

Food Justice and Food Sovereignty

Vera L. Chang, Teresa Mares, Martha Matsuoka, and Chad Raphael

Community-engaged research (CER) connecting environmental justice (EJ) with issues in the food system spans multiple disciplines to address a diverse array of topics, such as Indigenous communities' demands for food security and sovereignty, farm and food workers' struggles against contamination and exploitation, urban neighborhoods' efforts to challenge food apartheid and revitalize urban agriculture, and rural communities' battles to protect themselves against toxic farm runoffs and concentrated animal feeding operations.

Food justice, as both a social movement and an area of academic research, is firmly rooted in concerns raised within the EJ movement (Alkon and Agyeman 2011; Gottlieb and Joshi 2010; Sbicca 2018). Kristin Reynolds (2020) defines food justice as “a concept and related movement that considers the social and political roots of inequities in the food system and holds that these structural issues must be addressed to solve problems such as disparate access to healthy food and exploitative or unfair labour practices” (180). While food justice has been a primary framing for activism confronting structural racism in the U.S. food system, the food sovereignty movement spread from peasant struggles in the Global South to the Global North. Food sovereignty is “the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute, and consume food at the heart of food systems and policies rather than the demands of markets and corporations” (Forum for Food Sovereignty 2007). Both food justice and food sovereignty push for more equitable and dignified relationships between people,

TABLE 10.1. CER for Food Justice and Food Sovereignty

Dimension of Justice	In CER for Food Justice and Food Sovereignty
Distribution <i>Who ought to get what?</i>	Uncovering the social and political roots of injustices in the food system—especially exploitation of immigrants and other workers, racism, and colonialism—to promote equitable access to land and farming, safe working conditions and fair labor practices for farm and food workers, regeneration of land, and healthy food
Procedure <i>Who ought to decide?</i>	CER partnerships for building local capacities and power for organizing, movement building, and worker participation in decision making across the food system
Recognition <i>Who ought to be respected and valued?</i>	Foregrounding worker, producer, and community experiences and knowledge of the food system Respecting traditional ecological knowledge about agriculture and rights to culturally appropriate food
Transformation <i>What ought to change, and how?</i>	Decolonizing, antiracist CER and community-led movements to support structural transformation of the food system that advances food justice and food sovereignty for Black, Indigenous, and people of color (BIPOC) farmers, farm and food workers, consumers, and the land

food, and land—framing the environment as the spaces where we live, work, play, grow, and eat.

The projects described in this chapter illustrate the political, strategic, and imaginative role CER can play in identifying and resisting food injustices, recognizing and respecting multiple forms of knowledge and expertise, and building more equitable and sovereign food systems. CER on food justice exists on a continuum from projects in which communities provide input or other contributions (e.g., BAMCO and UFW 2011) to projects in which communities themselves define, design, and direct the research on issues that directly affect their lives (e.g., Fox et al. 2017). Because food-related disparities intersect with other forms of oppression and injustice—based on race/ethnicity, indigeneity, class, ability, sexual orientation, gender identity, and citizenship status—all CER must integrate decolonizing and antiracist approaches (Bang and Vossoughi 2016; Bradley and Herrera 2016). Table 10.1 summarizes the dimensions of justice relevant to this research.

CER is particularly important for challenging corporate and political efforts to resist regulation, minimize the importance of pollution and human rights violations, and silence scientific evidence (Nixon 2011). While industrial agriculture producers and food processors have strong ties to government and academic institutions, impoverished communities of color seldom have access to researchers, are underrepresented in the research profession (Wing 2002), and lack political clout to defend themselves (Nicole 2013).

However, it is important to interrogate the institutional hierarchies that may be embedded in CER. For example, the U.S. Department of Agriculture's Cooperative Extension (CE), operated through the nation's land-grant universities, has a mandate to address local and national environmental and agricultural issues through collective development of research and educational programming with local communities. Extension specialists ideally serve as problem solvers, educators, and collaborators working with communities to translate research into action and share knowledge with people who depend on it for their livelihoods. Yet CE and land-grant universities have been critiqued for persistent exclusion of social and political factors, inequitable policy making and resource allocations, and privileging production models and the interests of industrial producers (Henke 2008); imposing top-down technology transfer from "experts" to farmers (Warner 2008); and ignoring the needs of low-income, BIPOC, and female farmers (Ammons et al. 2018).

The food system raises more EJ issues than we can address in a single chapter. The Real Food Challenge, a national campaign to promote environmental and social justice across the U.S. food system, provides a helpful overview of these issues (see figure 10.1). In this chapter, we focus on three aspects of the food system that have provoked especially robust programs of CER on EJ issues: agricultural pollution of fenceline communities, demands for food sovereignty and security, and farmworkers' and food workers' rights.

AGRICULTURAL POLLUTION OF FENCELINE COMMUNITIES

Much of the initial research on EJ and the food system focused on disproportionate impacts of agricultural waste and chemicals on fenceline communities (Rhodes et al. 2020). CER contributed to the EJ movement's opposition to contamination of low-income and BIPOC communities' air and water from pesticides, herbicides, fertilizers, and noxious odors. Air- and water-monitoring studies have demonstrated community exposure to pesticide drift from nearby fields (Harrison 2011; Freese and Lukens 2015; Marquez et al. 2016). CER studies have monitored the impact of agricultural irrigation and runoff on nitrate and arsenic levels in fenceline communities' water systems (Balazs and Morello-Frosch 2013) and coastal acidification from agricultural emissions (Gasset et al. 2021). CER has also explored agricultural pollution's damage to local culture as well as environments, such as Mitchell's (2018b) photovoice project on an American Indian community's experience of river contamination on their homelands. CER has addressed the toll of confined animal feeding operations (CAFOs), or "factory farms," on communities surrounding industrial-scale dairy, poultry, cattle, and hog farms (Carrel, Young, and Tate 2016; Johnston and Cushing 2020).



Producers . Earth . Consumers . Communities

FIGURE 10.1. The Real Food Challenge movement's summary of justice issues in the food system.

SOURCE: WWW.SCU.EDU/sustainability/operations/food/rfc/.

Health Impacts of Hog Farms in North Carolina

An influential and sustained body of CER and organizing on community impacts of hog farming in North Carolina informed research in other regions and on additional CAFOs. In the 1990s, a shift to large-scale hog farming released unprecedented levels of air and water pollutants and malodors from manure lagoons the size of football fields, spray fields used to disperse additional hog waste, and decomposing hog carcasses. Community leaders understood this was an EJ issue.

“The pork industry came to eastern North Carolina because we are Black, poor, rural and have no political clout,” explained Gary Grant, executive director of Concerned Citizens of Tillery (CCT) (quoted in Vanderwarker 2012, 72). CCT collaborated with a research team from the University of North Carolina led by epidemiologist Steve Wing to conduct some of the first studies of the health effects of hog operations on surrounding communities, which supported landmark regulatory action and legislation (Rhodes et al. 2020).

The research collaboration began by showing that hog CAFOs were located disproportionately in communities with high levels of poverty, Black and Latinx residents, and households dependent on well water, which was vulnerable to groundwater contamination (Wing, Cole, and Grant 2000). Next, the research partners co-designed an innovative study of the hog farms’ effects on neighbors’ health and well-being. CCT recruited residents who lived near CAFOs from 16 communities to participate in a two-week sampling study. The study deployed trailers to conduct real-time monitoring of weather patterns and multiple air pollutants, combining these data with residents’ reports of the strength of malodors, respiratory problems, blood pressure, and lung function measurements. Residents also reported their perception of their quality of life, a psychological measure rarely included in EJ studies. CCT members led the study design and recruiting efforts and provided background knowledge on regional politics and history and on the industry’s tactics (Rhodes et al. 2020). To build trust with participants and protect their anonymity, researchers held training sessions at participants’ homes, churches, and other local meeting places.

This unique data set yielded multiple studies of physical and psychological effects of living near hog CAFOs and documented frequent malodor and elevated levels of multiple pollutants—including ammonia, volatile organic compounds, and particulates (Guidry et al. 2018). Researchers found an association between increased exposure to hydrogen sulfide gas (a hog waste biomarker) and elevated blood pressure among participants (Wing, Horton, and Rose 2013). Residents also reported increased levels of stress and changes to their daily activities in response to malodor (Horton et al. 2009). The study provoked additional research showing hydrogen sulfide exposure among children in schools near hog operations (Guidry et al. 2018), downstream contamination by swine waste (Heaney et al. 2015), and health threats to employees on hog farms, including potential transfer of antibiotic-resistant bacteria from hogs to workers (Davis et al. 2018).

These studies supported successful organizing campaigns led by CCT, the North Carolina Environmental Justice Network (formed by Wing, Grant, and other activists), and allied organizations representing communities and workers. In 2007, organizers celebrated a victory over the multinational pork corporations when the state adopted a permanent statewide moratorium on industrial hog operations. In 2018, three EJ organizations won a settlement from the North Carolina Department of Environmental Quality for failing to regulate hog facilities to

protect Black, Latinx, and Native American communities from pollution, one of the few successful complaints against environmental racism under federal civil rights law in the U.S. (Rhodes et al. 2020).

DEMANDS FOR FOOD SOVEREIGNTY AND SECURITY

Defined by the United States Department of Agriculture (USDA) as “access by all people at all times to enough food for an active, healthy life,” food security entails much more than possessing the financial resources to purchase food (Coleman-Jensen et al. 2021). Examining these deeper and more complex meanings of food security, or what is understood as the four pillars of food security—availability, access, utilization, and stability—opens up myriad possibilities for researchers who want to collaborate with communities plagued by food injustices. As a social movement, food sovereignty builds upon demands for food security to engage more fundamental questions of agency and control over land and other agricultural resources. Borrowing from Hannah Arendt, Raj Patel frames this as the “right to have rights” (Patel 2009).

The following case studies demonstrate the necessity of recognizing the particular and shared concerns that marginalized communities face in accessing food that is meaningful and conducive to well-being. These cases also demonstrate the importance of considering the historical and structural contexts that have shaped access to land and other food-related resources. These examples honor the deep, local, embodied knowledge or traditional ecological knowledge (TEK) connected to food and agriculture that resides in marginalized communities (Nelson and Shilling 2018), allowing researchers to connect food insecurity to systemic patterns of racialized injustice and exploitation. Although these cases focus on the U.S., they are linked to other parts of the world through diasporic connections and networks of migration.

Food Security and Gardening with Farmworkers in Vermont

For U.S. farmworkers, food insecurity stems from poverty, language barriers, fear of detention and deportation, and long work hours that leave little time to access and prepare healthy food. While there is a wealth of research on farmworker food insecurity, few studies have utilized CER to simultaneously document and ameliorate food disparities in farmworker communities (see, e.g., Brown and Getz 2011; Kresge and Eastman 2010; Villarejo et al. 2000). These studies have primarily focused on seasonal workers in traditional destinations of migration.

Teresa Mares, in collaboration with the Huertas Project (connected to the University of Vermont Extension’s Bridges to Health program), addressed food insecurity within a community of year-round farmworkers in New England’s dairy industry. Most of Vermont’s estimated 1000–1200 Latinx dairy workers live and work in isolated dairy farms in rural areas. Most workers are young men who

moved to Vermont from central and southern Mexico and are living on their own, separated from families in their countries of origin.

Beginning in 2009, the Huertas Project addressed migrant farmworker food security and sovereignty concerns, identified through years of the university's CE outreach to Vermont's dairy farms, by addressing disparities in access to fresh food. Huertas began collaboratively designing and planting kitchen gardens at farmworker homes, prioritizing the cultivation of culturally familiar foods that are often inaccessible in northern Vermont. For farmworkers from agrarian backgrounds, the gardens are a place to employ forms of agroecological knowledge learned in their home communities. For those from urban areas, the gardens are a place to become more deeply connected to foods they have enjoyed, but perhaps have not grown on their own. Since 2011, Mares has served as the co-director of the Huertas Project, integrating research findings and farmworker perspectives into a continual redesign and evaluation of the project, and sharing findings to better inform social service providers and other stakeholders in the local food system.

Over nine years of fieldwork, Mares and colleagues found that 18 percent of the 100 farmworker households surveyed were food insecure, with 4 percent experiencing very low food security (Mares 2019). These data were collected by administering the Household Food Security Survey Module (HFSSM), a tool designed by the USDA. However, Mares soon realized that the instrument is not well suited to farmworker households because of its heavy dependence on financial measures as a proxy for food security and the restrictive manner in which the survey module defines a household. For transnational farmworkers who are contributing economically to households on both sides of the border, the HFSSM fails to capture the complexity of their daily food access struggles.

CER can help to supplement inadequate measures of food insecurity such as the HFSSM, which have often been developed by government entities with little input from affected communities. Incorporating grounded theory and mixed methods, Mares supplemented these surveys with in-depth interviews that included questions and themes that were more relevant and rooted in the everyday experiences of farmworkers. These interviews revealed that for a majority of farmworkers, a lack of money was not the primary obstacle to obtaining food. Rather, a combination of limited time for grocery shopping given the timing of work shifts, language barriers, fear of Border Patrol and ICE personnel, and transportation challenges resulted in farmworkers having little agency over the sources of their food, or the means to access it. Additionally, the need to support families in their countries of origin often limited the amount of money farmworkers felt they could spend on their own food needs. Many of these interviews were conducted with Huertas participants, revealing that the gardens they planted increased their access to foods conducive to health. The strong relationships Mares developed through Huertas were key to understanding

the limitations of the HFSSM and the more relevant and pressing issues confronting farmworkers.

*Food Insecurity and Food Sovereignty for Indigenous Communities
in the Klamath River Basin*

Sowerwine, Mucioki, et al. (2019) note that “[u]nder settler colonialism, dramatic changes in the management of the lands and waterways related to mining, hydro-electric dams, agriculture, logging, and fire suppression have resulted in the near loss of Native fisheries, and drastic reduction in the abundance and availability of Native foods” (587). Alongside this ecological devastation came the structural violence linked to genocide and forced assimilation policies that disrupted traditional relationships of reciprocity and kinship and the knowledge systems connected to the natural world. Limited access to healthy food and high rates of diet-related disease are of serious concern in Native communities across the U.S. (see, e.g., Bauer et al. 2012), yet few studies employ a CER approach guided by the principles of environmental and food justice (Jernigan et al. 2012, 2017; Sowerwine, Mucioki, et al. 2019; Sowerwine, Sarna-Wojcicki, et al. 2019).

CER is especially valuable for revealing the connections between food security and food sovereignty within Indigenous communities, as illustrated by the collaborative work of Lisa Hillman, a member of the Karuk Tribe and the manager of its Píkyav Field Institute (PFI), and colleagues from the Department of Environmental Science, Policy, and Management at the University of California, Berkeley (UCB). This team has investigated barriers to food access among tribal members in the Klamath River basin. The Karuk word *píkyav* translates as “to repair” or “to fix,” and at the center of these reparative efforts are the Karuk’s intertwined social, cultural, and ecological systems on their homelands in northwestern California and southern Oregon.

The research partnership resulted from a long and deliberate process of co-creating principles to ensure “protection of intellectual and cultural property and recogniz[e] tribal sovereignty” (Karuk-UCB Collaborative, n.d.). These guidelines stem from the Indigenous Research Protection Act and were adapted to local needs and priorities. To better understand barriers to food access, the team employed a community-based participatory research (CBPR) approach, conducting more than 711 surveys, 115 follow-up interviews, and 20 focus groups with members of the Yurok, Hoopa, Klamath, and Karuk tribes. Tribal members and communities were engaged as “active and equal participants throughout the research process” (Sowerwine, Mucioki, et al. 2019, 588).

Data revealed that 92 percent of respondents were food insecure to some degree (one of the highest rates of food insecurity among Indigenous communities in the U.S.), compared with roughly 12 percent of the overall U.S. population (Sowerwine, Mucioki, et al. 2019). However, like Mares, the research team found significant limitations with the USDA’s HFSSM, including a narrow framing

of food security that does not include attention to deeper cultural and spiritual meanings of food or the ecological relationships between people and the food that sustains them.

To address these limitations with input from the tribes, the research team developed an indicator for “Native foods security” to examine the relationship between access to Native foods and household food security. Using this indicator, researchers found that only 7 percent of households were Native-foods secure and 70 percent of households never or rarely had access to Native foods on a consistent basis. The study demonstrated that improving access to Native foods is key, and that this requires revising laws and policies that limit access to ancestral lands and resources. Among the many applied outcomes of this research is the development of 89 lesson plans for K–12 students that “center content relevant to tribal identity and the traditional food system” (Sowerwine, Sarna-Wojcicki, et al. 2019, 177). Additionally, the project resulted in the development of a Karuk and Yurok Tribal Herbaria housed at the Karuk Office of Historic Preservation and the Karuk People’s Center, wherein tribal members “collected, pressed and mounted, and preserved hundreds of plant species of cultural and regional significance” (Sowerwine, Sarna-Wojcicki, et al. 2019, 178).

Black Farming, Resilience, and Agency

Like Latinx and Indigenous communities, Black communities in the U.S. disproportionately experience food insecurity and food injustice. Barriers to Black Americans’ access to food and farmland cannot be separated from the violent histories of slavery, disenfranchisement, and the systematic denial of land and agricultural lending. A number of studies have pointed to elevated rates of diet-related disease and food insecurity in Black households and communities that are connected to these forms of violence (e.g., Burke et al. 2018; O’Reilly et al. 2020). Some studies use a CER approach to examine these inequities (Carlson, Neal, and Magwood 2006; Paschal et al. 2020; Rollins et al. 2021). The loss of Black-owned farms has been dramatic, declining from a high point of 14.3 percent of all farmers identifying as Black in 1920 to 1.5 percent in 2012 (Taylor 2018).

In response, movements for Black food justice and food sovereignty have gained traction in recent years. While their priorities vary, a primary goal has been to cultivate Black resilience and freedom through re-establishing connections to both rural farmland and urban food systems (McCutcheon 2021; Penniman 2018; White 2018). The research on Black farming and resilience, most of it done by Black women, has often used decolonial forms of ethnographic research that leverages both deep emic knowledge of structural racism in the food system and close community connections (Garth and Reese 2020; McCutcheon 2013; Reese 2019). These studies challenge narrow definitions of CER wherein the lines between insider and outsider are often seen as static, rather than fluid and tied to intersectional identities.

Monica White is one example of a community-engaged researcher who has helped to connect and advance the intertwined movements for Black food sovereignty, land and environmental justice, and civil rights. Researching urban farmers in Detroit (White 2011), and their connections to cooperative practices of Black farmers in the U.S. South (White 2018), White has illuminated the collective agency and resilience that is embodied by Black farmers and their role in ensuring food security for their communities. White's approach to CER incorporates a historical perspective, showing how Black struggles for land and food sovereignty are not new, even if they are responding to new challenges.

White is the founding director of University of Wisconsin's Office of Environmental Justice and Engagement, which supports faculty and students working on CER connected to environmental issues. In this role, she draws upon her community engagement as past president of the board of the Detroit Black Community Food Security Network, on advisory boards of Southeastern African American Farmers' Organic Network and the Institute for Agriculture and Trade Policy's Food Justice Task Force, and as a fellow with Food First. Her CER approach also inspires her commitment to publishing open-access scholarship that reaches beyond academic readers, such as her columns in the *Journal of Agriculture, Food Systems, and Community Development*, underscoring that openly sharing research findings can be as valuable as co-producing those findings.

FARM AND FOOD WORKERS' RIGHTS

The long-term, underlying causes of exploitation and environmental injustices faced by food system workers globally are varied and complex, but a key driver is uneven value distribution along industrial supply chains, with power consolidated at the top that squeezes suppliers and workers as they compete. Inequities of race/ethnicity, gender, sexuality, citizenship, class, and ability have enabled unequal power relations to flourish in the production of goods consumed worldwide. This is particularly the case where early world markets for industries were entwined with colonialism, such as in tea production in India and chocolate production in Ghana, where forced labor persists today (LeBaron 2018).

Few consumers or food industry professionals understand farm and food workers' conditions and characteristics, because there has been little data gathered about them (BAMCO and UFW 2011; LeBaron 2018). Farm and food workers can be difficult to "count" in standard employment statistics because seasonal, contract, and undocumented workers are less likely to be reported to government agencies; small farms are often excluded from official statistics; and regulatory bodies can withhold data from the public for confidentiality reasons. Thus, farm-worker rights and needs are frequently overlooked in policy and academia.

CER on farm and food workers fulfills the dual goals of EJ to deepen democratic processes and support workers' rights. Through CER, workers, academics,

advocates, and even industry have teamed up to make empirical data on the conditions of workers more visible to the public and food industry, help advance human rights, and prove what is otherwise invisible: workers' marginal earnings, economic uncertainty, and harsh and often exploitative working conditions (BAMCO and UFW 2011; Fox et al. 2017; Gray 2013; Kline and Newcomb 2013; Mares 2019). CER outreach projects also combat exposure, injury, illness, and poverty of workers due to abusive and hazardous workplace environments. CER can provide factual bases for the need for greater attention, resources, and legal protections for workers and regulation of working conditions. The findings of CER projects on food workers point to an urgent need for enforcement systems that can uphold labor rights at the bottom of the supply chain.

To illustrate these ideas, we point to projects that exemplify how CER can address questions of labor and human rights in food systems. These examples demonstrate the need to recognize particular and shared barriers to marginalized worker communities' basic health and safety. The cases also demonstrate the importance of considering historical and structural contexts that contribute to workers' impoverishment, vulnerability, and exploitation. This literature recognizes the natural and built environment—including where people work and live—as intricately connected with people's well-being and with EJ.

Farmworker Issues and Protections in the United States

As corporations seek to increase their profits and power in the food system, food production becomes a source of economic, political, and cultural contention (Howard 2016). Through corporate consolidation, the most powerful and dominant corporations can generate downward pressure on wages and labor standards, and produce environmental inequalities that result in institutional violence. This leads to suffering and even lethal consequences for suppliers, workers at the bottom of the supply chain, and other marginalized communities. Simultaneously, some corporations may ameliorate some of their negative effects on communities and use their resources to raise awareness of and support for EJ goals.

An example of the latter is a for-profit and nonprofit CER partnership between Bon Appétit Management Company (BAMCO), a subsidiary of the largest food service company in the U.S., and the United Farm Workers of America (UFW), the country's largest farmworkers' union. In 2011, BAMCO and UFW (2011) collaborated to publish a fact-finding document, *The Inventory of Farmworker Issues and Protections in the United States*, which provided the most comprehensive and bleak picture of the few legal protections farmworkers had at the time.

The *Inventory* authors gathered, synthesized, and translated data on farmworker conditions into easily accessible formats for the public and food industry. BAMCO was responsible for the majority of research, data collection, and drafting of the *Inventory*. UFW provided project direction and legal expertise, Oxfam America

provided insight into the status of farmworkers, and an independent sociologist analyzed data.

Focusing on health, safety, and enforcement from federal, state, and private sources, the *Inventory* cataloged key laws and regulations for the United States and the six states with the largest farmworker populations. *Inventory* researchers compiled data on farmworker well-being from the U.S. Department of Labor's National Agricultural Workers Survey, USDA's Census of Agriculture, USDA's National Agricultural Statistics Service, state regulatory bodies, farmworker organizations, and academic research. Fifty-two farmworker advocacy groups, nonprofit legal organizations, and governmental agencies made contributions to the *Inventory* by providing background information, data, and other input.

The report illustrated rampant disregard for workers' well-being. It cataloged the many forms of occupational hazards and toxic exposures that farmworkers face resulting from loopholes in health and safety protections, lack of regulatory oversight, and widespread unreported labor violations. A major finding was the significant missing data on farmworker conditions and issues—due to poor, untraceable, and nontransparent labor law monitoring and record keeping by state and federal regulators. The absence of adequate data makes it difficult to publicize and remedy the health and safety problems rampant in farm labor.

The *Inventory* advocates for farmworkers to have the same legal protections in the workplace that apply to other occupations in the U.S. By establishing a baseline of conditions, the *Inventory* has been useful in calling for improvements for farmworkers, such as more legal protections against child labor, reproductive justice for farmworkers, better protection of women and girls against sexual violence, expanded regulations against pesticides and heat stress, greater accountability for pesticide reporting, comprehensive healthcare of farmworkers, and increased awareness of structural racism in the food system. The *Inventory* has also contributed to governments' understanding of farmworkers' legal needs (Legal Services Corporation 2015).

CHAMACOS

Another area of CER supports protecting farmworker women, children, and their communities against pesticide exposure. In 1998, the Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) launched the world's largest and longest birth cohort study of pesticides and environmental chemicals in pregnant women and children living in an agricultural community. The longitudinal study incorporated CER to disseminate findings creatively with community partners and inspired youth-led research on pesticide-related health, safety, and EJ issues.

The study is part of the Center for Environmental Research and Children's Health (CERCH), which investigates environmental exposures to families and helps translate research findings into strategies to reduce environmental disease.

Supported by environmental and health agencies and nonprofit organizations, the study is run by University of California, Berkeley (UCB) professor of public health Brenda Eskenazi; community partner Clínica de Salud del Valle de Salinas; and an advisory council of farmworkers, growers, youth, and scientists.

CHAMACOS measures environmental exposures and assesses children's growth, health, and development in California's Salinas Valley, one of the country's most productive farming regions. Methods include biological samples, environmental samples, neurodevelopmental tests, lung function tests, anthropometric data, neurodevelopmental and physical assessments, questionnaire data, and factors such as diet and school performance. Over 800 children were enrolled in the study, with over half tracked prior to birth.

Among many findings, the study has linked pesticides sprayed on fruit and vegetable crops with respiratory complications, developmental disorders, and lower IQs among children of farmworkers (Eskenazi et al. 1999, 2004, 2007, 2013). CHAMACOS research contributes to knowledge about the impacts of pesticides on children's brain development and respiratory health, the interaction of stress and early life adversity on health in chemically exposed populations, and methods to reduce pesticide exposures. This research underscores the urgent need for public policy to target economic, social, and gender disparities (e.g., improved wage and hour laws, access to healthcare, and occupational safety protections), and to address the material needs and protect the health of marginalized communities.

Over time, the project has focused on community engagement and bidirectional learning. CERCH developed outreach programs to address pesticide exposure prevention for farmworker families unlikely to receive formal training otherwise. The center educated more than 30,000 farmworkers and community members and distributed thousands of materials accessible to farmworkers for redistribution within their communities, such as graphic novellas, educational puppet shows, and hotline cards. CERCH also created a train-the-trainers model that teaches migrant farmworkers how to educate others about pesticide safety practices in their community. CERCH and its CHAMACOS Youth Council—Latinx youth learning about and addressing environmental health concerns—have collaborated with worker organizations, such as the California Department of Education's Office of Migrant Education, and arts organizations, such as Hijos del Sol, to communicate the study's health findings and conduct trainings on pesticide safety with the wider community.

Between 2016 and 2018, CHAMACOS Youth Council implemented a follow-up study called Chamacos of Salinas Evaluating Chemicals in Homes and Agriculture (COSECHA) to empower the next generation of environmental health leaders, researchers, and activists. COSECHA studied pesticide exposures associated with hormone-disrupting and carcinogenic effects among 100 teen girls (Harley et al. 2018, 2019). Led by a UCB reproductive epidemiologist, Kim Harley, Clínica de Salud del Valle de Salinas and 11 paid local youth research assistants collaborated

in each phase of the study. Methods included using GPS devices, environmental sampling bracelets capable of detecting over 1500 chemicals, indoor dust samples, in-person questionnaires, urine samples, and a catalog of crops grown on nearby fields. Drawing on experiential knowledge, the youth researchers designed strategies to communicate their public health findings through television segments, tabling at local events, community presentations, a Radio Novella “edu-tainment” series, and a community mural. They also distributed 800 doormats printed with tips for reducing pesticides in homes, which COSECHA research indicated had a protective effect. COSECHA also strengthened youth researchers’ professional skills. All but one member of the youth research cohort went on to college, in an area where only 59 percent of people (aged 25 years or older) have graduated from high school, and 13 percent have graduated from college (Town Charts 2021).

Immigrant Dairy Farmworkers in New York State

The report *Milked: Immigrant Dairy Farmworkers in New York State* revealed New York dairy farmworkers’ working and living conditions by highlighting these workers’ rarely heard voices (Fox et al. 2017). *Milked* was co-authored by a team of community leaders at two grassroots organizations advocating for institutional justice and change for low-wage workers—Worker Justice Center of New York (WJCNY) and Workers’ Center of Central New York (WCCNY)—and researchers from Syracuse University and Cornell University.

Farmworkers participated actively in the study, helping develop interview questions, lead focus groups, transcribe and analyze data, and contribute photographs. Additional researchers analyzed the dairy industry structure, and health and safety challenges on farms. The research team conducted 88 semistructured interviews with immigrant farmworkers on 53 dairy farms across the state. No source has compiled the full population of dairy farmworkers in New York from which to draw a sample, so the study demanded time- and labor-intensive direct outreach to workers. The interview’s 225 questions covered participants’ demographic information, work histories, wages, working and housing conditions, social integration, interactions with immigration enforcement agents, and interests in organizing for change.

WJCNY and WCCNY used *Milked* to support immigrant dairy farmworkers’ organizing to resist workplace violence and harassment, recover stolen wages, and lobby for improved farm housing and working conditions. *Milked* provides an empirical basis for advocating for federal and state agency intervention, as well as dairy processing company policy changes. For example, the report argues that New York State should no longer exempt farmworkers from basic labor rights, such as the rights to organize, to a day off, and to overtime pay. The report also presents evidence for state policy changes to enable undocumented immigrants to get driver’s licenses, provide state oversight of workplace health and safety for dairies, and ensure that all farmworkers have safe and dignified housing with a right

to receive visitors. The report calls upon dairy companies to adopt and enforce worker-led codes of conduct for their fresh milk suppliers to ensure they follow ethical labor practices, and to buy only from farms that participate in rigorous and independently conducted labor rights monitoring. The report also urges milk consumers to hold dairy companies accountable for working conditions.

Conducting this survey strengthened WJCNY and WCCNY outreach as researchers made contact with workers on farms and involved them in organizing efforts. The organizations had weekly conference calls with workers to strategize about how to respond to issues documented in the research, such as wage theft, workplace violence, and health and safety conditions. These workers' networks were key for developing leadership and solidarity for action, including farm protests and a campaign to implement occupational safety and health measures across the New York dairy industry.

NEW DIRECTIONS FOR RESEARCH

Within the food justice and sovereignty movements, building collective power, diversifying strategies, and forging solidarities across social boundaries are priorities (Sbicca 2018). CER can contribute to these goals in three broad ways. One involves CER practitioners forging broader collaborations with each other and with communities to build and sustain grassroots power. For example, the Agroecology Research-Action Collective has developed *community of practice* principles and protocols for researchers that describe horizontal nonexploitative learning with food movements and mechanisms for multidirectional accountability among research partners (Montenegro de Wit et al. 2021). Collective efforts such as this can help develop long-term collaborative projects across communities that build greater strength and relevance than isolated CER projects can do on their own. In addition, CER partners can move beyond documenting food injustices to *develop and disseminate policy solutions in public forums*. For example, Vera Chang (2020) has published findings from her CER with the Coalition of Immokalee Workers, a farmworker-led human rights organization, as examples of solutions journalism, which evaluates responses to social problems rather than simply describing them. These publications focus on effective worker-designed responses to problems in the agricultural workplace, educating the public and policy makers about the potential for constructive change. Third, academic researchers can *involve more of their students in CER on food issues* as a contribution to transforming public consciousness. Goldberg and Minkoff-Zern's (2021) research on a CER collaboration between an undergraduate class focused on labor and the food system and Restaurant Opportunities Centers United, a network of worker organizations fighting to raise restaurant wages and labor standards, found that participating in CER can shift students' viewpoints and values from a purely consumer-based perspective to include workers' perspective on the food system.

CER in this area can also *deepen decolonial and antiracist research*. First, CER can help protect immigrant rights advocates, including farmworkers and their advocates, from retaliation and arrests aimed at silencing dissent. A mapping database that shows incidents of harassment and detention of immigrants who speak up for their rights across the U.S. created by the New Sanctuary Coalition and New York University School of Law's Immigrant Rights Clinic offers one promising response (www.immigrantrightsvoices.org). Second, there is a need for additional work on BIPOC food sovereignty that addresses policy barriers, such as a recent CER study of how USDA's Farm Bill Conservation Title programs hinder Black farmers' ability to mitigate invasive species on their farmland (Fagundes et al. 2020). Third, we need to learn from new partnerships between academic institutions and Indigenous natural resource managers that center tribal food sovereignty and prioritize trust-building processes rather than maximizing research publications and products (e.g., Matson et al. 2021). Fourth, CER for food justice and sovereignty needs to expand to neglected constituencies and places. In part because urban communities are accessible to many researchers, we need more CER with rural communities (e.g., Cannon 2020; Engle 2019) and collaborations that bridge the urban-rural divide (e.g., Soergel 2021), which can help to build stronger ties and movements for food justice. In addition, prison food systems are significant sites of food insecurity, malnourishment, contamination, and exploitation of incarcerated labor by corporations for farming and manufacturing (Pellow et al. 2019).

CER is desperately needed to *strengthen community responses and resilience to disasters*. CER is starting to show that many effects of climate change on food and farming communities are disproportionately borne by women (van Daalen et al. 2020), as well as communities of color and low income, linguistically isolated people, and outdoor laborers (Aneesh et al. 2020; Castillo et al. 2021). For example, a research partnership conducted over a decade by researchers at Santa Clara University with smallholder coffee and corn growers in Nicaragua has documented and developed solutions to climate-induced drought and farming communities' seasonal hunger—an example of the “hungry farmer paradox” found in rural areas throughout the global food system (Bacon et al. 2014, 2021).

CER can also strengthen EJ communities' resilience to disasters by drawing lessons from rapid research on the COVID-19 pandemic. This research showed how the pandemic exacerbated intersectional forms of environmental injustice, such as poverty, discrimination, disease exposure, and other hazards (e.g., Ammons et al. 2021). Studies such as the multipart COVID-19 Farmworker Study, produced by a coalition of academics and community-based organizations based on data gathered with and by farmworkers, provided timely data to support immediate policy recommendations for strengthening safety net resources and ensuring safer working conditions (CBDIO et al. 2021). Additional research offers lessons for integrating CER and EJ principles into disaster and resilience responses, such as a

COVID-era study of how USDA-funded emergency food relief programs, which typically distribute processed foods supplied by agribusiness companies, can instead purchase local fresh produce from small farmers of color (Environmental Justice and the Common Good Initiative 2021).

Finally, CER can advance *restorative justice to transform academic institutions' relationships to BIPOC communities and the food system*. There is a need for more CER to serve the needs of underfunded tribal, historically Black land-grant, and Hispanic-serving agriculture colleges and universities (Valley et al. 2020). New initiatives can learn from promising examples—such as Michigan State University's Racial Equity in the Food System Workgroup, the First Americans Land Grant Consortium, and some Cooperative Extension programs—of how to resource BIPOC-led and BIPOC-serving institutions, and build bridges between them and predominantly white institutions, to advance food justice and sovereignty through research, teaching, and community outreach.