

Repackaging Plantation Relations: Green Revolution Technologies, Agriculture, and the Remaking of the Américas

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[P]lantation production is one of the most monumental burdens ever placed on a community. It disfigures every nation, region, and ethnicity it touches.

—Clyde A. Woods¹

Plantation relations can be reproduced under a variety of conditions so long as there is not systemic challenge to the dominant bloc.

—Clyde A. Woods²

What are some notable characteristics of plantation geographies and what is at stake in linking a plantation past to the present?

—Katherine McKittrick³

During the 1980s, farms and agricultural workers in the United States entered a prolonged crisis. According to Clyde Woods, the combination of the inability to gain access to European markets, high prices in industrializing countries, the overproduction of domestic crops, and increased US investment in agriculture in other parts of the world put many growers in a bind. Production in the cotton sector was indicative of the difficulties facing US agricultural workers: “yield-oriented federal and private lenders require[d] farmers to adopt the most capital-, technology-, and chemical-dependent forms of production. All these forces [operated] both to drive smaller farms out of business and to encourage land consolidations.”⁴ Concerning the overwhelmingly Black agricultural labor force, Woods wrote that “[t]he

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¹ Clyde Woods, *Development Arrested: Race, Power, and the Blues in the Mississippi Delta* (London: Verso, 1998), 271.

² *Ibid.*, 204.

³ Katherine McKittrick, “Plantation Futures,” *Small Axe* 17, no. 3 (2013): 1–15.

⁴ Woods, *Development Arrested*, 230, 261.

African-American communities in the Delta are in the grips of a highly capitalized and subsidized internationally oriented agricultural complex that is in the throes of a massive transformation having global implications.⁵ Given the increasing appearance of tropical goods from the Central and Southern Américas in markets today, Woods's words proved prescient. Small farm owners and agricultural workers across the United States were and are increasingly at the mercy of a liberalizing international agricultural complex that aims to reduce friction in the movement of goods between places. Export/import levies, market regulation, and other protectionist measures are quickly disappearing, making it easier for US consumers to purchase grapes during winter. Writing in the second half of the 1990s, Woods's comments came after the implementation of the North American Free Trade Agreement (NAFTA), which increased free trade and has been devastating to working-class and working-poor communities. Within these groups, women are bearing the brunt of this devastation, since joining the wage labor force has led to exploitation in the public and domestic spheres.⁶

The devastation of the 1980s was a result of a Green Revolution (GR) in the US South during the 1930s. US foreign policy of the 1960s and 1970s heavily emphasized GR agricultural technologies. What follows are notes on how the link between the US South and the Américas through agriculture and the plantation relations Woods described, theorized, and analyzed in *Development Arrested* were reproduced at the hemispheric scale in the wake of the social, material, and economic effects of GR agricultural technologies. After a schematic overview of GR practices and effects more broadly, I will focus on how plantation relations were reproduced in coffee production. A valuable part of the international agricultural complex, coffee producers and workers were heavily impacted by agricultural technologies that precipitated the coffee crises of 1999 and 2001 and fueled demand for more free trade by political leaders shaping and following post-World War II development discourse. Prior to unpacking development discourse, however, it is necessary to provide a schematic overview of the plantation and plantation relations in the Américas.

At its most distilled, the plantation is a spatial matrix for the organization of life in which planters articulate difference with power to fatal ends. It is physical (it has material boundaries, characteristics, and practices), social (it organizes life, interaction, and reproduction), economic (it sets parameters for what and who is valuable), and ontological (it sets parameters for what and how its inhabitants can exist in the world).⁷ In the Américas, the plantation was the matrix instituted by settlers onto the original inhabitants and territories. Large-scale monocrop agriculture on protected, dispossessed lands populated and worked by captured and unfree peoples to create and reproduce proto- and actual capital—this was and is the plantation. When the indigenous peoples proved unreliable as labor for plantations—because they either died, fled, or resisted—people were ripped out of their communities and brought to the Américas. Eric Williams makes plain that the plantation was the method by which planters, and what Woods and Bobby M.

⁵ *Ibid.*, 231.

⁶ See David Bacon, *The Children of NAFTA: Labor Wars on the U.S./Mexico Border* (Berkeley: University of California Press, 2004); Rosa Linda Fregoso, *meXicana Encounters: The Making of Social Identities on the Borderlands* (Berkeley: University of California Press, 2003); Melissa W. Wright, *Disposable Women and Other Myths of Global Capitalism* (New York: Routledge, 2006); and María Josefina Saldaña Portillo, "In the Shadow of NAFTA: 'Y Tu Mamá También' Revisits the Allegory of Mexican Sovereignty," *American Quarterly* 57, no. 3 (2005): 751–77.

⁷ In her "Plantation Futures," McKittrick also reminds us that resistance and struggle are part of these possibilities.

Wilson later called the planter bloc, shaped the Américas in their image.⁸ Woods and Wilson further theorized that the relationships forged on plantations can and do exist and persist both beyond and without the plantation.⁹

Whether on the plantation or on a factory floor in Birmingham, Alabama, plantation relations established by a planter bloc permeate all spheres of life. The key tenets of these relations were originally developed and refined on plantations and then recalibrated, reconfigured, and reproduced to operate beyond them: economic monopoly over agriculture, manufacturing, banking, land and water; fiscal, administrative, and regulatory control over local and county activities; and an authoritative monopoly over the conditions and regulation of ethnic groups and labor. It is the plantation as spatial matrix and these plantation relations as social organization that were incubated in the Northern Américas in the antebellum and post-Reconstruction US South that were exported to the Central and Southern Américas after World War II through development discourse and practice.

A GREEN MONSTER: AGRICULTURAL TECHNOLOGY AFTER WORLD WAR II

The Green Revolution was the physical and material application of post-Bretton Woods development discourse and policy that measured development in monetary terms. The implementation of GR technologies dramatically reshaped the Américas in the second half of the twentieth century. This effort was dominated by the United States through nongovernmental organizations (NGOs) such as the Ford Foundation and the Rockefeller Foundation; through official state foreign policy in Harry Truman's Point Four Program and John F. Kennedy's Alliance for Progress, administered by the US Agency for International Development (USAID); and through leadership in the World Bank, International Monetary Fund (IMF), the Food and Agricultural Organization of the United Nations (FAO UN), and the United Nations Economic Council on Latin America (UN ECLA). The crisis faced by small-farm owners and the overwhelmingly racialized and classed agricultural workers in the United States in the 1980s was the same crisis that ethnicized and classed small-farm owners and workers faced in the Central and Southern Américas beginning in the second half of the 1960s.¹⁰ In both cases, the agricultural technologies of genetically engineered seeds, chemical fertilizers, and mechanized labor exploited the political, economic, and physical differences between large and small farmers and led to a greater

⁸ Eric Williams, *Capitalism and Slavery* (Chapel Hill: University of North Carolina Press, 1944).

⁹ Woods, *Development Arrested*; and Bobby M. Wilson, *America's Johannesburg: Industrialization and Racial Transformation in Birmingham* (Lanham, MD: Rowman and Littlefield, 2000).

¹⁰ The predominantly Black and poor white agricultural workers in the US South previously faced displacement and enclosure as well. What they were experiencing in the 1980s were simply the side effects of the latest Mississippi Delta Plan devised by the dominant plantation bloc to maintain plantation relations after abolition. The point here is not to find a "prime mover" with regard to dispossession and displacement but rather to point out that this has been occurring across the Américas for many, many years. Woods's thesis that plantation relations can be reproduced under a variety of conditions is influential to my work. The plantation and plantation relations as methods for organizing social, political, and economic life as theorized by Woods are crucial as well. Regardless of location and/or application, the plantation and plantation relations that exploited racial and ethnic difference to fatal ends permeated agricultural life across the Américas. In addition, in the same way that Woods's *Development Arrested* traces the ability of the plantation bloc to maintain its dominant position in the face of crisis by violently suppressing, discursively delegitimizing or criminalizing, and/or absorbing alternative planning practices, I am arguing that the United States and US-based organizations have been able to maintain their dominant position in the Américas by using similar tactics.

disparity in the income earned by large and small farmers, concentration in landownership, a proliferation of monoculture cash-crop farming, and an increase in the number of people dependent on wage labor. These technologies also significantly remade the physical landscape of the Américas and exposed workers to harmful conditions. The international agricultural politics of development discourse and policy is vital to understanding how these processes unfolded.

The United States used its new hegemonic position to mold development discourse and policy in nonindustrialized countries and to construct the international agricultural complex. The two efforts were often conflated or pitted against each other. On the one hand, development theorists and economists with the World Bank, IMF, UN ECLA, FAO UN, Rockefeller Foundation, and Ford Foundation, as well as US policy in the Alliance for Progress and USAID, encouraged increasing agricultural diversity by adding nontraditional crops like broccoli, berries, sugar, cattle, and cotton to foster the internal economic growth necessary to spur industrialization.¹¹ These organizations offered aid in the forms of credit and/or grants at the same time that they encouraged foreign investment. On the other hand, the Alliance for Progress and USAID gave away or sold surplus grains at subsidized prices to nonindustrialized countries in the Américas as part of US foreign policy aimed at deterring them from pursuing a Communist alternative represented by Cuba after 1959. This had the twin effects of depressing the prices of agricultural products on the international market and making it easier to feed workers in urban centers.¹² Development policy provided a way for the United States to dispose of its mounting grain surplus and to use agricultural aid for political and economic leverage at an important historical moment in the construction of an international agricultural complex that fitted its desires.¹³

During the 1950s and 1960s, several countries in the Central and Southern Américas briefly introduced land reform measures in attempts to broaden their agricultural bases and participation in diversification policies. Cuba was in the middle of a revolution, the Cold War between the United States and the USSR was beginning, and the United States was the clear hemispheric hegemon and was intent on eliminating any administration, policy, or activity that appeared even faintly as Communist. In Guatemala, the administration of Jacobo Árbenz enacted land reform under Decree 900. The combination of his administration's commitment to redistributing unused land on estates larger than 672 acres, the impact of this reform on the landholdings of the United Fruit Company, and Fidel Castro were too much for the United States. In 1954 the Central Intelligence Agency (CIA) engineered a successful coup.¹⁴ Between 1960 and 1964, several countries enacted agrarian reform to appease peasant and indigenous struggles for land

¹¹ This diverse agricultural approach was singled out as the way for nonindustrialized countries to industrialize through import substitution. See Farshad Araghi, "Global Depeasantization, 1945–1990," *Sociological Quarterly* 36, no. 2 (1995): 345–49; David Carey Jr., "Guatemala's Green Revolution: Synthetic Fertilizer, Public Health, and Economic Autonomy in the Mayan Highland," *Agricultural History* 83, no. 3 (2009): 297; Daniel Faber, "Imperialism, Revolution, and the Ecological Crisis in Central America," *Latin American Perspectives* 19, no. 1 (1992): 18–19; David Conrad Johnson, "The International Coffee Agreement and the Production of Coffee in Guatemala," *Latin American Perspectives* 37, no. 2 (2010): 37–38; and Michael Taussig, "Peasant Economics and the Development of Capitalist Agriculture in the Cauca Valley, Colombia," *Latin American Perspectives* 5, no. 3 (1978): 68, 71, 80, 87.

¹² Araghi, "Global Depeasantization," 349.

¹³ *Ibid.*, 348–49; and Douglas L. Murray and Laura T. Reynolds, "Globalization and Its Antinomies: Negotiating a Fair Trade Movement," in *Fair Trade: The Challenges of Transforming Globalization*, ed. Laura T. Reynolds, Douglas L. Murray, and John Wilkinson (New York: Routledge, 2007), 6–8.

¹⁴ Carey, "Guatemala's Green Revolution," 292; and Eduardo Galeano, *Memory of Fire*, vol. 3, *Century of the Wind*, trans. Cedric Belfrage (New York: W. W. Norton, 1988), 149–53.

in an attempt preempt armed conflict. Guatemala—under US-approved conditions this time—Nicaragua, Costa Rica, Colombia, and Brazil passed measures that multiplied the number of small farms and small landowners.¹⁵ Many of these new land titles were granted for land that had never been farmed because of its unsuitable soil. In fact, many of those granted deeds as a result of these reforms had been forcefully removed from their traditional lands, and the land they were given was an insult.¹⁶ It was on these plots designed to provide subsistence or to marginally supplement wages earned on plantations that small farmers were slotted into the international agricultural complex. They were expected to compete with large capitalist plantations and owners with volume advantages and decades of participation in the international market and control of the export infrastructures. In practice—if not in theory—the plot sizes were too small to produce enough for the farmers to fully detach themselves from seasonal wage labor but were large enough to subsidize the large plantations in the form of less expensive labor. The small farms lowered the operation costs of the plantations by depressing wage rates: the owners did not need to pay the laborers as much because they made their own contributions to social reproduction.¹⁷ This functional dualism, peasant economics alongside capitalist economics, worked from the time of the land reforms until the late 1970s, when the gulf between large and small farmers grew too large.¹⁸ In the mid-1960s, land reforms ceased. The same actors who pushed for agricultural diversification delivered a modern scientific alternative to land redistribution.

Agricultural technologies of the GR arrived in the Américas as ways to fulfill the goal of broad-based agricultural diversification in the service of national economic growth and industrialization. Genetically modified high-yield variety (HYV) grain, synthetic fertilizers, and labor mechanization were substituted for land reform as the methods to achieve diversification. International and local political figures and development theorists and economists touted these technologies as a panacea.¹⁹ GR technologies gave local national political elites a way to promise to “increase economic growth without recognizing small scale farmers’ demands and strategies as legitimate. . . . Technical progress was regarded as an alternative to land reform.”²⁰ The immediate and long-term effects of the GR were altered landholdings, physical landscapes, and socio-economic structures of the countries that implemented the various technologies. A contributing factor that facilitated these changes was access to capital.

Access to credit and/or grants was distributed unevenly between large and small farmers. Stated simply, smaller farmers were systematically denied credit and/or grants to change their production from locally based and years-old practices to new Western-based, synthetic,

¹⁵ Araghi, “Global Depeasantization,” 346. Other countries that initiated reform during this time were the Dominican Republic, Panama, Ecuador, Peru, Venezuela, and Chile. They are not mentioned above because they are not major coffee growers, although Peru does export some.

¹⁶ Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 19.

¹⁷ Araghi, “Global Depeasantization,” 352; Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 24; Johnson, “The International Coffee Agreement and the Production of Coffee in Guatemala,” 43; and Taussig, “Peasant Economics,” 86.

¹⁸ Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 36.

¹⁹ See Araghi, “Global Depeasantization”; Carey, “Guatemala’s Green Revolution”; Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America”; Taussig, “Peasant Economics”; William C. Thiesenhusen, “What Changing Technology Implies for Agrarian Reform,” *Land Economics* 50, no. 1 (1974): 35–50; and Lakshman Yapa, “Ecopolitical Economy of the Green Revolution,” *Professional Geographer* 31, no. 4 (1979): 371–76.

²⁰ Carey, “Guatemala’s Green Revolution,” 293.

and chemically engineered agricultural methods. Quite often, smaller farmers were showed and offered GR technologies but not extended the credit necessary to use them.²¹ Small farmers faced barriers to capital at two scales. Internationally, financial institutions and development agencies preferred large-scale farmers because they were considered better risks, more likely to provide a return on investment to lenders or a success story for development agencies. When small farmers did receive capital, it usually depended more “on the requirements of the donor country than on those of the recipient.”²² According to Thiesenhusen, “Because development is too often equated with growth in average per capita output in the economy as a whole, investments [were] channeled to those projects which promise[d] the highest short-run rate of return.”²³

Small farmers also encountered more obstacles to credit at the local, national scale. They were at the mercy of banks that essentially worked for the large landowners, US-owned lenders, and oligarchic government agencies whose members usually doubled as large landowners; these banks sought to appease US and international institutions. In Guatemala, local banks favored large-scale farmers. In 1975 a US-owned lending institution received US\$550,000 of the total US\$1.6 million the country received in aid while small coffee farmers received only US\$181,000.²⁴ In Colombia, capital from the World Bank and US investors helped sugar plantations expand across the Cauca flatlands. Exports jumped from 2,000 metric tons in 1938 to 91,000 in 1969. As large landowners received an unequal amount of capital to increase production with GR technologies, small farmers stopped planting traditional crops and implemented GR methods with limited to no funding. Exacerbated by cheap US grains flooding the Américas, side effects—intentional or unintentional, planned or unplanned—took hold.

The disparity in capital made available to large and small farmers for agricultural technology led directly to local food underproduction and land concentration. Without the land or capital necessary for GR goods, small farmers saw their subsistence foods drop and the gap in cash income between them and large farmers increase dramatically. Small farmers who did convert their farming with GR methods and/or converted to nontraditional agriculture (NTA) with meager savings or minimal credit literally uprooted sources of food and long-held agricultural practices. In their place, they instituted what former USAID chairman Clifton Wharton called “new farming skills and expertise of higher order.”²⁵ The ethnocentric dismissal of locally cultivated food and agricultural practices laid bare the colonial logic behind development and the GR. Or, as Richard Peet and Michael Watts stated, it illustrated that “[d]evelopment was modernity on a planetary scale in which the West was the ‘transcendental’ pivot of analytical reflection.”²⁶ Agriculture “as a technique for fixing the radiant energy of the sun and converting it to a form that is directly usable by animal and man” was replaced with a modern agriculture designed to bypass the sun and obtain its high yields via windfall energy subsidies locked in

²¹ A. Eugene Havens and William Finn, “Green Revolution Technology and Community Development: The Limits of Action Programs,” *Economic Development and Cultural Change* 23, no. 3 (1975): 472; and Johnson, “The International Coffee Agreement and the Production of Coffee in Guatemala,” 39.

²² Thiesenhusen, “What Changing Technology Implies for Agrarian Reform,” 41.

²³ *Ibid.*, 49.

²⁴ Carey, “Guatemala’s Green Revolution,” 297; and Johnson, “The International Coffee Agreement and the Production of Coffee in Guatemala,” 43.

²⁵ Clifton Wharton, “The Green Revolution: Cornucopia or Pandora’s Box?,” *Foreign Affairs* 47, no. 3 (1969): 466.

²⁶ Richard Peet and Michael Watts, “Introduction: Development Theory and Environment in an Age of Market Triumphalism,” *Economic Geography* 69, no. 3 (1993): 232.

nonrenewable fossil fuels. Farmers who did begin using new methods were not only changing their local practices but doing so with inputs dependent on a volatile oil market.²⁷ Many small farmers who uprooted subsistence and traditional crops overexploited their limited resources and superexploited their familial units to try and ameliorate the volume disadvantage under which they operated.²⁸ At first, the GR technologies increased yields. Over time, yields dropped. More inputs were required and the oil crisis of 1973 and collapse of the Bretton Woods system drove the costs of seed and fertilizer up.²⁹ Already lacking subsistence foods, receiving low wages in plantation employment, and selling their goods in a market with depressed prices due to large-scale growers and cheap grains from abroad, farmers had to pay even more to maintain their diminishing production. Instead of alleviating the need to work on large plantations and estates, the new technologies increased it.

In retrospect, GR technology and the land reforms initiated in the Américas during the 1950s and early 1960s functioned to momentarily redistribute land only to reconcentrate it a few years later. Increasing food and rent costs, depressed earnings and wages, and large-scale farming came together to force many small and peasant farmers to sell or abandon their land. Through coercion (requirements attached to aid by development agencies) and consent (applying for meager credit), small and peasant farmers and their agricultural practices were articulated into a nascent international agricultural complex that was itself developing within an international system of financializing capitalism, both dominated by the United States in the Américas. The breakup and recongealing of land illustrated the changing same of colonial power and plantation relations.³⁰ More than one hundred years later, the large-scale farms, estates, and plantations of henequen and coffee that marked a second conquest of the Américas were replaced with cotton and cattle, bananas and more coffee, and debt that marked another conquest of the Américas.³¹ The alchemy that turned petroleum into fertilizer also turned peasants and small farmers into members of a growing international class of working poor people.

ZOMBIE AGRONOMY: THE AFTERLIFE OF THE GREEN REVOLUTION

Land concentration coupled with synthetic agronomy remade the agricultural landscape and devastated ecologies across the Américas. In the Central Américas, cotton and cattle production brought the most dramatic changes in land use and the landscape. Between 1952 and 1967, cotton production increased by 400 percent in Nicaragua while food production was halved. By 1970, 80 percent of arable land along the Central American Pacific and 40 percent of all cultivated land was occupied by cotton. This trend continued throughout the 1970s, making the Central Américas the third-largest producer of cotton, behind only the US South and Egypt.³² Cattle

²⁷ Yapa, "Ecopolitical Economy of the Green Revolution," 375.

²⁸ Faber, "Imperialism, Revolution, and the Ecological Crisis in Central America," 27, 33.

²⁹ Carey, "Guatemala's Green Revolution," 302–6.

³⁰ Amiri Baraka, "The Changing Same (R & B and New Black Music)," in *Black Music* (New York: Akashic Books, 2010), 205–42.

³¹ Steven C. Topik and Allen Wells, *The Second Conquest of Latin America: Coffee, Henequen, and Oil during the Export Boom, 1850–1930* (Austin: University of Texas Press, 1998).

³² Faber, "Imperialism, Revolution, and the Ecological Crisis in Central America," 19. The ties between the US South and the nonindustrial and industrializing world continue with cotton. In 1904, the Delta Experiment Station was established in Stoneville, Mississippi, with funding from the USDA. As Woods noted, by 1925, 95 percent of all cotton planted in the South descended from strains developed at the station. USDA-funded

ranching expanded along the mountains throughout the Central American interior with funding from US-based and international agencies. During the 1970s, 15 percent of the region's forests were destroyed for the pasture needed to make deboned frozen beef—the Central Américas' fastest-growing export between 1961 and 1974. In these thirteen years, production of beef increased 400 percent. In the 1980s, the rain forests disappeared at a rate of 3,500–4,000 square kilometers per year. Between 1960 and 1992, “over two-thirds of Central America's (broad-leafed) lowland and lower montane rain forests, the largest expanse north of the Amazon Basin, [were] destroyed.”³³ The concentration of land and expansion of cash crops closed the door to the possibility of diversification. Cotton and cattle and, to a lesser extent, sugar were added to coffee, bananas, and other tropical commodities to once again position the Central Américas as suppliers of cheap agricultural goods and raw materials in the international market. In the mid-1970s, cheap agricultural goods and raw materials accounted for 82–85 percent of extraregional trade and 60 percent of the Central Américas' earnings.³⁴ The GR agronomy that catalyzed the export boom not only deforested and gridded the landscape but destroyed the land and people who worked on it.

Years of GR agronomy devastated the health of the landscape and the people of the Central and Southern Américas. The fossil- and chemically fueled synthetic seeds created unnaturally high yields on a faster timetable. Operating according to the needs of the capitalist market and on capitalist time, the new agricultural practices exploited the ground and soil past their maximum capacities. By moving away from the natural pace and intensity of solar-powered agriculture and to that of GR technologies, both large- and small-scale farmers sapped the soil of vital rest and nutrients, significantly weakening it over time. According to a farmer in Guatemala, “The land lost strength because it was not allowed to rest, the synthetic fertilizer is just like a cup of coffee for breakfast, it wakes you up but it does not nourish you.”³⁵ The scale at which these new methods were used not only degraded soil quality but also eroded and deforested vast amounts of land in the Américas. For example, by 1990, over 65 percent of Guatemala's original forests were destroyed, and abandonment of traditional terrace farming caused up to thirty-five tons of soil loss per year. More than 95 percent of El Salvador's original tropical forests were destroyed,

research and agricultural technology—including that pertaining to cotton—were exported abroad in the 1960s as GR aid to countries in the Américas, including Guatemala, El Salvador, Nicaragua, and Brazil. Although Woods did not expand on the specifics of how US foreign policy in the Américas grew out of the dominant plantation bloc's Mississippi Delta Plans, it is clear that there are connections to be made (*Development Arrested*, 94, 101, 182). For instance, he noted how, “[a]s a pillar of post-war US foreign policy, Green Revolutions were launched in Mexico, India, China, and many other countries along the same strategic lines developed in the South. Internationally, a more dependent agricultural and rural leadership was created through the reorganization of production and credit structures. Not only did US foreign aid support the growth and power of those farmers most dependent on US-produced machinery and chemicals, but new educational and health initiatives lent these extremely conservative and brutal rural elites the air of legitimacy they needed in order to defeat the social movements of dispossessed peasants and workers” (*Development Arrested*, 159). Unfortunately, this is not the place to fully develop the connections and specifics of how in many ways post-World War II development theory and practice should be theorized as reflecting the plantation and plantation relations writ large. Katherine McKittrick's work, however, is vital to thinking about how the plantation needs to be understood as a planning tool and how plantation relations persist.

³³ Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 20. According to Faber, in 1975 the 20 million acres of pasture used for cattle ranching exceeded the acreage used by all other agricultural production combined (*ibid.*, 25).

³⁴ *Ibid.*, 21.

³⁵ Carey, “Guatemala's Green Revolution,” 302–3.

and 77 percent of the country was suffering serious soil erosion.³⁶ Guatemala's Maya-Kaqchikel people and their history address these issues:

A long time ago there was not chemical fertilizer and because of that men were tougher; they did not fall ill. They farmed and ate the pure strength of the land. Now chemical fertilizer weakens us. The corn is bigger but it has chemicals in it. The land is no longer strong. It has disease in it. Furthermore, the underground insect population and waste have increased. These insects and waste eat the harvest. When there was not chemical fertilizer, nothing hurt. My grandfather lived to be eighty-five and when he died he was never hurt.³⁷

The connection between environmental, ecological, and community health made by this Kaqchikel elder reveals the effects of uneven exposure to chemicals along ethnic and class lines. Agricultural workers in the Central Américas were surrounded by what similarly ethnicized and classed agricultural workers thousands of miles away called *la medicina*.³⁸

Chemicals in synthetic fertilizers and pesticides used in GR agronomical practices were lethal to farmers and workers. Uneven exposure of small farmers, poor workers, and their communities to the toxic elements in these artificial products resulted in an uneven distribution of poor health and early death in the Américas. According to Ixxeq, another member of the Kaqchikel community,

A long time ago my grandfather did not use chemical fertilizer, he only used natural fertilizer from chickens and goats. He carried it in a sack when he went to his land in the hills and then he would throw a little under each corn stalk. My grandfather said that chemical fertilizer gives illness. That is why so many people are sick now because of the poison from chemical fertilizer. In fact, there is more poison than fertilizer. . . . Cancer is one of the grave diseases that this poison provoked. Now people die young because there are so many diseases. A long time ago people lived much longer.³⁹

Application methods, working conditions, and chemical saturation of the subsistence food supply led to sharp increases in disease and death in communities who worked with synthetic fertilizers and pesticides. Fertilizer and pesticide application assaulted workers' bodies by exposing them to toxic materials in multiple ways: contact with bare skin, inhalation, eye and ear contact, and direct incorporation into the bloodstream through broken skin. Working conditions compounded the dangerous effects of application methods. Quite often, workers ate lunch in the

³⁶ Faber, "Imperialism, Revolution, and the Ecological Crisis in Central America," 28–30.

³⁷ Carey, "Guatemala's Green Revolution," 299–300.

³⁸ Laura Pulido, *Environmentalism and Economic Justice: Two Chicano Struggles in the Southwest* (Tucson: University of Arizona Press, 1996), 83. One of the components on the United Farm Workers Organizing Committee's (UFWOC) agenda was the effects that pesticide use in Central California had on the health of the workers, most of whom were people of color and/or poor. The UFWOC's pesticide campaign of 1965–71 was the result of years of experience with the very technologies that small farmers and poor agricultural workers were becoming familiar with in the Américas. Agricultural workers in the Mississippi delta also suffered from poor health brought on by exposure to GR technologies. Once again, most of them were people of color and/or poor. The use of toxic pesticides from the 1920s forward caused widespread health crises in Black communities throughout the region beginning in the 1950s and 1960s (Woods, *Development Arrested*, 227). These cases of the disproportionate exposure of people of color and poor people to hazardous materials while performing agricultural work show that, although the methods have changed, the international agricultural complex modeled on the plantation and structured by plantation relations finds labor disposable.

³⁹ Carey, "Guatemala's Green Revolution," 300.

middle of the fields without washing their hands—for expediency and because of lack of facilities. Since seasonal workers—and sometimes full-time workers—usually lived in housing camps on the large estates and plantations on which they worked, they were subjected to “pesticide drift.” Lacking viable alternatives, workers and their families used contaminated sources of water, such as irrigation ditches and streams, around the fields.⁴⁰ Chemicals found their way from the soil in which crops were sown into the crops themselves. Reaping, gathering, and fishing became a “double-edged sword.” Hunger was sated, but at a high health cost.⁴¹ All these factors combined to displace the toxicity of GR technology into the bodies of small farmers and poor workers to produce disease. During the 1960s and 1970s, Honduras and Nicaragua were the world leaders in per capita illness and death from pesticide poisoning. As a region, the Central Americas experienced 73,230 cases of acute pesticide poisoning in the 1970s.⁴²

Many of these practices continue today and have directly led to the creation of the organic and fair-trade markets to compete with conventional farming. The irony is that there is nothing conventional about GR technology, nor was there when it became the common form of agricultural production across the Americas—in the United States in the 1930s and the Central and Southern Americas in the 1960s and 1970s. By the 1990s, over one thousand Costa Rican banana workers had been rendered infertile from exposure to the soil fumigant and nematode (worm) killer 1,2-Dibromo-3-Chloropropane (DBCP), a carcinogen.⁴³ The US Environmental Protection Agency prohibited its use in agriculture in 1985, but the damage was done.⁴⁴ In 1992, Guatemalans and Nicaraguans were the populations with the most dichloro-diphenyl-trichloroethane (DDT) stored in their fatty tissue on the planet.⁴⁵ Although DDT was banned in the United States in 1972, its use in other parts of the world has persisted.⁴⁶ DDT is known to have adverse ecolog-

⁴⁰ The information on application methods and working conditions comes from Carey, “Guatemala’s Green Revolution”; and Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America.” I also witnessed some of these issues during my own fieldwork at a farm in Matagalpa, Nicaragua.

⁴¹ Woods also addresses this with regard to Black agricultural workers in the Mississippi delta: “the common practice of fishing, hunting, and picking of fruits, nuts, and vegetables to supplement diets becomes a double-edged sword. On the one hand, many attempts to secure food are defined as trespassing and, on the other hand, there are numerous contaminants in the environment which have led to numerous bans on commercial fishing and on drinking river water, from Memphis to New Orleans” (*Development Arrested*, 227).

⁴² Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 23.

⁴³ *Ibid.*

⁴⁴ US Environmental Protection Agency, “1,2-Dibromo-3-Chloropropane,” last modified November 6, 2007, <http://www.epa.gov/ttnatw01/hlthef/dibromo-.html>. In 2007, Amvac Chemical Corporation, based in Newport Beach, California, agreed to pay US\$300,000 to thirteen Nicaraguan banana workers who contended that they were sterilized by their exposure to DBCP. Dow Chemical and Dole Fruit Company remained defendants (T. Christian Miller, “Pesticide Company Settles Sterility Suit for \$300,000,” *Los Angeles Times*, last modified April 16, 2007, <http://articles.latimes.com/2007/apr/16/local/me-amvac16>). The two companies have litigated and litigated in attempts to force the plaintiffs to drop their accusations. For a documentary account of the ongoing legal suit brought by Nicaraguan banana plantation workers against Dow and Dole, see the film *Bananas!**, directed by Fredrik Gertten (Malmö, Sweden: WG Film, 2007), and *Big Boys Gone Bananas!**, directed by Fredrik Gertten (Malmö, Sweden: WG Film, 2012). A study by the National Toxicology Program reported “high incidences of tumors of the nasal tract, tongue, adrenal cortex, and lungs of rodents” (“1,2-Dibromo-3-Chloropropane”).

⁴⁵ Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 23.

⁴⁶ A recent conversation with my father revealed that DDT was also used to control the spread of malaria among people. He grew up on a farm in Siuna, a small mining town near the Atlantic coast in northeast Nicaragua. I asked him if he knew that there was so much DDT residue in Nicaragua and if he knew folks who used it in his community. He answered, “I’m not surprised. We did not use it, but every year a helicopter passed by that

ical effects, is carcinogenic, and causes liver tumors in laboratory animals. What makes DDT so dangerous is that it persists in the ground and air and in the fatty tissue of humans long after exposure has ceased.⁴⁷ Of the twenty-five most popular agrochemicals used during the GR, nineteen are carcinogenic and persistent, with long-term effects likely to continue to accrue for quite some time.⁴⁸ The continued use of agrochemicals has contributed to millions of agrochemical poisonings worldwide each year. In Guatemala, about 1,200 cases of acute pesticide intoxication (short-term reaction) are reported every year.⁴⁹

CAFFEINATED CRISIS: THE GREEN REVOLUTION AND COFFEE IN THE AMÉRICAS

Green Revolution agronomy eventually seeped into longstanding crops such as coffee as well. New technologies were introduced with the hope of helping coffee growers increase production and/or diversify as needed to avoid redistributing land. In Brazil, agronomists and biological engineers worked long hours in labs to develop robusta plants more resistant to *roya* (*Hemileia vastatrix*), or coffee rust. Funded by the Rockefeller International Basic Economy Corporation (IBEC), Jerry Harrington and Colin McClung “figured out that zinc and boron were essential micronutrients for coffee cultivation, and with the massive addition of lime and fertilizer.”⁵⁰ Previously unusable *cerrado* lands could now grow even more coffee. The scientific meddling went one step further when Brazilian-based researchers successfully produced hybrid plants. “Capable of withstanding full sunlight, the new trees didn’t require shade trees, but they did demand fertilizer to grow so prolifically without mulch,” usually produced by nearby foliage. The Catuai plant, created by GR research, was the product of 1950s development discourse and the belief in the salvific power of science. The Mundo Novo was also “found” during this time. It is an arabica tree that resists *roya* (a debilitating fungus), matures in three years instead of four, and produces far more beans.⁵¹ In 1966, Brazil produced 87 million bags of green coffee.

Biological engineering and “technification” also impacted Colombia’s coffee industry. In Antioquia, income, landownership, and coffee production were concentrated as the result of the uneven adoption of technologies. The National Federation of Coffee Growers made two new coffee varieties engineered for higher yields, Caturra and Bourbon, and fertilizers available to growers in 1965, but not credit. A study by A. Eugene Havens and William Finn found that the farmers in the municipality of Tamesis who adopted the new plants and methods increased their

would drop a fine white powder on the whole town. You could see it. It looked like snow. You could drag it off of buildings with your finger. And we knew, *ELP* [*el polvo*, “the powder”]. It was actually really pretty.”

⁴⁷ US Environmental Protection Agency, “DDT, a Brief History and Status,” last modified May 9, 2012, <http://www.epa.gov/pesticides/factsheets/chemicals/ddt-brief-history-status.htm>. Currently, the World Health Organization (WHO) and the Stockholm Convention on Persistent Organic Pollutants encourage indoor residual spraying (IRS) of DDT: “the application of long-acting insecticides on the walls and roofs of houses and domestic animal shelters in order to kill malaria-carrying mosquitoes that land on these surfaces.” World Health Organization, “WHO Gives Indoor Use of DDT a Clean Bill of Health for Controlling Malaria,” last modified September 15, 2006, <http://www.who.int/mediacentre/news/releases/2006/pr50/en/>; and World Health Organization, “About the Convention,” accessed March 29, 2013, <http://chm.pops.int/Convention/tabid/54/Default.aspx>.

⁴⁸ Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 23.

⁴⁹ Carey, “Guatemala’s Green Revolution,” 302.

⁵⁰ Mark Pendergrast, *Uncommon Grounds: The History of Coffee and How It Transformed Our World* (New York: Basic Books, 2010), 269.

⁵¹ *Ibid.*, 226.

income far more than nonadopters did. Adopters' average income rose from Col\$6,731 in 1963 to Col\$11,620 in 1970. For those who did not adopt, it only rose from Col\$4,509 to Col\$6,274. Broken down by income per acre, adopters made Col\$290 in 1963 and Col\$1,642 in 1970; nonadopters brought in Col\$222 and Col\$632, respectively.⁵² Farmers who adopted the technologies experienced a 173 percent increase in real income and a 566 percent increase in income per year over the life of the study. The corresponding figures for those who did not alter their production were 139 and 285 percent. As was the case with most GR technology, the availability of the new plants and methods was biased toward larger landowners, who were deemed safe credit risks. The study found not only that land was concentrated in favor of adopters but also that certain adopters acquired more land than others. Over the course of seven years, the average acreage of adopters increased 176 percent, where the average acreage of nonadopters decreased 19 percent. Within the two categories, differences are also evident. Among adopters, 17.6 percent worked between 15.1 and 20 acres in 1963, but none did so in 1970. Instead, that population moved up *and* down: the percentage working 25 acres or more rose from 23.6 to 29.6 percent; the percentage working 5.1–10 and 10.1–15 increased from 11.8 to 17.6 percent in both of these subcategories. Havens and Finn's study shows how GR agronomy facilitated income, land, and therefore coffee production concentration. Again, smaller farmers avoided the new coffee varieties and artificial fertilizers as much on principle as they did due to lack of credit. As one grower put it, "I haven't cultivated it [Caturra] because it is very costly due to the requirement of chemical fertilizers, insecticides, and fungicides. How can a person afford that if he can't get credit?"⁵³ The case of growers in Támesis demonstrates that development planning and modernization schemes did little but further concentrate power.⁵⁴ Because development theory measured productivity at the national level—GDP—these figures could be read as proof that the GR was working. In the same way that a bullish New York Stock Exchange obscures high unemployment rates, low real income, and rampant foreclosures, rising GDPs can hide the concentration of wealth and land: the recalibration, reconfiguration, and reproduction of plantation relations.

In Guatemala, use of GR agricultural practices in coffee production exacerbated class divisions, concentrated land, and damaged local ecologies. Although synthetic and artificial agronomic practices were in use since the 1950s, they did not really take hold in coffee production until the 1970s. Coffee crops experienced an outbreak of *roya* as well as a *broca* plague after remaining largely disease and pest-free since coffee's introduction to Guatemala in the 1750s. *Broca* (*Hypothenemus hampei*) is an insect that burrows into coffee berries and reduces the amount that the tree produces. These scourges moved the Asociación Nacional de Café (ANACAFE) to "technify" coffee production because it "allowed farmers to use scientific information and apply pesticides/fungicides to protect their crops from damage" and "because of the prestige associated with modern farming techniques."⁵⁵ The ethnocentrism that degraded local agronomy is part of the arrogance embedded in the colonial logic that drives the belief in the universality of modernity. Small farmers received little to no support in the form of grants or credit to implement the modern techniques while *finqueros* (large coffee growers) received aid and used their private

⁵² Havens and Finn, "Green Revolution Technology and Community Development," 476.

⁵³ *Ibid.*, 479.

⁵⁴ James C. Scott, *Seeing like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven, CT: Yale University Press, 1998), 264.

⁵⁵ Johnson, "The International Coffee Agreement and the Production of Coffee in Guatemala," 40, 43.

resources. By 1980, adopters of the new technologies had net profits that were almost four times those of nonadopters: US\$2,274 versus US\$867.⁵⁶ Concentration in income was directly tied to the concentration in coffee production. At the end of the 1970s,

[f]our thousand producers grew 83 percent of the coffee, while 56,000 producers grew only 17 percent of the coffee. Large farms used technification to grow 16 bags of coffee per manzana (0.7 hectare), while small farms without technification had a yield of only 10 sacks per manzana. In addition to lower productivity per manzana, the size of the farm dictated the price that the coffee grower received for arabica [*sic*], once again demonstrating the disadvantages confronting small producers.⁵⁷

In Guatemala, GR agronomy concentrated wealth and land while creating and sharpening class divisions. Small producers did not disappear altogether, but they were beholden to large producers as well as to the international coffee market, into which they were unevenly articulated. Michael Taussig argues that when compared side by side, small producers are actually more efficient than large ones but are unable to make up their volume disadvantage. In other words, it is the “bigness” of the large-scale producers that allows them to compensate for their inefficiencies. According to Taussig, “bigness and technology are not in themselves inherently more efficient”; rather, they provide the political—and economic, social, and material—muscle necessary to shape policies and practices.⁵⁸ The same “bigness” that protected large producers from inefficiencies also protected them from the international market in ways smaller producers were not—especially during the coffee crisis of 1999 and 2001.

Coffee production creates an array of by-products that can be recycled, composted, and otherwise repurposed. However, when done without regard for local ecologies, large-scale coffee production is incredibly damaging. Arsenic, boron, and chloride are three of the more common pollutants found in the wastewater of coffee mills. According to Daniel Faber, as of 1992, *beneficios* (coffee mills) in Costa Rica “produce 66 percent of the country’s water contaminants. In El Salvador, more than 200 such plants dump contaminated wastewater directly into the country’s rivers and streams.”⁵⁹ In Honduras, pesticides and organic waste from coffee production are the most common sources of water pollutants.⁶⁰ The same holds true in Nicaragua, where the drinking water of the country’s coffee centers—Jinotega and Matagalpa—is constantly contaminated by production runoff originating from the farms just north of both *departamentos* (departments) on the Pan-American Highway.⁶¹

⁵⁶ *Ibid.*, 42.

⁵⁷ *Ibid.*, 44.

⁵⁸ Taussig, “Peasant Economics,” 66.

⁵⁹ Faber, “Imperialism, Revolution, and the Ecological Crisis in Central America,” 22.

⁶⁰ Caribbean Environment Programme, “Persistent Organic Pollutants (POPs) and Pesticides,” accessed April 2, 2013, <http://www.cep.unep.org/publications-and-resources/marine-and-coastal-issues-links/persistent-organic-pollutants-pops-and-pesticides>.

⁶¹ “The Nicaraguan Environment... a Legacy of Destruction,” *Envío* 100 (November 1989), accessed April 2, 2013, <http://www.envio.org.ni/articulo/2756>.



After being incubated in the US South into the 1930s in the aftermath of the forced failure of Black Reconstruction, GR agricultural technologies were repackaged and exported to the Central and Southern Américas in the 1960s. Between GR technologies in the early twentieth century and the precarious position of agricultural workers in the US South in the 1980s, these technologies and plantation relations were reproduced across the Américas from the 1960s and have since completed their hemispheric orbit and persist into our contemporary moment. Woods's words about the burdens and reproducibility of plantation relations are even more pressing today as capitalism's imaginative capacities are once again mobilizing within the international agricultural complex: fair-trade and organic certifiers are debating the merits of offering certification to large-scale plantations and not just small farmers to meet the growing demands of those markets. Given this, another of Woods's admonitions is fitting here: until we change our present, the past will be our future. A