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From Sugar to Blackberries: Restructuring Agro-export Production in Michoacán, Mexico

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In recent years, economic crisis in the sugar industry and the closure of an important sugar mill in Michoacán, Mexico, has fostered the entry of transnational agribusinesses that contract with local growers for blackberry production. Land concentration is under way as wealthy growers rent ejido (agrarian reform) land to grow berries and small-scale growers shift to less capitalized berry production or migrate out of the region. An analysis of the impact of this transition, part of the globalization of the agro-food system, on campesinos, workers, and their communities reveals that a general improvement in the economy has been accompanied by increased inequality, concentration of land ownership, and out-migration, a division of labor by gender that is detrimental to women, and damage to human health and the environment due to increased use of pesticides. Keywords: Mexico, Globalization, Transnational agribusiness, Agro-chemicals, Campesinos

A bygone era of state control of Latin American economies, import substitution industrialization, and expansion of parastatal enterprises, bolstered by windfall oil revenues and foreign loans, culminated in the debt crisis of the 1980s, the “lost decade.” The International Monetary Fund (IMF) and the World Bank stepped in to call for radical transformations and rescue the international banking system from a potential tidal wave of defaults should Mexico fail to meet its debt obligations. IMF structural adjustment plans throughout the region were contingent on slashing of government subsidies, privatization of parastatals, and adherence to free-trade agreements (Carlsen, 1991; Glade, 1986). These neoliberal policies ushered in a new era of nontraditional production of export fruits and vegetables, new forms of land control, realignment of labor relations under contract farming, and substantial out-migration by uncompetitive small-scale campesinos.

To analyze this transition from traditional to nontraditional commodity production in Michoacán, Mexico, I employ a political economy theoretical framework that intersects with globalization and political ecology and incorporates history, culture, economy, and power (Edelmann and Haugerud, 2005). In this framework I examine dynamic transitions associated with the emergence of neoliberal capitalism, the role of international institutions in ensuring conditions for capital accumulation, and the impact on social actors. I analyze global-local dialectics with the uneven expression of material and cultural outcomes across time and space and along the chain of agro-production (Conway and Heynen, 2006). Rather than suggesting a global-local dichotomy, I propose a critical examination of the multiplex ways in which global, national, regional and local processes are historically and mutually constitutive.

Globalization is not a novel phenomenon; commodities have been traded around the world for centuries (see Mintz, 1985, for example, on sugar as a global commodity). The

information age, rapid transfer of financial capital, swifter forms of transportation, and outsourcing by transnational corporations have accelerated the pace of globalization to levels unprecedented before the current era. Some scholars argue that transnational corporations operate in the global market unhindered by governments weakened by deregulation. I depart from this thesis to argue that the state continues to play a fundamental role in fomenting export substitution in the Global South (Raynolds, 1994). Too often globalization theorists take a macro-level approach that elides local realities for campesinos, workers, and their communities. Global macroeconomics traverses the agroecological food chain, leaving a legacy that shapes and is shaped by people's experiences. The mutual support of transnational corporations and nation-states to ensure global capital accumulation creates conflict between global capital and local labor (Conway and Heynen, 2006).

Political ecology encompasses concerns of political economy and agroecology to examine the dialectics between resource use and social groups and the relations among social classes within the agroecological system. It considers space, time, and scale to understand the divergent locations of food producers and consumers, historical shifts in production and seasonality, and connections along the production chain from grower to consumer. My use of political ecology is strategic for theorizing the environmental consequences of the vice grip of neoliberal capitalism on global and local environments. Distinct ideologies held by actors with differential access to power and resources confront the transnationalization of food production and resource use. Agents of multilateral institutions such as transnational corporations, the IMF, the World Bank, the World Trade Organization, and national governments increasingly view land and resources as sources of profit. Campesinos who depend on them for survival, often view them as patrimony imbued with cultural meaning. Marx's concept of commodity fetishism sheds

light on this situation. Consumers in the North take the price tag of imported food as its real value. Political ecology theory takes as relevant the costs of externalities, the hidden costs of class inequalities, environmental degradation, the risks posed to human health by pesticide poisonings, and the tremendous costs of transporting global commodities from production sites of impoverished campesinos to Northern consumers with the means to enjoy exotic fruits and vegetables.

HISTORICAL TRANSITIONS AND PROCESSES

In 1941 U.S. government officials exerted pressure on the Mexican government to stimulate agricultural development and in 1943 the Rockefeller Foundation signed an agreement establishing the basis for the Green Revolution. The high-yielding seed varieties created to promote the industrialization of agriculture in Mexico brought increased production, but the technological package that made these seeds successful became concentrated among wealthier producers. From 1940 to 1970 the Mexican authorities subsidized crop prices and agricultural inputs and provided credit, producing what is known as the “Mexican Miracle.” The more capitalized irrigation zones of the Northwest received the majority of state support, while for campesinos with marginal land the model displaced traditional seeds and exacerbated structural inequalities. These developments satisfied capitalist interests in the United States through provision of cheap food and labor, while agricultural exports generated foreign exchange for Mexico. As Mexico began to lose its food self-sufficiency, Mexican policy makers stepped in with price supports, fertilizer subsidies, credit, and marketing institutions for undercapitalized regions (Esteva, 1983). In the 1970s, the government, USAID, and the World Bank promoted the export of nontraditional winter crops as a solution to agricultural stagnation, but Mexico remained a significant food importer (Friedland, 1994). By the end of the decade, economic

crisis limited the Mexican state's ability to sustain paternalism with regard to the rural area. Since the 1970s, transitions in global capitalism (U.S. export dependency, transnational corporate control of agriculture, and the formation of the WTO regime) established the context for the decline of sugar as a traditional commodity and its replacement by non-traditional blackberry production.

More than a decade of economic upheaval beset the Mexican sugar industry following the 1982 debt crisis and the implementation of structural adjustment. Throughout its history, from debt peonage to state encroachment into the sector to the more recent privatization of sugar mills, unequal relations of power between mill owners and cañeros (sugarcane growers) have undergirded the Mexican sugar sector. While growers have experienced unfair payments for their product, lack of control over the production process, and strikes and repression, the environment has suffered the degrading effects of monocrop production, factory pollution, and annual burnings have destroyed vegetation and wildlife (Chollett, 1994). The sugar industry was propelled into crisis as the North American Free Trade Agreement (NAFTA) created an unequal playing field in trade of Mexican cane sugar and U.S. high-fructose corn syrup. Seven sugar mills closed between 1988 and 2002, bringing hunger and poverty to their respective production zones (Chollett, 2003).

FROM SUGAR TO BERRIES

The debt crisis is key to analysis of the structural transformation of agriculture and the policies that shape the emergent agro-food system (Raynolds, 1994). The post World War II political economy was characterized by oligopoly capitalism and heavy state support for Mexico's sugar industry. State control of the industry climaxed in the 1970s as the government nationalized sugar mills and unionized mill workers and cañeros gained social benefits such as

higher wages and cane prices. These benefits came undone, however, with the 1982 debt crisis and the subsequent structural adjustment (Chollett, 1994). The Mexican state, pressured by international financial institutions concerned with debt repayment, facilitated the dissolution of traditional institutions for managing the agricultural economy and promoted a transition to nontraditional crops in order to remain competitive in the global market (McMichael, 1994).

NAFTA is a primary component of the neoliberal reforms that link the United States, Canada, and Mexico in a “free-trade” regime. Mexican policy eases the entry of foreign capital and promotes the production of commodities for export at the expense of local consumption needs. Polaski (2006) reports that every year since NAFTA went into effect in 1994, Mexico has had a net trade deficit in agricultural goods; exports of fruit and vegetables have increased, but still lagged behind imports of U.S. grains, and there has been a net loss of 2 million agricultural jobs. Polaski identifies NAFTA as the most significant factor contributing to job loss. Not only have Mexican wages diverged further from those in the United States, but wages and household incomes are trending toward greater inequality. Moreover, as Donahue (2003) argues, markets like NAFTA systematically undermine agrarian values such as land stewardship, healthy family relationships, and community life. The United States benefits from an unequal playing field that offers a cheap source of labor and relaxed trade rules to ease the flow of exports and imports.

Over the past 15 years, scholars of rural Mexico have examined dynamic shifts for sugarcane growers in the context of structural adjustment and increasing market competition (Butler Flora and Otero, 1995; Buzzanell and Lord, 1993; Chollett, 2003; García Chávez, 1998). As Mexico transitioned into NAFTA, the United States, to absorb incessant overproduction, converted corn into high-fructose corn syrup (HFCS). The influx of HFCS into Mexico, along with the low world market price for cane sugar, did much to undermine the sugar industry (Chollett,

2000). U.S. insistence on its unrestricted right to export HFCS to Mexico and its maintenance of protective barriers that limited Mexican cane sugar imports is but one example of market conditions encouraging nontraditional production in the Global South. The soft-drink industry absorbs one-third of the 55 percent of sugar destined for industrial use in Mexico, and 45 percent is destined to domestic consumption. NAFTA reduced Mexico's ability to export its surplus sugar, often around 1 million tons per year (see Chollett, 2003). Ultimately, in 2002 one of the two regional sugar mills, San Sebastián, closed, leading many growers to withdraw from cane production and either rent out their ejido (agrarian reform) lands or shift to blackberry production.

Sugar and berries are subject to the vagaries of a globalized market in strikingly different ways. Although commodity chains integrate cañeros and berry producers in similar hierarchies of power and labor exploitation, the government regulates the price only of sugar. The law considers cane production in the public interest, and cañeros culturally identify with their long history of cane production. Both those with ejido land and private landowners contract with sugar mills that control their productive activities. Once the mill has refined the cane into sugar, it is obligated to pay the cañero within 30 days of the termination of the harvest season. All costs of production are deducted, leaving cañeros with small profits and occasionally with debts. Whereas sugarcane must be delivered to a single mill for processing within 72 hours of harvest, blackberry growers may choose among the nine companies in the region and often switch from one company to another. Berries must be picked and delivered the same day because they spoil quickly, and unlike cane cutting this labor is done predominantly by women. Both commodities are monocrops that pose environmental hazards, but the use of pesticides is greater with blackberry production.

Cane production was once a viable means of subsistence in the Los Reyes region of Michoacán. The closing of the San Sebastián sugar mill contributed to a dramatic decline in sugarcane production. Transnational agribusinesses entered the region and began to contract with former cañeros for the export of blackberries to markets in the Global North. In the community of Los Angeles, three-fourths of the ejido lands are rented for blackberry production. This profound transformation fosters concentration of land ownership. Since I initiated research in the Los Reyes region in 1997, the majority of cane lands have been converted to blackberry production. My research demonstrates a growing disparity between wealthy, large-scale blackberry growers and growers who produce berries on small ejido plots. Blackberry production also creates a gendered division of labor between mostly male growers and women hired for picking at substandard wages. Furthermore, production of this nontraditional crop poses the risk of increasing pesticide exposure for men, women, and the environment.

This transition to nontraditional, chemical-dependent berry production raises significant questions (Raynolds, 1994). How do transnational corporations negotiate international demands for seasonal fruit and still meet standards for food safety? What does the new segmentation of the labor force mean for the social transformation of local communities? What are the implications for social needs and agroecology in this transnational context? Does contract farming involve political disenfranchisement or offer new economic opportunities? These questions reverberate from corporately controlled international market regimes into the berry fields, packing sheds, and households of agricultural workers in rural Mexico.

CREATING THE BERRY REGIME

Natural, economic, and political factors shape the creation of the berry regime. Nontraditional crops travel across national boundaries but represent disparity between producers

in the South and consumers in the North (Friedland, 1994). Blackberries constitute a luxury product that fills Northern niche markets to meet the demands of affluent consumers.

Globalization has clearly contributed to increased demand for exotic seasonal fruits. Berries are exported to global markets including Germany, Holland, Belgium, and the United Kingdom, and in smaller volumes to Canada, Spain, France, Hong Kong, and Argentina. Chile has increased its production over the past decade but faces competition from Mexico. Because high freight charges from Chile and greater concern over pesticide residues in the European market inhibit exports to Europe, Chilean companies have established blackberry production in Mexico, where transportation costs to the United States are one-fourth lower, shelf-life one to two days longer, and border regulations less stringent (Strik et al., 2006). Ninety-three percent of Mexico's blackberries are grown in the state of Michoacán.

NAFTA—supported by IMF, World Bank, and government policy—facilitates the export of fresh fruit and vegetables to the United States Chapter 8 of NAFTA eliminates all tariffs, permits, and antidumping regulations on blackberries as long as they bear a certificate of origin. State policy makers have implemented attractive incentives for foreign investment. Regulations now allow 100 percent foreign ownership in Mexico, and the 1992 modification to Article 27 of the constitution gave campesinos the right to sell previously protected ejido parcels or rent land to foreign investors. These policy changes provide support for contract farming at a time when government support for small-scale agriculture is all but nonexistent. Favorable climate and soil conditions give the region a comparative advantage. The berry season in Mexico extends from November to May, filling the gap of the May to September cycle in the Global North. Research has led to the development of hybrids with firmer berries that can withstand export. Access to refrigerated storage facilities, trucks, and aircraft has made possible the export of commodities

with a very short shelf-life between regions with distinct seasonal cycles. Mexico also offers the comparative advantage of low-cost labor and lax environmental standards, including use of pesticides banned in the United States. With demise of the Los Reyes cañero union, the lack of union organization among berry growers who are divided among nine different companies weakens their bargaining power and provides an additional incentive for foreign agribusiness (Llambi, 1994).

The first blackberry grower in the Los Reyes region, Raúl Sánchez Sánchez, planted blackberries in 1987. He had brought blackberries from the United States to the University of Chapingo, where Dr. Jorge Rodríguez, "the father of blackberries in Mexico," conducted research, and then introduced the varieties tested there to Los Reyes. Sánchez explained, "I tore out my sugarcane 19 years ago and planted one hectare of blackberries. Everyone thought we were crazy!" When Leobardo Guillén Zamudio first planted blackberries in Los Angeles in 1994, there were still no companies to purchase and export the fruit: "When we began, we didn't know how to produce, not even the experts knew. There was no one to buy the fruit. Only the popsicle shops wanted it. At times we went around selling it in the streets!" Once companies were established to purchase and export the fruit, the transition was under way. The supply zone of the two regional sugar mills at one time included 10,000 hectares of sugarcane produced by 1,500 cañeros. In March, 2006, the Ministry of Agriculture reported that the region included 2,500 to 3,000 hectares of blackberries and raspberries and 800 to 1,000 growers producing approximately 6.5 million boxes of berries per year. Four hundred hectares of the ejido Gildardo Magaña, in the community of Los Angeles had been converted from cane to blackberry production.

The blackberry companies arrived in Los Reyes in 1995, and by 2006, there were nine, representing three countries: the United States (Driscolls, Hursts, and Sunny Ridge), Chile (Hortifrut and Sun Belle), and Mexico (El Molinito, Exifrut, and Expofrut) and a U.S.-Chilean joint venture (VBM-Giumarra). Hortifrut arrived in 1995 and managed to monopolize production until 1998. The first year it exported 20,000 boxes of berries, and by 2006 it was exporting 1,700,000 boxes. It exports through Global Berry Farms, a global firm whose sales soared from 72 million pesos in 2001 to 214 million pesos in 2005 and were projected to reach .5 billion pesos in sales by 2008 (Perales Rivas, 2005: 81-83). VBM-Giumarra tripled its production in just four years. In 2002 the region exported 1,756,592 boxes of blackberries, and by 2005 it was exporting 4,674,272 boxes with a value of US \$46,742,720. Given current trends, with 356 percent growth in area planted from 1993 to 2004 (Williams and Hernández, 2006: 18), Strik et al. (2006: 4) project 5,000 hectares of blackberries in Mexico by 2015, up from only 500 hectares in 1995.

Berry production forms a vertically integrated chain of production and distribution whose corporate owners rely largely on contract farming. Contract farming became the strategy of choice for international corporations in Mexico during the postwar import-substitution era. Today, institutional and market failures in countries such as Mexico serve as a driving force (Runsten and Key, 1996). Berry firms in Michoacán own or rent very little land; through contracting they gain access to the products of the land, since control of land still rests primarily in ejidos.¹ While direct production allows greater control over production, contracts allow companies to transfer the costs and risks of production to the grower. Campesinos who grow berries have access to distant markets otherwise unavailable to them and occasionally obtain credit for production as well. Nonetheless, they remain vulnerable within this vertical chain of

command, in which company executives determine prices and input requirements and exercise the privilege of rejecting fruit. Accountability is practically absent (Hefferman and Constance, 1994).

In 1998, growers formed the Association of Producers of the Los Reyes Valley to export their fruit directly. Donaldo reported the treatment growers received from Jaguar Brand, a berry company that operated in Los Reyes from 1995 to 1998: “I delivered 25 boxes. They treated us bad, they left, and they did not pay us. I don’t know why, they received berries from some people but not others. They left us flying. What were we going to do? We formed an association.” Jaguar Brand co-opted the association president, since the company did not want to deal with an organized group, and members soon abandoned the association.

Sun Belle, the third-largest company in the region, contracts with 160 growers, 70 percent of whom rent land. The company also rents 54 hectares for direct production. It hires 650 temporary workers during the harvest season and retains 120 workers throughout the year. Instability of employment runs throughout the berry industry. Women who work for Sun Belle complain of long hours and low pay and report that the berries they pick are sometimes undercounted. Sun Belle hires indigenous Tarascan women who are often illiterate and thus unable to identify these fraudulent practices. Company officials express racist notions about indigenous workers (“they have a very low culture”). Living conditions illustrate the disparity between the agribusiness corporations and their hired workers. While workers at Hortifrut wear electronically coded badges to record their presence in the fields, a poverty-stricken husband-and-wife team from Los Angeles working for the company earns substandard wages and lives in a one-room house with no running water, stove, or refrigerator.

CHANGING ROLES FOR GROWERS AND WORKERS

Without exception, the blackberry growers of Los Reyes were cañeros before switching to berry production. After a decade of crisis in the sugar industry and the closing of the San Sebastián sugar mill, cañeros with sufficient financial resources invested in berry production. Whereas costs for cane production average 15,000 to 20,000 pesos per hectare, the costs for blackberries can range from 180,000 pesos for more traditional methods to 300,000 pesos with expensive infrastructure. The costs of irrigation systems, tunnels, packing sheds, dining sheds, sheds to store chemical containers, portable toilets, drinking water, and washing facilities in the field constitute substantial investments that small-scale growers cannot make.

Berry executives prefer to extend credit to larger growers; company managers informed me that growers receive credit only after they prove themselves to be efficient berry producers. Producers unwilling or unable to make investments, in the words of the Sun Belle manager, do not “interest Sun Belle.” Undercapitalized growers are likely to use family labor and fewer inputs and achieve lower yields. Perales Rivas (2005) reports that net income per hectare for growers utilizing traditional technology averages 114,786 pesos per year (US \$10,435), whereas growers with full technological infrastructures average 327,659 pesos (US \$29,787). Socioeconomic differentiation is under way between growers and those who lack resources and resort to renting their land (at 20,000 to 25,000 pesos per hectare) to others. Because companies show preference for larger growers, those less able to afford the new technologies are being displaced (Perales Rivas, 2005). Thus, company policies contribute to land concentration and increasing economic inequality in the region.

This transition also contributes to a significant differentiation in the roles of men and women. Growers are almost always men, while 70 to 80 percent of the berry labor force are women. Berry companies thus provide women new income-generating opportunities, but my

2006 research revealed substantial gender segmentation of the labor force premised on ideologies that justified substandard wages for women. Berry executives often remark on the “natural” ability of women to pick berries, but they pay them less than men because the men’s work is “heavier.” Women work 8 to 14 hours per day and fill containers that already bear the electronic price code. A woman who picks 10 boxes (120 containers) per day earns 120 pesos, or US \$10.91, For each container that sells for US \$4.00 in the United States, she earns nine cents. Most waged berry pickers are not covered by health insurance, and the health of women workers remains in greater jeopardy. Companies contract with growers to reduce risks of production while maintaining control through prices, credit, and acceptance or rejection of fruit. Growers, in turn, transfer their lack of control over prices to field workers. The berry picker falls to the bottom of this agroindustrial chain, putting in excessive hours, accepting inferior wages, and risking her health as she is exposed to toxic chemicals.

CHIMICALIZATION OF AGRICULTURE

Although sugarcane absorbs substantial amounts of agro-chemicals, the expansion of berry production has contributed to an increase in agro-chemical use in the Los Reyes region. Agro-export industries must meet the demands of U.S. and European consumers and at the same time comply with export standards to reduce the risk of rejection at the border. Most companies delay payment to the grower until the fruit has been delivered. When the United States rejects fruit, the grower is not paid, in spite of the fact that the company accepted the fruit at the warehouse. Frequently, companies reject as much as 10 percent of the berries that growers deliver.

In 2006 the Food and Drug Administration (FDA) twice rejected the entry of berries from Sunny Ridge, a U.S. company operating in Los Reyes, because of the presence of

chloramphenicol, a chemical that causes aplastic anemia and is fatal. It refused entry of Hursts' berries from the Los Reyes region five times in 2004 for excessive pesticides. On one occasion, the FDA rejected a truckload of 10,000 to 15,000 boxes of Hursts' blackberries and the growers were never compensated. After protests by growers, a Hursts' manager claimed that the United States had rejected the fruit because of the presence of mold. Few growers believed this. Felipe, who lost 70 boxes, complained, "And I as a producer still have to pay my workers. The company does not risk anything; we are the ones who take the risk." Bernardo contended: "They said the fruit arrived with mold. God knows! How would we know? When the packing company receives our fruit, then it is the company's responsibility. That is what we said, but they denied that. What could we do?" Concepción remembered: "Hursts was good at first, but they began to reject the fruit. They were saturated with growers. I had to work under the hot sun, with the thorns of the blackberries. That made me very angry. They returned a mountain of boxes—60, or 70, or 80, sometimes all of it. It made me mad. It was a pretext."

Traditional blackberry production involves frequent doses of an astonishing variety of chemicals, including highly toxic organophosphate pesticides (azinphos methyl, carbaryl, diazinon, diuron, methyl parathion, permethrin), fungicides (benomyl, captan), and herbicides such as paraquat. New concerns arise from recognition that some of these disrupt the endocrine system and affect the pituitary, thyroid, and adrenal glands and sex hormones. Among these are: 2,4-D, an herbicide; benomyl, a fungicide; and the pesticides DDT, methyl parathion, lindane, carbaryl, dieldrin, and endosulfan (Pretty and Hine, 2005). Carbaryl, diuron, and captan are carcinogenic, and carbaryl is also known to cause mutations (FASE, 1998: 5-6). Pests have already developed resistance to some pesticides, creating a pesticide treadmill.

The World Health Organization (WHO) classifies organophosphates as class 1a/b (extremely and highly toxic), but these are in common use in Michoacán.² Paradoxically, while “free-market” proponents seek to deregulate trade and protectionism, the increasing use of agro-chemicals demands increasing oversight. The Food and Agriculture Organization (FAO) International Code of Conduct on the Distribution and Use of Pesticides is, in fact, voluntary and practically impossible to enforce in Mexico (Dinham, 2005).

FAO guidelines specify the amount of chemicals that can be used, the strength of each, and the time that must expire before workers can enter the field. Nonetheless, there seems to be little oversight on how growers manage their own fields; most growers in Los Angeles remain unaware of the dangers associated with agro-chemical use and resist recommended safeguards against overexposure. I have never observed proper use of protective clothing and masks during fumigation and have documented reports of several pesticide poisonings, including two deaths. Over the years, Leobardo had sprayed his plants with malathion (diethyl butanedioate) and gusathion (azinphos methyl). In 2001, he developed throat cancer, and he was still under treatment when I interviewed him in 2006. Malathion and gusathion are commonly mentioned by growers as the pesticides of choice. One of the growers reported that a friend with 30 hectares of blackberries died of stomach cancer in 2004. He blamed his friend’s death on “all the chemicals that he used all those days.” Even though women berry pickers are moved to other fields during fumigation, the majority reported experiencing dizziness, headaches, burning eyes, sore throats, rashes, nausea, and vomiting when the chemicals drifted into their work area. One young woman and her coworkers were hospitalized when exposure to methyl bromide at Sun Belle caused severe respiratory problems, and another woman suffered a miscarriage in the field.

Exposure to chemicals remains a complex issue. Blackberries are packed directly off the bush with no processing, and therefore companies strive to comply with the U. S. Department of Agriculture's Good Agricultural Practices (GAP) or EuropGAP (when exporting to Europe). Company officials recognize the importance of food safety, but their discourse focuses on marketability rather than health concerns. Members of the two larger-scale growers' organizations in Los Reyes expend much effort in improving sanitary conditions and ensuring safety of the berries. A participant at the Productores Para la Calidad de Zazamora (PROCAL) meeting in 2006 explained, "They already closed the door to Guatemala, and they can close the door to us too. They can reject the entire process of commercialization, and everything will end." Growers discussed in detail standards for irrigation water, application of agro-chemicals, disinfecting of packing sheds, disposal of garbage, worker hygiene, and so forth. Ironically, none of their discussions included how to protect growers and workers from agro-chemical exposure.

The WTO administers the Codex Alimentarius, a set of standards, guidelines, and recommendations established by the FAO and the WHO to protect the health of consumers and ensure fair practices in the food trade. The intent of the Codex is to harmonize international standards to facilitate trade in food between countries. Of the 3,285 pesticides for which the Codex has standards, 1,539 are illegal in the United States (Spitzer, 2000). During the negotiations that led to creation of the WTO, policy makers feared that protective measures to ensure food safety would serve as disguised trade barriers and the WTO safety and environmental standards are in fact weak, leading to downward harmonization (FAO, 1999; Spitzer, 2000). Although NAFTA includes agreements regarding food safety and requires its member countries to employ the Codex Alimentarius, its chapter 11 allows investors to sue governments whose import restrictions disrupt "free trade"—a privilege unprecedented in

international law. Spitzer (2000) asserts that pesticide use is promoted by WTO rules that support the industrial model of agriculture.

The Environmental Protection Agency sets maximum residue limits on pesticides for each crop that enters the United States. The FDA is responsible for checking these foods at the U.S. border (Murray, 1994). Petitions for residue limits submitted to NAFTA are required to conform to GAP standards, but for blackberries only three field tests are required for the 3,000 hectares in the Los Reyes region (EPA, 2005). Despite established standards, the Mexican government, strapped for funding to conduct adequate inspections, allows private companies in western Mexico to fund their own labs for testing pesticide residues (Sparks, 1988). It lacks agencies for monitoring and enforcing for pesticide use, and only 1 percent of food imports from Mexico undergoes FDA inspection (Dingell, 1997).

Perspectives drawn from political economy, globalization, and political ecology help us to position this ecological debacle in the context of the transnationalization of nontraditional commodity production. Pretty (2002) refers to the dangers inherent in the conceptual separation of people and nature that accompanies agro-chemical use. Corporate capitalism, under pressure from transnational corporations, pressures exerted by TNCs, multilateral institutions such as the World Bank, development agencies such as USAID, elites within national governments, and free-trade agreements, restructures global, national, regional, and local environments to maximize profits and ensure benefits for the wealthy. This agribusiness regime protects an industry that earns US \$30 billion per year from the sale of pesticides, to the neglect of the health effects of workers' exposure to toxic chemicals. Indeed, the pesticide treadmill is a dramatic symptom of a mismanaged agroecological system. The concept of "harmonization" fetishizes what are perceived to be harmonious global trade relations. In this conceptualization, attempts to

protect local environments become antithetical to “free” trade because loosened standards are essential to capital accumulation. Given the power of these institutions and the challenges posed in WTO dispute-resolution deliberations, the prospects for preventing downward harmonization of standards seem bleak. In this context, pesticide poisoning is a to the health of workers and the public goes un contemplated by transnational corporations, multilateral institutions, and Northern consumers. It is unlikely that a major restructuring of global capitalism will take place in the near future; the one possibility for a more equitable future would seem to be the growing organic and sustainable agriculture movement, which is effecting significant changes in local environments.

CONCLUSIONS

The very rapid expansion of berry production in the Los Reyes region has had mixed results. One positive consequence has been a general improvement in the economy. Perales Rivas (2005) reports on the reactivated economy of the region and its spillover benefits. Construction work, jobs for mechanics who maintain irrigations systems and drivers who transport workers and products, employment in the sale of agricultural products, and work for agronomists and engineers have strengthened the regional economy. Women berry workers now have jobs and income that were formerly unavailable to them. At the same time, the region is part of a global agro-food system characterized by neoliberal “free-trade” fetishism. The retraction of government assistance for campesinos, withdrawal of price supports, and reduction of import tariffs create markets in which small farmers are unable to compete, thus opening the door for the expansion of transnational agribusiness. Mexican agriculture suffers benign neglect by policy makers enraptured by neoliberalism. Transnational blackberry agroindustries form a commodity chain that establishes hierarchies of power linked to broader initiatives of the WTO and NAFTA. As men are displaced from cane production, a segmented labor force that relies on

unequal compensation divides workers by gender and separates capitalized growers from small-scale campesinos who lack the resources to compete in the new transnational order.

The market economy under neoliberal capitalism undermines conditions for community development and environmental sustainability (see Shiva, 2005). In Mexico, the number of campesinos declined from 4.3 million in 1991 to 2.7 million in 2003. Michoacán has one of the highest out-migration rates in Mexico (Williams and Hernández, 2006). Larger-scale berry growers in Michoacán may benefit economically, but as land becomes increasingly consolidated through rental, poorer campesinos will continue to migrate, often leaving families behind. Indeed, divorced and abandoned women head a significant number of households in Los Angeles. A disjuncture based on increasing chemical use ruptures the relationship of people to nature and distances ecology from the economy (Shiva, 2005). From the traditional export of sugar to satisfy foreign tastes for sweets to the journey of blackberries across ever-more-porous borders, resources are diverted from the sustenance needs of local communities to ensure capital accumulation for actors within the transnational agribusiness regime.

An obsession with neoliberal capitalism subordinates the development of sustainable agricultural production systems and self-sufficient local communities to the profit-driven ravages of transnational business. The land, resources, environment, and lives of men and women suffer depredations in order to provide luxury fruits to a middle- and upper-class global market. Embedded in that tiny \$4.00 package of berries on the supermarket shelf are tremendous transportation costs, unbalanced trade arrangements, uncountable chemical poisonings, and the entrenchment of labor exploitation in rural Mexico.

NOTES

1. Only 55 percent of ejido lands have been titled since the reversal of agrarian reform in 1992; few ejidatarios have sold their land, but land rental is quite common (Williams and Hernández, 2006).

2. Class Ia/b agro-chemicals include zinc phosphide, terbufors, phorate, methyl parathion, monocrotophos, and dichlorvos; Class II (moderately toxic) includes quinalphos, profenophos, paraquat, lambdacyhalothrin, fenvalerate, ethion, dimethoate, deltamethrin, DDT, alpha cypermethrin, and chlorpyrifos (Dinham, 2005).

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