position would have done the same. She grabbed the microphone and broadcasted the warning, “The police have been notified and are on their way.”

The kidnapers became spooked. Klein heard the assailant closest to him begin to hyperventilate and noticed, for the first time, sweat running down the gunmen’s faces. They were scared too, he could see. Gallego’s announcement rang over the loudspeakers again. The men with guns grabbed the two unlucky INCAP professionals and made a run for it. Police were not, in fact, on the way, but they would be shortly as the international scandal began to unfold.

Tejada and Newman were held from June 24 to August 11, 1980. The official story documented in the US government’s weekly report on international terrorism states that the Central American Workers Revolutionary Party (PRTC) kidnapped the scientists in the hope of pressuring newspapers to publish their political manifesto and receiving a large ransom. Neither request came to pass. The terrorism report notes that the kidnapers “lacked training and professionalism in terrorist tactics” (CIA 1980).

Scientists who were in the INCAP auditorium remain skeptical about who was responsible for the events that transpired, but there is doubt that the PRTC was to blame. The head of this Marxist-Leninist party, who was based in El Salvador, disappeared that same month, and the party, which was already at the point of being dissolved, never reconvened. It is common knowledge in Guatemala today that the cry “Marxism” was frequently used as a government foil. The two sides fighting in Guatemala were anything but even, with the military responsible for most of the war’s violence. While there was well-organized resistance to the military throughout Guatemala (see McAllister forthcoming), many people labeled as guerrillas were primarily involved in the project of survival, not insurgency. One nutritionist speculated in an interview with me years later, “It seems more probable than not that this was state authorities dressed up in revolutionary clothes.”

Newman, a US American who served in Vietnam, had learned how to respond to kidnapping during his military training. Right away, he asked the kidnappers for a pen and paper and began to write down the story of his life to keep his mind occupied. Tejada, a Guatemalan who had assumed the directorship of INCAP because of his expertise in nutritional pathology, had no such preparation. The weeks alone in a dark room, waiting through uncertainty, took a lasting toll. Following his eventual release, Tejada fled the country—as did his friend Fernando Viteri, previously tapped to be his successor, who would instead spend his life as a nutrition professor at Berkeley. Unable to find a qualified replacement for Tejada, the Pan American Health Organization (PAHO) eventually stepped in to oversee administrative matters.

INCAP's scientists had once prided the institute on its focus on basic, cutting-edge nutrition science. The center was not indifferent to health policy; after all, its research on protein aimed to not only understand, but eliminate protein malnutrition, and Scrimshaw and Béhar had started the Pachali farm with the belief that there were social benefits to nutrition to be found in the interchange of cultural knowledge. But the scientists saw themselves as primarily answering to their peers through the process of peer review and not to political agendas of the moment. As INCAP came to be managed by PAHO after the kidnapping, many of the scientists felt overburdened by the bureaucratic turn, and several of INCAP's key researchers left the institution shortly afterward.

Noel Solomons, a Harvard-trained chemist who arrived at INCAP in the late 1970s, had been in the audience during the event. He worked for the institute for a few more years before breaking away to start a small, independently run Guatemala City-based research center of his own. Reflecting on the chain of events that would come to transpire following the revolutionary act, he quipped, "In the end, no one died that day but INCAP."

Of course, INCAP did not die, though the event did shape the trajectory of its future. Agroecology, the interchange of cultural knowledge, systems thinking, and anything that might appear to advocate for the possibilities of organized collectives or land and labor reform disappeared quickly from the institute's agenda. Through the 1980s and 1990s, the discipline of nutrition in Guatemala became narrowed and solidified into the science of supplements. The institute became famous for its promotion of human capital through protein powders. Foods became equated to nutrients, the broader political and cultural ecosystems cut from view.

Some of the scientists who worked at INCAP have presented the shift as one in which science became replaced by politics, but a different framing strikes me as more useful. Several of the scientists, including the founding director, Nevin Scrimshaw, held science to be an apolitical pursuit of knowledge, but it is clear that politics was integral to INCAP's work from its beginnings, shaping the questions scientists asked and the methods they used to explore their answers. The kidnapping—along with the broader war and violence that surrounded



FIGURE 17. The view of fields of drying maize from a nutrition supplement hand-off point in San Juan Ostuncalco. Photo by author, 2009.

it—did not cause their research to become political but, rather, changed the kinds of questions that were acceptable to ask. The critical tension was not science versus politics but whose sciences and whose politics the institute would have to follow. From my vantage today, the problem was not that INCAP became political but that its scientists were ill equipped to defend its noncorporate commitments and its engagement with Indigenous knowledges of farming, agriculture, and feeding communities.

In hindsight, this appears to be a chronicle foretold. By Scrimshaw's own admission, it was a fallacy to think that an institute run by a US scientist and funded in large part by US corporations would challenge the forces of monocultural capitalism in the way the founders of the Center for Teaching and Interchange of Knowledge at the Pachali farm may have hoped. Scrimshaw and Béhar had wanted to gain a better understanding of Guatemala's nutritional problems so they could produce better solutions. They did not seem to anticipate how the solutions ultimately offered by nutrition science could exacerbate poor health and hunger. They saw early on that hunger was linked to American imperialism, but

they did not seem to grasp how addressing hunger would require confronting the imperial legacies in and of their own academic field.

CONCLUSION: FEEDING THE FUTURE

In 2010, US secretary of state Hillary Clinton convened a New York City event titled “1,000 Days: Feed a Life, Feed the Future.” Several Guatemalan scientists have told me that this was where the phrasing “the first 1,000 days” gained international traction and began to stick. “It was catchy,” one Guatemalan scientist told me.

Clinton began her introductions with acknowledgments, thanking governmental representatives, UN organizations, and members of the private and nonprofit sectors. In specific, she named Coca-Cola, noting, “Coca-Cola has a global reach and has demonstrated a real commitment to corporate responsibility . . . serving as a catalyst for creating alliances and partnerships, and we thank you and Coca-Cola very much” (Clinton 2010). She then turned to address the importance of intervening during the critical window of early life—the agenda of the day. On offer was a teleological vision of anatomical development in which the body forms in a predictable way. When the critical window has ended, the opportunity for development is over.

Clinton’s language would be directly taken up by the Guatemalan president and vice president, Pérez Molina and Baldetti, in their Window of 1,000 Days agenda, which promised to improve nutrition in early life to expand Guatemala’s economic opportunities. At a launch event held at the Museum of Archaeology and Ethnology in Guatemala City in 2012, Baldetti gathered with nutrition experts from Mexico and Bangladesh to announce that her agenda would be investing 90 million quetzales (roughly US\$11.5 million) in the intervention. They would bring targeted investment to poor, rural Guatemalan communities “where no one has ever arrived,” she declared—as if people had not lived there all along.

Baldetti’s cruel statement of territorial conquest, with its history in the Doctrine of Discovery used by colonizers to justify stealing Indigenous people’s lands and “modernize” the landscape, was made worse by the kind of help they would offer (Quemé Chay 2020). The investment she called for would go almost exclusively toward vitamin and mineral supplementation to improve deficient bodies and nutrition education to change ignorant minds. This was colonial, corporate profit-making masquerading as structural change.

Whereas robust developmentalism had accompanied the military-style violence of United Fruit, Pérez Molina and Baldetti began to dismantle state funding for health and education programs, including those in the department of Quetzaltenango. As described in previous chapters, the narrow focus on the Window of 1,000 Days helped authorize a neoliberal evisceration of state services. The concern for fetal development placed the responsibility for the future on pregnant

women, all while turning development into a project for international aid. Rather than build out health care infrastructures from taxpayer-supported funding or draw from the wisdom of Guatemala's Indigenous communities who had been growing crops sustainably for generations, the president put USAID in charge of maternal nutrition in rural communities. By 2014, it was clear that President Pérez Molina would not actually provide the money for services he had promised. At the time, he and Vice President Baldetti were busy embezzling all funds they could find, eventually being so egregious in their greed that they were caught and after five months of intense citizen uprising removed from their governmental positions and imprisoned for their crimes.

I met with Oswaldo Francisco Perez, a project specialist for maternal and child health programs run by USAID, several times in the years following their arrest. Francisco Perez was proud of the fact that USAID's offices in Guatemala, unlike those in other countries, primarily employed local workers and not US expats. He regretted that massive political turnover limited his work—reminding me that he had to attune his projects to the demands of four presidential administrations in the five years between 2012 and 2016. Still he was unfailingly optimistic about the possibilities of working within these limits, harnessing what he could from USAID's infrastructure to improve Guatemalan futures. (Perhaps this optimism is a precondition to institutional survival. I have thought this about his work with USAID—and about my own work in the academy as well.)

I always left our meetings armed with pamphlets and infographics detailing Window of 1,000 Days priorities, many printed in English—a sign, perhaps, that their real audience may have been US donors and political advocates who held control of the coffers of USAID. But if local funding was limited, local talent was not. Francisco Perez had thoughtful teams working to design cultural sensitivity training programs that could navigate the complexities of family planning in a pro-church, antiabortion state. For example, he pointed me to research suggesting that making contraception widely available is one of the most important steps to improve children's nutrition. He had even advocated for an innovative “new masculinity” family planning campaign that would involve “men and other gender roles” in childrearing.

Francisco Perez and I share an interest in drawing attention to the neglected field of reproductive health when it comes to food security. Yet his work continued to define reproduction in narrow terms, through a focus on family planning, pregnancy, and childbirth. What remained absent from USAID's maternal and child nutrition programs was the topic of land and labor, in the economic sense of the term. The “affordable solutions” to malnutrition that Clinton's first thousand days campaign highlighted were found in products that could be marketed to pregnant people such as vitamins or fortified foods, not in Indigenous sovereignty. USAID's efforts to assure “equitable access”—the title of one of the posters—centered on access to new commodity goods, not the means of production. The agency

produced calendars for “healthy living” and recipes for “healthy eating” focused on nutrients and vitamins. It taught rural mothers how to eat and how to prepare supplement-based pancakes and oatmeal for their children. It was certainly not in the business of teaching people to organize collectively to reclaim their land.

Meanwhile, in highland communities where USAID has operated for decades, storefronts are painted with the word *toxic*. This is not, in fact, a warning of danger to health but marketing. Toxicity, in the paradigm of development that highlanders are living through, is needed to kill invasive predators and superbugs to help plants grow. Of course, many farmers like Beti’s mother still try to avoid synthetic chemicals, but they have the forces of colonial development working against them. Pesticides are everywhere, while INCAP’s agroecological farm is in ruins.

Today a new research hypothesis for chronic malnutrition in Guatemala is emerging in the news. This research, funded by corporations such as Nestlé and the Feed the Future Innovation Lab of USAID, overlooks the heavy metals in the soils and the insecticides on the leaves. It focuses instead on maize, one of the world’s most powerful foods, first domesticated from the grass species *teosinte* that grew wild in Mesoamerica roughly nine thousand years ago. According to the hypothesis advanced by this research, maize grows symbiotically with a naturally occurring fungus. When ingested, the fungus produces a harmful aflatoxin or mycotoxin that can pass from the gut into breast milk, stunting the development of the fetus-child (Voth-Gaeddert 2017). This fungus, according to the hypothesis, is not a side effect of current environmental degradation but intrinsic to the growth of maize. Were this hypothesis to be true, the result—almost too ugly to write—would be that the food that lies at the foundation of both culture and agriculture in Guatemala would be intrinsically damaging to both human and global development.

It comes as no surprise that corporations such as Nestlé are interested in funding this line of research on aflatoxins, since linking toxicity to breast milk would be a tremendous boon for their infant formula. Without much governmental investment in research, very often the only kind of research carried out in Guatemala is research with the promise of commercial profit. In this case, there are significant commercial possibilities in showing that breast milk from women who consume maize is harmful, not protective. Green Revolution scientists, who championed factory-produced chemicals, would have loved these results, since they would indicate that investing in synthetic baby formula and supplemental nutrition over breast milk would be a good way of investing in future life.

Conclusions often end with a single unified message. Challenging this narrative structure, however, I would like to close this chapter with two divergent threads.

One of these threads resolutely refuses optimism to make clear what Guatemala’s Indigenous communities are up against. Looking at the *historia* of Pachali’s interchange of knowledge program, we can observe a time when the field of nutrition in Guatemala could have grown to encompass agroecology, when nutritionists

might have learned to think deeply about Indigenous agriculture or wondered how nutrition was tied up in systems of exploitation. They might have even begun to follow Indigenous leaders by connecting the theme of agricultural sovereignty to reproductive autonomy. And they might have brought this knowledge about how to produce good food environments directly to the topic of maternal/child health that was animating the design of the Oriente Study in another part of the country.

That window of opportunity slammed shut. It did so through the military force of genocide meant to put an end to land reform and insurgency. That window was also closed by the smaller and quieter actions of replacing the handmade ash volcanoes with synthetic chemicals and the sacred maize atole with an industrially produced protein drink. We see clear violence in a kidnapping by gunpoint that led to INCAP scientists being held hostage in the dark for months. But nutrition scientists were not only victims; they were also complicit in building a food system in which profit-driven toxins now cover plants that were once a source of life. In this historia of INCAP, we can see how violence does not only happen through obvious warfare, but also through acts of care. Throughout the highlands today, US-financed development projects deliver fertilizers and protein powders, all while claiming to help. As Vandana Shiva (1988, 11) has written, “At no point has the global marketing of agricultural commodities been assessed against the background of the new conditions of scarcity and poverty that it has induced.”

The second thread of my conclusion pauses at the idea that the “window of opportunity” has ended, making political transformation and agricultural revolution impossible. The logic of human development offered up by the Window of 1,000 Days agenda follows a linear teleology: There is a critical window that must be acted upon. If we don’t act in this window, we lose our chance. But the development of bodies, economies, and societies need not follow this vision: it can happen along other trajectories and in other ways.

Take, for example, research on aflatoxins. According to research funded by the USAID’s Feed the Future Innovation Lab for Nutrition, aflatoxins are a “naturally occurring” result of the symbiosis of maize and fungus (Andrews-Trevino et al. 2021). Because they pass through the breast milk of people who eat corn, they are being discussed as a natural cause of stunting. But historical research into their history also suggests that even though aflatoxins are classified as natural, their prevalence is heavily influenced by human actions and interventions such as crop choice, agricultural practices, and storage conditions (Mueller 2019). In addition, whereas some aflatoxin research paints fungus as harmful, other research shows that fungus can enhance the micronutrient content of crops and that it may also keep crops strong through drought or disease and minimize reliance on pesticides. Some fungal-plant relations appear to have a protective effect against heavy metals (Hachani et al. 2020), or even to help reduce the nitrogen emissions that contribute to climate change (Bender et al. 2014). It is certainly imaginable that if research were premised on Mayan ingenuity and not Mayan

deficiency, nutrition scientists could engage with aflatoxins in ways that would allow landscapes to flourish and people to be well fed.

What else might be learned from approaching Indigenous knowledge of cultivation as a carefully developed science? Nutrition and agricultural sciences in Guatemala still have not fully reckoned with their mischaracterization of swidden cultivation as ignorant and harmful. Nonetheless, a substantial body of research is affirming the merits of swidden practices, which have long recognized burning as an act of regeneration (Zeng et al. 2017). To draw a lesson from swidden cultivation: destruction is not a given. As Micha Rahder (2020, 169) observed while doing ethnographic research on Indigenous forestry stewardship in Guatemala, life emerges, phoenix-like, after fire. Instead of thinking in terms of critical windows where opportunities are finite, we might think of life as persistently in formation and ash as protective of subsequent growth.

While highland soils today may be full of plastics and chemicals, seeds may also be germinating in fallow soil, ready to sprout. Plastics, despite their toxicity, may also be drawn in to protect these seeds and help them survive. The violence of monocultural capitalism may compel us to open a window to another kind of science—one built from collective practices, supporting collective actions, encouraging the production of foods from collective lands, and helping foster reproductive cycles in which women, children, and their entire communities can flourish. A lesson from the milpa is that under certain conditions, we can grow and burn, and grow and burn—repeating the process as a means of finding ourselves on a more nourishing path.