



***Second National People of Color Environmental  
Leadership Summit - Summit II***

**Resource Paper Series  
October 23, 2002**

**Environmental Justice and Sustainable Agriculture:  
Linking Ecological and Social Sides Of Sustainability  
Devon G. Peña**

**Department of Anthropology  
University of Washington  
Denny Hall M-42  
Campus Box 353100  
Seattle, WA 98195  
Phone: 206-543-1507  
Fax: 206-543-3285  
e-mail: [dpena@u.washington.edu](mailto:dpena@u.washington.edu)**

Summit II National Office  
1612 K Street, N.W. Suite 904  
Washington, DC 20006  
Toll free: 800-736-0986  
Phone: 202-833-1333  
Fax: 202-833-9770  
e-mail: [ejsummit2@aol.com](mailto:ejsummit2@aol.com)  
Web Page: <http://www.summit2.org/>

Disclaimer: The Summit II Resource Paper Series was commissioned and assembled by the Environmental Justice Resource Center at Clark Atlanta University with funding support from the Ford Foundation, Turner Foundation, Public Welfare Foundation, Agency for Toxic Substances and Disease Registry, National Institute for Environmental Health Sciences, U.S. Department of Energy, and U.S. Environmental Protection Agency. The opinions expressed in this commissioned paper represent those of the author(s) and not those of the commissioning institutions or the funding agencies.

# **Environmental Justice and Sustainable Agriculture: Linking Ecological and Social Sides Of Sustainability**

Devon G. Peña  
*University of Washington*

## **Abstract**

Environmental justice seeks systemic changes in agricultural production and consumption based on the underlying goals of environmental sustainability, social justice, and local food security for all. This paper surveys the major environmental justice issues in the development of grassroots public policy visions for sustainable agriculture. Issues selected for this policy brief include:

- (1) Persistent patterns of inequality of environmental protection with continued disproportionate exposure to environmental risks and harms and suppression of effective rights to collectively bargain and organize among farm workers of color and their families;
- (2) Persistent patterns of inequitable treatment and discrimination against farmers of color by the USDA with a clearly documented legacy of institutionalized racial discrimination in the settlement of debt and foreclosure, denial of loans, allocation of subsidies, and other policies that have led to the displacement of farmers of color from the land base;
- (3) Persistent patterns of inequitable and discriminatory treatment of farmers of color as a collective class of mostly smallholders by the programs and policies of the land grant college and agricultural extension service complex; scientific priorities and technical practices embraced by professionals in the land grant college-extension service complex that are too often biased in favor of white-dominated corporate agribusiness interests and priorities; this includes racial, class, and cultural bias in the definition and shaping of priorities for research and development, extension services, conservation programs and other agricultural programs that have the effect of marginalizing the special assets and needs of smallholder farmers of color;
- (4) Inequitable access to private sector credit markets and experience of land loss caused by public policies that encourage predatory lending practices, real estate speculation, and rural gentrification;
- (5) Procedural inequities and patterns of discrimination in public policy- and decision-making in the states' and counties' administration and planning of land and water use laws and policies affecting agriculture;
- (6) Growing patterns of inequitable access to "public land" and "open space" resources and amenities among urban and rural communities of color and conflicts with public land managers and other multiple use interests;
- (7) Enclosure of several hundred million acres of ancestral tribal and Mexican American lands for the establishment of the public domain including many lands in national forests, grasslands, and wildlife refuges and other federally administered lands;
- (8) Loss of local food security in low income communities of color in rural and urban contexts; policies favoring the globalization and concentration of agriculture create uncertainty for local food security; these changes reinforce the disarticulation of communities of color from processes of local food production and distribution; they

- also increase the vulnerability and isolation of our elderly and low-income communities and block their access to affordable, safe, and nutritious food sources;
- (9) Failure by the mainstream organic, alternative, community-supported, and sustainable agriculture movements to systematically address the social side of sustainability by integrating demands for environmental justice, equal exchange, workplace democracy, and restoration of communal land and water rights into their own movements' philosophies, strategies, organizational forms, and policies;
- (10) Failure by the academic establishment to recognize the legitimacy of the local agroecological knowledge of farmers of color; inter-linking relationships between public universities and private biotechnology corporations that involve conflicts of interest; these are symptomatic of imbalances in publicly-funded support of biotechnology and a corresponding failure to support agroecological research in sustainable agriculture; these policies limit the prospects for smallholder farmers of color and may reduce local food security.

This policy paper offers a broad historical overview of the political economic conditions that resulted in patterns of racial discrimination against people of color and shaped their experiences with agriculture and food systems. The people of color affected by environmental injustice in agricultural and food systems include farm workers, farmers, grocery workers, low-income families, and the elderly. This paper criticizes a wide range of public policies, laws, and regulations that shape our systems of agricultural production and distribution, natural resource access and management, land and water use, and food security. Finally, it proposes a set of action plans to guide discussions on the development of a policy-making strategy for movement mobilization around the problematic of sustainable agriculture, local food security, and environmental justice.

**KEYWORDS:** environmental justice, farm workers and farmers of color, racial discrimination and inequality in agricultural and natural resource policies, sustainable agriculture, local knowledge

**DIRECT CORRESPONDENCE TO:** Devon G. Peña, Professor of Anthropology, Box 353100, University of Washington, Seattle WA 98195. Email to: [dpena@u.washington.edu](mailto:dpena@u.washington.edu).

## **Introduction**

Environmental justice seeks to establish a system of agricultural production and consumption based on the unified goals of environmental sustainability, social justice, and local food security for all. From the vantage of the environmental justice movement (EJM), sustainable agriculture involves efforts to integrate the ecological and social sides of sustainability (Allen and Sachs 1991). It also involves struggles to recover or protect existing community-based systems of local food security as a hedge against the vagaries of globalized agribusiness (Henderson 2000). Local food security is a particularly important principle of environmental justice because it involves the affirmation of the right to clean air, land, water, and food.

## **Historical Overview**

Development of environmental justice (EJ) perspectives on sustainable agriculture must begin with an understanding of and respect for the diverse historical experiences, cultural traits, and socioeconomic positions of the different communities of color. For example, the historical experiences and public policy needs of African American farmers are distinct from those of Native, Latino, or Asian American farmers. Yet, all these communities of color share affinities in the form of similar experiences with centuries of racial and ethnic discrimination, dispossession, displacement, and impoverishment in the aftermath of the westward expansion of the United States and the industrialization and corporatization of agriculture (Magdoff, Foster and Buttel 2000).

While the 20<sup>th</sup> century witnessed a veritable revolution in the agricultural capacity and productivity of the United States, patterns of inequality in the production, distribution, and consumption of food remain salient. The history of agriculture in the U.S. involves a gradual and conflict-ridden transition from a

nation of farmers to a nation of consumers dependent on an ever-shrinking number of corporate agribusiness producers, processors, and distributors of food. The 20<sup>th</sup> century witnessed the emergence to dominance of industrialized monocultures controlled by a handful of transnational corporations such as Monsanto, ConAgra, Archer Daniels Midland (ADM), Iowa Beef Processors (IBP), Cargill, and others.<sup>1</sup> The concentration of capital, industrial economies of scale, and uniform monoculture models of farming were the most significant developments in 20<sup>th</sup> century agriculture (Heffernan 2000). Vertical integration and globalization proceeded from this basis in an economy characterized by highly concentrated agricultural capital (see Bonanno et al 1994). The domination of agriculture by a handful of corporations has meant that local communities have increasingly lost the ability to control access, affordability, and safety of their own food supplies. The adverse economic and social consequences of the dominant corporate model of agriculture have undermined the well being of communities of color everywhere.

Numerous ecological consequences resulted from the historical patterns of capital concentration, monocultures, and growing disconnect between local communities and their food sources. Between the 1940's and 1980's, a first wave of environmental problems developed out of excessive reliance on mechanized monocultures and their associated inputs of chemical fertilizers, pesticides, and herbicides. The technologies and practices of the so-called Green Revolution led to accelerated soil erosion and compaction, depletion of soil fertility, salinization and alkalinization of soils, pollution of surface and ground waters, loss of farm land to urban development, destruction of wild life habitat, and loss of agricultural biodiversity (Altieri 2000:80-81; also see Altieri 1995). Of course, the U.S. exported the Green Revolution model to the rest of the world, a point we will return to later.

A second wave of environmental problems emerged more recently as a result of the rise of commercial agricultural biotechnology (CAB). The development of genetically engineered herbicide-resistant crops is the most important example of the new environmental threats. Such transgenic crops were developed so that farmers would continue to purchase more of the weed-killing chemicals that are marketed by the same corporations that promote the use of GEOs (Altieri 2000:84; also see Goldberg et al 1990; Teitel and Wilson 1999). This means that instead of reducing the use of agroindustrial chemicals, CAB actually maintains "crop treatment protocols" with increased hazards for farmers, farm workers, and wild life (also see Peña 2003a). CAB also represents a serious threat to the preservation of the diversity of agricultural crops by creating conditions for crop uniformity in rural landscapes. The simplification of cropping systems results in the loss of domesticated plant genetic resources because older varieties, most of them developed and preserved by small family farmers, become extinct (Fowler and Mooney 1990; Altieri 2000:85).

Another serious problem posed by CAB is the risks associated with a process that molecular biologists define as horizontal gene transfer (HGT). The transfer of genes from transgenic crops to non-GMO crops and their wild or semi-domesticated relatives (through cross-pollination) could lead to the contamination of native land race varieties or the creation of super weeds (Altieri 200:85; also see Ho 1998). Additional problems are posed by the development of another class of transgenic crops, the Bt (*Bacillus thuringiensis*) transgenic crop varieties bioengineered by Monsanto, Novartis, and other CAB corporations. For decades, organic farmers have used naturally occurring Bt for organic pest control. CAB incorporates the Bt toxin into the plant itself, presenting this as an example of the contributions the industry is making to sustainable agriculture. However, the transgenic Bt crops are problematic in at least two ways. Field trials verify that transgenic Bt crops are eliminating not just the "target pests" but also numerous species of beneficial insects. Also, transgenic Bt crops reduce the long-term effectiveness of the use of Bt by organic farmers because the targeted organisms develop a generalized resistance (Altieri 2000:85). This is an example of how CAB is re-inventing the old problem of the "pesticide treadmill."

Beyond these serious ecological consequences, corporate dominated agriculture in the United States has also produced dire social and economic consequences. The historical experiences of people of color with agriculture are characterized by patterns of land loss, labor exploitation, and reduced food self-sufficiency caused by the loss of traditional foods and food ways. These problems are associated with patterns of increased poverty and the persistence of hunger and malnutrition. The loss of local food production, processing, and distribution capacities has been a key factor underlying these trends. The deterioration of traditional diets among communities of color is one aspect of the detrimental effects associated with

changes in food systems that resulted from agricultural modernization and industrialization. For example, Native Americans experienced a dramatic transformation of traditional diets that resulted in the appearance of new diseases such as cancer, hypertension, cardiovascular illnesses, stroke, diabetes, and other health problems associated with obesity and malnutrition. One study specifically links ecocide (environmental degradation and land loss) to detrimental changes in nutrition and widening health problems among Native Americans: “Depriving a people of land and resources and forcing them to live in conditions of crowding and malnourishment are likely to increase the risk of infectious disease... Landlessness and poverty appear, therefore, to have played a significant role in the demographic impact of disease on [Native American populations]” (Barsh 1990:222).

The loss of traditional subsistence activities continues to affect Native Americans by making them increasingly susceptible to malnutrition and infectious diseases. The Yankton Sioux in South Dakota are an example of communities that have experienced the deleterious health effects caused by the loss of traditional foods and subsistence activities. These losses are not just a result of the erosion of traditional ecological knowledge. Modernized agriculture has a direct impact on traditional food ways and the habitat of important edible and medicinal plants. A report by the Native American Women’s Health Education Resource Center notes:

Each year, gatherers of indigenous plants traditionally used by the Yankton Sioux report that the food sources have become harder to find. Chokecherry trees, wild plum bushes, medicine herbs, [wild] vegetables and roots are encroached upon by the development, farming and ranching that overrode wild prairie. Now toxic herbicides and pesticides are used to kill off many medicinal plants that farmers consider “weeds.” Yet for generations, indigenous plants provided us nutritional foods and medicines adapted to our body systems, and played important parts in our ceremonies (Chew 2002:1).

African American and Latino populations, groups that also underwent the “modernization” of their diets and loss of traditional foods and food ways following urbanization, have experienced similar problems. The increasing incidence of diabetes among African Americans and Latinos is directly associated with the adoption of the dietary practices of a “Fast Food Nation” or “Big Gulp Culture” (see Schlosser 2001). Traditional healers in rural Chicano communities, known as *curanderas* or *curanderos*, also report the loss of critical habitat for numerous medicinal plants as a result of logging, mining, and other extractive industries on lands that were historic common use areas and are now managed by the federal government or by private owners (Peña 2002: 63).

Clearly then, the historical experiences of people of color in the United States during the 20<sup>th</sup> century were characterized by growing impoverishment, land loss, hunger, and malnutrition in the midst of an agricultural revolution that increased the productivity of farming and the volume of food available for consumption. But the availability of food for consumption did not translate into equitable access to that food; it did not lead to less hunger or the elimination of malnutrition and related health problems. Quite the contrary, the agricultural revolution led to wider disparities in access to nutritious food and at the same time undermined the viability of traditional foods, food ways, and subsistence activities. The policies that encouraged growth in productivity and concentration of agricultural capital also led to the decline of family farmers of color. For example, the policies that favored economies of scale and thus promoted ecological degradation discriminated against farmers of color who tend to operate smaller farm units that do not qualify for the bulk of subsidy or conservation reserve benefits offered by the federal government.

### **Current Policy Problems**

This section addresses a select group of public policy problems related to environmental injustice in our nation’s agriculture and food systems. Ten issues were selected for inclusion in this policy brief, including: (1) unequal environmental protection and suppression of labor rights among farm workers; (2) inequitable treatment and discrimination against farmers of color by the U. S. Department of Agriculture (USDA); (3) inequitable and discriminatory treatment of farmers of color by the programs and policies of the land grant college-agricultural extension service complex; (4) inequitable access to private credit markets and land losses among farmers of color caused by predatory lending practices, real estate speculation, and rural

gentrification; (5) inequalities and discrimination in state and county level land use administration and planning; (6) inequalities in access to public lands among urban and rural communities of color; (7) loss of millions of acres of ancestral common lands by enclosure among Native and Mexican Americans; (8) loss of local food security caused by the globalization and concentration of agriculture and food systems; (9) failures by the organic, alternative, community-supported, and sustainable agriculture movements to integrate environmental justice principles; and (10) failure by the academic establishment to recognize and value the legitimacy of the local agroecological knowledge of farmers of color.

### **1. Unequal Environmental Protection and Suppression of Labor Rights Endanger Farm Workers**

Native-born and immigrant farm workers of color face persistent patterns of inequality of protection in work and living places; they are still experiencing disproportionate exposure to environmental risks and harms. Moreover, these problems occur in the context of political, legislative, and legal policies and practices that create and reinforce the suppression of the exercise of effective rights to collective bargaining and organization among farm workers of color and their families. There are more than four million farm workers in the United States today, including 100,000 minor children. At least two-thirds of these workers are immigrants and eighty percent are from Mexico (Marentes 1997). Environmental justice for farm workers extends beyond resistance to environmental racism in the workplace and living conditions. Farm workers face a legacy of generations of exposure to toxic chemicals. Yet, the range of problems facing farm workers extends beyond the important issue of pesticides and other toxins. The terrains of struggle include health problems related to inadequate housing, malnutrition, and lack of access to medical care (Leon 2000). This is all framed by their continuing struggles for unionization, collective bargaining contracts, and self-organization. An important aspect of farm worker struggles derives from its relevance for the building of a more inclusive and equitable sustainable agriculture movement.

*Unequal Protection: Disproportionate Environmental Risk and Harm.* Farm workers lack access to basic human needs like safe drinking water and sanitary latrines. Male and female workers are forced to relieve themselves in the open fields and often must drink water from drainage ditches. The short hoe is another example of the outrages that endure. For decades, farm workers sought to ban the use of the short hoe, which typically involves a two-foot long handle. They repeatedly asked legislators in Texas, California, and other states to set a minimum of four feet. The short hoe forces farm workers to do “stoop” labor and this often results in lower back injuries and kidney damage. It took decades for the legislators to respond, and most states have not adopted laws to explicitly ban the short hoe. This is but one example of a wide-range of problems related to ergonomic risks in farm work.

The risk posed to the health and safety of farm workers by agroindustrial chemicals remains serious in both living and work places. Data for California on the incidence of pesticide-related illnesses and fatalities show a steady increase over the 1990’s compared to previous decades. The death rate among farm workers in 1996 was estimated at 20.9 per 100,000 compared to the average for all industries of 3.9 per 100,000 workers (Reeves et al 1997). According to the Occupational Health and Safety Administration (OSHA), Latino (and especially Mexican) immigrants constitute a disproportionate number of workplace fatalities (Frommer 2002). Federal and state laws that exempt “small businesses” (with ten or fewer employees) from providing toilets, hand washing facilities, or drinking water, compound these problems.

High morbidity among farm workers is compounded by other factors including weak protective regulations and lackadaisical enforcement (Perfecto 1992). Not all states have adequate laws to protect farm workers from exposure to toxins. Even in the states with regulatory statutes, the laws are not readily or consistently enforced. For example, in California, the law sets penalties for violations related to exposure or failure to provide training and safety equipment to protect workers. Yet, in more than half of the incidents, growers were not fined and instead faced meaningless “notices of violation” (Reeves et al 1997: 30). Enforcement is further weakened by budgetary cutbacks that reduced the number of pesticide safety inspectors and changes in the laws that cripple labor’s effectiveness in combating these practices.

The rates for infectious and chronic diseases, malnutrition, and infant and maternal mortality among U.S. farm workers by far exceed national averages and are more like patterns we have callously grown to accept in third-world nations. The EPA reports at least 300,000 pesticide poisonings each year, and this is

considered an unrealistically low estimate (Farm Labor Organizing Committee n.d. and Kay 1994).<sup>ii</sup> There are a number of chronic illnesses correlated with pesticide exposure and commonly reported among farm worker populations.

Conditions in labor camps and other housing present aspect of environmental racism and social injustice. Crowded and unsanitary conditions in labor camps are a persistent feature of corporate agriculture. Farm workers and their families are often forced to live in one-room shacks without heating, running water, or toilet facilities (Kay 1994). In places like southern California's Imperial Valley, farm workers live in caves or holes dug out of cliff sides with nothing more than tattered plastic tarps and tin scraps for roofing held in place by rocks, dirt, and discarded tires (Greenhouse 1998). Lack of access to medical and health care facilities and services remains a serious compounding factor. Not surprisingly, farm workers have a life expectancy of 49 years (Perfecto 1992: 180-82).

*Genetically-engineered organisms and Farm Worker Health and Safety.* The development of CAB is an issue of emergent concern to farm workers and organizers. One type of agricultural biotechnology involves the production of Genetically-engineered organisms (GEOs, a.k.a. transgenic crops). Many of these transgenic crops have been engineered for increased resistance to herbicides and other agroindustrial chemical agents (Teitel and Wilson 1999). In other words, these crops have been genetically altered to survive higher chemical treatment protocols. One concern is that farm workers will bear a disproportionate burden of higher-level toxic exposures in fields planted with GEOs (Peña 2003a). Another concern is that farm workers may be disproportionately affected by the consumption of transgenic crops since they often consume whatever crop they are harvesting. Many transgenic crops include antibiotic resistance genes; this may result in reduced effectiveness of antibiotics leading to uncertain future health effects that could further endanger farm worker health and safety (Peña 2003a).

*Suppression of Farm Worker Rights and Environmental Racism.* There is a direct relationship between the persistence of environmental racism in farm work and the political, legal, and economic conditions that maintain farm workers in a state of labor repression. The patterns of unequal environmental protection and disproportionate exposure to environmental risks and harms result from the combined effects of several political, legal, and economic conditions. First, public policies and laws that support the farm labor contractor (FLC) system limit the ability of farm workers to organize for protection of their rights. The undocumented immigrant status of many farm workers further weakens their ability to confront and challenge injustices in the agricultural work place. The use of Special Agricultural Workers (SAWs) and other guest workers further undermines labor-organizing campaigns. The imposed geographic mobility and seasonal character of farm work compounds these organizing challenges (see Majka and Majka 2000). The lack or weakness of legal frameworks for union organizing, collective bargaining rights, and the right to strike are the most serious barriers to the attainment of environmental justice for farm workers. This basically means that as long as farm workers remain vulnerable, unorganized (or at least without enforceable collective bargaining contracts), they will retain limited capacity to challenge environmental racism in their working and living places.

## **2. Racial Discrimination by the USDA Harms Farmers of Color**

It is first important to acknowledge that statistical data on farmers of color remain highly problematic. According to the 1997 Census of Agriculture, only 47,700 or 2.5 percent of all U.S. farm operators are non-white. This includes 18,500 African American, 10,600 Native American, 8,700 Asian American and Pacific Islanders, and 27,700 Latinos (Census of Agriculture 1997). It seems likely that these estimates represent a serious undercount. The Agriculture Census focuses on commercial operators and thus overlooks the substantial numbers of subsistence or so-called "hobby" farmers. For example, the Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) estimates that there are about 3,477 "Hispanic" farmers in New Mexico (NRCS 2002: 13, table 3). However, according to estimates provided by the Upper Rio Grande Working Group (1989), there are at least 1,000 acequias (community irrigation ditches) in the state, and most of these are concentrated in the northern Upper Rio Grande watershed. Each acequia has an average of 10 parciantes (irrigators) and some have as many as 100. This means that there are at least ten thousand acequia farmers in New Mexico rather than a total of

all Hispanic farmers of 3,477 estimated by the USDA. This suggests that the USDA has not developed reliable methodologies to arrive at a more accurate count of farmers of color.

*Discrimination in USDA Loan, Credit, and Subsidy Programs.* Inequitable treatment and discrimination against farmers of color by the USDA (United States Department of Agriculture) involves a clearly documented legacy of institutionalized racism. An internal report admits to a systematic failure by the USDA to comply with federal civil rights laws. The 1997 report, compiled by the Civil Rights Action Team (CRAT), concluded that “[m]inority farmers have lost significant amounts of land and potential farm income as a result of discrimination by FSA [Farm Service Agency] programs and the programs of its predecessor agencies” (USDA Civil Rights Action Team 1997; as cited and discussed by Judge Emmet G. Sullivan in Keepseagle v. Veneman, p. 5). Racial and ethnic discrimination within the USDA was largely left unchecked after the Reagan administration, in 1983, eliminated the USDA Office of Civil Rights as part of a policy to reduce the size of the federal government. The Clinton administration reinstated the office in 1996, but the damage had been done and enforcement of civil rights complaints remained lax throughout the 1990’s.

The legacy of institutional racism in the USDA has been challenged by three important lawsuits filed by African American (Pigford v. Glickman 1997), Native American (Keepseagle v. Glickman 2000), and Latino (García v. Glickman 2000) farmers.<sup>iii</sup> These lawsuits confirmed patterns of racial discrimination across a wide range of USDA programs including those dealing with farm debt and foreclosure, loan and credit, and subsidies. The lawsuits documented the displacement of farmers of color from the land base as a result of discriminatory practices. In 1999, the USDA settled with African American farmers to end the Pigford litigation; the farmers sought more than \$3 billion but settled out of court for \$375 million. Many plaintiffs in this lawsuit contend that the \$50,000 awarded to each farmer was insufficient, especially since the settlement did not address the call for the elimination of debt that threatens so many of them with foreclosure. The plaintiffs in Pigford have an average debt load of \$75,000 to \$100,000 so the settlement amount will do little to thwart the steady loss of farmland.

Changes in agriculture that led to the emergence and dominance of large-scale corporate agribusiness have often been used to explain the decline of the American family farmer. However, the decline of African American farmers is further rooted in the history of institutional racism and discrimination. The number of African American farmers in the United States declined precipitously since the early 1900s. In 1910, close to twenty percent of all farmers were African Americans, who then owned more than 15 million acres of farmland. In 1920, there were more than 925,000 African American farmers (more than 1 out of every 7 farmers). By 1982, their numbers had declined to less than 18,000 farmers who owned 3.1 million acres of farmland (Bullard 1999). What were the factors underlying this precipitous decline?

The single most important factor underlying the decimation of African American family farms was the USDA and other federal and state agencies that fomented this decline through discriminatory policies and practices in loan, credit, subsidy, extension service, and natural resource management programs. The list of wrongs is a long one and includes the denial of loans and credit for agricultural production. Only 56 percent of black farmers receive loans and when they have received loans, they have had to wait an average of 222 days for approval, compared to an average of 84 days for white farmers (Mittal and Powell 2000:1). There are numerous cases where African American farmers have been denied disaster relief after suffering crop losses and other damages from hurricanes, droughts, or other natural occurrences (Mittal and Powell 2000:1). Discriminatory practices are also evident in the setting of interest rates for approved loans; for example, African American farmers are being charged as much as 18 percent interest while neighboring white farmers benefit from rates as low as 3 percent (Rural Migration News 1997). It is hardly surprising, then, that more than half of the USDA’s current inventory of land holdings are a farm formerly owned by African Americans (Mittal and Powell 2000:1).

Other ethnic and national origin groups have followed a different, but no less trying, track. In contrast to the declining number of black family farms, the number of Latino and Asian American farm owners and operators is expanding at a phenomenal rate. Recent social scientific studies document what has been characterized as the Latinoization of rural America (Rochin 1995). An important and little understood aspect of the demographic trend is the rapidly growing number of Latino farm owners and operators



(Rochin 1992, 1997, Peña 2000a). According to official agricultural census data, between 1987 and 1997 the number of Latino owned or operated farms in the United States increased by nearly 40 percent. There were 16,183 farms operated by Latinos in 1982; 17,476 in 1987; 20,956 in 1992; and an estimated 23,000 in 1997 (Census of Agriculture 1997). At this rate, there will be at least 50,000 Latino operated farms by 2022 (Peña 2000). The increase was most salient in the southwest and northwest. For example, in the state of Washington, the number of Latino owned or operated farms (including commercial orchards) increased by 343 percent during that period. Significant growth of the Latino farm sector was also observed in Arizona, California, Colorado, Florida, New Mexico, Oregon, and Texas. Michigan, Wisconsin, Minnesota, and other midwestern states also experienced growth. Latino farm owners and operators are present in every state in the nation. However, approximately 72 percent of Latino farm operators are concentrated in five states: California, Colorado, Florida, New Mexico, and Texas; at least 80 percent of these are Mexican American or Mexican-origin farmers.

Despite the increase in the number of farmers, the overall picture for Latinos is not encouraging. Like black and Native American farmers, Latino farmers have also faced persistent patterns of discrimination in USDA loan, credit, subsidy, and conservation programs, resulting in the García v. Glickman (now García v. Veneman) lawsuit filed in 2000. The Latino plaintiffs seek \$3 billion in damages alleging a twenty-year history of systematic and discriminatory denial of loans and a failure to investigate discrimination complaints as required under the law. According to a report prepared by the law firm of Howrey, Simon, Arnold, and White, LLP, discrimination in the USDA runs deep and is rooted in the very organizational structure for the allocation of loans and credit:

Under a system that dates from the 1930s, farmers for whom the USDA is the creditor of last resort must have their eligibility to receive farm credit and participate in noncredit benefits programs determined by county committees. Historically, these committees have invariably consisted of white male farmers from the local counties... It is easy to see how much a system could lend itself to rampant discrimination against disfavored minorities. (Howrey 2002: 1).

The case of the putative class representative in García v. Veneman, Guadalupe L. García is indicative of the difficulties and discrimination experienced by Latino farmers.<sup>iv</sup> In 1988, Mr. García filed a loan application with the Farmers Home Administration (FmHA). After a two-year delay, García was denied the loan. In 1994, the FmHA refused to work with García on a farm debt restructuring with guaranteed loans. In 1998, García needed to sell part of his family's farm land to reduce debt and, again, the FmHA refused to provide financing for the sale. As a result, Mr. García suffered serious financial losses and lost his land in a 1999 foreclosure action. This case is exemplary of the discriminatory treatment of Latino farmers by USDA programs.

Discriminatory treatment of farmers of color extends into the area of USDA subsidy programs. Over the course of the post-World War II period, federal USDA agricultural subsidies have favored large-scale corporate agribusiness. According to the most recent estimates, at least 75 percent of all subsidies are received by the largest ten percent of corporate growers (Tyson 2002). The 2002 farm bill reinforces this historic pattern by increasing subsidies to the largest and richest growers by more than one hundred billion dollars over the next ten years. This pattern has been in place at least since the years of the first Nixon administration when then Secretary of Agriculture Earl Butz first championed the twin goals of "bigger is better" and "food [as] a political weapon."<sup>v</sup> Butz argued that federal policies should promote "corporate control to rationalize agricultural production" (McLeod 1976: 190). The concentration of agricultural capital would, in part, be achieved by privileging economies of scale in the design of programs to allocate commodity price supports (*qua* subsidies). This has remained the dominant ideology and policy over the past forty years. Because farms owned or operated by people of color are typically small in size, the "bigger is better" policy has tended to exclude and marginalize them from participating in most crop support programs.

*Discrimination in Conservation Programs.* The Food Security Act of 1985 authorized the establishment of the Conservation Reserve Program (CRP) under the auspices of the Farm Security Administration (FSA) of the USDA. The administration of the CRP illustrates how conservation programs have historically also

avored large-scale agribusiness interests to the detriment of small family farmers. The objectives of the CRP include efforts to reduce destruction of wetlands and preserve other wildlife habitat affected or damaged by farming activities. In practice, the CRP has favored proposals from larger corporate farmers and discouraged projects initiated by small family farmers.

The extent of discriminatory practices in USDA conservation programs is not well understood or sufficiently documented. However, in some regions, local committees overseeing the CRP have engaged in demonstrable discriminatory actions and have consistently displayed racial prejudices in the conceptualization of what constitutes an appropriate conservation program application. This is at least partly due to the fact that farmers of color are underrepresented within USDA program staff and voluntary screening committees; Latinos are the most severely under-represented group in USDA staff and local committees.<sup>vi</sup> This under-representation is evident in the USDA's CRP, which is dominated by white farmers. For example, in Colorado's San Luis Valley, Chicano farmers report that local CRP committees consistently dismiss the role of traditional irrigation methods and fail to acknowledge or understand the ecological benefits associated with the flood irrigation techniques of the ancient acequia (gravity-driven, earthen-work, and communally-managed) irrigation systems. As one Chicano farmer explains:

They [the local USDA committee] think we are just playing around with water. The government agents say we are wasteful. We are seen as inefficient because the flood irrigation makes the wetlands and they see this as wasting water. But then over there [in the northern part of the San Luis Valley with a landscape that is dominated by corporate farms], they are getting money and credit for protecting wetlands. Why don't we get recognized for taking care of the habitat and environment? You only get the credit and recognition if you are a big corporate farmer and if you are Anglo.<sup>vii</sup>

It may be that these patterns of discrimination are rooted in highly biased and racialized concepts of agricultural modernity and productivity (see discussion in section 3 below). The persistence of Anglo-dominated local screening committees reproduces a decision-making regime that discriminates against farmers of color. This is no less the case in the area of conservation programs.

The relationship between farmers of color and the Natural Resources Conservation Service (NRCS, formerly the Soil Conservation Service) thus remains problematic. One study of the relationship between African American farmers and the NRCS reveals that, while 81 farmers reported having wetlands, only six (7 percent) had participated in wetlands conservation programs in the previous five years (Federation of Southern Cooperatives 2002). The same study reports that 26 percent of the African American respondents felt they had experienced discrimination by NRCS staff because of their race and 19 percent because of the size of their farm operations. This is certainly a smaller proportion than those reporting discriminatory treatment in the USDA's farm loan and subsidy programs but is still suggestive of a significant problem.

The status of conservation assistance to Latino farmers is also problematic. According to a report prepared by the NRCS, some 17,379 Latino farmers were recipients of conservation services in 2000. However, this accounts only for about 37 percent of all potential Latino farm clients (Buland 2002: 18). The data indicate that on average the rate of conservation program assistance provided to Latino farmers is at least 27.6 percent lower when compared to "more traditional" (*qua* white) farmers. There are even more troubling disparities in specific regional contexts. For example, this study reports that in 2000 only 24 percent of farmers in Puerto Rico were served by the NRCS compared to the national average of 64 percent (Buland 2002: 18).

### **3. Discrimination by the Land Grant College Complex Harms Farmers of Color**

The Morrill Act of 1862 set up the nation's land-grant college complex, whereby federal lands were given to each state to endow colleges in agriculture and the mechanical arts. The Hatch Act of 1887 provided annual federal grants for research to each state and set up the state agricultural experiment stations. The Smith-Lever Act of 1914 created the federal-state Cooperative Extension Service, completing the nation's vast agricultural educational system of teaching, research, and extension. Over the years, as U.S. farming evolved to a much grander scale, the land-grant mission shifted from serving America's small family

farmers to meeting the needs of giant agribusinesses. In the process, reductionist concepts of efficiency and productivity came to predominate the mission. Federal and state research grants and extension service priorities in the land-grant college system have mostly been directed toward the needs of large-scale monocultural agribusiness, while neglecting smallholder, intensive polycultures more typical of ethnic minority operations (Warner and Christenson 1984).

*Research and Development Bias.* Scientific priorities and technical practices embraced by professionals in the land grant college-extension service complex are biased in favor of white-dominated corporate agribusinesses interests and priorities; this includes racial, class, and cultural bias in the definition and shaping of priorities for research and development, extension services, conservation programs and other agricultural programs that have the effect of marginalizing the special assets and needs of smallholder farmers of color. Agricultural research has long been subsidized by agroindustrial capital (Hightower 1976; Busch and Lacey 1983). This institutional context has encouraged reductionist research, contributing to the displacement of diversity by uniformity as the key measure of agricultural performance. Agricultural research has also been biased in favor of larger corporate growers by focusing on the development of high-input, high-yield hybrids, which require capital expenditures beyond the reach of smallholding producers.

Biotechnology takes this one step further by increasing and concentrating technological and financial resources in the hands of an even smaller set of multinational, vertically integrated, chemical/seed corporations. Biotechnology research may well come at the expense of studying alternative and sustainable agroecological food production models and the role of ethnic minority farmers (and farm workers). These inequities, perhaps inadvertently, being reinforced by our nation's great research and agricultural development institutions need to be addressed. The current focus on biotechnology probably means that a disproportionate share of R&D resources will continue to serve large-scale corporate agribusiness firms, with detrimental consequences for smaller family farms, including most of those operated by people of color. One study demonstrates that the most active agricultural biotechnology research programs in the universities are those with direct industry partnerships (Krimsky 1991).

Biotechnology has also shifted attention from the ecological to the microbiological level of analysis (Jackson 1987). This technology, based on the molecular reconstruction of the DNA code with little regard for ecological consequences, is accelerating the rate at which diversity is reduced to uniformity (from the genetic through the landscape ecology levels). Precision farming is merely an expression of the desire by biotechnological capital to assert command and control at all levels. Farmers become contract growers (i.e., bio-serfs) who must conform to the imposition of an externally administered corporate plan of organization and the rule of (patent) law. The place for farmer autonomy, as well as locally adapted technical innovation, is probably eliminated by this new highly integrated, spatially-dispersed, and hierarchical structure.

*Biases in Economic Analysis.* For farmers of color, the corporate bias of the agricultural research establishment has too often meant that sustainable agroecological alternatives are overlooked and devalued. The conventional agricultural research and extension perspective presents technology through the filter of a mechanistic and market-driven paradigm that overlooks cultural and ecological components of farming systems. Critics note how “[a]s an heir to the logical-positivist tradition, the conventional ag scientist will attempt to understand sustainable agriculture in terms of existing mechanistic models... Historically, we have viewed our farms as factories and applied the laws of efficiencies, economies of scale, and economics as if agriculture were [only] an industrial process” (Matheson, Oien, and Kurki 1991:301). However, science and technology do not have to be reduced to a one-dimensional mechanical aspect. The study of agricultural systems could involve more subtle and, admittedly, more difficult attempts to understand the techniques of an agroecological paradigm, one that views the farm as a living organism and ecological community instead of as a machine (Altieri 1995; Jackson 1987). This is the approach of agroecology that favors a more holistic view emphasizing the interrelation of ecological, cultural, social, and economic aspects of farming.

The time has come to challenge the hegemonic concepts of efficiency and productivity — and the displacement of local knowledge by “scientific” agriculture. While the current research focus on biotechnology is merely an extension of a long historic trend, because of the rapidity of its developments,

there is a new sense of urgency about this need to challenge the establishment. Agricultural productivity must no longer be reduced to measurements of economic output derived from narrow formulas that deify mechanized economies of scale. Agroecologists recognize that productivity must be measured in terms of the land's capacity to renew its biological diversity and thus to support the long-range sustainability of agroecosystemic disturbance regimes. This is a different view of productivity, one that values the ecological services provided by a farming system (see discussion on pp. 35-36 below).

#### **4. Inequitable Access to Private Credit Markets and Rural Gentrification Harm Farmers of Color**

Patterns of discrimination in the USDA have forced many farmers of color to seek financial resources from the private sector. This has left many of them vulnerable to a variety of harmful and discriminatory practices including predatory lending. In addition, farmers of color are increasingly susceptible to land loss as a consequence of patterns of real estate speculation associated with processes of rural gentrification.

*Predatory Lending Practices.* Discrimination by the USDA has forced many farmers of color to seek financing from private banks and other creditors. This means that farmers of color, like other people of color in rural areas, are especially vulnerable to exploitation, fraud, and manipulation by creditors and subprime mortgage purveyors. Farmers of color are among the limited resource population in rural communities experiencing difficulties in gaining access to private farm production, mortgage loans, and other types of credit. Many farmers of color live in substandard housing and a significant number have to allocate at least half or more of their total income to housing costs (see Zippert 2002). In some cases, farmers of color have had to offer their land holdings as collateral for home mortgage loans that impose outrageously high interest rates or manipulative balloon payments. The result, too often, is foreclosure and land loss.

*Real Estate Speculation and Rural Gentrification.* The loss of land among farmers of color is further compounded by the fact that land values in many rural areas are increasing dramatically. For example, in northern New Mexico land values are now driven by a post-agricultural tourism economy that has inflated real estate values and priced most farmers and ranchers out of the land market (Rodriguez 1987, Peña 1998, Peña and Martínez 2000). An increasing number of rural communities of color are facing displacement and ecological devastation from the so-called "amenity" industries. Toxic racism has its analog in the form of exotic racism, which arises with the so-called new economy based on "global village tourism" and "nature-culture appreciation industries." Exotic racism threatens to consume the landscapes and cultures of rural communities of color as commodities for the amusement and enjoyment of tourists. The new economy of tourism is driven by the growing consumer demand for natural and cultural spectacles. The bucolic scenery and "quaint" local cultures are the basis of this new economy, and yet the political economy of the system tends to undermine that which it would celebrate as an "exotic other" (Peña 1998: 25-57).

Hunting, fishing, hiking, skiing, snowboarding, rafting, and other outdoor recreational experiences are expanding as global investment capital supports the growth of amenity industries. The tourism industry increases the demand for land, and farming landscapes are blacktopped for the construction of resorts, condominium clusters, shopping centers, roads, and other facilities to serve tourists. In New Mexico, for example, a highly speculative market for second homes has emerged, and Chicano farms, orchards, and pastures are over-priced by a globalized real estate market. Some of these ancestral landscapes are being bought out at \$80 to \$100,000 an acre (Peña and Martínez 2000). Pressures to sell are increasing along with the growing burden of property taxes. In this manner, land rich, but cash-strapped, locals are slowly being displaced by the new economy of tourism and the growing market for vacation and second homes (see discussion of land use planning immediately below).

#### **5. Inequality in Land and Water Use Planning and Administration Harms Farmers of Color**

As a consequence of procedural inequities and patterns of discrimination in public policy- and decision-making in the states' and counties' administration and planning of land and water use laws and policies affecting agriculture, farmers of color experience additional negative impacts affecting their ability to manage production or hold unto their land. Two critical areas that merit discussion here are public policies

related to land use planning and zoning at the local level and the imposition and adjudication of culturally-biased water law regimes at the state level.

*Land Use Planning and Zoning.* The role of land use planning, as a factor underlying patterns of environmental racism and the siting of environmentally harmful or hazardous facilities, is a widely documented problem in urban environmental justice struggles (Bullard 1993, 1994; Rechtschaffen and Gauna 2002). Less well known are inequities in land use planning in rural areas and their detrimental effects on farmers of color. The range of problems caused by land use planning for farmers of color run the gamut from the imposition of unwanted land uses that degrade farm land or water resources, zoning laws that encourage the blacktopping of vital farm land to make room for sprawl and gentrification, and exclusion from effective participation in land use planning commissions. One study notes the ineffectiveness of traditional land use zoning as a tool to protect farmers from encroachment by rural developers:

A significant obstacle to keeping land and small farmers in agriculture has been the ineffectiveness of traditional zoning methods...zoning is subject to change when economic forces are sufficiently strong. Those who would profit by a change in zoning from agriculture to development usually succeed in obtaining the change. (Sargent, Lusk, Rivera, and Varela 1991: 94)

There are numerous examples of county-level land use planning that harms farmers of color. In New Mexico, traditional Pueblo Indian and Chicano farmers have resisted encroachment on farmlands and sensitive watershed areas by industrial facilities, ski resorts and other tourism-related facilities, and subdivision developments. The shift from an old extractive economy based on logging, mining, and other industrial activity to a new economy based on tourism has been touted as an ecologically sustainable and culturally sensitive alternative. However, studies show that the new economy of tourism is also harming farmers of color. An important example comes from northern New Mexico where development pressures, combined with weak enforcement of land use codes and zoning laws threaten the preservation of Chicano farmland. The “Valdéz Condo War” is a well-known example of local grassroots resistance to harmful development activities encouraged by weak or biased land use plans (see Rodriguez 1987). Land use planning commissions in rural areas of northern New Mexico have tended to support tourism development at the expense of the preservation of traditional farmlands and watersheds (Rodriguez 1994).

Even in settings where strong participation by farmers in local land use planning commissions is extant, limitations imposed by the courts to protect “private property rights” often result in ineffective defense of the rights of people of color (Arnold 2002, 300). For example, in Colorado’s San Luis Valley, Chicano farmers have been harmed by the inability of the land use planning commission to effectively regulate and restrict activities on private property, even if these bring harm to downstream property owners. This has led one farmer to observe how “...property rights count only if you are rich, white, or well-connected...We also have private property, our farm land is private property, right? But that doesn’t seem to count as far as the local courts are concerned. When it comes to the private property rights of a large landowner like [Zachary] Taylor and the property rights of the acequia farmers, the big landowner wins every time” (Joseph C. Gallegos as quoted in Peña in-press).

The application of tax and other economic policies to the area of land use planning has also proved detrimental to farmers of color. One study notes that: “Federal farm policy has favored farmers with larger holdings, allowing them to purchase adjacent small farms. During the late 1970s and early 1980s, tax laws encouraged non-farmers to buy farms as tax losses...reducing the ranks of small and moderate family farms...” (Sargent, Lusk, Rivera and Varela 1991: 94). As a result of powerful economic interests, land use planning and zoning have generally failed to protect black and Latino farmlands from the effects of encroachment. This too often has resulted in the displacement of traditional farmers of color; many can no longer afford to continue farming given the additional pressures of land development and rising property values discussed earlier. Efforts to restrict subdivision developments through land use planning and zoning have generally proved ineffective as strategies to protect farmers of color in Southwestern and Southern rural communities as a consequence of other policies that privilege the development rights of larger property owners and real estate developers.

*Appropriation and Adjudication of Water Rights.* Native American and Chicano communities long have struggled over water rights.<sup>viii</sup> Native American water rights, writ large, were confirmed under a 1908 U. S. Supreme Court ruling that established the so-called Winters Doctrine. The Winters v. United States decision involved a lawsuit brought by the Ft. Belknap tribe against white settlers over water rights to the Milk River in Montana. It established the basic principle that the U. S. Congress, in establishing reservations had also intended, implicitly, to grant Native Americans water rights whose existence was, de jure, prior to the adjudicated water rights of nonnative settlers (see Shurts 2000). However, the Winters Doctrine, as the principle of reserved water rights for Native Americans is known, conflicted with the dominant legal regime, particularly extant in the Western states, of appropriative rights that established the principle of “first in use, first in rights” (a.k.a. the doctrine of prior appropriation). This means that Native American tribes, generally, have legal or “paper” water rights but in most cases lack clearly adjudicated “wet” water because white settlers have prior appropriated and adjudicated water rights. The past one hundred years have thus witnessed an unending stream of litigation involving efforts by Native American tribes to secure “wet” water to match their paper rights (Shurts 2000; also see Hundley 1978, Deloria 1985).

As previous studies have noted, during the first fifty years after the Winters decision, the states basically ignored the doctrine of reserved rights for Native Americans, preferring instead to abide by the dominant regime of appropriative rights (Brown and Ingram 1987: 122). It was not until 1963, and another Supreme Court decision in Arizona v. California, that the states were forced to recognize and implement the Winters Doctrine. Despite these legal developments, many Native American nations are still without water; they have suffered dire economic losses, social upheaval, and damage to their cultural integrity.

Chicano acequia farmers have also been harmed by the imposition of the doctrine of prior appropriation. The acequia irrigation systems of New Mexico and Colorado are among the oldest institutions of local self-governance and watershed management in the United States (Peña 1998, 1999, 2002, Rivera 1998, Hicks and Peña 2003). The Pueblo Indian and Chicano acequia irrigation tradition is widely recognized as a rare type of “watershed democracy” and a critical component of an indigenous form of sustainable agriculture (Peña 1998, 1999, Rivera 1998). The acequia is a snowmelt-fed, gravity-driven, earthen-work, and communally managed and maintained irrigation institution recognized under federal law as an important part of our nation’s heritage. The 1987 Water Resources Development Act (Public Law 99-662) recognizes the acequia system as an “early engineering work [of] significance in the settlement and development of the western portion of the United States.” The Act thus declares “that the restoration and preservation of the Acequia systems has cultural and historic values to the region” (as quoted in Rivera 1998: 149).

Despite the supportive rhetoric of federal water development statutes, the imposition of the doctrine of prior appropriation has proved extremely harmful to the acequia communities of the Southwestern United States. It is important to note that the customary law of the acequia considers water a communal resource while the appropriative rights regime treats water as a private commodity right. While the customary law of the acequia ties water to the land, the appropriative rights doctrine allows for the severing of water from the land for marketing to “higher” and “more efficient” uses; hence, the aphorism: “In Colorado, water moves uphill towards money.” Another important difference is the manner in which the two water law regimes define beneficial use and efficiency. The acequia doctrine embraces an essentially biocentric (earth or life-centered) concept of beneficial use that derives from the ancient Islamic “right of thirst” (see Rivera 1998, Peña 1999, Peña and Martínez 2000, Wescoat 1998). This means that beneficial use is not restricted to uses that are beneficial to humans; all living things with thirst are seen as having a right to water (Wescoat 1998: 259; also see Clark 1987: 9-10). In contrast, the doctrine of prior appropriation has a markedly anthropocentric (human-centered) concept of beneficial use emphasizing the idea that beneficial use must satisfy human economic needs (see Hicks and Peña 2003).

Moreover, the customary law of the acequia involves a system that, if viewed from the vantage of a purely economic and utilitarian rationality, is not altogether that efficient. The earthen-work ditches leak water to the surrounding landscape, creating vast corridors of native riparian vegetation; the process of flood irrigation results in the creation of anthropogenic (human-induced) wetlands because subirrigation leads to

the accumulation of water in natural sumps. The acequia system is in fact based on an incomplete control of the water that allows for the overall healthy functioning of the watershed (e.g., through aquifer recharge, water filtration, return to in-stream flows, and the creation of wild life habitat). However, water courts, water district commissioners, and the State Engineers Offices (SEO) in Colorado and New Mexico generally have frowned on these characteristics as examples of a primitive irrigation technology that is “wasteful” and “inefficient” (see Hicks and Peña 2003). Under the appropriative rights regime, there is an over-riding concern with establishing the primacy of the principle of maximum utilization as an underlying value that guides the complex political and legal processes in the decreeing, appropriation, and adjudication of water rights.

These normative and legal conflicts have undermined community acequia systems in several important ways that harm traditional acequia farmers. First, many acequias lost much of their water over the course of the late 19<sup>th</sup> century and the first half of the 20<sup>th</sup> century when water rights were re-adjudicated under the aforementioned terms set forth by the doctrine of prior appropriation. Despite their standing as the oldest adjudicated water rights in the Southwest, many acequias saw their apportionments eliminated or cut on the basis of culturally biased principles of waste, efficiency, and maximum utilization.<sup>ix</sup> This obviously greatly reduced the acreage for acequia irrigation. Second, the appropriative rights regime imposes a system of priority calls (i.e., first in use, first in right) that directly conflicts with the customary law of acequias. In times of drought, the water district commissioners follow priority lists and this constrains the traditional acequia practice of shared scarcity (every one uses less water so all the irrigators can have some water for vital food crops). These modern practices undercut the ability for acequias to manage their own water resources and cause grave economic damage to acequia farmers who are left without water. Third, the appropriative rights regime increased pressure on the acequias to “modernize” the ditches by lining them with cement or adopting new techniques like drip irrigation or the use of corrugated pipes. Acequias have resisted such modernization because they value the communal labor cycles required for the maintenance and operation of earthen-work ditches and recognize the important ecological services provided by the moist acequia banks (see discussion on agroecological knowledge and ecosystem services in section 10 below).

It seems clear that the dominant institutions of water resource management and use, particularly those that operate under the appropriative rights regime in the western portion of the United States, represent a serious, long-term threat to the survival and sustainability of traditional community irrigation systems like the acequia. Both Native American and Chicano farmers are threatened by a water rights regime that commodifies water and disregards the cultural, social, and ecological values of customary laws and communal values. The role of racial and cultural biases in water rights regimes is a critical public policy problem for the EJM.

## **6. Inequitable Access to Public Lands and Open Space Harms Urban and Rural Communities of Color**

Patterns of inequitable access to public lands, parks, open space, and other environmental amenities are well documented (Rechtschaffen and Gauna 2002, 80-85). With the growth of African American, Latino, and Asian American populations, demographic shifts are reshaping the nature of public land use patterns in the United States, especially in the national parks and forests (see Salinas 1999 and Floyd 2001). There are persistent and growing patterns of inequitable access to public lands and open space resources and amenities as well as conflicts with land managers and other users with claims under the government’s multiple use policy (West 1989, Gramann 1996, Floyd 2001). Commenting on inequities in access to environmental amenities like trees, parks, open space, and waterfronts, Samara F. Swanston notes that “...open space in urban areas is as significant to the environmental health of urban residents as areas in pristine conditions are to people in rural areas” (2002: 82).

The issue of access to public lands, parks, and open space is not related to sustainable agriculture or local food security in any obvious way. However, access to national forests and grasslands is an important issue for farmers and other people of color, particularly from the vantage of the informal production of goods destined for use in a system of local food security. Beyond the more obvious concern of ranchers of color for access to grazing rights on public lands, many people of color, in both rural and urban communities,

may use these lands for foraging activities, i.e., to gather a wide variety of plants for medicinal and edible purposes.

Responding to mounting pressures for policy changes to address demographic shifts and discrimination against people of color, the USFS held a “National Conference on the Interrelationship between Demographic Shifts and Natural Resource Management” in June 2000 to initiate discussions related to inequities and conflicts associated with increasing demands for access to public lands by urban and rural communities of color. African American, Native American, Latino, and Asian American communities in many metropolitan areas, including the Los Angeles basin, regularly rely on access to the surrounding national forests, parks, and open spaces to forage for medicinal and edible wild plants. However, conflicts with people of color occur because national park managers and other federal land managers must enforce laws that prohibit the gathering of wild plants or because the predominantly white recreational users are offended by the presence of people of color engaged in foraging activities.

One of the objectives of the USFS June 2000 conference was to review proposed changes to the rules governing the National Forest System Land and Resource Management Planning (36 CFR Parts 217 and 219, Federal Register, October 5, 1999). While people of color, primarily academics, were invited to participate in this important conference, some of these participants felt that it was too little too late. The current author objected that academics of color should have been involved in the process that led to the development of the proposed rule changes instead of being asked to respond to rules that had already been developed and posted. This process had included the deliberations of an academic expert panel charged with developing “recommendations for stewardship of the national forests and grasslands into the next century” (Committee of Scientists 1999). There were no academics of color included in the Committee of Scientists (nine of the twenty-one members were white women). This is an example of continuing problems with the exclusion of people of color from important advisory and decision-making boards and commissions that shape our nation’s environmental policies.

It is now widely recognized that cultural differences exist with respect to the use of national forests, grasslands, parks, and other open spaces (Gramann 1996). In general, urban-based whites tend to view public lands as places for outdoor recreation (hiking, bird watching, scenic appreciation, etc.), while people of color may use the outdoors for recreation but are also more likely to use public lands for foraging activities. These differences are significant in and of themselves, but from the vantage of the EJM, they are significant as a source of continuing inequities in the management of access to the public land resources of the nation. There is an urgent need for federal land managers to recognize the place of public lands in the subsistence and food procurement strategies of people of color. In this sense, access to public lands is part of the struggles by communities of color to deal with local food security.

## **7. Loss of Access to and Control of Historic Common Property Resources Harms Farmers of Color**

During the westward expansion of the United States, millions of acres of ancestral Native and Mexican American common lands were enclosed by the federal and state governments for the establishment of the so-called public domain (see Briggs and Van Ness 1987, Acuña 1988, Ebright 1994, Oswalt 1988). These include many lands that are now administered as part of the national forests, grasslands, monuments, parks, and wildlife refuges. Many more lands were lost to encroachment and usurpation by private land speculators. Today, there are hundreds of tribal and mestizo communities that continue to press for resolution of disputed claims to ancestral land, water, and other natural resources. Struggles to restore traditional resource rights and local self-management of watersheds remain critical aspects of the EJM.

Among the sovereign nations of Native Americans, land loss was the direct result of military conquest and white settlement. Between 1778 and 1871, the United States negotiated hundreds of treaties with Native American nations, and most of these involved the removal of indigenous communities from their ancestral lands. The Indian Allotment Act, also known as the Dawes Act, was adopted in 1887 and it played a significant role in further undermining Native American control of remaining ancestral lands. As a result of the Dawes Act, close to 50 million acres of Native lands are now held “in trust” by the federal government. These lands have been mismanaged for decades and are now the subject of a massive lawsuit that resulted in a judgment against the Department of Interior alleging for fraud, mismanagement, the loss



of more than ten billion dollars, and even contempt of the court for a failure to implement the requirements of the ruling.<sup>x</sup> This history of conquest and land theft undermined, and in many cases destroyed, Native American agricultural systems and traditions. Policies that led to forced removal from ancestral homelands or that imposed a system of forced assimilation contributed to the loss of Native American knowledge of agriculture and further weakened ancestral ties to the land (see Jaimes 1992 and Churchill 1993).

The loss of land among the Mexican-origin people was one of the most important factors shaping their experiences during the 19<sup>th</sup> and 20<sup>th</sup> centuries. More than 35 million acres of Spanish and Mexican land grants, subject to adjudication after 1891 and the establishment of the Court of Private Land Claims, were lost. The Court confirmed only 2.05 million acres (Deutsch 1987: 20). Many of these lands were lost to the expansion of the railroads and the incursions of Anglo homesteaders. Unscrupulous lawyers took large portions of the land grants as payment for defending the aboriginal land claims before the legal system. An even larger chunk of the common lands were converted to the public domain, and they became part of the system of national forests, grasslands, parks, and monuments. Article 8 of the Treaty of Guadalupe Hidalgo was to protect the land rights of the Chicanos. However, the treaty was not enforced and a variety of mechanisms were used to take the land from the Mexican-origin people (see the policy paper prepared by Ruben O. Martínez for further discussion). The theft of land grants was accomplished through title fraud, taxation, condemnation by the government, and violence. For example, in New Mexico the infamous Santa Fe Ring, a group of land speculators and lawyers, gained control of land grants through title fraud, destruction of court records, and lawsuits to partition the common lands into private holdings. In some cases, lands were lost because the people failed to comply with new tax and land registration laws. The laws were written in English and legal notices were not discernable to the majority of Spanish-speaking Chicanos. Many land grant heirs did not have the financial resources to defend their claims before the courts and had to pay with portions of the grants, which they turned over to lawyers as collateral in lieu of cash payments.

The new Anglo American legal system was hostile to the claims of the Chicanos for protection and confirmation of their land rights, and especially the common lands of the Spanish and Mexican grants. This pattern of legal hostility was cemented when the U.S. Supreme Court in 1897 issued its infamous United States v. Sandoval decision involving the San Miguel del Bado land grant in New Mexico. Malcolm Ebright, a renowned legal historian, summarizes the significance of this decision: “It appears that the Supreme Court was in error on this point of Spanish and Mexican law. After the 1897 Sandoval decision, the land claims court rejected the common lands of every community grant that came up for adjudication. The vast acreage acquired by the United States now comprises most of Kit Carson and Santa Fe National Forests in Northern New Mexico” (1994: 48-9).

In similar fashion, land grants in Arizona, California, and Texas were also lost to the Anglo American speculators and settlers. In California, the Gold Rush brought white squatters who overwhelmed the rancheros. New laws establishing land and poll taxes compounded the pressures exerted by squatters. Unable to respond to the new economic system, the rancheros mortgaged land grant holdings to pay taxes and quickly lost their lands (Acuña 1988: 115-116). In Texas, similar laws displaced the Mexican-origin people from the land. However, the use of violence played a major role when groups like the Texas Rangers forced Mexican Americans from the land to make way for new Anglo-owned cattle ranches. The Texas Rangers tolerated and even encouraged lynching to terrorize the Mexican Americans into submission and to force families to sell their land grants to Anglo speculators for pennies an acre (Acuña 1988: 27-31). Millions of acres in land holdings were transferred in this manner to the newcomers. The problem of lost common lands is widespread, as indicated by a General Accounting Office report that lists 154 community land grants for New Mexico alone (see General Accounting Office 2001).

African American communities also have long struggled to preserve commonly held and used natural resources. The “Low Country” basketmakers from the coastal and island communities of South Carolina are an example of a rural African American community seeking to protect the natural resources that are basis of their right livelihoods. In this case, African American men and women basketmakers seek to protect the native meadowlands habitat of sweetgrass (*Muhlenbergia filipes*). Sweetgrass is inextricably connected to the persistence of their culture and livelihoods. The threats posed to sweetgrass habitat by development endanger an artisan tradition and its local culture and economy. As one collector of

sweetgrass explains: “I was collecting sweetgrass for forty years. But current change in coastal land use and lifestyle put the place of a basketmaker in jeopardy. A lot of habitat are [sic] developed as beach resort and planned closed community. So the sweetgrasses are destroyed” (South Carolina Folk Arts Program 1988: 33). Historically, sweetgrass habitat was found on lands that were managed as common property resources (CPRs) by African Americans, even if the land was formally under private ownership.

Similar problems of habitat destruction and watershed impairment have affected the ability of traditional acequia farmers to irrigate. Across much of northern New Mexico and southern Colorado, logging activities in upland headwater zones have transformed the hydrology of basins such that the rate of spring runoff has been dramatically altered. Hydrologists call this an altered stream hydrograph slope and refer to changes in the rate at which snow pack melts to produce runoff that feeds the watercourses and irrigation networks. Logging opens up the tree canopy and thus accelerates the rate at which snow pack turns to in-stream flow (especially during common springtime rain-on-snow events); it also increases sedimentation of watercourses and ditches caused by erosion from timber roads and skid trails. This has affected the ability for acequia irrigators to manage the runoff and has shortened the irrigation season by as much as three to six weeks (Curry 1995, Curry, Soulé, Peña and McGowan 1996). The enclosure of common lands in this manner undermines the ability of communities to manage their watersheds in a sustainable manner (see Peña 2002).

Clearly, the enclosure and commercial or industrial exploitation of CPRs has undermined the ability for local communities of color to conserve their natural and cultural assets in a manner that supports traditional agricultural systems and community stability. The restoration and protection of these natural and cultural assets is critical to the material livelihoods of numerous Native American, African American, and Latino land-based communities. Unless these communities can find ways to restore and protect their CPRs, then the local watershed and economic values that support their local economies, involving both agricultural and artisan traditions, will continue to be compromised.

## **8. Erosion of Local Food Security Harms People of Color in Rural and Urban Communities**

It is one of the great ironies of the last fifty years that in the midst of record-breaking quantities of food, there is so much hunger and malnutrition. As a nation we are producing more food today than at any previous time in history, and yet hunger, malnutrition, obesity, and related health problems are also becoming much more widespread (Rosset 1999: 330). A recent report on food, diets, and health in the United States notes the existence of “a clear social divide” in which poor people suffer from a lack of access to nutritious and fresh foods:

Both hunger (which still afflicts 10 million households in America) and unhealthy excess correlate closely with poverty and poor education. Shops in poor neighborhoods stock less fresh food (and at higher prices) while fast-food joints proliferate. Poorer people also have fewer parks and playgrounds in which to exercise (The Economist 2002:23)

This report makes the critical point that many of our food-related health problems come not from a lack of access to food but from an excess of access to unhealthy foods (i.e., high sugar, high carbohydrate, and high fat foods). Recent government reports confirm that obesity is a nation-wide epidemic that seems to disproportionately affect low-income people (Schlosser 2001).

However, these reports fail to consider that the most serious problem underlying patterns of hunger and malnutrition in communities of color is the loss of local food security. This is an issue that affects communities of color in both rural and urban contexts. The concept of local food security goes beyond the conventional issues of hunger and malnutrition. At its heart, local food security involves issues of unequal access to locally-produced, affordable, nutritious, culturally-appropriate, and safe sources of food (Boucher 1999 and Henderson 2000).

Other studies demonstrate that over 30 million U.S. residents (10.5 percent of the population) experienced food insecurity in 2000 (Gottlieb, Fisher, and Jakowitsch 2002: 1; also see Nord 2002). While we might

think that this problem primarily affects the inner-city poor, close to 14 percent of rural residents also faced food insecurity in 2000. Furthermore, people of color tend to pay higher prices for produce of inferior quality (Gottlieb, Fisher, and Jakowitsch 2002: 2-3).

Studies suggest that there are typically three times as many grocery stores per capita in upper and middle-income neighborhoods compared to low-income neighborhoods (Cotterill and Franklin 1995; Shaffer 2002). When race is included, then there are four times as many groceries in white neighborhoods compared to black neighborhoods (Morland et al 2002). These disparities are further compounded by problems that stem from inequities in public and private transportation. Studies demonstrate that people of color in rural and urban communities have inequitable access to mass transit and this affects their ability to obtain food security. As Gottlieb and colleagues note: “Residents of urban neighborhoods with few food markets have to travel farther to shop for food...without adequate transportation options, many families are denied equitable access to fresh, nutritious food” (Gottlieb, Fisher and Jakowitsch 2002: 3). The relationship between transit injustice and local food insecurity makes an even stronger case for the development of local alternatives to provide low-income communities of color with access to affordable, safe, and nutritious food sources. The recent proliferation of urban farmers’ markets has not generally served low-income communities of color; the principal beneficiaries of this encouraging but highly stratified trend appear to be white middle and high-income residents.

### **9. Alternative Agriculture: Forgetting the Social Side of Sustainability?**

Given the previous discussion on the erosion of local food security, the development of the organic, community-supported, and sustainable agriculture movements seems particularly relevant. However, these movements, despite their progressive and social change orientation, have only begun to address the social side of sustainability. Alternative agriculture movements have emphasized ecological sustainability and the survival of family farming. These are important objectives. However, there is a pressing need for these predominantly white alternative agriculture movements to become more sensitive and responsive to the issues posed by farm worker, farmer of color, native people, consumers of color, and grocery workers’ demands for environmental justice, equal exchange, workplace democracy, food security, and restoration of communal land and water rights. These movements must seriously consider the environmental justice implications of their own philosophies, strategies, organizational forms, and policies.

The organics movement is not inherently just, and may in fact reinforce existing patterns of inequality in access to safe and nutritious foods. For example, the Organic Consumers Association endorses the concept of “biodemocracy” and emphasizes food safety, organic farming, and sustainable agriculture. This organization, in typical fashion, emphasizes problems such as genetic engineering, irradiation, toxic sludge fertilizer, mad cow disease, and rBGH (bovine growth hormone in milk cows). The Organic Farming Research Foundation is an example of the type of organizational philosophy that characterizes much of the sustainable agriculture movement; this group sponsors research related to organic farming practices and disseminates research results to organic farmers and to growers interested in adopting organic production systems. The myopic approach of much of the organic and sustainable agriculture movement has long been criticized. In an pioneering critique published more than a decade ago, Patricia L Allen and Carolyn E. Sachs argued that

Dominant sustainability discourses generally do not analyze the different interests and classes that participate in the food and agriculture system...In most sustainability discourse, women’s demands for change have not been incorporated; rather, the farmer [and farm worker] is assumed to be male...Discussion of race and ethnicity is also absent. To some extent, this is a result of the absence of people of colour from decision-making positions in Western agriculture. People of colour have been integral to the functioning of American agriculture, but in subordinate roles...The dominant vision seems to focus on the profit needs of white farmers and the food needs of affluent (and predominantly white) consumers and therefore reproduces existing race relations. (Allen and Sachs 1991:578-582)

Recent trends suggest that this situation has only worsened in many quarters. Perhaps this is partly due to the fact that corporate agribusinesses have increasingly co-opted the organic farming movement for their own purposes. One observer notes:

As corporate agribusiness enters the field of organics, small-scale organic farmers have seen the principles and values of “organic” farming co-opted in the marketplace. There is an emerging chasm between those who simply view “certified organic” as a marketing tool and those who believe that organic farming must be a sustainable agricultural practice...How sustainable is a large-scale organic dairy operation situated in a desert? How sustainable is an organic farm that depends on “illegal” migrant laborers? (Zastrow 1999:1)

The corporatization of organic, and other forms of sustainable, agriculture is a growing trend with troubling implications not just for alternative agriculture movements but the EJM as well. But “traditional” and “corporate” organic farmers are not necessarily different in their use of labor simply as an extension of the differences in their scales of production. In fact, small-scale organic farmers have also exploited migratory farm workers as is evident from reports on the experiences of Mexican workers in the California and Pacific Northwest organics industry (Voeltz 2002). The EJM is poised to challenge the politics of sustainable agriculture by focusing attention on the need to integrate the ecological and social sides of sustainability.

#### **10. Conflicted Academics: Agroecology versus Biotechnology**

While racist policies in the USDA and the land grant college-extension service complex have directly undermined farmers of color, research scholars in academic institutions outside this complex have also contributed to the proliferation and persistence of the social, economic, and political problems facing our communities. A principal issue is the continuing lack of legitimacy attributed to the local knowledge and place-based agroecological practices of farmers of color. Academic research institutions outside the land grant college complex have generally failed to address the concerns and knowledge bases articulated by farmers and communities of color. Few academics seem to understand the real ecological, social, and economic value of black, Latino, Asian American, and Native American farmers and landowners.

The lack of academic research on the contributions of farmers of color is reinforced by media stereotypes, many of which are uncritically accepted and internalized by people of color. As one African American farmer explains:

...the media [are] largely controlled and our images are manipulated in the headlines to suit the stereotypes of white people...When you say black farmer and ask someone what image comes to mind, many will see a dirty, ignorant, barefoot, uneducated person. Many blacks see the stereotype. They don't understand that the black farmer has been a mathematician, a scientist, a meteorologist, a doctor, a veterinarian, and even a lawyer. Until we are able to destroy that stereotype, black farmers will always be misunderstood and unappreciated by our professional people (Grant as quoted in Bullard 1999:4).

This suggests that the problem of legitimacy (of local agroecological knowledge) is as much a problem within the academic community as it is an aspect of the internalized racism in our own communities. Farming is too often viewed by people of color as a stigmatized lifestyle full of drudgery and lacking skill or knowledge.

Agroecologists and environmental anthropologists have made important contributions to the documentation and legitimation of the sustainable knowledge of traditional smallholder farmers. However, most of this research has focused on third-world peasant and indigenous farmers (see, for e.g., Altieri 1995). The study of agroecological farming practices in the context of communities of color in the United States has eluded most researchers.<sup>xi</sup> One study of historic acequia farms in the Upper Rio Grande amply demonstrates the wealth of agroecological knowledge, and sustainable practices, among Chicanos (Peña 1998, Peña and Martínez 2000, Peña and Martínez in-press, and Peña in-press). Another study has documented the

ecosystem and economic base services provided by traditional acequia farms in the Upper Rio Grande watershed (Peña 2003b). The acequia system generates agricultural income in goods and services sold in markets as well as through informal barter. In addition to being productive agricultural systems in their own right, the acequia agroecosystems are storehouses of native wild plant and landrace crop genetic diversity. The value of heirloom landraces and traditional knowledge to local plant breeders includes annual savings from reduced seed purchases, reduced agrochemical inputs, and reduced losses to pests and other pathogens. These heirloom landraces have additional value as a “firewall” protecting agricultural and food security from threats posed by the erosion of genetic agrobiodiversity. Second, the raw materials, open spaces, wildlife habitat, vernacular architecture and built environments generated by the acequia system produce significant artisan, subsistence, and amenity values.<sup>xii</sup> Third, the acequia system provides ecosystem services such as soil formation and water quality for the seven-county bioregion. For example, the anthropogenic wetlands created by acequias produce higher water quality, which in turn reduces the cost of water treatment and pollution mitigation.

The study estimates that the historic acequia agroecosystem biome in the seven-county Rio Arriba bioregion annually produces an average of \$350 million in agricultural, open-space, wildlife habitat, water quality, forest conservation, and other environmental and economic values.<sup>xiii</sup> These findings clearly illustrate the need for further research on the agroecological knowledge and practices of traditional farmers of color.

Finally, the problems endemic to the epistemological orientations of mainstream academic research institutions derive from the scientific and ideological conflicts that exist between biotechnology and agroecology as opposing paradigms of sustainable agriculture. Most tier-one research universities, such as the University of Texas, University of California, and University of Washington, emphasize direct links with the private biotechnology sector. The interlocking relationships between university-based researchers and agricultural biotechnology corporations pose serious questions related to ethics and conflicts of interest (see Krinsky 1991). This interlocking set of relationships means that the production of scientific knowledge and discourse is, in effect, “market-steered” and this limits the prospects for a balanced research agenda that can address the needs of smaller farm operations, including those owned by people of color. The EJM must develop a systematic critique of these biases and conflicts of interest and press the public universities to attain some semblance of scholarly balance by supporting research scholars in the fields of agroecology, environmental anthropology, and related disciplines. Clearly, the hegemony of the biotech industry in academic research must be challenged.

### **Environmental Justice Policy Goals and Actions for Sustainable Agriculture:**

The EJM must continue developing a progressive vision of sustainable agriculture to effect changes in the direction of public policy discourses. It can do so by contributing to the analysis of food production and consumption as social justice problems in local, regional, national, and global contexts. It can do so by demonstrating the role of racial and class discrimination in the experiences of people of color with land loss, farm labor exploitation, hunger, malnutrition, and health problems. Environmental justice frames the goals of sustainable agriculture according to the values and objectives of social justice and equity. An environmental justice framework for sustainable agriculture might therefore support the following objectives:

- Farm worker rights to organize to attain workplace health and safety and economic justice;
- Elimination of racial and class discrimination in federal and state agricultural policies and especially in farm loan, subsidy, and conservation programs;
- Survival and flourishing of family farms owned and operated by people of color; restoration of the lost lands of African, Native, Latino, and Asian American farmers and recovery of traditional customary systems of local management of natural resources and watersheds;
- Local food security to promote self-sufficiency, autonomy, and health of communities of color;
- Development of organic, community-supported, and alternative methods of farming to serve low-income families and the elderly in urban and rural communities of color;

- Protection of traditions of seed saving of heirloom crop varieties by farmers of color and resistance against the “patenting of life;”
- Adoption of the “Precautionary Principle” and solidarity with farmers, seed savers, and food consumers of color opposed to the commercialization and environmental release of GEOs (Genetically-engineered organisms) and the marketing of transgenic foods;
- Recognition of the contributions of farmers of color in the development of place-based agroecological knowledge;
- Recognition of the ecological, economic base, and social services and benefits provided by farmers of color as managers of millions of acres of farmland, open space, wildlife habitat, and diverse and healthy cultural landscapes.

## **1. Linking Environmental Sustainability and Social Justice for Farm Workers**

*Protection and organization of Farmworkers* . The most fundamental policy goals and actions for the EJM to consider in this area must focus on the rights of farm workers to self-organize into unions, and other organizational forms, in order to pursue environmental protection in the workplace, healthy living conditions, access to medical care, and just and livable wages. The search for collective bargaining rights and negotiated contracts remains a critical, and largely unfulfilled goal, of the farm worker movement (see Majka and Majka 2000). How can farm workers improve working and living conditions unless they are first able to negotiate with growers as organized laborers? It is essential that the EJM support farm worker organizations including the Farm Worker Network for Economic and Environmental Justice (FNEEJ), the Farm Labor Organizing Committee (FLOC), and the United Farm Workers of America (UFW) in their efforts to secure legal rights and collective bargaining contracts with growers . The resurgence of the Farm Labor Contractor (FLC) system is a major barrier to the self-organization of farm workers (Majka and Majka 2000); this basic injustice must be addressed by the EJM.

It is also important that the EJM recognize that not all agricultural workers are field laborers. Many farm workers are employed in packing sheds, warehouses, and processing plants. For example, the exploitation of Latino immigrants in the meatpacking industry is an area that urgently needs our attention (see Gouveia 1994). Workers in meatpacking and other processing plants and so-called canneries face some of the most hazardous working conditions in the country and this is reflected in the extraordinarily high rates of death and injury from industrial accidents.

*Transgenic crops and biosafety*. An emerging issue of concern is related to the growing use of genetically-engineered crops (GEOs or transgenic crops) in the agribusiness sector. In many cases, this means that farm workers are being exposed to higher levels of herbicides, pesticides, and other agroindustrial chemicals. As we have seen, many transgenic crops have been designed to withstand higher treatment protocols and this means that farm workers are facing even greater risk from increased levels of exposure to toxic substances (see Peña 2003a). A related cause for concern is the possible impact of transgenic crops in the diets of farm workers. Many farm workers will eat whatever crops they happen to be harvesting; this means they could face higher rates of exposure to the transgenic substances in bio-engineered crops. Some of these transgenic crops include protein sequences and gene fragments that convey antibiotic resistance (usually these are present as promoters as in the case of the Cauliflower Mosaic Virus, CaMV). We do not yet know if these gene and protein sequences will have compounding or cascading effects on the effectiveness of antibiotics in the treatment of human infectious diseases. We do not yet have a predictive ecology or epidemiology for these potential effects on farm worker health and safety; thus, as recommended below for other areas of agricultural policy, the EJM must urge the adoption of the “Precautionary Principle” and call for the banning of transgenic crops until these risks can be determined. Obviously, if scientific research demonstrates a link between transgenic crops and the impairment of antibiotic effectiveness in humans, then the EJM might work to completely ban the planting of transgenic crops as a threat to public health and safety.

*Farm worker cooperatives*. Perhaps the most powerful pathway to environmental sustainability with social justice for farm workers is for the EJM to support their efforts to make the transition from farm work to farm ownership and operation. Farm worker owned cooperatives have a successful track record in

California and other parts of the country (Rochin 1988). The principle of self-determination is paramount here, and the EJM must continue supporting efforts by farm workers to establish worker- and community-owned and self-managed cooperatives. The linking of workplace and economic democracy will strengthen the prospects for environmental protection, health, safety, and social and economic justice for farm worker communities. This should become a priority for the EJM. This also has important implications for the recovery of local food security (see discussion in section 4 below).

## **2. Reforming the USDA and Land Grant College-Extension Service Complex**

*Eliminating Racial Discrimination.* All areas of institutional organization related to agricultural policy under the control of the USDA – including farm loans and credit, subsidies, and conservation – must be transformed to eliminate persistent patterns of racial discrimination. The just settlement of lawsuits (i.e., Pigford, Keepseagle, and García) is only a beginning. The EJM must pressure the USDA to increase its monetary settlements to address the unresolved issues posed by these lawsuits, and especially by black farmers in Pigford, over the problems of foreclosure. As noted earlier, the settlement in Pigford did not go far enough and additional resources must be committed if the loss of farm lands due to foreclosure is to be reversed. The EJM should call for an immediate halt to foreclosures and demand the forgiveness of all debt incurred by farmers of color as a result of action (or inaction) by the USDA. The average debt load for African American farmers is approximately \$75 to \$100 thousand. Subsequent court-mandated settlement agreements must address demands for debt forgiveness. Moreover, the USDA must be forced to return any land that it has unjustly acquired from farmers of color through discriminatory foreclosure actions.

*Integrating People of Color in Agency Leadership and Staff.* Beyond the need for compensatory justice for farmers of color, there are enduring problems within the organizational structure of various components of the national agricultural establishment. For example, the structure of the local county committees must be addressed, because it leads to racial discrimination in loan, credit, and subsidy programs. As we have seen, there is also discriminatory treatment of farmers of color in the area of natural resource conservation. Decisions by white farmer-dominated local committees have long negatively impacted farmers of color in all these areas. The EJM must insist on a complete overhaul of these local committees so that farmers of color are equitably integrated into every level of decision and policy-making.

The integration of people of color into the leadership and staff of the various agencies of the USDA, including the Forest Service, remains illusive and is the subject of growing internal criticism. A recent report prepared by José Salinas, the Special Assistant for Hispanic Public Policy with the Office of the Deputy Chief for Programs and Legislation at the United States Forest Service (USFS), offers a damning critique of the USDA's Forest Service "Draft Civil Rights Strategic Plan, 2002:"

...the draft Civil Rights Strategic Plan...has little substance. It provides no new direction or potential to take us beyond the current Civil Rights mire described so well in the plan itself...We have gone through a 40-year civil rights process, to a large degree conceived and directed by the Anglo American male... A strategic civil rights plan, prepared in Washington, affecting 4,850 minority employees in the field, without significant participation from these same employees reflects the internal attitudes and problems we are faced with today...(Salinas 2002: 2-5)

This scathing report identifies a long list of problems that are a fetter on effective integration and transformation of the USDA and its agencies. The continuing lack of accountability is one problem, but the underlying concern is a reversal of the progress made in recent decades in the recruitment and hiring of people of color. Salinas notes that during the past forty years, the Hispanic portion of the civilian labor force (CLF) has grown from 2 to nearly 12 percent. Compared to the CLF figures, Hispanic parity within the USDA has dropped from 64 percent of parity with the CLF in 1990, 50 percent in 2000, and an estimated 45 percent in 2010 (2002: 7). Instead of progress in the integration of the USDA workforce, the opposite is evident and the recruitment and hiring of people of color is declining. Moreover, the \$25 to 30 million needed annually to resolve the backlog of individual employee EEO (Equal Employment Opportunity) complaints exceeds the amount needed to resolve these problems by a ratio of 100 to 1. It seems that the transformation of the USDA, through the integration of people of color into leadership and

staff positions, is of limited effectiveness and cannot be relied on by the EJM as a route to empowerment, accountability, and social justice.

*Transforming Land Grant College and Extension Service Research and Development.* Integration, while a worthy goal, is clearly insufficient as the basis for a holistic strategy for sustainable development. The EJM must address the nature of the research and development mission embraced by the agricultural establishment. Changes here must include demands for the transformation of the research focus of the land grant college-agricultural extension service complex. The emphasis on larger corporate agribusiness operations must be challenged and replaced with an orientation that truly values and serves the needs of smallholders of color.

However, as with the cause of the integration of the USDA workforce, there is tremendous resistance to “outside ideas and input from minorities” including scholars of color (Salinas 2002: 9). Critical perspectives, such as those advanced by agroecologists, must find a home in the land grant college complex. The EJM can promote change by demanding the transformation of the research and development mission, and a good place to start is to increase the pressure on the land grant colleges to reform their curriculum and increase the recruitment, hiring, and retention of scholars and students of color. In addition, the land grant colleges have never systematically addressed the implications of Executive Order 12898; while the current administration is hostile to the EJM, we must pressure the land grant universities to respond by developing plans for compliance with the principles of environmental justice.

### **3. Restoring Ancestral Common Lands and Traditional Local Resource Management Institutions**

*Restoring traditional resource rights and sovereignty.* The enclosure of millions of acres of ancestral Native American and Chicano lands is one of the greatest injustices of American history. Land-based communities of color were severely harmed by the persistent patterns of poverty, marginality, and displacement that are rooted in the theft of the ancestral common lands (see the policy brief by Martínez 2002). The restoration of the historic common lands of Native American and Chicano land-based communities remains an important ideal of the EJM. The restoration of these common lands is a difficult proposition since most are now parts of the public domain and administered by an unyielding and arrogant federal bureaucracy.

Restoration of Native American land, and more broadly traditional resource rights (TRRs), remains one of the most significant unresolved issues facing the EJM. A major initiative began in June 1996 when the Native American Rights Fund (NARF), along with other lawyers, filed a massive class action lawsuit against the Department of the Interior and the Bureau of Indian Affairs (BIA). The lawsuit focuses on the lack of accountability by federal agencies in the management of the Individual Indian Trust Fund (IIM) accounts; approximately 300,000 IIM account holders are involved in this multibillion-dollar lawsuit. Most of the funds in the IIM accounts have been generated from the sale or lease of natural resources on so-called Indian allotment lands. The BIA has mismanaged these funds and allowed for the unrelenting exploitation of Native American interests (for example, by allowing for sales of coal or other natural resources from Indian lands at prices well below the market rate). The current litigation does not address the mismanagement or gross negligence issues posed by this tragic scandal.<sup>xiv</sup>

The restoration of Native American land and TRRs involve a challenge to the entire edifice of colonial domination. The Indian Allotment (or Dawes) Act and the Indian Reorganization Act (1934) not only reduced the ancestral land holdings to mere vestiges (i.e., reservations); they replaced traditional patterns of self-governance, communal use, and collective management of resources with the Euro-American system of law and property ownership.

There are more than four hundred Native American reservations, rancherías, and village communities in the United States today (Ryser 1991: 14). These indigenous nations vary greatly in their cultures, rural/urban composition, natural assets, and the size and character of land holdings. In the context of this diversity, Native rights activists have largely focused attention on two fundamental issues: (1) the restoration, protection, or extension of TRRs and (2) the restoration, maintenance, and expansion of Native American sovereignty. Indigenous land rights struggles today are largely focused around the restoration or protection of TRRs like hunting, fishing, and wildcrafting rights on lands that have been expropriated and occupied by



members and institutions of the dominant society. Because of the special status of Native American communities as sovereign nations, much of the work addressing these issues involves a complex array of political, administrative, and cultural entities.

Indigenous environmental justice struggles thus encompass resistance to the ecological destruction unleashed by globalization and capitalist maldevelopment; but these struggles also involve resistance to imposed, top-down conservation programs (qua environmental managerialism, see Redclift 1989) as well as newly-fangled eco-tourism, a form of exoticizing racism. Indigenous EJ struggles also address problems related to unsustainable economic activities by members of indigenous communities. All of these problems undermine sustainable agricultural practices and traditions in Native communities. The survival and contributions of indigenous cultures are critical to future prospects for sustainable agriculture in their own communities and in the larger world as well:

...[T]wo of the various elements that will determine the success of sustainable agriculture and rural development are land conservation and the participation of rural people. Indigenous Peoples carry millennial knowledge founded in generations of hunting and agricultural practices, land management and sustainable water use, and agriculture-related engineering and architecture. The maintenance of these cultural and spiritual relationships with the natural world [is] key to their survival as Peoples or civilizations...The maintenance of these...relationships is also vital to the conservation of biodiversity. (Indigenous Peoples' Caucus of the Commission on Sustainable Development 2002: 13-14)

To support sustainable agriculture in indigenous communities, the EJM must continue to support campaigns that link policies for the restoration of indigenous land and traditional resource rights with the theory and practice of sovereignty (i.e., self-governance according to customary laws). From the vantage of indigenous nations, there can be no sustainable agriculture without cultural survival and political autonomy.

*Restoring land grants and watershed democracies.* Chicano land-based communities face similar difficulties and prospects. Given the difficult context of massive land loss, there are a number of strategies that can be pursued by the EJM to seek redress for traditional Chicano communities. One possible avenue is to press for a new round of Congressional hearings. Hearings on the "Hispanic land grant question" have taken place on other occasions with few results other than endless reports and volumes of testimony. Congressional hearings could lead to action, but Chicano land grant communities must act cautiously since many right-wing conservatives who favor the resolution of the land grant issue seek to privatize the public domain not for the sake of economic and social justice but for the purpose of making these lands more easily exploitable by corporate interests. There is an overriding need for the Chicano land grant movement to find common ground and establish productive collaborative relationships with progressive and sympathetic elements of the environmental movement in northern New Mexico. These two movements have been too deeply divided and conflicted in the past and their reconciliation is essential in moving toward the restoration, and sustainable management, of the land grants currently part of the public domain.

The EJM must support the struggles of land grant communities and can work to help define any Congressional political agenda in a manner consistent with the principles of environmental justice. For example, EJ principles can help guide land grant communities in pressing for co-management models. There may be cases of land grant commons currently in the public domain that will not be restored to local communal ownership. In those cases, the EJM can support local struggles to establish frameworks for local participation and control of the management of these lands. It is important to promote a movement that focuses not just on the restoration of land rights but, equally important, the recovery of traditional systems of local natural resource management.

*Establishing land and water trusts.* Some land grant communities are working to establish their own land and water trusts to deal with the restoration of enclosed commons. This seems especially important in the context of land grants that were enclosed by private speculators such as the case of the Tierra Amarilla and Sangre de Cristo land grants. The focus of much of this work is not just on the recovery of lost land grant commons but the protection of historic farmlands that are threatened by development pressures and the

speculative real estate market (Peña 2003b). The Colorado Acequia Association is among the organizations developing land and water trusts to deal with these threats. This means that the EJM must encapsulate the issues related to land grant rights with the objectives of protection of water rights and the struggles for watershed-based models of ecosystem management.

The EJM must support struggles that articulate demands not just for the restoration of common lands but the protection of private farmlands owned by people of color and the water rights of communities that still derive most of their livelihoods from agricultural production. The EJM needs to develop a critical awareness and discourse on environmental justice and water rights. The struggles against threats posed to traditional acequia farmers in the Southwestern United States are a critical battleground in this area and provide an opportunity for the EJM to develop its vision of water rights, ecological sustainability, and social justice.

#### **4. Recovering Local Food Security: Community-Supported Agriculture and Urban Horticulture**

Communities of color are contributing to the development of the urban agriculture movement. This movement addresses the need for local food production systems that can deliver fresh, organic produce to low-income, inner city families and communities. Raquel Pinderhughes, a leading proponent of the movement, clarifies the connection between urban food self-sufficiency and environmental justice:

...urban agriculture has the potential to transform blighted, vacant lots into vibrant green community spaces...Producing food has multiple benefits. It supplements household food security and reduces stress on household food budgets. It provides a venue for the production of food that is culturally appropriate for local residents. It can generate surplus food that community members can share with others in need...and...for urban food banks. Urban agriculture can provide a venue for innovative community-based programs that can directly meet the needs of low-income residents...includ[ing] job training for local youth, alternate sentencing for youth offenders...Urban agriculture can provide opportunities in which the intergenerational transfer of knowledge can take place (Pinderhughes and Kerry 2000: 1-2).

Low-income communities of color have limited access to land for urban agriculture. Pinderhughes and other activists emphasize the effectiveness of grassroots organizing campaigns that pressure elected officials to increase the amount of land designated for local food production as opposed to industrial, commercial, or up-scale housing developments (Pinderhughes and Kerry 2000: 6). The EJM must develop strategies involving the innovative use of land trusts, conservation easements, or compensation to land owners for the transfer of development rights to support access to land for agriculture among low-income urban communities of color.

Urban agriculture can dovetail nicely with a principal objective of the EJM: brownfields reclamation. As Pinderhughes and Perry note: "Urban agriculture has the capacity to clean up blighted, toxic vacant land [i.e., brownfields]. In most low-income communities, vacant lots are contaminated by heavy metals and organic compounds from industrial and commercial uses...Urban agriculture reduces soil toxicity...through the intentional removal of toxic soil and/or through phytoremediation, the use of plants and trees to clean up contaminated soil" (Pinderhughes and Kerry 2000: 11). The urban agriculture movement can also contribute to food security among low-income families that are marginalized by the mainstream food system. Moreover, in contrast to "hunger relief," the urban agriculture movement increases local peoples' capacity to be more food self-sufficient (Pinderhughes and Kerry 2000: 12). Finally, this movement can also build on the existing tendency among many Mexican-origin immigrants and Mexican Americans to engage in home gardening. For example, Zapoteca and Mixteca immigrants from Oaxaca maintain urban horticultural spaces in thousands of back and front yards, vacant lots, and even alleys and street medians across the LA basin.<sup>xv</sup> This grassroots subsistence horticulture is evident in other U.S. rural and metropolitan areas where these native mexicanos have settled over the past twenty years. The extraordinary ethnobotanical and agroecological knowledge of these Oaxacalifornios could be tapped as part of a broader campaign to link the urban agriculture and environmental justice movements. Urban agriculture, brownfield reclamation, and the farm worker movement for the establishment of small

producer cooperatives can and must all be directly linked as part of an overarching EJM strategy for local food security and sustainable agriculture.

## **5. Protecting Seed Savers**

We have recently witnessed a struggle over the patenting of the Mexican yellow bean, a locally adapted native crop grown for centuries by Indian and mestizo peasants. Larry Proctor, the president of an American seed company, POD-NERS, brought seeds of a native land race variety of yellow bean that is commonly farmed in Mexico to the U.S. After a few years of planting and selecting for an even size and shade of yellow, he applied for and received a patent for the seed, despite the fact that it has been grown for centuries in Mexico. The Mexican government has challenged the patent because POD-NERS is attempting to ban exports of the beans from Mexico and because they are charging Mexican farmers royalties to use the patented variety. The “Enola bean” patent conflict illustrates the threat posed by commercial agricultural biotechnology (CAB) to the traditional crops of Mexican and Mexican American farmers (Peña 2001). The EJM can play a role in educating farmers of color about the efforts by biotechnology corporations to appropriate locally stewarded germplasm. How many of the traditional Mexican crops will be collected, genetically modified, and patented? How will these practices affect the autonomy and integrity of farmers of color as plant breeders and seed savers?

The EJM can articulate an active stance against the patenting of life forms. It can do so by pressing for legislation to reform United States patent laws to prohibit the ownership of cultivated plant varieties. It can press for U.S. adoption of the Convention on Biological Diversity (CBD), which also prohibits the appropriation and patenting of the biological resources of indigenous and traditional farmers. It can press Congress and the administration to adopt the biosafety protocols endorsed by most of the world’s nations. Such actions will go far in protecting traditional seed savers from biopiracy and the loss of local control of native plant genetic resources.

However, such reforms are highly unlikely in the current political milieu. Thus, direct action against producers of GEOs must be developed; this could include boycotts of CAB firms that have a record of biopiracy and encroachment on indigenous rights to maintain stewardship of native germplasm. Campaigns for “Safe Seeds” and “No Patents on Life” are gaining momentum across the country and the world.<sup>xvi</sup> The EJM must develop active relationships with these campaigns to strengthen the struggles of native seed savers and traditional farmers of color against biopiracy. The EJM can also support traditional farmers of color who are working to establish local seed banks and seed saver exchange networks.

## **6. Adopting the Precautionary Principle: Resistance against Transgenic Crops**

Biotechnology poses additional threats to traditional farmers of color. Concerns about the environmental and health risks of GEOs focus on issues raised by the current lack of a predictive ecology and thus the uncertainty of potential effects on human health and the environment. There are valid concerns related to antibiotic resistance, allergens, the use of viral promoters, genetic pollution, and threats to wildlife including insects and soil organisms (Ho 1998: 142-144; Kolehmainen 2000). The dangers are primarily posed by the threat of horizontal gene transfer, in which GEO crops exchange genes with non-GEO crops and their wild weedy relatives (see Ho 1998: 154-158). This type of biological contamination could undermine the increasing number of farmers of color who are working to protect traditional organic crop varieties and related farming practices. Some sustainable agriculture activists are pressing for the establishment of GEO-free zones that would prohibit the cultivation of transgenic crops. The EJM can join forces with these efforts.

Small farmers have no use for biotechnology. Anything that can be done with genetic modification can also be done naturally, with fewer, if any, environmental consequences (see Altieri 2000). In addition, the political and economic interests of small farmers of color are not served by the contractual obligations created by the use of biotechnology. They, and the EJM, are far better protected with traditional methods of farming. The EJM must articulate a coherent critical analysis of the threats posed by commercial agricultural biotechnology to farmers of color. Moreover, the movement must support the efforts of

farmers of color to preserve or adopt sustainable and regenerative farming practices that are grounded in links to local and regional economies.

Direct action campaigns must be nurtured and could focus on pressing for the adoption of labeling laws to identify transgenic crops. Public opinion polls verify overwhelming support among consumers for labeling; furthermore, polls also indicate that a majority of consumers would not purchase GEO foods. EJM activism in support of labeling laws is critical and could expand the base of dedicated activists working on this issue. The EJM could also develop linkages with organic and sustainable agriculture organizations and support farm workers in their efforts to protect themselves from the health effects related to increased toxic exposures associated with the production of transgenic crops.

The EJM could also articulate support for the adoption of the Precautionary Principle. The Precautionary Principle holds that if scientific uncertainty exists with respect to the environmental risks of a given technology, then public policies should err on the side of caution. Technologies with uncertain risks must not be marketed, or in the case of GEOs, released into the environment (see Teitel and Wilson 1999; Kolehmainen 2000). Resistance to biotechnology dovetails with resistance to globalization. The biodiversity-based livelihoods of farmers of color will prove to be an important battlefield in the movements for global environmental justice and a sustainable and equitable future.

## **7. Recognizing and Legitimizing the Agroecological Knowledge of Farmers of Color**

The development of EJ perspectives on sustainable agriculture must include efforts to document and legitimize the traditional environmental knowledge (TEK) of farmers of color. The agroecological knowledge base developed and nurtured over generations by farmers of color is an important source of lessons for sustainable agriculture. Yet, the USDA, land grant college-extension service complex, other tier-one research universities, and even the sustainable/organics/alternative agriculture movements have all failed to recognize or value the TEK of farmers of color.

Over the past fifty years or so, anthropologists and other social scientists have developed volumes upon volumes of studies on TEK and sustainable agroecological practices among indigenous and farmers of color (for e.g., see Altieri 1995, González 2000, Hunn 1990, Laird 2002, Nabhan 1997, Nazarea 1999, Netting 1993, Wilken 1990). Invariably, these studies verify that over generations of living in place, traditional farmers have developed an impressive corpus of ethnoscientific knowledge and practices that allow them to inhabit their ecosystems in a more or less sustainable fashion. These patterns of sustainable inhabitation must be more widely recognized beyond the relatively small circle of academic scholars like environmental anthropologists and agroecologists.

Given the context of globalization – and attendant pressures of imposed modernization, cultural homogenization, rapid urbanization, and environmental degradation – the continued documentation, recovery, and preservation of TEK has never seemed more urgent. As Eugene Hunn, a leading ethnobiologist notes, “TEK is both local and fragile.” Moreover, TEK represents “designs for independent alternatives to the globalization of a market mentality that at present comes close to overwhelming all competition for the hearts and minds of humanity” (Hunn 1999: 23-25).

The EJM has a unique responsibility and role to play in the struggle to protect TEK and the local cultures that produce such precious knowledge. The preservation of TEK, which involves protecting indigenous and communities of color in the places they have sustainably inhabited in some cases for hundreds if not thousands of years, is a critical component of EJ struggles to link the protection of cultural and biological diversity. This means that the EJM must embrace a policy of proactive environmental education, in part, to legitimize TEK, and not for outsiders so much as among the youth in our own endangered communities. The restoration of ancestral common lands; the protection of the millions of acres of farmlands, open space, and wildlife habitat owned and managed by people of color; the protection and ecological restoration of our watersheds; the recovery of traditional systems of natural resource management; the protection of indigenous seed savers; the end to racial discrimination in the agricultural establishment; all these efforts will prove ineffectual if future generations of stewards in our communities disappear with the passing of our elders.

## **8. Revaluing the Ecological, Economic, and Social Services of Farmers of Color**

Through their land and water management and agroecological practices, farmers of color provide vital ecological, economic, and social services to their surrounding environments and communities. Traditional farming systems of people of color in rural areas, from the Deep South and the Southwestern borderlands and from the Rocky Mountains to the Pacific Northwest, provide vital ecological services such as open spaces and wildlife habitat, soil conservation, high water quality, in-stream flows, aquifer recharge, and the preservation of wild and domesticated plant biodiversity. These ecosystem services have not been recognized or valued by the dominant agricultural institutions of our society both in government and academia.

Traditional agroecosystems also provide vital economic base services to local and bioregional communities by generating employment, sustaining local small businesses, attracting investments, and generating cash flow, tax revenues, and substantial informal barter and exchange networks. Farmers of color provide stability for local communities and enhance the quality of life for all their neighbors. These traditional farms promote the formation and sustenance of “social” or “cultural capital,” including the transmission of artisan skills and a broad range of technical knowledge and expertise, which are then used by people in other areas of economic life and social organization. They provide an institutional context for the reproduction of land and water ethics, stewardship values, and the aforementioned corpus of TEK. These economic base and social services also have not been recognized or valued by our societal institutions. Some have argued for the adoption of public policies that reward farmers of color for the ecosystem, economic base, and social assets that they generate and sustain (e.g., see Peña 2003b). Instead of subsidizing large-scale corporate agribusinesses for engaging in practices that degrade the environment, produce surplus food that is inequitably distributed, endanger the nation’s biodiversity, harm the health of farm workers, and undermine the stability of rural communities, we need public policies that reward small-scale farmers of color for their sustainable and equitable practices.

The EJM must develop strategies to protect and enhance the natural, cultural, social, and financial assets created by farming communities of color. In part, this involves an important shift in the nature of the organizing priorities of the EJM, from an approach that focuses on reactively defending our communities from the disproportionate harms wrought by the persistence of environmental racism toward a more proactive set of strategies that emphasize the principles of community-based asset building and local autonomy with the aim of establishing the political and economic conditions for the emergence of a just sustainability (see Agyeman, Bullard, and Evans 2003).

**Author:**

**Devon G. Peña**, is a Professor of Anthropology and Chicano Studies at the University of Washington. He Teaches courses on Culture and Politics of Environmental Justice, Comparative Social Movements: Mexico and the United States, and Culture, Ecology and Politics. His teaching and research interests nclude agroecology, environmental justice, environmental history and ecological politics. Some of his publications Include: *Chicano Culture, Ecology, Politics: Subversive Kin* (Arizona Press, 1998); *The Terror of the Machine: Technology, Work, Gender and Ecology in the U.S.-Mexico Border* (CMAS Books/University of Texas Press, 1997).

## Bibliography

- Acuña, R 1988. *Occupied America: A History of Chicanos*. New York: Harper and Row.
- Agyeman, J, R D Bullard, and B Evans 2003. *Just sustainabilities: Development in an unequal world*. London: Earthscan.
- Allen P and C Sachs 1991. The social side of sustainability: class, gender, and ethnicity. *Science as Culture* 2:569-90.
- Altieri, M 1995. *Agroecology: the science of sustainable agriculture*. Boulder: Westview Press.
- Altieri, M 2000. Ecological impacts of industrial agriculture and the possibilities for truly sustainable farming. In: *Hungry for profit: the agribusiness threat to farmers, food, and the environment*. New York: Monthly Review, pp. 77-106.
- Arnold, C A 2002. Planning milagros: Environmental justice and land use regulation. In: *Environmental justice: Law, policy, and regulation*, ed. C Rechtschaffen and E Gauna. Durham: Carolina Academic Press, pp. 298-300.
- Barsh, R L 1990. Ecocide, nutrition, and the “vanishing Indian.” In: *State violence and ethnicity*, ed. P. L. van den Berghe. Niwot: University Press of Colorado, pp. 221-52.
- Baskin, Y 1997. *The work of nature: How the diversity of life sustains us*. Washington, D.C.: Island Press.
- Bonanno, A, L Busch, W Friedland, L Gouveia and E Mingione 1994. *From Columbus to ConAgra: the globalization of agriculture and food*. Lawrence: University of Kansas.
- Boucher, D H 1999. *The paradox of plenty: Hunger in a bountiful world*. Oakland: Food First Books.
- Briggs, C L and J R Van Ness 1987. *Land, water and culture: New perspectives on Hispanic land grants*. Albuquerque: University of New Mexico Press.
- Brown F L and H M Ingram 1987. *Water and poverty in the Southwest*. Tucson: University of Arizona Press.
- Buland, D 2002. *NRSC support of Hispanic farmers: By the numbers*. Prepared for the 2002 Annual Training Conference of Professional Hispanic NRCS Employees, Ft. Worth, Texas (June 27).
- Bullard, R D 1999. No 40 acres and a mule: an interview with a displaced black farmer. Environmental Justice Resource Center, Clark-Atlanta University (June 25). Available on-line: <http://www.hartford-hwp.com/archives/45a/203.html>.
- Busch L and W B Lacey 1983. *Science, Agriculture, and the Politics of Research*. Boulder, CO: Westview Press.
- California Agriculture 2000. Research Update: UC center focuses on weight and health. Available on-line at: <http://danr.ucop.edu/calag/SO00/resupd.html>.

- Chew, A 2002. Traditional food system preservation program. *Native American Women Health Education Resource Center Newsletter* (spring issue). Available on-line: <http://www.nativeshop.org/actionalertfood.html>.
- Churchill, W 1993. *Struggle for land: Indigenous resistance to genocide, ecocide, and expropriation in contemporary North America*. Monroe, ME: Common Courage Press.
- Clark, I G 1987. *Water in New Mexico: A history of its management and use*. Albuquerque: University of New Mexico Press.
- Cleaver, H 1982. Technology as political weaponry. In: *Science, politics, and the agricultural revolution in Asia*, ed. R. Anderson, et al. Washington, D. C.: American Association for the Advancement of Science. Available on-line at <http://www.eco.utexas.edu/facstaff/Cleaver/hmctechasweaponry.htm>.
- Committee of Scientists 1999. *Sustaining the people's land: Recommendations for stewardship of the national forests and grasslands into the next century*. Washington, D. C.: U.S. Department of Agriculture.
- Cotterill, R and A Franklin 1995. *The urban grocery store gap*. Food Marketing Policy Center, University of Connecticut.
- Curry, R 1995. The state of the Culebra watershed: The impact of logging on the southern tributaries. *La Sierra: National Edition* 4:10-11.
- Curry, R, M Soulé, D G. Peña and M McGowan 1996. *Critical analysis of Montana best management practices and sustainable alternatives*. Technical consultants' report presented in October to the Costilla County Land Use Planning Commission. Costilla County Conservancy District and La Sierra Foundation, San Luis, Colorado.
- Deloria, S 1985. A Native American view of western water development. *Water Resources Research* 2:1785-86.
- Deutsch, S 1987. *No Separate Refuge: Culture, Class, and Gender on an Anglo-Hispanic Frontier in the American Southwest, 1880-1940*. Oxford: Oxford University Press.
- Ebright, M 1994. *Land grants and lawsuits in northern New Mexico*. Albuquerque: University of New Mexico Press.
- Farm Labor Organizing Committee, *Farm workers and farm labor conditions*. Available online: <http://www.iupui.edu/~floc/fws.htm>.
- Federation of Southern Cooperatives 2002. Report reveals farmers approval of NRCS programs. Available on-line: <http://www.federationsoutherncoop.com/april02.htm>.
- Floyd, M F 2001 Managing national parks in a multicultural society: Searching for common ground. *The*



- George  
 Wright Forum 18: 41-51. Available on-line at: <http://www.georgewright.org/183floyd.pdf>.
- Fowler, C and P Mooney. 1990. *Shattering: Food, politics, and the loss of genetic diversity*. Tucson: University of Arizona Press.
- Frommer, F J 2002. Immigrant and Hispanic workers describe unsafe working conditions,” *San Francisco Chronicle* (February 27). Available on-line: [http://www.sfgate.com/cgi-in/article/cgi?file=/news/article/2002/02/27/national\\_1836EST0833.DTL](http://www.sfgate.com/cgi-in/article/cgi?file=/news/article/2002/02/27/national_1836EST0833.DTL).
- General Accounting Office 2001. *Report to Congressional requesters. Treaty of Guadalupe Hidalgo, definition and list of community land grants in New Mexico*. GAO Report 01-951. Washington, D. C.: U.S. Government Printing Office.
- Goldburg, R, J Rissler, H Shand, and C Hassebrook 1990. *Biotechnology's bitter harvest: herbicide-tolerant crops and the threat to sustainable agriculture*. Seattle: Biotechnology Working Group.
- González, R J 2001. *Zapotec science: Farming and food in the northern Sierra of Oaxaca*. Austin: University of Texas Press.
- Gottlieb, R 1993. *Forcing the spring: the transformation of the American environmental movement*. Washington, D. C.: Island Press, 1993.
- Gottlieb, R, A Fisher, and N Jakowitsch 2002. *Transportation and food: The importance of access*. Policy Brief, Center for Food and Justice, Urban and Environmental Policy Institute, Occidental College (October). Available on-line at: <http://departments.oxy.edu/uepi/resources/briefs/>.
- Gouveia, L 1994. Global strategies and local linkages: The case of the U.S. meatpacking industry. In: *From Columbus to ConAgra: the globalization of agriculture and food*, ed. Bonanno, A, L Busch, W Friedland, L Gouveia and E Mingione. Lawrence: University of Kansas Press.
- Gramann, J H 1996. Ethnicity, race, and outdoor recreation: A review of trends, policy, and research. *Miscellaneous Paper R-96-1*, U.S. Army Corp of Engineers. Washington, D. C.: U.S. Army Corp of Engineers.
- Greenhouse, S 1999. As U.S. economy booms, housing for migrant workers worsens, *New York Times* (March 31).
- Gutierrez, P and J Eckert 1991. Contrasts and commonalities: Hispanic and Anglo farming in Conejos County, Colorado,” *Rural Sociology* 56: 247-63.
- Hundley, N 1978. The dark and bloody ground of Indian water rights: Confusion elevated to principle. *Western Historical Quarterly* 9: 455-82.
- Hunn, E 1990 *Nch'I-Wána, The Big River: Mid-Colombia Indians and their land*. Seattle: University of

- Washington Press.
- Heffernan, W D 2000. Concentration of ownership and control in agriculture. In: *Hungry for profit: the agribusiness threat to farmers, food, and the environment*. New York: Monthly Review, pp. 61-76.
- Henderson, E 2000. Rebuilding local food systems from the grassroots up. In: *Hungry for profit: the agribusiness threat to farmers, food, and the environment*. New York: Monthly Review, pp. 175-188.
- Hicks, G and D G Peña 2003. The persistence and sustainability of community acequias in Colorado's Rio Culebra watershed: (Re)Visions of efficiency and the prospects for a customary commons in the domain of prior appropriation. *Colorado Law Review* 74: 2 (in-press).
- Hightower, J 1976. Hard tomatoes, hard times: the failure of the land grant college complex. In: *Radical Agriculture*, ed. R Merrill. New York: Harper Colophon, pp. 87-110.
- Ho, M W 1998. *Genetic engineering – dream or nightmare? The brave new world of bad science and big business*. Bath, UK: Gateway Books.
- Indigenous Peoples' Caucus 2002. *Dialogue paper by indigenous people*. Addendum 3 – Multi-Stakeholder Dialogue Segment of the Second Preparatory Session, World Summit on Sustainable Development (January 28-February 2). United Nations Economic and Social Council.
- Jackson, W 1987. *Altars of unhewn stone: science and the earth*. San Francisco: North Point Press.
- Jaimes, M A 1992. *The state of Native America: Genocide, colonization, and resistance*. Boston: South End Press.
- Kay, J. 1994. California's endangered communities of color. In: *Unequal protection: environmental justice and communities of color*, ed. R D Bullard. San Francisco: Sierra Club Books, pp. 155-188.
- Kolehmainen, S 2000. Precaution before profits: An overview of issues in genetically engineered food and crops. *Council for Responsible Genetics Home Page*. Available on-line at: <http://www.genewatch.org/programs/food/law-sophia.html>.
- Krimsky, S 1991. *Biotechnics and Society: The Rise of Industrial Genetics*. New York: Praeger.
- Laird, S 2002. *Biodiversity and traditional knowledge: Equitable partnerships in practice*. London: Earthscan.
- Leon, E. 2000. The health condition of migrant farmworkers," *Occasional Paper* 71 (August 2000), Julian Samora Research Institute, Michigan State University. Available online: <http://www.jsri.msu.edu/RandS/research/ops/oc71abs.html>.
- Lewontin, R C 2000. The maturing of capitalist agriculture: farmer as proletariat. In: *Hungry for profit: the agribusiness threat to farmers, food, and the environment*, ed. Magdoff, F, J B Foster, and F H Buttel. New York: Monthly Review.

- Magdoff, F, J B Foster, and F H Buttel. 2000. *Hungry for profit: the agribusiness threat to farmers, food, and the environment*. New York: Monthly Review.
- Majka, L C and T J Majka 2000. Organizing U.S. farm workers: A continuous struggle. In: *Hungry for profit: The agribusiness threat to farmers, food, and the environment*, ed. F Magdoff, J B Foster, and F H Buttel. New York: Monthly Review Press.
- Marentes, C . 1997. Food production under globalization and neoliberalism: the plight of the workers of the land.” Paper presented at the 1997 Agricultural Missions Annual Meeting, Study Session on Economic Globalization, El Paso, TX (May 2). Available on-line: <http://www.farmworkers.org/foodsys.html>.
- Martínez, R O 2002. *Environmental justice issues and Chicana/o land grants*. Policy paper commissioned by the Second Annual People of Color Environmental Leadership Summit, Washington, D.C. (October 23-27).
- Matheson, N D, D Oien, and A Kurki 1991. Still learning to farm: agricultural research and extension in the 1980's. In: *Ethics and Agriculture: An Anthology on Current Issues in World Context*, ed. C V Blatz. Moscow, ID: University of Idaho Press, pp. 399-401.
- McLeod, D 1976. Urban-rural food alliances: A perspective on recent community food organizing. In: *Radical agriculture*, ed. R Merrill. New York: Harper Colophon, pp. 188-211.
- Mittal, A and J Powell 2000. The last plantation: Black-owned farms face extinction in the US. *Earth Island Journal* 15 (fall). Available on-line: [http://www.earthisland.org/eijournal/fall2000/wr\\_fall2000lastplant.html](http://www.earthisland.org/eijournal/fall2000/wr_fall2000lastplant.html).
- Morland, K et al 2002. Access to healthy foods limited in poor neighborhoods. *American Journal of Preventive Health* 21:
- National Research Council 1989. *Alternative agriculture*. Washington, D.C.: National Academy Press.
- Nabhan, G P 1997. *Cultures of habitat: On nature, culture, and story*. Washington, D.C.: Counterpoint.
- Nazarea, V 1999. *Ethnoecology: Situated knowledge/located lives*. Tucson: University of Arizona Press.
- Netting, R McC 1993. *Smallholders, householders: Farm families and the ecology of intensive, sustainable agriculture*. Stanford: Stanford University Press.
- Nord, M 2002. Rates of food insecurity and hunger unchanged in rural households. *Rural America* 14:4 (winter).
- Oswalt, W H 1988. *This land was theirs: A study of North American Indians*. Mountain View: Mayfield Publishing.
- Pearce, D and D Moran 1995. *The economic value of biodiversity*. London: Earthscan.
- Peña, D G 1998 *Chicano culture, ecology, politics: Subversive kin*. Tucson: University of Arizona Press.

- Peña, D G 1999. Cultural landscapes and biodiversity: The ethnoecology of an Upper Rio Grande watershed commons. In: *Ethnoecology: Situated knowledge/located lives*, ed. V Nazarea. Tucson: University of Arizona Press, pp. 107-132.
- Peña, D G 2000. The browning of the American farm. *High Country News On-line*. Available on-line: <http://www.hcn.org>.
- Peña, D G 2001. Latina/o farmers and biotechnology. *GeneWatch* 14:1, 3-4.
- Peña, D G 2002. Endangered landscapes and disappearing people? Identity, place, and community in ecological politics. In: *The environmental justice reader: Politics, poetics, pedagogy*, ed. J Adamson, M M Evans, and R Stein. Tucson: University of Arizona Press, pp. 58-81.
- Peña, D G 2003a. Biotechnology and rural Latino communities: a critical first look at imminent threats Forthcoming in *Aztlan: International Journal of Chicano Studies Research* (fall 2003).
- Peña D G 2003b. The watershed commonwealth of the Upper Rio Grande. In: *Natural assets: Democratizing environmental ownership*, ed. J K Boyce and B Shelly. Washington, D.C.: Island Press (forthcoming spring 2003).
- Peña, D G in-press. *Gaia en Aztlan: Endangered landscapes and disappearing people in the politics of place*. Tucson: University of Arizona Press (forthcoming 2004).
- Peña, D G and R O Martínez 2000. *Upper Rio Grande Hispano farms: A cultural and environmental history of land ethics in transition, 1598-1998 – final report*. Submitted to the National Endowment for the Humanities (Grant RO-22707-94) by the Rio Grande Bioregions Project, Department of Anthropology, University of Washington.
- Peña, D G and R O Martínez in-press. *Voces de la tierra: Four hundred years of acequia farming in the Rio Arriba, 1598-1998*. Tucson: University of Arizona Press (forthcoming 2004).
- Perfecto, Y 1992. Pesticide exposure of farm workers: The international connection. In: *Race and the incidence of environmental hazards: A time for discourse*, ed. B Bryant and P Mohai. Boulder: Westview Press.
- Pinderhughes, R and K Perry 2000. Poverty reduction, environmental protection, environmental justice: The urban agriculture connection. Paper presented to the Conference on Natural Assets and Poverty Reduction, Political Economy Research Institute (PERI), University of Massachusetts, Amherst and The Ford Foundation. Santa Fe, New Mexico (February).
- Rechtschaffen C and E Gauna 2002. *Environmental justice: Law, policy, and regulation*. Durham: Carolina Academic Press.
- Redclift, M 1987. *Sustainable development: Exploring the contradictions*. London: Routledge.

- Reeves, M, K Schafer, K Hallward, and A Katten 1997. *Fields of poison: California farmworkers and pesticides* (San Francisco: Californians for Pesticide Reform, Pesticide Action Network; Sacramento: California Rural Legal Assistance Foundation; Watsonville: United Farm Workers of America, 1997). Available on-line: <http://www.igc.org/panna/resources/documents/fields.pdf>.
- Rivera, J 1998. *Acequia culture: Water, land, and community in the Southwest*. Albuquerque: University of New Mexico Press.
- Rochin, R 1988. The conversion of Chicano farm workers into owner-operators of cooperative farms, 1970-1985. *Rural Sociology* 51: 95-115.
- Rochin, R 1992. Hispanic Americans in the rural economy: Conditions, issues, and probable future adjustments. In: *National Rural Studies Committee: A proceedings*, ed. E Castle and B Baldwin. Corvallis: Western Rural Development Center, Oregon State University.
- Rodriguez, S 1987. Land, water and ethnic identity in Taos. In: *Land, water, and culture: New perspectives on Hispanic land grants*, ed. C L Briggs and J R Van Ness. Albuquerque: University of New Mexico Press, pp. 313-404.
- Rodriguez, S 1994. Art, tourism, and race relations in Taos. In: *Discovered country: Tourism and survival in the American West*, ed. S Norris. Albuquerque: Stone Ladder Press, pp. 143-60.
- Rosset, P 1999. Afterword. Food and justice in the new millennium: Changing how we think about hunger. In: *The paradox of plenty: Hunger in a bountiful world*, ed. D H. Boucher. Oakland: Food First Books, pp. 330-36.
- Rural Migration News 1997. Minority farmers allege USDA discrimination. *Rural Migration News* 3 (January). Available on-line at: [http://migration.ucdavis.edu/rmn/archive\\_rmn/jan\\_1997-15rmn.html](http://migration.ucdavis.edu/rmn/archive_rmn/jan_1997-15rmn.html).
- Ryser, R C 1991. Who will govern Indian country? In: *Critical issues in native North America*, ed. W Churchill. Document 68, International Work Group for Indigenous Affairs. Copenhagen: IWGIA.
- Salinas, J 2002. A Review of the USDA Forest Service's draft civil rights strategic plan, 2002. Unpublished draft circulated to colleagues on the Internet. In the author's personal files. Available on-line at: <http://www.clearfork.com/>.
- Schlosser, E 2001. *Fast food nation: the dark side of the all-American meal*. Boston: Houghton Mifflin.
- Shaffer, A 2002. The persistence of Los Angeles' grocery store gap. Urban and Environmental Policy Institute, University of California-Los Angeles (May 31).
- Shurts, J 2000. *Indian reserved water rights: The Winters doctrine in its social and legal context, 1800s-1930s*. Norman: University of Oklahoma Press.
- South Carolina Folk Arts Program 1988. *Sweetgrass basket conference: proceedings*. Charleston:

McKissick  
Museum.

Salinas, J. 1999. *Demographics and natural resources: Proximity to national forests, growth trends, household composition, minorities, aging*. Report prepared by the Washington Office, Programs and Legislation Deputy Staff.  
Washington, D. C.: United States Forest Service.

Swanston, S F 2002. Environmental justice: mobilizing for the 21<sup>st</sup> century: Environmental justice and environmental quality benefits: The oldest, most pernicious struggle and hope for burdened communities. In:  
*Environmental justice: Law, policy, and regulation*, ed. C. Rechtschaffen and E Gauna. Durham: Carolina Academic Press, pp. 82-3.

Teitel, M and K A Wilson. 1999. *Genetically engineered food: changing the nature of nature*. Rochester, VT: Park Street Press.

Tyson, L D 2002. The farm bill is a \$200 billion disaster. *Business Week* (June 3).

United States Department of Agriculture, Civil Rights Action Team 1997. *Civil Rights at the United States Department of Agriculture*. Unpublished internal report cited in the case of Keepseagle v. Veneman (Civil Action No. 99-03119, United States District Court for the District of Columbia).

Upper Rio Grande Working Group 1989. *Upper Rio Grande waters: Strategies*. Albuquerque: Southwest Hispanic Research Institute, Natural Resources Center, and Native American Studies Center.

Voeltz, L 2002. Grown your own food; grow your own revolution. *The Twin Cities Green Guide*. Available on-line at: <http://www.thegreenguide.org/gardening/index.php>.

Warner, P D and J A Christenson 1984. *The Cooperative Extension Service: a national assessment*. Boulder: Westview Press.

Wescoat, J L, Jr. 1998. The 'right of thirst' for animals in Islamic law: A comparative approach. In:  
*Animal geographies: Place, politics, and identity in the nature-culture borderlands*, ed. J Wolch and J Emel. London: Verso Books, pp. 259-79.

West, P C 1989. Urban region parks and black minorities: Subculture, marginality, and interracial relations in park use in the Detroit metropolitan area. *Leisure Sciences* 11: 11-28.

Wilken, G C 1990. *Good farmers: Traditional agricultural resource management in Mexico and Central America*. Berkeley: University of California Press.

Wright, A 1990. *The death of Ramón González: a modern agricultural dilemma*. Austin: University of Texas Press.

Zastrow, L 1999. Midwestern agriculture. *Wedge Co-Op Newsletter* (August-September). Available on-

line at: [http://www.wedgecoop.com/newsletter/aug\\_sep99/Agriculture.html](http://www.wedgecoop.com/newsletter/aug_sep99/Agriculture.html).

Zippert, J 2002. Statement before the U.S. House of Representatives Committee on Agriculture. Available on-line at: <http://agriculture.house.gov/hearings/h10626w6.pdf>.

## Endnotes

<sup>i</sup> The current structure of agriculture is one in which growing numbers of farmers are being reduced to the status contract growers. This has been especially the case among farmers who sign so-called precision farming contracts with their seed and chemical input suppliers (e.g., Monsanto) who dictate the details of their production activities; see Lewontin (2000).

<sup>ii</sup> Kay notes (1994:173) that of the 175 chemicals used to formulate pesticides, only 41 have been fully tested to determine their correlation with cancers, birth defects, nerve damage, or other chronic diseases. Nationwide, the EPA currently lists 65 pesticides used on food crops as possible, probable, or known carcinogens.

<sup>iii</sup> The first civil rights lawsuit filed against the USDA was Williams v. Glickman (1997). This lawsuit involved both African American and Latino farmers. However, the lawsuit was thrown out when the court determined that the class of plaintiffs could not be adequately defined.

<sup>iv</sup> This summary is based on the Second Amended Class Action Complaint filed in García v. Veneman available online at <http://www.garciaclassaction.org>.

<sup>v</sup> This statement is attributed to Secretary Butz and was made in November 1974 during a presentation to a World Food Conference in Rome. Also see Cleaver (1982) for further discussion of food as a political weapon.

<sup>vi</sup> According to data from the Equal Employment Opportunity Monitoring and Analysis System (EEOMAS) as reported in the Second Amended Complaint in the case of García v. Veneman, page 42; available on-line at <http://www.garciaclass.action.org>.

<sup>vii</sup> Anonymous interview with Devon G. Peña (San Luis, Colorado, June 1998); brackets added. Also, see Peña (1998, 1999).

<sup>viii</sup> Unfortunately, the process of the re-adjudication or development of water rights has sometimes pitted Native American against Chicano agricultural water users. There is at least one water development project that benefited Native American interests but was detrimental to multigenerational land-based Chicano communities. The construction of the Navajo Dam and Reservoir and the displacement and flooding of the Chicano-Ute Indian communities of Rosa, New Mexico is illustrative. The Navajo Reservoir was constructed in part to meet the demands of the Navajo Nation for its rightful water under the terms of the *Winters* doctrine.

<sup>ix</sup> While the process of re-adjudication of water rights after the imposition of the appropriative rights regime did not always directly invoke waste and inefficiency as the basis for the elimination or reduction of acequia water rights, the water courts did decree that these rights failed to comply with the principle of maximum utilization or involved the over-appropriation of water rights. For further discussion see Hicks and Peña (2003).

<sup>x</sup> The original complaint was filed in 1999 and is known as Cobell et al v. Babbitt. For further information and updates, visit the web site for “Indian Trust: Cobell v. Norton.” Available online at: <http://www.indiantrust.com/>.

<sup>xi</sup> An important exception is the work of the Rio Grande Bioregions Project and its interdisciplinary and collaborative research project, “Upper Rio Grande Hispano Farms: A Cultural and Environmental History of Land Ethics in Transition, 1598-1998.” For discussion of this project, see Peña (1998, 1999), Peña and Martínez (2000), and Peña (in-press).

<sup>xii</sup> Artisan production includes hand-crafted wood products (furniture, wooden saints in the form of *retablos* and *bultos*, and other art objects); building and shelter materials (*vigas*, *latillas*, fenceposts, lumber); wild crafted herbs and medicinal plants; hand-woven rugs, blankets, vests, and coats; hand-made artifacts; and tools for home and ranch. Subsistence production includes crops harvested from family garden plots and orchards; vegetables and fruits canned for storage, barter, or sale; medicinal and edible plants wild crafted for home use; hunting and fishing for the family table; gathering of firewood; and related services to produce these subsistence goods. Amenity production includes the sales and services generated by the tourism industry such as lodging, food, and other retail sales, but do not include sales of arts and crafts.

<sup>xiii</sup> For the formal estimating models, data sources, and conceptual elaboration see Peña (2003b). See also Rivera (1998) and Peña (1999). For varied approaches to the study of the economic values associated with biodiversity and ecosystem services see, for example, Baskin (1997) and Pearce and Moran (1995).



---

<sup>xiv</sup> For further information, see the web site of the Native American Rights Fund (NARF) at <http://www.narf.org>.

<sup>xv</sup> This is based on the author's own personal observations during recent visits to Los Angeles. One Zapotec family was maintaining three separate milpas in a South Central LA neighborhood. It was planted with native land race varieties of maize, bean, calabacita, avocado, lime, chile, and numerous aromatic or medicinal herbs. Many of the seeds for these family heirloom crops are brought to the U.S. from Oaxaca as part of the immigrants' biological baggage or "contraband."

<sup>xvi</sup> For information on the "Save Seeds" and "No Patents on life" campaigns, visit the web site of the Council for Responsible Genetics (CRG) at <http://www.gene-watch.org>.