
NOTE

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Creating a Sustainable Urban Agriculture Revolution

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[H]ow and what we eat determines to a great extent the use we make of the world—and what is to become of it.¹

An adequate food supply is essential for the survival of the human race. Historically, the U.S. food system has been one of abundance. However, degradation of the environment, climate change, dependence on foreign oil and food imports, urban development trends, and increased demand due to population growth and the emerging biofuel industry² all threaten our food supply. In response

¹ MICHAEL POLLAN, *THE OMNIVORE’S DILEMMA* 11 (2006).

² Industrial biofuels (fuels made from plants) are a false solution to the energy crisis. Biofuel production consumes land and results in food-producing land being converted into fuel-producing land. See VANDANA SHIVA, *SOIL NOT OIL: ENVIRONMENTAL JUSTICE IN AN AGE OF CLIMATE CRISIS* 5 (2008) (“Increasing biofuel production worsens the food crisis by taking land and food from the people in order to produce ‘feedstock’ for the insatiable appetite of the fossil fuel infrastructure and the limitless consumption it requires.”).

to these threats, local-food and sustainable agriculture movements have recently formed to raise awareness of the need to pursue alternatives to the current system.³ In 2009, the White House acknowledged the importance of changing the way we grow food by planting an organic garden on its grounds.⁴ In the wake of the economic crisis of 2008, victory gardens, which were first made popular during the World War II era, have reemerged and created additional awareness of the need to pursue food production alternatives.⁵ Victory gardens and local sustainable agriculture reduce dependency on the established food production system, but, because the U.S. population is clustered in densely populated metropolitan areas,⁶ the majority of the population currently lacks access to land on which to grow food.

In the face of environmental, economic, and social equity challenges, it is imperative that the government, at federal, state, and local levels, establish policies that promote sustainable urban agriculture to ensure access to an adequate food supply produced with minimal impact on the environment. Environmental threats stemming from climate change and the depletion and degradation of natural resources will increasingly impact the planet's food production

³ E.g., Eat Local Challenge, <http://www.eatlocalchallenge.com/2009/03/index.html> (last visited Apr. 17, 2010) (highlighting the benefits of eating food that is grown and produced locally); 100-Mile Diet, <http://100milediet.org/> (last visited Apr. 17, 2010) (promoting eating sustainably grown local food); Sustainable Table, <http://www.sustainabletable.org/home.php> (last visited Apr. 17, 2010) (educating consumers about food-related issues).

⁴ Marian Burros, *Obama to Eat Local Produce (Really Local)*, N.Y. TIMES, Mar. 20, 2009, at A1. In the spring of 2009, Michelle Obama planted the first garden "at the White House since Eleanor Roosevelt's victory garden in World War II." *Id.* The garden is more than a food source for the White House, as Michelle Obama intends for the garden to be used to educate children on the importance of eating healthy, fresh produce. *Id.* Additionally, the garden is a political and environmental symbol of the importance of eating local, organic food as a means to "reduce reliance on huge industrial farms that use more oil for transportation and chemicals for fertilizer." *Id.*

⁵ See A. Bryan Endres & Jody M. Endres, *Homeland Security Planning: What Victory Gardens and Fidel Castro Can Teach Us in Preparing for Food Crises in the United States*, 64 FOOD & DRUG L.J. 405, 408–09 (2009) ("During World War II, American home gardeners, through the federal government's Victory Garden program, supplied 40 percent of the nation's fresh produce . . .").

⁶ In 2000, twenty-one states had seventy-five percent of their populations residing in metropolitan areas. FRANK HOBBS & NICOLE STOOPS, U.S. DEP'T OF COMMERCE, ECON. & STATISTICS ADMIN., U.S. CENSUS BUREAU, DEMOGRAPHIC TRENDS IN THE 20TH CENTURY 41–42 (2002), available at <http://www.census.gov/prod/2002pubs/censr-4.pdf>.

system.⁷ The current economic crisis has increased the burden on the government to provide relief in the forms of unemployment compensation⁸ and supplemental nutrition assistance.⁹ An inherent consequence of the economic crisis is a widening disparity between the rich and poor and increased social inequity between the socioeconomic classes in America. Establishing a sustainable urban agricultural system would reduce the environmental degradation that is caused by modern agricultural practices, reduce the financial strain on government resources by increasing urban productivity and enabling urbanites to grow a local food supply, and reduce socioeconomic disparities by providing less-advantaged populations in urban areas with access to an adequate supply of fresh, nutritious food.

This Note discusses the harms of our current agricultural and urban development practices as well as the benefits of an urban agricultural system, both in terms of sustainability and food security. This Note also examines case studies of existing urban agricultural systems and makes recommendations for government incentives that would promote the development of a sustainable urban agricultural system. Specifically, Part I provides an overview of the history and current state of the U.S. industrial agricultural system. Part II examines the current urban development trend in the United States. Part III describes a sustainable urban agricultural system. Part IV discusses the principles of sustainability and then evaluates the current agricultural system, urban land development trends, and a sustainable urban agricultural system in terms of these principles. Part V presents a case study of Cuba, discussing the consequences of the collapse of the Soviet Union and the subsequent U.S. embargo on Cuba's food supply, followed by Cuba's development of a sustainable urban

⁷ See Jodi Soyars Windham, *Putting Your Money Where Your Mouth Is: Perverse Food Subsidies, Social Responsibility & America's 2007 Farm Bill*, 31 ENVIRONS ENVTL. L. & POL'Y J. 1, 4 (2007) (describing America's food production system as heavily reliant on the use of chemicals).

⁸ According to the Bureau of Labor Statistics, the average unemployment rate for 2009 was 9.3%, the highest rate of unemployment in over twenty-five years. Bureau of Labor Statistics, U.S. Dep't of Labor, Statistical Tables, 57 EMPLOYMENT & EARNINGS 1, 5 (2010), <http://www.bls.gov/opub/ee/empearn201001.pdf>.

⁹ The number of persons receiving supplemental nutrition assistance increased from approximately 26.5 million in 2007 to 33.75 million in 2009, and the cost of assistance increased from \$30 billion in 2007 to \$50 billion in 2009. U.S. DEP'T OF AGRIC., SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM PARTICIPATION AND COSTS 1 (2010), <http://www.fns.usda.gov/pd/SNAPsummary.htm>.

agricultural system. Part VI presents case studies of current urban gardening projects in several U.S. cities. Part VII discusses recommendations for federal, state, and local governments to incentivize urban agriculture and community garden projects throughout the United States.

I

CURRENT U.S. INDUSTRIAL AGRICULTURE PRACTICES

The U.S. agricultural system is becoming increasingly more concentrated, specialized, and industrialized.¹⁰ As of this writing, ninety-eight percent of the food supply in the United States is produced by agribusinesses running industrial farms that employ mechanically and chemically intensive farming methods for the maximization of profit.¹¹ These farming methods are further encouraged through government subsidies, which operate to affect the supply and price of agricultural commodities.¹² Government subsidies have tended to benefit large agribusinesses¹³ and have encouraged the use of chemical inputs and unsound farming practices, which maximize short-term yields and profits at the expense of the environment and small local farmers.¹⁴ An additional consequence of farm subsidies is the overproduction of commodity crops, which requires that the United States supplement its food supply with fruits and vegetables imported from other countries.¹⁵

¹⁰ See Neil D. Hamilton, *Agriculture Without Farmers? Is Industrialization Restructuring American Food Production and Threatening the Future of Sustainable Agriculture?*, 14 N. ILL. U. L. REV. 613, 613–15 (1994) (discussing the industrialization of American agriculture); see also William S. Eubanks II, *A Rotten System: Subsidizing Environmental Degradation and Poor Public Health With Our Nation's Tax Dollars*, 28 STAN. ENVTL. L. J. 213, 228–31 (2009) (discussing changes in ownership of farms and production of commodity crops over the past fifty years).

¹¹ Windham, *supra* note 7, at 4.

¹² See generally Erin Morrow, *Agri-Environmentalism: A Farm Bill for 2007*, 38 TEX. TECH L. REV. 345 (2006) (presenting a thorough discussion of U.S. farm policy and farm subsidies).

¹³ See *id.* at 369–71; see also Thomas Richard Poole, Note, *Silly Rabbit, Farm Subsidies Don't Help America*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 183, 195 (2006) (describing how industrial farms dominate U.S. food production as well as receive the majority of government subsidies).

¹⁴ See Windham, *supra* note 7, at 17–18.

¹⁵ Eubanks, *supra* note 10, at 237 (“[T]he heavy over-emphasis on planting corn and other subsidized commodity crops in the United States requires our nation's large population to seek fruits and vegetables from other nations, which typically results in those

Industrial agriculture in the United States has only been in place since the mid-twentieth century.¹⁶ Modern agricultural practices began with the Green Revolution, a response to world food shortages in the 1940s that sought to increase productivity of land by employing science-based technologies in agriculture.¹⁷ The Green Revolution was born in the 1950s and continued developing new farming methods through the 1970s; these methods include the engineering of high-yielding plants and the establishment of large, monocultural farms heavily reliant on chemical pesticides and fertilizers, mechanization, and irrigation.¹⁸ While the Green Revolution's techniques were successful in increasing food production for several decades, the long-term effects of this method of farming on the environment, economy, and society are now evident: groundwater contamination from chemical pesticides and fertilizers; soil erosion and depletion of soil nutrients caused by unsound cropping practices; destruction of necessary insects, such as bees, from pollution and the indiscriminate use of pesticides; inherent economic risks stemming from reliance on monocrops; and side effects on humans from agrochemicals.¹⁹ Further, these agricultural methods have resulted in the loss of the family farm²⁰ and many rural farmers have lost their livelihoods as human labor has been replaced by machinery.²¹

Rapid population growth will increasingly burden the planet's food supply system. In 2008, United Nation's Chief Ban Ki-moon told world leaders the following: "The world needs to produce more food. Food production needs to rise by 50 per cent [sic] by the year 2030 to meet the rising demand."²² Unfortunately, the Green Revolution's

nations cultivating their best lands for exports to the United States or the European Union.").

¹⁶ See Windham, *supra* note 7, at 7.

¹⁷ ANDREW PEARSE, SEEDS OF PLENTY, SEEDS OF WANT: SOCIAL AND ECONOMIC IMPLICATIONS OF THE GREEN REVOLUTION 1 (1980).

¹⁸ Keith Aoki, *Malthus, Mendel, and Monsanto: Intellectual Property and the Law and Politics of Global Food Supply: An Introduction*, 19 J. ENVTL. L. & LITIG. 397, 401–02 (2004).

¹⁹ Mona L. Hymel, *The Population Crisis: The Stork, the Plow, and the IRS*, 77 N.C. L. REV. 13, 80–82 (1998).

²⁰ See Eubanks, *supra* note 10, at 228–29.

²¹ See SHIVA, *supra* note 2, at 2.

²² Ban Ki-moon, Secretary-General, United Nations, Remarks at the High-Level Conference on World Food Security (June 3, 2008), <http://www.un.org/News/Press/docs/2008/sgsm11612.doc.htm>.

agricultural methods may have already reached their limits.²³ Most fertile land is already cultivated and urban development trends threaten existing farmland;²⁴ furthermore, the effects of environmental degradation are resulting in declining crop yields.²⁵

Peak oil²⁶ is yet another threat to the food supply system. Current agricultural practices in the United States are highly dependent on oil. Chemical fertilizers currently used in industrial agriculture are produced by an extremely energy-intensive process that combines hydrogen, which comes from fossil fuels, with nitrogen.²⁷ The current U.S. food supply is also dependent upon fossil fuels for the processing, storage, and transportation of food.²⁸ As the planet's oil supply decreases, current fossil-fueled agricultural practices will cease to be viable and sufficient.

Industrial agricultural practices are also responsible for significant environmental degradation. For example, the Environmental Protection Agency attributes more than half of the pollution contaminating rivers and streams in the United States to farm runoff containing chemical fertilizers and pesticides as well as manure.²⁹ "Dead zones," oxygen-deprived coastal areas where deadly algae bloom, are attributed to agricultural runoff and are known to occur in

²³ SHIVA, *supra* note 2, at 99 ("Today, the Green Revolution has failed in Punjab. Yields are declining. The soil is depleted of nutrients. The water is polluted with nitrates and pesticides."); *see also id.* at 102 ("The failure came from micronutrient deficiencies caused by the rapid and continuous removal of micronutrients by 'high-yielding varieties.'").

²⁴ *See* discussion *infra* Part II.

²⁵ Gordon Conway & Gary Toenniessen, *Feeding the World in the Twenty-first Century*, 402 NATURE C55, C55 (Supp. 1999).

²⁶ Peak Oil refers to the point in time when oil production reaches its peak. *See* Jacqueline Lang Weaver, *The Traditional Petroleum-Based Economy: An "Eventful" Future*, 36 CUMB. L. REV. 505, 508–09 (2006) (describing the "Peak Oil debate involv[ing] the application of [Dr. M. King Hubbert's] curve to global oil production" that suggests that the world has already consumed half of the planet's oil supply and we are now "on an irreversible decline curve").

²⁷ Windham, *supra* note 7, at 8.

²⁸ SHIVA, *supra* note 2, at 96 (discussing industrialized, globalized agriculture's dependence upon oil).

²⁹ Windham, *supra* note 7, at 19. Furthermore, the Environmental Protection Agency "has found seventy-four different pesticides in the groundwater of thirty-eight states," including the highly toxic pesticide Aldicarb, which was found in sixteen states. Jennifer Hoffpauir, *The Environmental Impact of Commodity Subsidies: NEPA and the Farm Bill*, 20 FORDHAM ENVTL. L. REV. 233, 250 (2009) (citing James Stephen Carpenter, Note, *Farm Chemicals, Soil Erosion, and Sustainable Agriculture*, 13 STAN. ENVTL. L. J. 190, 199–200 (1994)).

the Gulf of Mexico and the Chesapeake Bay.³⁰ Groundwater and soil are also contaminated by the vast amounts of chemicals dumped onto crops, and these chemicals ultimately destroy the soil's natural fertility process.³¹ As soil fertility declines, industrial farms use ever-increasing amounts of chemical fertilizers to achieve consistent yields.³²

Chemical pesticides are also used in ever-increasing amounts.³³ As pests and insects become resistant to chemicals, industrial farmers must use increasingly lethal chemical pesticides.³⁴ Furthermore, chemical pesticides are applied indiscriminately and beneficial insects are destroyed alongside harmful ones.³⁵ Additionally, mechanized administration methods are harmfully imprecise; much of the administered pesticides never reach the plants but do reach surrounding soil and water.³⁶ Thus, mechanized administration causes excessive contamination of the soil and water without providing a countervailing benefit to the crops.³⁷

Industrial monocultural farming focuses on large-scale production of a single crop; as a result, land is overcultivated, crops are not rotated, and cover crops that protect topsoil between growing seasons are not employed.³⁸ Monocultural farming practices have many negative consequences, including soil erosion, depletion of soil nutrients, loss of biodiversity, extinction of natural enemies, increased agricultural waste, and increased use of chemicals.³⁹ Monoculture practices also upset the natural balance of the planet's ecosystems.⁴⁰

³⁰ Windham, *supra* note 7, at 19; *see also* Hoffpauir, *supra* note 29, at 251 (discussing the effects of increased algal production creating "a hypoxic (or low-oxygen environment) that is inhospitable habitat for fish, shellfish, and most forms of marine life").

³¹ Windham, *supra* note 7, at 19.

³² *Id.* at 19–20.

³³ *Id.* at 20.

³⁴ *Id.*

³⁵ For example, in Egypt, the spraying of insecticides has led to the death of beneficial insects. Michael J. Donovan, *Genetically Modified Insects: Why Do We Need Them and How Will They be Regulated?*, 17 MO. ENVTL. L. & POL'Y REV. 62, 71 (2009).

³⁶ Windham, *supra* note 7, at 20.

³⁷ *See id.*

³⁸ *See generally* Agroecology in Action, Modern Agriculture: Ecological Impacts and the Possibilities for Truly Sustainable Farming, http://www.cnr.berkeley.edu/~agroeco3/modern_agriculture.html (last visited Apr. 17, 2010) (Miguel A. Altieri, Division of Insect Biology, University of California, Berkeley, discussing the harms of monoculture).

³⁹ *Id.*

⁴⁰ *Id.*

When we upset the balance of ecosystems, the long-term effects of these disturbances may not be realized for many years, and at that point it will be too late to reverse the damage.

Industrial, monocultural agriculture systems are also threatened by climate zone shifts brought on by greenhouse gas emissions.⁴¹ Climate change will reduce water sources, raise sea levels resulting in flooding of coastal land, and dry the interiors of the northern continents.⁴² Flooding and drought conditions will stress agricultural systems, and food shortages will likely ensue.⁴³ Industrial monoculture farms require intensive investment into land development, irrigation, and equipment.⁴⁴ As climate change continues, many monoculture farms will no longer be suitable for producing the single crops they were designed to produce.⁴⁵ Diverse, multidimensional agricultural systems will allow for the adaptation of crop and farming practices in response to rapidly changing climate conditions and will help to ensure food security.⁴⁶

II

U.S. URBAN DEVELOPMENT TRENDS

The trend in U.S. urban growth is rapid development of the outlying areas of cities and towns, coupled with a steady decline in the property values and quality of life in the interior urban areas.⁴⁷ Suburban development is not a new trend; communities located on the fringe of cities have existed in the United States since the eighteenth

⁴¹ Cf. SHIVA, *supra* note 2, 9–13 (describing the cause and effects of climate change and its horrific impact on India's Bundelkhand region where drought has left many people starving).

⁴² *Id.* at 10; Gerald C. Nelson, *Agriculture and Climate Change: An Agenda for Negotiation in Copenhagen*, FOCUS 16 (Int'l Food Policy Research Inst., Wash. D.C.), May 2009, at 1, available at <http://www.ifpri.org/sites/default/files/publications/focus16.pdf>.

⁴³ See Nelson, *supra* note 42, at 1.

⁴⁴ Agroecology in Action, *supra* note 38.

⁴⁵ Cf. U.S. EPA, Agriculture and Food Supply, <http://www.epa.gov/climatechange/effects/agriculture.html> (last visited Apr. 17, 2010) (“[T]he enduring changes in climate, water supply and soil moisture could make it less feasible to continue crop production in certain regions.”).

⁴⁶ Cf. SHIVA, *supra* note 2, at 15–16; Hymel, *supra* note 19, at 86 (setting forth scientists' projections regarding significant climate zone shifts that would cause “[u]nprecedented disruption to food production”).

⁴⁷ Robert W. Burchell, *Economic and Fiscal Costs (and Benefits) of Sprawl*, 29 URB. LAW. 159, 162 (1997).

century.⁴⁸ Today, however, sprawl is occurring at unprecedented rates.⁴⁹ Current suburban development features larger homes built on larger lots⁵⁰ and requires development of additional infrastructure and services to support these new communities.⁵¹ Infrastructure costs to support sprawl include capital expenditures to construct roads, utilities, schools, public services, and commercial development as well as expenditures to maintain the systems once in place.⁵² An additional by-product of urban sprawl is increased dependence on automobiles and fossil fuels as suburban dwellers typically commute great distances.⁵³

Urban sprawl converts open space and greenfields into land for urban use.⁵⁴ In addition to home sites and commercial development, construction of roads and highways to support sprawl further destroys green space.⁵⁵ Land that was once a natural habitat for flora and fauna is rapidly being consumed by developers.⁵⁶ While zoning and building codes attempt to mitigate some of the effects of this habitat consumption, sprawl still greatly impacts biodiversity.⁵⁷

Furthermore, agricultural land is increasingly being consumed by new development.⁵⁸ In the late 1990s, the American Farmland Trust declared twelve U.S. agricultural regions, which were producing seventeen percent of total U.S. agricultural sales, to be highly threatened by population growth and urbanization.⁵⁹ As food

⁴⁸ Chad D. Emerson, *All Sprawled Out: How the Federal Regulatory System Has Driven Unsustainable Growth*, 75 TENN. L. REV. 411, 414–15 (2008).

⁴⁹ See Douglas R. Porter, *Reinventing Growth Management for the 21st Century*, 23 WM. & MARY ENVTL. L. & POL'Y REV. 705, 708 (1999) (presenting statistics on population growth and corresponding but disproportionate increases in urbanized land areas in and around U.S. cities).

⁵⁰ See *id.* at 707–08 (describing how the U.S. trend of single-family home ownership on larger lots has resulted in rapid consumption of undeveloped land).

⁵¹ See Burchell, *supra* note 47, at 162.

⁵² *Id.* at 159. Additionally, the cost of maintaining the old infrastructure in declining areas increases taxes and developmental costs throughout the metropolitan area. *Id.* at 162.

⁵³ William W. Buzbee, *Sprawl's Political-Economy and the Case for a Metropolitan Green Space Initiative*, 32 URB. LAW. 367, 372 (2000).

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ Burchell, *supra* note 47, at 168.

⁵⁷ *Id.* at 168–69.

⁵⁸ Buzbee, *supra* note 53, at 372.

⁵⁹ Hymel, *supra* note 19, at 79.

production rates level or decline, efforts to curb sprawl and conserve remaining fertile land are critical to ensure future food production.

Also, as a result of urban sprawl, most economic activities have abandoned the interior urban areas,⁶⁰ and urban services, schools, and businesses continue to deteriorate. As property values and quality of life decline, only those who are too poor to leave inhabit these run-down areas.⁶¹ This exodus further drives down property values in urban areas, often resulting in abandoned properties.⁶² Rising crime rates, including property crimes, are prevalent in declining urban areas.⁶³ Cities incur additional expenditures for crime prevention and maintenance of vacant properties; urban lots “host criminal behavior, accumulate trash, and create various health risks.”⁶⁴ Vacant lots are also economically unproductive and negatively impact neighborhood communities.⁶⁵ Tax revenue that could be spent to improve the existing infrastructure in interior urban areas is instead used to develop new infrastructure in the outlying developments.⁶⁶ Due to the lack of investment in urban infrastructure, the quality of schools, law enforcement agencies, and other public services in urban areas are steadily declining.⁶⁷ Without policies aimed at improving the quality of life in urban areas, this revenue-spending trend will result in urban sprawl continuing to grow as the interior urban areas continue to decline.

⁶⁰ Burchell, *supra* note 47, at 162.

⁶¹ See Tamara Mullen, Note, *The McMansion: Architecture's Role in Facilitating Urban Sprawl and Farmland Loss*, 12 DRAKE J. AGRIC. L. 255, 258 (2007).

⁶² See Jane E. Schukoske, *Community Development Through Gardening: State and Local Policies Transforming Urban Open Space*, 3 N.Y.U. J. LEGIS. & PUB. POL'Y 351, 351–54 (2000). A 1998 study found that nearly one-quarter of land in American cities is classified as vacant, which includes “‘publicly-owned and privately-owned unused or abandoned land or land that once had structures on it, but also land that supports structures that have been abandoned, derelict, boarded up, partially destroyed or razed.’” *Id.* at 351 n.2 (quoting ANN O'M. BOWMAN & MICHAEL A. PAGANO, LINCOLN INST. OF LAND POL'Y, URBAN VACANT LAND IN THE UNITED STATES 18–19 (1998)).

⁶³ *Id.* at 353.

⁶⁴ *Id.* at 351.

⁶⁵ *Id.* at 353 n.11.

⁶⁶ See Porter, *supra* note 49, at 711 (“Development in greenfield areas also requires costly extensions of basic community infrastructure systems such as roads and schools, while existing systems in urbanized areas go begging for maintenance and reinvestment.”).

⁶⁷ Burchell, *supra* note 47, at 162.

III URBAN AGRICULTURE

Urban agriculture is a system that ensures food security by providing access to land and resources to support urban farming efforts.⁶⁸ The United Nations Development Programme defines urban agriculture as follows:

[A]n industry that produces, processes, and markets food and fuel, largely in response to the daily demand of consumers within a town, city, or metropolis, on land and water dispersed throughout the urban and peri-urban area, applying intensive production methods, using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock.⁶⁹

In the United States, urban agriculture is perhaps better known as community gardening.⁷⁰ Community gardens are areas where residents grow food on publicly held or privately held land that they do not own.⁷¹ Most often, community gardens are located within neighborhoods, on public housing premises, or on school grounds.⁷²

In the face of an imminent food shortage, especially in light of the economic and energy crises discussed above, it is imperative that urban residents expand urban food production. Neglected and abandoned vacant lots in blighted urban areas comprise a vast amount of land that could be converted into urban gardens.⁷³ In addition to vacant lots, other urban areas including schoolyards, hospital grounds, parks and other open spaces, utility easements, alleys, rooftops,⁷⁴

⁶⁸ See generally KATHERINE H. BROWN & ANNE CARTER, N. AM. URBAN AGRIC. COMM., URBAN AGRICULTURE AND COMMUNITY FOOD SECURITY IN THE UNITED STATES: FARMING FROM THE CITY CENTER TO THE URBAN FRINGE (2003), available at <http://www.foodsecurity.org/PrimerCFSCUAC.pdf> (providing a thorough discussion of urban agriculture's benefits).

⁶⁹ JAC SMIT ET AL., U.N. DEV. PROGRAMME, URBAN AGRICULTURE: FOOD, JOBS AND SUSTAINABLE CITIES 4 (1996).

⁷⁰ See, e.g., Schukoske, *supra* note 62, at 355.

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.* at 351.

⁷⁴ See BROWN & CARTER, *supra* note 68, at 8 ("Rooftops typically comprise at least 30 percent of a city's total land area, thus creating a large area of production."). An increase in the number of rooftop gardens would reduce greenhouse gas emissions, food transportation costs, and environmental harms. *Id.*

building walls,⁷⁵ and even windowsills all provide opportunities for urban agriculture.⁷⁶

While the many benefits of a sustainable urban agricultural system will be discussed below, additional benefits to urban communities deserve mention here. Urban gardens beautify and green urban neighborhoods while also building a sense of community.⁷⁷ Urban gardens provide educational and employment opportunities, promote self-respect, and can even reduce crime rates.⁷⁸ These gardens also offer urban residents an opportunity to connect with nature and can instill environmental ethics.⁷⁹ Additionally, urban gardens promote entrepreneurship, as urban farmers can sell excess produce at farmers' markets, through Community Supported Agriculture programs,⁸⁰ and directly to restaurants.⁸¹ Finally, urban gardening provides low-income urban residents with a supply of fresh and healthy organic food that can combat problems associated with inadequate nutrition, such as illness, fatigue, depression, anxiety, and hunger.⁸²

IV SUSTAINABILITY

Sustainability is best described as a concept of making decisions for the courses of action we choose in a way that balances the three

⁷⁵ See Ken Belson, *The Rooftop Garden Climbs Down a Wall*, N.Y. TIMES, Nov. 19, 2009, at F4. "Edible walls" are the newest innovation in urban gardening. *Id.* Edible walls consist of "metal panels filled with soil and seeds" that are hung vertically to produce food, herbs, and flowers. *Id.* Like rooftop gardens, edible walls reduce greenhouse gas emissions and require little space to provide food for urban residents. *Id.* In addition to providing food and reducing emissions, edible walls provide additional insulation to buildings, thus reducing heating and cooling costs (and further reducing emissions). *Id.*

⁷⁶ In Cuba, in the face of catastrophic food shortages, urban residents grew food not only in yards and vacant lots but also in alleys, patios, balconies, rooftops, and windowsills. See discussion *infra* Part V.

⁷⁷ Schukoske, *supra* note 62, at 352.

⁷⁸ Dorothy A. Borrelli, Note, *Filling the Void: Applying a Place-Based Ethic to Community Gardens*, 9 VT. J. ENVTL. L. 271, 276–77 (2008).

⁷⁹ *Id.* at 279.

⁸⁰ See, e.g., LocalHarvest, Community Supported Agriculture, <http://www.localharvest.org/csa/> (last visited Apr. 17, 2010) (allowing farmers to sell their seasonal produce directly to consumers on a subscription basis).

⁸¹ BROWN & CARTER, *supra* note 68, at 9.

⁸² *Id.* at 5.

“E’s” of sustainability—environment, economy, and social equity⁸³—as well as the lesser known prong of sustainability, national security.⁸⁴ Sustainability is a big-picture concept. Our individual actions as well as local, state, and federal policies do not exist in a vacuum; every action has an impact on the world at large and on future generations. To create a truly sustainable world, all of our decisions, from individual choices to federal policies, must consider the impact on the environment, economy, society, and national security.

Media coverage, marketing of consumer products,⁸⁵ and recent documentaries have all contributed to bringing the terms “green” and “sustainability” into our everyday vocabulary,⁸⁶ yet no clear definitions of these terms exist. While green focuses on protection of the environment, sustainability is much broader. In 1987, the World Commission on Environment and Development, in the Brundtland Report, defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”⁸⁷ At a more fundamental level, sustainability can be defined as “able to be sustained,”⁸⁸ where sustain means to “strengthen or support physically or mentally . . . [to] keep (something) going over time or continuously.”⁸⁹ In this broader context, sustainability requires that we look at our current lifestyles and practices and evaluate their capability of being continued indefinitely.

Much of the recent attention concerning sustainability focuses on technologies designed to reduce energy consumption and foster

⁸³ See Sheila R. Foster, *From Harlem to Havana: Sustainable Urban Development*, 16 TUL. ENVTL. L.J. 783, 790 (2003) (citing to U.N. Conference on the Environment and Development, Agenda 21, ¶ 8.4, U.N. DOC. A/CONF.151.26 (June 3–14, 1992)).

⁸⁴ SUSTAINABLE AMERICA: AMERICA’S ENVIRONMENT, ECONOMY AND SOCIETY IN THE 21ST CENTURY 4–5 (Daniel Sitarz ed., 1998).

⁸⁵ For example, Clorox launched its Green Works line of natural green cleaning products. See Colin Dunn, *Introducing Clorox’s Green Works Cleaners*, TREEHUGGER, Jan. 18, 2008, <http://www.treehugger.com/files/2008/01/clorox-green-works.php>.

⁸⁶ E.g., AN INCONVENIENT TRUTH (Paramount Classics 2006); THE 11TH HOUR (Warner Independent Pictures 2007); FUEL (Greenlight Theatrical 2008); FOOD, INC. (Magnolia Pictures 2009).

⁸⁷ World Comm’n on Env’t & Dev., *Our Common Future: From One Earth to One World*, ¶ 1, U.N. Doc. A/42/427 (Mar. 20, 1987), available at <http://www.un-documents.net/ocf-02.htm#I>.

⁸⁸ OXFORD ENGLISH DICTIONARY 1444 (Rev. 10th ed. 2002).

⁸⁹ *Id.*

development of renewable energy sources.⁹⁰ Little discourse has been directed towards the immediate impact individuals can have merely by reducing personal levels of consumption through a simplified lifestyle, yet such a reduction would yield immediate results and require little financial investment. As individuals, we can foster sustainability while increasing our food supply simply by providing more for ourselves through a sustainable urban agricultural system. Government incentives, discussed *infra* Part VII, provide land and resources that would enable individuals and communities to take action to transform our agricultural system into one that is both sustainable and secure.

In the following sections, this Note provides an overview of each of the four elements of sustainability—environment, economy, equity, and national security. This Note also discusses modern industrial agriculture, urban development trends, and urban agriculture in terms of the elements of sustainability.

A. Environmental Sustainability

In the environmental context, sustainability encourages production and development methods that preserve and protect our natural resources and reduce our impact on the environment.⁹¹ This involves “protecting existing environmental resources (both in the natural and ‘built’ world), including the preservation of historical sites and the development of environmental resources and assets for future use.”⁹² To accomplish this goal, we must find innovative ways to reduce our consumption of resources and replenish the resources we do consume. We must protect biodiversity and ecosystems, as well as our land, air, and water resources by reducing greenhouse gas emissions, carbon footprints, air and water pollution, and soil contamination.⁹³ In the

⁹⁰ Development of clean alternative energy sources, such as solar, wind, and wave energy, green construction, and energy efficient vehicles, has dominated the discussion regarding the impending energy crisis. *E.g.*, John M. Broder, *Gore Calls for Energy Shift to Avoid a Global Crisis*, N.Y. TIMES, Jul. 18, 2008, at A17; *see also* SHIVA, *supra* note 2, at 4 (“Most of the discussions and negotiations on climate change have been restricted to the commercial, consumption-oriented energy paradigm rooted in a reductive, mechanistic worldview and consumerist culture.”).

⁹¹ SUSTAINABLE AMERICA, *supra* note 84, at 14.

⁹² Foster, *supra* note 83, at 790.

⁹³ *See, e.g.*, Association of Bay Area Governments, Smart Growth Strategy / Regional Livability Footprint Project, http://www.abag.ca.gov/planning/smartgrowth/3Esof_sustainability.html (last visited Apr. 17, 2010).

context of land use and food production, environmental sustainability demands that we conserve undeveloped land and employ food production methods that will have a minimal impact on the planet.

1. Environmental Sustainability and Industrial Agriculture

Industrial agriculture is a system in which economies of scale and maximization of profits are the ultimate goals.⁹⁴ Profits are maximized when agribusinesses produce the largest yield of single crops at the lowest possible cost, primarily through mechanization and intensive use of agricultural chemicals.⁹⁵ As discussed *supra* Part I, the environmental effects of industrial agricultural methods include soil erosion, depletion of soil nutrients, groundwater contamination from chemical inputs, and consumption of finite fuels.⁹⁶ Additionally, as crop yields decline due to environmental degradation and demand for agricultural products rises due to population growth and the increased use of plant-derived biofuels, more and more land will be consumed by industrial agriculture. This will result in an agricultural system that depletes and destroys natural resources at an increasing rate, which will negatively impact the planet's carrying capacity.⁹⁷

Along with farm subsidies and corporate control of food production in the United States, policies that allow the harms of industrial agriculture to be treated as externalities help perpetuate the current agricultural system.⁹⁸ Under the current system, agribusinesses may pollute the environment, deplete clean water and soil, and promote social inequity without having to account for these

⁹⁴ Windham, *supra* note 7, at 4.

⁹⁵ *Id.*

⁹⁶ See *supra* notes 28, 38 and accompanying text.

⁹⁷ Carrying capacity refers to "the maximum population size of any organism that an area can support, without reducing its ability to support the same species in the future." See Hymel, *supra* note 19, at 19 (emphasis omitted) (quoting PAUL R. EHRLICH ET AL., *THE STORK AND THE PLOW* 4 (1995)). Carrying capacity is a function of population, consumption patterns of the planet's resources, and the amount of resources available. *Id.* at 19–20. The ability of future generations to sustain themselves is threatened when industrial farms contaminate the air, water, and earth and overconsume undeveloped land.

⁹⁸ Externalities are costs imposed on society that are not paid for by the producer and are not justified by the benefits to the consumer. See Richard D. Gary & Michael L. Teague, *The Inclusion of Externalities in Electric Generation Resource Planning: Coal in the Crossfire*, 95 W. VA. L. REV. 839, 844 (1993). Treating environmental degradation and consumption of natural resources as externalities creates artificially cheap food prices and removes incentives for industrial farms to reduce the harms to society. See *id.*

harms when calculating profits. These external costs are significant; contaminated industrial farm runoff alone causes an estimated \$9 billion of damage annually to U.S. surface waters.⁹⁹ Further, the externalization of these costs discourages agribusinesses from conserving water, fertile land, and other natural resources.

2. *Environmental Sustainability and Urban Development Trends*

Current urban development trends impact the environment in several significant ways. The most direct impacts are land consumption and the destruction of natural habitats.¹⁰⁰ While interior urban areas are deteriorating and being abandoned at an increasing rate, the constant consumption of land to support new urban development is destroying greenfields, forests, and species.¹⁰¹ These new communities require land not only for building homes and businesses, but also for housing public services, such as schools and hospitals, and for creating an expanded transportation infrastructure.¹⁰² Increased commuting associated with urban sprawl and flight from blighted areas relies on oil, a finite resource with decreasing availability, and significantly contributes to greenhouse gas emissions,¹⁰³ which pollute the air and contribute to climate change.¹⁰⁴

Urban sprawl further contributes to the degradation of the environment by polluting water sources with runoff from newly constructed impervious surfaces such as homes and transportation infrastructures.¹⁰⁵ During the construction phase, stormwater flows over construction sites, “pick[ing] up debris, chemicals, and sediment

⁹⁹ Windham, *supra* note 7, at 19 (citing JENNIFER KENT & NORMAN MYERS, *PERVERSE SUBSIDIES: HOW TAX DOLLARS CAN UNDERCUT THE ENVIRONMENT AND THE ECONOMY* 53 (2001)).

¹⁰⁰ See Burchell, *supra* note 47, at 168–69; see also Buzbee, *supra* note 53, at 372.

¹⁰¹ See Burchell, *supra* note 47, at 162.

¹⁰² See *id.*

¹⁰³ Cf. Buzbee, *supra* note 53, at 372; Adrienne Lyles-Chockley, *Building Livable Places: The Importance of Landscape in Urban Land Use, Planning, and Development*, 16 *BUFF. ENVTL. L.J.* 95, 114 (2008–2009) (“Rooftops typically comprise at least 30% of a city’s total land area and offer prime space for food production with the added benefits of reduced energy consumption and decreased greenhouse gas emissions.”).

¹⁰⁴ See Rahul Saxena, Feature, *Economic Growth and the Environment: India Confronts the Link Between Automobiles and Climate Change*, 7 *SUSTAINABLE DEV. L. & POL’Y* 59, 59 (Winter 2007).

¹⁰⁵ See Buzbee, *supra* note 53, at 372.

that flow into water bodies.”¹⁰⁶ Water pollution continues to degrade the environment post-construction as stormwater runoff from paved surfaces, including new roads and highways, is also contaminated.¹⁰⁷

3. *Environmental Sustainability and Urban Agriculture*

Transitioning from an industrial agricultural system to a sustainable urban agricultural system would minimize the impacts of food production on the planet. Urban agriculture reduces the consumption of undeveloped land for farming. Food would be produced in areas that are already developed and populated, thereby conserving open space for natural habitat.

Due to the proximity of urban gardens to dwellings and other buildings, urban agriculture must be performed without the use of large machinery and without the use of chemical pesticides and fertilizers.¹⁰⁸ While lack of such inputs could be perceived as a challenge, urban gardening methods may result in increased crop yields on smaller plots of land than conventional farming practices achieve.¹⁰⁹ Rather than maximizing crop yields through extensive use of chemicals, sustainable agriculture relies on crop rotation, composting, biofertilizers, and other organic farming techniques to improve soil fertility.¹¹⁰ Organic farming methods also protect water resources because organic farms do not use chemical inputs so there is no contamination of groundwater and streams.¹¹¹ Furthermore,

¹⁰⁶ Eileen D. Millett, NPDES Issues in Urban Environments, Presentation at American Bar Association Continuing Legal Education Course on Clean Water Act: Law and Regulation (October 27–29, 2004), in SK037 ALI-ABA 67, 73 (2004).

¹⁰⁷ See *id.*

¹⁰⁸ Cf. Colin Crawford, *Necessity Makes the Frog Jump: Land-Use Planning and Urban Agriculture in Cuba*, 16 TUL. ENVTL. L.J. 733, 746 (2003).

¹⁰⁹ Urban commercial gardens using intensive production methods can yield thirteen times more per acre than rural farms. BROWN & CARTER, *supra* note 68, at 9; see also Windham, *supra* note 7, at 16 (“While it is true that farmers converting from industrial production to organic production often experience lower yields in the first few years as the soil and surrounding biodiversity recover from the use of chemicals and farmers learn how to grow organic, recent studies show that over time organic farms produce almost equal if not greater yields than industrial farms.”).

¹¹⁰ See Carmen G. Gonzalez, *Seasons of Resistance: Sustainable Agriculture and Food Security in Cuba*, 16 TUL. ENVTL. L.J. 685, 724 (2003) (describing benefits of transitioning to sustainable agriculture in Cuba).

¹¹¹ See U.S. EPA, Pesticides and Food: What “Organically Grown” Means, <http://www.epa.gov/pesticides/food/organics.htm> (last visited Apr. 17, 2010) (“‘Organically grown’ food is food grown and processed using no synthetic fertilizers or pesticides.”).

organic fertilizers reduce the amount of waste deposited in landfills because they are made from composted and recycled food waste, leaves, and lawn clippings.¹¹²

Urban gardening reduces the effects of climate change by decreasing greenhouse gas emissions. Unlike industrial farms, urban gardens are cultivated and harvested with minimal mechanization and do not use oil-based fertilizers.¹¹³ Moreover, food that is grown and sold locally eliminates the need for wasteful plastic packaging and fossil-fueled transport to market.¹¹⁴ Additionally, having fresh food available in every neighborhood would reduce carbon-emitting automobile trips to the grocery store.¹¹⁵

Urban agriculture presents an opportunity to reverse the decline of urban areas. A significant benefit of urban gardens is the beautification of urban neighborhoods and strengthening of community spirit.¹¹⁶ Urban gardens also can prompt the cleanup of contaminated vacant lots.¹¹⁷ Furthermore, increasing the amount of vegetation in urban areas would reduce surface temperatures during hot months and improve urban air quality.¹¹⁸

B. Economic Sustainability

Sustainability requires that economic growth and development must be integrated with environmental protection and sustainable utilization of resources.¹¹⁹ Economic growth and development must

¹¹² BROWN & CARTER, *supra* note 68, at 8.

¹¹³ *See id.*

¹¹⁴ Transportation of food consumes significant amounts of fuel as “[i]t is estimated that the average American meal travels about 1500 miles to get from farm to plate.” Center for Urban Education about Sustainable Agriculture, *Issues in a Nutshell: How Far Does Your Food Travel to Get to Your Plate?*, http://www.cuesa.org/sustainable_ag/issues/foodtravel.php (last visited Apr. 17, 2010).

¹¹⁵ *Cf.* Nature Conservancy, *Climate Change: What You Can Do*, *Climate-Saving Tips from a Nature Conservancy Scientist*, <http://www.nature.org/initiatives/climatechange/activities/art19630.html> (last visited Apr. 17, 2010) (“In the United States, automobiles produce over 20 percent of total carbon emissions.”).

¹¹⁶ Schukoske, *supra* note 62, at 352.

¹¹⁷ *Cf.* Lyles-Chockley, *supra* note 103, at 111–13.

¹¹⁸ *Id.* at 115–16, 126; *see also* U.S. EPA, *Urban Heat Island Mitigation*, <http://www.epa.gov/heatisland/mitigation> (last visited Apr. 17, 2010) (describing heat island effects and the benefits of trees and vegetation in urban areas).

¹¹⁹ *Cf.* Victoria Jenkins, Review, *Communication from the Commission: A Sustainable Europe for a Better World: A European Union Strategy for ‘Sustainable Development,’* 14 J. ENVTL. L. 261, 262–63 (2002) (discussing the European Union’s strategy for

also promote both intergenerational and intragenerational equity.¹²⁰ While a steadily expanding economy is considered prosperity, a growing world population coupled with increasing overall consumption threatens to strain our planet beyond its carrying capacity.¹²¹ When economic stability is equated with increased consumption, we push the limits of the planet's carrying capacity. Simply put, we are depleting the Earth's resources at a rate that threatens the Earth's future ability to support our species.

The economic aspect of sustainability also addresses the fact that many of the planet's resources are treated as externalities in the marketplace.¹²² For example, the costs of depleting natural resources and polluting the air, water, and ground are not reflected in the price of goods. Through regulations, mandates, and incentives, the U.S. government addresses some of these environmental costs,¹²³ but more must be done to implement policies that will incorporate external costs into pricing structures.

1. Economic Sustainability and Industrial Agriculture

Industrial agriculture is not economically sustainable. Industrial agriculture seeks to maximize profits without regard for environmental degradation or the long-term effects of heavy reliance on chemical pesticides and fertilizers. Rather than balancing economic growth with environmental protection and equity, industrial agriculture concentrates on maximizing profits at the expense of the environment and society, both in the present and the future. The United States currently has no regulations or policies in place that would impose costs upon agribusinesses for externalities;¹²⁴ rather, current policies promote harmful industrial agricultural methods.¹²⁵ A

implementation of the United Nation's plan of action for sustainable development that includes "[i]ntegrating environmental protection and economic development").

¹²⁰ *Cf. id.* at 263.

¹²¹ *See supra* note 97 and accompanying text.

¹²² *See supra* note 98 and accompanying text.

¹²³ *See* Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 29 (2001) (tracing the U.S. history of environmental regulations and controls).

¹²⁴ All but the largest of farms are implicitly or explicitly exempt from U.S. environmental laws, including the Clean Water Act and the Clean Air Act. *See* Eubanks, *supra* note 10, at 249–51 (presenting examples of implicit and explicit exemption from environmental laws).

¹²⁵ Morrow, *supra* note 12, at 362; *see also supra* note 98 and accompanying text.

food production system that allows businesses to maximize profits without concern for its impact on society and the environment is not sustainable.

2. *Economic Sustainability and Urban Development Trends*

The U.S. urban sprawl-based land development trend perpetuates economic growth in development at the expense of the environment and society. Destruction of greenspace in lieu of restoring deteriorated built areas harms the environment by destroying or fragmenting a habitat, consuming open space, and increasing pollution caused by commuting, water runoff, and the transportation infrastructure.¹²⁶ In a system that treats the economic costs of these environmental harms as externalities, development profits come at the expense of society and create intragenerational inequity. Additionally, unbridled development today will result in fewer resources for future generations, which creates intergenerational inequity. Urban development policies that perpetuate urban sprawl and budget expenditures that favor suburban growth at the expense of the poor and future populations are not equitable, and therefore not sustainable.

3. *Economic Sustainability and Urban Agriculture*

Urban agriculture has the potential to increase urban productivity¹²⁷ and benefit the general economy while comporting with the other principles of sustainability. Urban agricultural programs provide skills and job training to urban residents.¹²⁸ Providing land and support infrastructure for urban residents to produce food promotes economic growth by allowing urban residents to supplement their income if they distribute their produce—through community supported agriculture programs or otherwise.¹²⁹ Furthermore, implementing an urban agricultural system in which food stamp recipients would be able to obtain fresh fruits and vegetables directly from community food-bank gardens where they contribute labor

¹²⁶ See Edward T. Canuel, *Supporting Smart Growth Legislation and Audits: An Analysis of U.S. and Canadian Land Planning Theories and Tools*, 13 MICH. ST. J. INT'L L. 309, 312 (2005); Burchell, *supra* note 47, at 168–69; Buzbee, *supra* note 53, at 372.

¹²⁷ Crawford, *supra* note 108, at 747.

¹²⁸ BROWN & CARTER, *supra* note 68, at 12.

¹²⁹ See Crawford, *supra* note 108, at 747 (“[I]n Cuba and elsewhere, urban agriculture can supplement cash incomes.”).

would reduce government food stamp benefit payouts. Such a system would give low-income residents additional benefits including access to more nutritious food, acquisition of farming skills and practices, increased social connectedness, and pride in “ownership.”¹³⁰

Conversion of vacant lots for gardens will allow for food to be grown in urban areas, reducing the consumption of land for food production. Urban agriculture can benefit the economy by reducing government expenditures for crime prevention, trash removal, maintenance, and environmental protection in blighted areas.¹³¹ Another potential economic benefit of an urban agricultural system may be increased tax revenues stemming from increased property values and economic activity in currently blighted areas.¹³²

C. Equity and Sustainability

Equity considerations, both intragenerational and intergenerational, should impact our choices. Regarding intragenerational equity, all members of society “should have a satisfactory quality of life, particularly with respect to access to resources and development opportunities.”¹³³ Intergenerational equity requires that actions taken to meet the current generation’s development needs do not prevent future generations from meeting their own development needs.¹³⁴ A society where some segments consume more than their share of resources results in current social inequity as well as inequity between current and future generations.

Overconsumption by the developed world, and within that subset by the wealthy, results in inequitable resource depletion and may lead to “resource wars.”¹³⁵ Building local communities where the

¹³⁰ Lyles-Chockley, *supra* note 103, at 112 (“Urban farms educate a person to control their own food and resources, which in turn manages their health and makes available the healthiest foods to the neediest individuals. . . . Neighborhood revitalization happens when residents take pride in a community garden. Economic development is achieved when residents gain the ability to grow and market their own food Community empowerment is developed when residents have access to, and greater control over, their own food system.”).

¹³¹ See *id.* at 116–18 (describing the struggles faced by cities concerning maintenance of vacant lots and open space).

¹³² *Id.* at 115 (“[N]eighborhood greenspaces typically increase the value of properties located nearby.”).

¹³³ Foster, *supra* note 83, at 790.

¹³⁴ *Id.*

¹³⁵ Water shortages, food shortages, and migration crises caused by global warming (resulting from over consumption of resources and resultant pollution) could lead to

consumption of natural resources is reduced and all of society has equal access to food, security, education, healthcare, fair pay, and equitable treatment fosters sustainability.

1. *Equity and Industrial Agriculture*

The harmful effects of industrial agriculture's chemical farming practices inequitably impact residents living near industrial farms, as well as infants and young children who are more susceptible to the risks of long-term health effects caused by agricultural chemicals.¹³⁶ Agribusiness benefits from the intensive use of chemicals while society pays the price. For example, several cancers, brain and nervous system disorders, as well as other immune system disruptions have been linked to pesticides.¹³⁷ Government expenditures in the form of farm subsidies benefit agribusinesses at the expense of small, local, and organic farmers.¹³⁸ All of these circumstances result in intragenerational inequities.

Unsound farming practices, indiscriminate use of chemicals, water contamination, soil depletion, pollution, and consumption of finite land and oil resources by today's generations will all impact future generations' ability to sustain themselves. If the current levels of depletion, destruction, and pollution continue, industrial agricultural methods will create intergenerational inequity because crop yields will continue to decline and the planet will no longer have adequate resources to support an ever-growing population.

2. *Equity and Urban Development Trends*

Urban sprawl results in increased social inequity and a breakdown of social communities. Job scarcity, inadequate educational opportunities, and elevated crime rates have negatively impacted the quality of life for urban dwellers.¹³⁹ The economic effects of urban sprawl also create inequities in access to public services and an uneven consumption of resources.¹⁴⁰ Under the current urban sprawl

resource wars for basic necessities. Michael Shellenberger et al., *Fast, Clean, & Cheap: Cutting Global Warming's Gordian Knot*, 2 HARV. L. & POL'Y REV. 93, 94-95 (2008).

¹³⁶ Windham, *supra* note 7, at 20.

¹³⁷ *Id.* at 20-21.

¹³⁸ See Eubanks, *supra* note 10, at 227-29 (discussing farm subsidy recipients and Farm Bill policies favoring agribusiness).

¹³⁹ See Burchell, *supra* note 47, at 168-69; Schukoske, *supra* note 62, at 352-54.

¹⁴⁰ Burchell, *supra* note 47, at 162, 168.

development scheme, the gap between rich and poor grows and society and communities suffer.¹⁴¹ Urban sprawl and declining urban interiors contribute to increased intragenerational inequity.

The overconsumption of open space creates inequity between current generations and future generations. Land is a finite resource; the unbridled consumption of greenspace and agricultural land currently employed by urban sprawl limits future generations' access to undeveloped land and fertile soil. To promote equity and create a sustainable future, local communities and all levels of government should invest in and revitalize urban areas. Creating urban areas that are safe and economically viable will promote equity while also helping to curb urban sprawl and minimize negative environmental impacts by protecting the biosphere and preserving land for future development.

3. *Equity and Urban Agriculture*

Establishing an urban agricultural system in the United States would promote social equity among socioeconomic classes while ensuring that future generations have adequate natural resources to sustain themselves. Improving the quality of life and increasing property values of interior urban areas strengthens community ties and gives residents of impoverished and deteriorating areas an opportunity to rebuild their neighborhoods. Furthermore, urban gardens allow residents of inner areas to experience the joy and satisfaction of producing nutritious food in their own neighborhoods.¹⁴²

Urban agriculture provides food security for urban residents by promoting self-sufficiency.¹⁴³ As opposed to 100 years ago, "when 50 percent of Americans lived on farms or in small rural communities where they fed themselves with locally grown foods," today, eighty percent of Americans reside in cities.¹⁴⁴ Because of this shift, food must be transported great distances to reach urban residents.¹⁴⁵ Additionally, many Americans live below the poverty line and require emergency food assistance, a condition exacerbated by the current

¹⁴¹ Buzbee, *supra* note 53, at 372.

¹⁴² Borrelli, *supra* note 78, at 276–77.

¹⁴³ Crawford, *supra* note 108, at 738.

¹⁴⁴ BROWN & CARTER, *supra* note 68, at 4.

¹⁴⁵ *Id.* ("Food products typically travel between 1500 and 2500 miles from farm to plate . . . [and] can spend as many as seven to fourteen days in transit . . .").

economic crisis.¹⁴⁶ As food shortages become a reality, landowners will have the ability to grow their own food. Without an urban gardening system, impoverished urban dwellers will not have that same opportunity. If land and resources for food production are not available in interior urban areas, as food prices rise and food eventually becomes scarce, the gap between the rich and poor will continue to grow. Urban gardens promote self-reliance within local communities by allowing residents to produce food for themselves and others by utilizing resources already locally available.¹⁴⁷

In the deteriorating neighborhoods of interior urban areas, poverty, inadequate services, lack of job opportunities, and high crime rates degrade the quality of life. This degradation creates a spiral effect, and the decline of urban areas continues. Urban gardens provide urban dwellers the opportunity to develop a sense of ownership and pride in their neighborhoods. Transforming vacant lots into thriving urban gardens brings people together, giving them a common goal of beautifying their neighborhoods while producing healthy food. While most urban dwellers may never have the opportunity to own property, urban gardens allow them to experience the pride of ownership as they own the fruits of their labor.¹⁴⁸ In this sense, urban gardens can reduce the social inequities between the rich and poor. The beautification of once vacant lots and the increased sense of community make urban neighborhoods safer and more attractive places to live, which, in turn, revitalizes urban neighborhoods.¹⁴⁹

Urban gardens also help create equity between the rich and poor by ensuring that even our poorest residents have access to fresh and healthy food. Many Americans live below the poverty line and cannot afford the food they need.¹⁵⁰ Even when urban residents can afford food, access to quality food in urban areas is lacking.¹⁵¹ As food scarcity increases and oil prices rise, high quality food will become increasingly expensive and the average diet of the

¹⁴⁶ *Id.*

¹⁴⁷ See Lyles-Chockley, *supra* note 103, at 112.

¹⁴⁸ Smart Communities Network, Success Stories: The Power of Hope Garden, http://www.smartcommunities.ncat.org/success/power_of_hope.shtml (last visited Apr. 17, 2010) (describing how gardening raises “more than vegetables” because it raises “people’s self-esteem”).

¹⁴⁹ BROWN & CARTER, *supra* note 68, at 7.

¹⁵⁰ *Id.* at 4.

¹⁵¹ *Id.* at 5 (discussing urban residents and the lack of adequate quantities of quality food in urban areas).

economically disadvantaged will continue to decline. Equity requires that access to healthy food is available to all. Urban gardens ensure this access by allowing a community's poorer residents to produce food for themselves and to share the excess with other disadvantaged members of their community.

As we change our agricultural system from one in which increasingly large areas of land are consumed to produce steadily decreasing crop yields to one in which all available developed land is cultivated to attain maximum production, we conserve undeveloped land for future generations. Undeveloped land is a finite resource; development of greenspace attributable to sprawl and industrial agriculture will eventually consume all remaining fertile land, precluding future generations from sustaining themselves. Shifting our agricultural methods to a sustainable urban agricultural system will ensure that adequate resources will be available for the future inhabitants of the planet.

D. National Security

In order to be capable of sustaining itself, the United States must eliminate dependence on foreign oil and food imports. Dependence on foreign oil and food imports makes the United States vulnerable to an attack on the existing import-reliant system.¹⁵² Further, in order to protect U.S. interests in foreign oil, the United States funds wars and military troops overseas while many U.S. residents struggle to survive. These funds could be employed to bolster the U.S. economy and provide additional education, healthcare, housing, and food to U.S. residents, all of which would promote social equity. As the vast majority of Americans reside in urban areas, adequate energy supply and transportation infrastructure are vital to our current food supply system.¹⁵³ A sustainable society capable of providing basic necessities within each community would sharply reduce the impact

¹⁵² Endres & Endres, *supra* note 5, at 405–06 (discussing risks and threats to food security inherent in a consolidated and centralized production, distribution, and processing food system).

¹⁵³ As a result of a consolidated and concentrated food production system, food in the United States “travels long distances, requiring large amounts of energy to reach the majority of consumers.” *Id.* at 406; *see also id.* at 410 (“Exclusive reliance on the ability of the complicated national-level agricultural and food processing system neglects the potential of local food networks to respond to chronic food shortages caused by shocks to other aspects of the system.”).

of an attack on the existing infrastructure or an energy supply shortage.¹⁵⁴

1. *National Security and Industrial Agriculture*

An industrial agricultural system is inherently dependent on fuel and energy for food production, transportation, and storage. Distribution of food in such a system is not only dependent on oil, but also transportation infrastructure. An attack on the oil supply or the transportation infrastructure would have an immediate and drastic impact on the food supply. Industrial monocultural farming in the United States, focused on large-scale production of only the most profitable crops, threatens national security by creating dependency on foreign imports to supplement the domestic food supply.¹⁵⁵ Yet another threat to food security stems from the risk of bioterrorism;¹⁵⁶ centralized food production sites and complex food distribution systems increase the opportunity for bioterrorist attacks on the food supply.¹⁵⁷ Eventual food scarcity resulting from declining crop yields through industrial agricultural methods may lead to resource wars, further jeopardizing national security.

2. *National Security and Urban Development Trends*

Urban development, like industrial agriculture, is reliant upon oil and energy to function. Declining oil and energy supplies will lead to escalating financial costs for commuting. In the face of an oil shortage, current development trends may cease to be viable as commuting via oil-dependent automobile transportation will become prohibitively expensive or, if oil is no longer available, even impossible. Similarly, the cost of transporting goods such as food will become increasingly expensive.

¹⁵⁴ *Id.* at 408 (“Over the long-term, a diverse, more localized agricultural sector may be more resilient and better able to combat the more chronic threats to national security such as energy shortages and/or price escalation . . .”).

¹⁵⁵ See *supra* note 14 and accompanying text.

¹⁵⁶ BROWN & CARTER, *supra* note 68, at 9.

¹⁵⁷ A. Bryan Endres & Donald L. Uchtmann, *Survey of Illinois Law: Conservation, Energy and Food Developments in Agricultural Law*, 32 S. ILL. U. L.J. 793, 809 (2008) (“[T]he threat of bioterrorism has further elevated the importance of local food chains.”); see also Michael T. Roberts, *Role of Regulation in Minimizing Terrorist Threats Against the Food Supply: Information, Incentives, and Penalties*, 8 MINN. J.L. SCI. & TECH. 199 (2006) (presenting a thorough discussion of the threat of bioterrorism on U.S. food security).

Current consumption of land and other resources to support suburban growth patterns also creates global inequalities. To maintain suburban developments, the United States must consume more of the planet's resources, including land and materials for construction and oil for transportation. Suburban development also contaminates clean air and water. If this resource consumption is not managed properly, resource wars between socioeconomic classes within our own society as well as between the United States and other countries will likely ensue.¹⁵⁸

3. *National Security and Urban Agriculture*

Urban gardens promote both national security and food security. A local sustainable agricultural system is not dependent upon foreign oil to produce chemical fertilizers, run farm equipment, or transport food to market. Under this type of a system, threats to the food supply, in the form of oil shortages or oil price increases, would be diminished. Demand for food imports also decreases as local communities provide themselves with a constant supply of fresh food. Establishing local food production and distribution networks would reduce food scarcity vulnerabilities in the event of an attack on U.S. transportation infrastructures.

As the world population continues to grow, food scarcity will become a reality. While the United States currently relies on food imports to supplement domestic production, worldwide food scarcity will undoubtedly impact food supplies available for importation. Urban agriculture fosters national security by reducing the risk of bioterrorism and other attacks on the food supply.¹⁵⁹ Creating a sustainable food supply system now will strengthen our national security and ensure that an adequate supply of fresh and healthy food is available to all U.S. residents.

¹⁵⁸ For example, resource wars prompted by drought conditions have already occurred in Ethiopia. Ernest Waititu, *Drought Spurs Resource Wars*, INDEPENDENT (N.Y.), Apr. 25, 2008, at 10.

¹⁵⁹ Endres & Endres, *supra* note 5, at 406–07 (“The typical mono-cropping, coupled with reliance on fossil fuels and long range transportation networks, create a complicated and inflexible system that lacks resiliency. . . . A complex system, on the other hand, consisting of multiple local/regional food systems is more resilient . . .”).

V

INTERNATIONAL CASE STUDY: CUBA'S SUSTAINABLE URBAN AGRICULTURE REVOLUTION

In the years prior to 1990, Cuba was reliant upon industrial agriculture and foreign imports for its food supply.¹⁶⁰ A study of the food shortage crisis Cuba experienced in the early 1990s demonstrates the vulnerability of the current U.S. food production and supply systems. Cuba's subsequent shift to an urban agricultural system employing sustainable farming practices provides a model for change that could be used in the United States. A sustainable farming system would minimize the impacts of the food production system on the environment, reduce U.S. dependence on foreign resources, and create stable supplies of healthy and nutritious food within urban communities.

Prior to the collapse of the Soviet Union, Cuba's agricultural system was largely monocultural,¹⁶¹ highly mechanized, and dependent upon petrochemicals, oil, and machinery,¹⁶² similar to the present U.S. agricultural system.¹⁶³ Much of Cuba's land was dedicated to the production of sugar cane, which resulted in "increasing reliance on imports to satisfy the basic food requirements of the population."¹⁶⁴ Food imports from the Soviet Union made up fifty-seven percent of Cuba's food supply.¹⁶⁵ With the collapse of the Soviet Union in 1990 and the United States' passage of the Torricelli Bill in 1992, which tightened the embargo against Cuba, Cuba was cut off from food production supplies, oil, and food imports.¹⁶⁶ The impact of fuel shortages quickly resulted in food not being able to be refrigerated and transported into the urban areas.¹⁶⁷ By 1992, Cuba was plunged into a food shortage crisis, with average daily caloric and

¹⁶⁰ See generally Gonzalez, *supra* note 110, at 692–95 (presenting an extensive overview of Cuba's pre- and post-revolution agricultural systems, the subsequent food crisis following the collapse of the Soviet Union, and Cuba's development of a sustainable agricultural system as a response to food shortages and environmental degradation).

¹⁶¹ See *id.* at 689–92 (discussing Cuba's sugar monoculture).

¹⁶² Endres & Endres, *supra* note 5, at 421.

¹⁶³ See *supra* Part II.

¹⁶⁴ Gonzalez, *supra* note 110, at 691; see also *id.* at 692–93, 706 (detailing Cuba's reliance on imports prior to the Special Period).

¹⁶⁵ RAQUEL PINDERHUGHES ET AL., URBAN AGRICULTURE IN HAVANA, CUBA (2000), http://bss.sfsu.edu/raquelrp/pub/2000_aug_pub.html.

¹⁶⁶ See Gonzalez, *supra* note 110, at 712.

¹⁶⁷ PINDERHUGHES ET AL., *supra* note 165.

protein intake dropping as much as thirty percent below levels seen during the 1980s.¹⁶⁸ Due to the austerity of the wartime conditions and the implementation of government emergency measures without the presence of military conflict, this period of Cuba's history has become known as the Special Period.¹⁶⁹ Cuba's Special Period serves as a model for the threat that exists when a nation's food supply is tied to petroleum and food imports.

In response to the food shortage crisis, Cubans in urban areas faced two options: starvation or self-sufficiency without reliance on chemical or mechanical technologies.¹⁷⁰ Havana, with a population of 2.2 million, did not have a food production infrastructure and virtually no land had been dedicated to food production, which made the city particularly vulnerable to the threat of mass starvation.¹⁷¹ Independent of government action, Havaneros "spontaneously began to plant food crops in the yards, patios, balconies, rooftops and vacant land sites near their homes."¹⁷² Those who had space began to raise chickens, rabbits, and pigs; neighborhoods came together to plant crops without the use of chemical inputs and machinery.¹⁷³ Thus a sustainable, organic agricultural system was born within the urban areas of Cuba.¹⁷⁴

Several years after the spontaneous development of urban gardens by Cuban residents, the Cuban Ministry of Agriculture created the Urban Agriculture Department to develop a state-supported infrastructure to aid and support urban gardens.¹⁷⁵ The goal was to cultivate all of the city's open land and provide extension services and

¹⁶⁸ Mavis Alvarez et al., *Surviving Crisis in Cuba: The Second Agrarian Reform and Sustainable Agriculture*, LAND RESEARCH ACTION NETWORK, Sept. 20, 2009, <http://www.landaction.org/display.php?article=337>.

¹⁶⁹ Sergio Díaz-Briquets & Jorge F. Pérez-López, *The Special Period and the Environment*, 5 CUBA IN TRANSITION 281, 281 (1995), available at <http://lanic.utexas.edu/la/cb/cuba/asce/cuba5/FILE23.PDF>.

¹⁷⁰ Eliza Barclay, *Cuba's Organic Food Revolution Flourishing*, ENVT'L NEWS NETWORK, Sept. 12, 2003, http://www.organicconsumers.org/organic/cuba_organic_food.cfm.

¹⁷¹ PINDERHUGHES ET AL., *supra* note 165.

¹⁷² *Id.*

¹⁷³ *Id.*

¹⁷⁴ In addition to urban agriculture within cities, the Cuban government converted state farms, previously used to produce sugar cane, into sustainable, organic cooperatives producing food for domestic consumption. See Gonzalez, *supra* note 110, at 712-16.

¹⁷⁵ PINDERHUGHES ET AL., *supra* note 165.

resources for the newborn urban gardens.¹⁷⁶ The Urban Agriculture Department works with Cuba's agricultural research sector to develop information and resources to foster small-scale, sustainable urban agriculture.¹⁷⁷

In order to ensure an adequate supply of land for urban farming, the Urban Agriculture Department adopted city laws to permit public and private vacant lots to be officially sanctioned as farms and gardens.¹⁷⁸ Most of this land has been handed over in usufruct, which grants urban farmers the free and indefinite right to derive profits and benefits of farming the land without having ownership of the land.¹⁷⁹ While Cuba's urban farm yields are supplemented with crops grown on the island's former sugar cane fields, as of 2002 more than 86,450 acres of urban Cuban land was dedicated to intensive farming, producing more than 3.2 million tons of food.¹⁸⁰

The Urban Agriculture Department assisted Cuba's urban farmers in developing organic and sustainable farming methods.¹⁸¹ The Department established a network of extension agents, usually women who live in the neighborhoods in which they work, to assist local growers.¹⁸² These extension agents teach farmers how to employ sustainable farming methods and practices such as biofertilization, composting, companion planting, crop rotation and permaculture methods.¹⁸³ The Department also set up seed houses that sell seeds, plants, garden inputs, tools, books, organic fertilizers and pest controls, and other necessary inputs.¹⁸⁴ The Department works with the agricultural research sector to develop new techniques and provide information to promote small-scale, sustainable urban agriculture.¹⁸⁵

There is great diversity among the urban gardens in Cuba. Some gardens are grown by urban residents in small backyard or individual plots; larger gardens are grown by institutions and workplaces; other,

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ Barclay, *supra* note 170.

¹⁸¹ Gonzalez, *supra* note 110, at 718.

¹⁸² PINDERHUGHES ET AL., *supra* note 165.

¹⁸³ *Id.*

¹⁸⁴ *Id.*

¹⁸⁵ See Gonzalez, *supra* note 110, at 723.

still larger farms are owned by the state and run as cooperatives, where workers share in profits.¹⁸⁶ Food grown in the urban farms is sold directly to residents at neighborhood farmstands, eliminating the need for packaging and transportation.¹⁸⁷ Excess food is given to local schools, retirement homes, and hospital kitchens.¹⁸⁸

While urban agriculture was a response to a dramatic crisis in Cuba's history, through the development of a community-based system of cultivation on previously vacant lots employing organic farming techniques, Cuba has created a sustainable food production system.¹⁸⁹ As of 2005, Havana was producing over ninety percent of the perishable produce consumed in its city as well as a significant portion of its milk and meat.¹⁹⁰ With government support, the urban gardens have become a profitable economic enterprise for many Cubans.¹⁹¹ Local access to fresh foods has added diversity to the Cuban diet and reduced the carbon footprint associated with its food supply by reducing the transportation and chemical input required to grow and transport the food.¹⁹² The development of urban farming has also ensured food security for Cuba.¹⁹³ The success of Cuba's system has established the country as a model for the urban production of sustainable agriculture around the world.¹⁹⁴

In transitioning to a sustainable urban agricultural system, Cuba has drastically reduced its harmful impacts on the environment. Cubans have been able to significantly reduce their carbon footprints as their food supply is no longer shipped across oceans and Cuban residents can walk to local markets for fresh produce rather than drive

¹⁸⁶ PINDERHUGHES ET AL., *supra* note 165.

¹⁸⁷ See Barclay, *supra* note 170.

¹⁸⁸ *Id.*

¹⁸⁹ Gonzalez, *supra* note 110, at 722 ("When the collapse of the socialist bloc produced a shortage of agricultural inputs, private farmers were quick to adapt because they had not become dependent on imported petroleum, animal feed, pesticides, or fertilizers. . . . The accumulated knowledge of the Cuban farmer played a critical role in helping Cuba recover from the food crisis precipitated by the 1990 collapse of the socialist trading bloc.").

¹⁹⁰ Max Ajl, *Eat Local: Cuba's Urban Gardens Raise Food on Zero Emissions*, SOLVE CLIMATE, Jan. 27, 2009, <http://solveclimate.com/blog/20090127/eat-local-cubas-urban-gardens-raise-food-zero-emissions> (describing how Cuba's urban gardens meet food needs of residents and consequently "cut back on emissions").

¹⁹¹ *Id.*

¹⁹² See *id.*; see also PINDERHUGHES ET AL., *supra* note 165.

¹⁹³ Alvarez et al., *supra* note 168.

¹⁹⁴ Barclay, *supra* note 170.

to grocery stores.¹⁹⁵ Reduced mechanization in food production further reduces carbon emissions. Increased urban vegetation also mitigates the impact of climate change because vegetation has a cooling effect when air temperatures are high.¹⁹⁶ Because much of Cuba's urban land is now vegetative, surface temperatures in Cuba may remain cooler due to the thermoregulation created by the vegetation cover.¹⁹⁷

According to Dr. Nelso Camponioni Concepción, the Cuban government, through its urban agricultural program, aims "to gain the most food from every square meter of available space."¹⁹⁸ By utilizing available urban space for sustainable food production, Cuba is reducing its impact on the planet's carrying capacity. The organic urban gardening techniques do not consume greenspace or harm the environment; therefore, measuring the true cost of externalities is not an issue. The growth of the urban gardens has created an increasing food supply and a new economy for many Cubans without negatively impacting the environment or society.

Urban gardens in Cuba promote social equity in many ways. Perhaps most important, urban gardens have enriched the quality of life in urban neighborhoods. As neighbors share plants, gardening techniques, and food, and as farm stands have become a part of the neighborhood, community life has been enriched. The Cuban diet has also been enriched; Cubans now have access to a greater variety of fresher, healthier food at lower cost.¹⁹⁹ Buying fresh, organic, locally grown food exemplifies ethical consumerism and self-reliance within communities. Equally important, the current generation of urban gardeners will leave future generations fertile, nutrient-rich land on which they can produce food for themselves.

Cuba's urban gardening system is the result of a breach to its national security.²⁰⁰ Due to the development of the urban gardens, Cuba is no longer reliant on food and oil imports; an energy crisis or oil shortage would not impact Cuba's food production system. The availability of fresh food and gardening inputs within neighborhoods

¹⁹⁵ Ajl, *supra* note 190.

¹⁹⁶ See Lyles-Chockley, *supra* note 103, at 114 (discussing vegetative cooling to combat heat island effects).

¹⁹⁷ See Ajl, *supra* note 190.

¹⁹⁸ Barclay, *supra* note 170.

¹⁹⁹ Crawford, *supra* note 108, at 735.

²⁰⁰ See *supra* notes 166–169 and accompanying text.

further ensures Cuba's national security, as an attack on the transportation infrastructure would not significantly affect Cuba's food distribution system.

VI

U.S. CASE STUDIES: CURRENT URBAN GARDENING PROJECTS

Many cities across the United States currently have urban garden programs in place. Most of these programs consist of community gardens on publicly owned urban land where individual plots are leased to community residents.²⁰¹ While these programs are a step in the right direction, they are merely a starting point for a truly sustainable agricultural system. The existing programs are useful case studies for developing a federal approach to urban farming.

This Note highlights urban gardening projects in the following cities: Portland, Oregon; Baltimore, Maryland; and Milwaukee, Wisconsin.

A. Portland, Oregon

The Portland Parks and Recreation Department's Community Gardens Program was started in 1995 and today has thirty-two gardens throughout the city.²⁰² The use of parks and open spaces for community gardens is authorized by the Portland zoning code: "Parks And Open Areas are uses of land focusing on natural areas, large areas consisting mostly of vegetative landscaping or outdoor recreation, community gardens, or public squares."²⁰³ In addition, Friends of Portland Community Gardens, a volunteer nonprofit organization, works with the Parks and Recreation Department to raise funds to secure land for gardens and organize educational events and activities.²⁰⁴

The Portland Parks and Recreation Department leases garden plots for a small fee, sponsors classes and programs, and hosts work

²⁰¹ See, e.g., College of Agriculture & Natural Resources, Baltimore City Community Gardens, <http://www.growit.umd.edu/Community%20Gardens1/Baltimore%20City%20Community%20Gardens.cfm> (last visited Apr. 17, 2010) (describing a program where individual plots in Baltimore City Park are leased by that city for twenty dollars per season).

²⁰² City of Portland Parks & Recreation, Community Gardens, <http://www.portlandonline.com/parks/index.cfm?c=39846> (last visited Apr. 17, 2010).

²⁰³ PORTLAND, OR., PLANNING AND ZONING CODE tit. 33, § 33.920.460 (2009).

²⁰⁴ Friends of Portland Community Gardens, About Us, <http://friendspdxgardens.org/facts.htm> (last visited Apr. 17, 2010).

parties. Volunteer garden managers also offer gardeners on-site assistance.²⁰⁵ The Department runs Produce for People, a program that allows gardeners to dedicate a plot in their garden or donate extra produce to any of eleven participating emergency food agencies.²⁰⁶ Since 1995, Portland Community Gardens have donated over twenty-five tons of fresh produce to local emergency food agencies.²⁰⁷ The Department also runs the Children's Gardening Program, a free gardening program for school-aged children that takes place during the summer.²⁰⁸

B. Baltimore, Maryland

The City of Baltimore created the City Farms program in 1978.²⁰⁹ Currently, seven city parks host City Farms, leasing a total of 640 plots to urban gardeners for a small annual fee.²¹⁰ City Farms provides some amenities to gardeners including hoses, water, and leaf compost, and gardeners are responsible for maintaining plots and common areas.²¹¹ Baltimore's Parks and People Foundation, an organization dedicated to restoring Baltimore's neighborhoods and their natural resources, has partnered with the Maryland Cooperative Extension to form the Community Greening Research Network (CGRN).²¹² CGRN is a membership-based program that provides seeds, compost, plants, tools, workshops, and networking opportunities to urban gardeners growing food on the city's alleyways, restored vacant lots, and inner-block areas.²¹³

Baltimore is also home to the Power of Hope Garden, a neighborhood gardening project founded by Master Gardener Gloria

²⁰⁵ City of Portland Parks & Recreation, Brochure on Community Gardens, <http://www.portlandonline.com/parks/index.cfm?c=39846&a=200912> (last visited Apr. 17, 2010).

²⁰⁶ *Id.*

²⁰⁷ *Id.*

²⁰⁸ City of Portland Parks & Recreation, *supra* note 205 (describing the Children's Gardening Program).

²⁰⁹ Baltimore Urban Agriculture, City Farms Information, <http://www.baltimoreurbanag.org/content/city-farms-information> (last visited Apr. 17, 2010).

²¹⁰ *Id.*

²¹¹ *Id.*

²¹² Parks & People Foundation, Community Greening Resource Network, <http://www.parksandpeople.org/greening/resource-network> (last visited Apr. 17, 2010).

²¹³ *Id.*

Luster and the Reverend Choyce Hall.²¹⁴ The Power of Hope Garden developed vacant lots in a rundown area of Baltimore's inner city through the Adopt-A-Lot program.²¹⁵ The Adopt-A-Lot program allows individuals and groups to annually lease abandoned city lots at no cost provided the land is maintained.²¹⁶ The Power of Hope Garden employs organic gardening methods combined with labor provided by local low-income residents and homeless persons to grow food for local residents and food banks.²¹⁷ The Garden saves the city the expense of maintaining vacant lots, beautifies the neighborhood, and builds a sense of community while also providing food for the hungry.²¹⁸

C. Milwaukee, Wisconsin

Milwaukee County has dozens of community gardens run and supported by a variety of organizations.²¹⁹ The University of Wisconsin–Extension runs the Accessible Garden Program, providing space for special needs gardeners, demonstration gardens, and rental plots available on city owned property.²²⁰ Urban gardeners may also obtain short-term leases to garden on vacant city-owned lots through the City of Milwaukee.²²¹

Milwaukee Urban Gardens is a nonprofit land trust dedicated to acquiring and preserving land held in trust for neighborhood community gardens.²²² Milwaukee Urban Gardens was founded in 2000 and currently holds title to four urban gardens in the city.²²³ Milwaukee Urban Gardens also helps community groups acquire long-term leases from the City of Milwaukee for sustainable garden sites and organizes education and community outreach events.²²⁴

²¹⁴ Smart Communities Network, *supra* note, 148.

²¹⁵ *Id.*

²¹⁶ *Id.*

²¹⁷ *Id.*

²¹⁸ *Id.*

²¹⁹ MATTHEW B. MIKOLAJEWSKI, MILWAUKEE COMMUNITY GARDENS: CURRENT TRENDS AND RECOMMENDATIONS 1 (2002), available at <http://www.uwm.edu/SARUP/gallery/planning/planstudentpdf/milwaukeecommunitygardens.pdf>.

²²⁰ *Id.* at 3–4.

²²¹ *Id.* at 11.

²²² *Id.* at 9.

²²³ *Id.*

²²⁴ *Id.* at 11.

In 1993, Will Allen and Growing Power, Inc., a North Milwaukee organization that helps teens find work, formed a joint venture and developed a program that allowed teens to work on Allen's farm and grow food for their community.²²⁵ Today, Growing Power is a national nonprofit organization and land trust committed to providing outreach, training, and assistance to foster sustainable community agriculture and food security.²²⁶ Growing Power's main headquarters are located on an historic two-acre farm in the City of Milwaukee; hands-on activities, large-scale demonstrations, and classes are all offered on-site.²²⁷ Growing Power's goal is to develop Food Community Centers where community members can work together to produce fresh, high-quality, affordable food using sustainable practices.²²⁸

VII ESTABLISHING AN URBAN AGRICULTURAL SYSTEM IN THE UNITED STATES

Establishing an urban agricultural system requires acquisition, dedication, and protection²²⁹ of urban land for agricultural use.²³⁰ Securing urban land for the development of sustainable gardens is the first step in creating an urban agricultural system in the United States. State and local governments must recognize the importance of urban

²²⁵ Growing Power, Inc., Our History, http://www.growingpower.org/our_history.htm (last visited Apr. 17, 2010).

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ *Id.*

²²⁹ The success of an urban agricultural system is dependent upon permanence of urban gardens. Borrelli, *supra* note 78, at 280. The benefits of urban gardens will not be fully realized in a few growing seasons as time is required to nurture and cultivate the soil as well as for urban farmers to develop the skills required to maximize production. *See id.*

²³⁰ Even in cities that have created urban gardens, such gardens are at risk of being sold for development purposes. For example, in 1998, New York City Mayor Rudolph Giuliani attempted to auction off 1100 city garden lots to housing developers. *See* Schukoske, *supra* note 62, at 386–87. The urban gardens were saved when Bette Midler's New York Restoration Project and the Trust for Public Land bought the lots to convey them to community gardeners. *See id.*; N.Y. Envtl. Justice Alliance v. Giuliani, 50 F. Supp. 2d 250, 251 n.1 (S.D.N.Y. 1999). Also, in 2006, a Los Angeles court upheld the sale of a fourteen-acre urban garden back to its original developer-owner, Ralph Horowitz. Associated Press, *Judge Upholds Sale of Urban Garden*, N.Y. TIMES, July 27, 2006, at A23. The city originally acquired the property by exercising its power of eminent domain and the property, prior to the sale back to Horowitz, was home to the largest urban garden in the United States. *Id.*

gardening for food security and sustainability when adopting land use and zoning ordinances.²³¹

Parks, open spaces, schools, and vacant city-owned lots all provide opportunities for cities to dedicate publicly owned land to urban agriculture. In addition to publicly owned urban land, under the doctrine of eminent domain, state governments may resort to takings of privately owned urban lots for public use to increase the amount of urban land available for agriculture.²³² Just compensation to landowners is required, but that cost would quickly be outweighed by the environmental, economic, and social benefits of urban farms. Nonprofit land trusts can also be formed to acquire and manage urban lots for gardening projects.²³³ These land trusts would allow private landowners to donate urban lots or the use of urban land to these organizations for the development of urban farms. Federal and state tax benefits can be implemented to incentivize donations of urban land to such land trusts.

Creating an adequate infrastructure is also critical to the success of a sustainable urban agricultural system in the United States.²³⁴ Because most urban residents have never cultivated land nor raised crops, agricultural support policies must be implemented;²³⁵ providing education, resources, implements, and materials is essential to the success of an urban agricultural revolution.²³⁶ Federal and state governments will need to establish outreach programs, sustainable gardening educational opportunities, hands-on assistance for

²³¹ See generally Schukoske, *supra* note 62, at 368–92 (discussing state and local land use laws relating to urban gardening).

²³² See U.S. DOJ, Environmental & Natural Resources Division, History of the Federal Use of Eminent Domain, <http://www.justice.gov/enrd/Anniversary/1767.htm> (last visited Apr. 17, 2010) (discussing condemnation of property for “establishing parks and setting aside open space for future generations, preserving places of historic interest and remarkable natural beauty, and protecting environmentally sensitive areas”).

²³³ See, e.g., Milwaukee Urban Gardens, What We Do!, <http://www.milwaukeeurbangardens.org/Programs.html> (last visited May 17, 2010) (“A nonprofit land trust dedicated to acquiring and preserving land and partnering with neighborhood residents to develop and maintain community gardens to enhance the quality of life.”).

²³⁴ The Cuban Department of Agriculture provides an exemplary model of such an infrastructure. See *supra* notes 181–185 and accompanying text.

²³⁵ Cf. Endres & Endres, *supra* note 5, at 428 (“Hit hard by recession, many communities, particularly urban ones, would benefit greatly by individual food production, but lack the necessary gardening skills.”).

²³⁶ Schukoske, *supra* note 62, at 367.

gardeners, and training for garden managers.²³⁷ In addition, federal and state governments would need to provide funding for tools, equipment, seeds, and organic fertilizers and pest management techniques, as well as food distribution and preservation methods. Outreach and education programs could be established through local extension services and community colleges. Sustainable agriculture programs could be incorporated into the curriculum at the primary and secondary grade levels, and urban garden planning could be a component of landscape architecture programs at the university level. Creating mentoring programs to foster the growth of sustainable gardens would be critical. Finally, tax incentives to promote education and donations of time and garden inputs would play a central role in developing a viable urban agricultural system.

In addition to creating essential educational and support systems, state and local governments would need to determine which types of gardens will meet the needs of local communities. Possible types of gardens include community, cooperative, educational, and food bank gardens. Community gardens would consist of privately leased plots in publicly owned gardens where gardeners are responsible for and receive the benefits of their individual plots directly. Cooperative gardens would be managed by a public agency and grown by gardeners who contribute shares of labor in exchange for shares of food. Educational gardens would be established on school properties and used to teach students sustainable agricultural skills; students would be responsible for maintaining the gardens and food produced in these gardens would be used for school-provided meal programs. Food bank gardens would be run by public agencies and maintained by volunteers to provide food to emergency food banks. Food bank and cooperative gardens could supplement state food benefit systems by requiring able-bodied food benefit recipients to work in the gardens as a condition for receiving benefits. Food produced in these gardens would be available for distribution to all persons qualified to receive food benefits. This system would provide low-income persons with high-quality fresh food and would reduce the financial strain on governments imposed by our current food benefit systems. In addition, such a system would provide skills training, community

²³⁷ In response to food shortages during World War II, the federal government established the Victory Garden program, which provided similar resources to U.S. residents to encourage local food production and distribution. See Endres & Endres, *supra* note 5, 416–21 (describing the development of the Victory Garden program).

building, and a sense of pride for many food benefit recipients. The following sections discuss federal and state tax incentives that could be implemented to achieve a sustainable urban agricultural system.

A. Federal Tools and Incentives

1. Cultivation Easements

Currently, section 170 of the U.S. Internal Revenue Code (I.R.C.) allows a tax deduction for a charitable contribution to a qualified organization.²³⁸ Donations of a qualified real property interest to a qualified organization exclusively for certain qualified land conservation purposes are eligible for a section 170 charitable contribution deduction.²³⁹ Qualified real property interests, known as conservation easements, are defined as any of the following interests in real property: “(A) the entire interest of the donor other than a qualified mineral interest, (B) a remainder interest, and (C) a restriction (granted in perpetuity) on the use which may be made of the real property.”²⁴⁰ Eligibility for an income tax deduction for a qualified conservation contribution requires the taxpayer’s entire interest in the property to be donated.²⁴¹

Similarly, an I.R.C. tax deduction provision for the contribution of urban property to urban agricultural land trusts should be enacted. Modeled after conservation easements, “cultivation easements” would grant income tax deductions to taxpayers for the donation of urban lots to cultivation organizations. Qualifying for a deduction for the charitable contribution of a conservation easement would require the taxpayer to donate the entire interest in the property for perpetuity.

In the current economic recession, land values have fallen significantly and many landowners are unable to find buyers for their current holdings. Creating an incentive for the donation of these parcels to urban gardening projects would economically benefit the landowners and put the vacant properties to use. While some tax revenue would be lost due to the increased tax deductions, the benefits of increased food security, decreased harm to environment, creation of new jobs, and a tax-benefit driven stimulus to the economy would compensate for the lost tax revenues.

²³⁸ I.R.C. § 170 (West 2009).

²³⁹ *Id.* § 170(h)(1).

²⁴⁰ *Id.* § 170(h)(2).

²⁴¹ *Id.* § 170(f)(3).

2. *Urban Agriculture Lease Credit*

The federal government has used tax credit incentives to promote rehabilitation of existing and historic buildings and installation of renewable energy sources.²⁴² To encourage long-term leases of urban land between private landowners and urban agricultural land trusts, the federal government could implement an “Urban Agricultural Lease Credit.” Credits would be available to private landowners “leasing” urban property for a fixed number of years. Land trusts would not pay to lease the property, but landowners would be compensated through the tax credit. The tax credit would be based on a percentage of the assessed value of the property and would require the landowner to enter into a fixed-term lease for a minimum of five years. This type of tax credit would allow landowners to retain rights to the property while putting vacant urban land to use for urban agriculture.

3. *Eminent Domain*

The federal government could also employ its power of eminent domain to acquire land for urban gardens. The power of eminent domain stems from the English common law and permits federal and state governments to take private land for public use.²⁴³ The Fifth and Fourteenth Amendments to the U.S. Constitution recognize this power and require just compensation for takings of private land for public use.²⁴⁴ In 1954, the Supreme Court expanded the definition of public use to encompass a broad and inclusive concept of the public welfare and granted deference to the legislature in determining the means to best achieve public welfare.²⁴⁵ Through this expansive interpretation of eminent domain, the legislature has broad authority to take private land when the public welfare is at stake. The benefits of an urban agricultural system to our environment, economy, society, and national security would improve the public welfare; therefore, takings of private land for urban agriculture would arguably fall within the scope of the legislature’s power. In areas lacking adequate

²⁴² See *id.* §§ 47–48.

²⁴³ See Katherine M. McFarland, Note, *Privacy and Property: Two Sides of the Same Coin: The Mandate for Stricter Scrutiny for Government Uses of Eminent Domain*, 14 B.U. PUB. INT. L.J. 142, 144–46 (2004) (discussing the history of eminent domain).

²⁴⁴ *Id.*

²⁴⁵ *Berman v. Parker*, 348 U.S. 26, 33 (1954).

urban land for agriculture, states can exercise their power of eminent domain to take private property for urban agriculture projects.

4. *Education Credits*

The federal government can encourage residents to learn sustainable agricultural techniques by expanding tax credits for educational expenses to include sustainable agriculture educational expenses paid to extension services and nonprofit agricultural organizations. Under section 25A of the I.R.C., educational expenses must be paid to a qualified educational institution²⁴⁶ to qualify as eligible educational expenses for federal income tax credits.²⁴⁷ Creating a “Sustainable Agricultural Education Tax Credit” that contains an expanded definition of eligible educational institutions would provide an incentive to residents to acquire the skills necessary to create a viable urban food production system.²⁴⁸

5. *Charitable Contribution Deductions*

The federal government should implement tax policies that incentivize donations to the urban agriculture movement. For example, permitting tax deductions for contributions to organizations and programs that support urban agriculture would motivate taxpayers to invest in these programs and organizations. These tax policies would bring in monies that could be used to ensure an adequate supply of garden materials and tools and to support the development of a much-needed urban agriculture infrastructure.

Under section 170, the I.R.S. allows taxpayers to deduct from income contributions made to qualifying nonprofit organizations.²⁴⁹ Thus, many organizations that support urban agriculture may already qualify to receive tax-deductible contributions. For example, nonprofit organizations operating for the purpose of relieving the poor, lessening neighborhood tensions, and combating community

²⁴⁶ See I.R.C. § 25(f)(2) (defining “eligible educational institution” as an institution eligible to participate in the U.S. Department of Education student aid program); see also Higher Education Act of 1965 § 481, 20 U.S.C. § 1088(b) (2006).

²⁴⁷ I.R.C. § 25A(f)(2).

²⁴⁸ *Id.* § 170(c)(1).

²⁴⁹ Charitable deductions may be deductible for income tax purposes if, among other things, the contribution is: made for exclusively public purposes; to a qualifying nonprofit entity; “organized and operated exclusively for religious, charitable, scientific, literary, or educational purposes. . . .” *Id.* § 170.

deteriorations qualify as charitable for section 170 purposes.²⁵⁰ As discussed previously, urban agricultural programs in decaying urban areas will aid the poor and improve declining communities. Therefore, donations to these programs should be deductible. Furthermore, given that nonprofit organizations operating for scientific or educational purposes qualify for section 170 purposes,²⁵¹ contributions to urban agricultural programs operating for such purposes are tax deductible. Finally, section 170 considers organizations that operate to “preserve and protect the natural environment for the benefit of the public” to be charitable organizations.²⁵² Urban agriculture encourages such preservation and protection. Accordingly, organizations that support urban agriculture may qualify as charitable under several provisions of section 170, making donations to these organizations tax deductible.

Though current tax policies may generate some amount of funding, the language of the tax code could be altered to increase the monies available for urban agriculture. Specifically, the federal government should expand the definition of “charitable purpose” as applied to section 170 to explicitly include urban agricultural programs. Including urban agriculture within the definition of “charitable purpose” would bring more attention to the urban agricultural movement and would increase the likelihood that taxpayers will make donations to organizations that support urban agriculture. Achieving a truly sustainable food production system will involve a significant effort; urban gardens must produce high yields and they must be located in every neighborhood. This effort will require a great deal of resources. Changing the language of the tax code could help ensure that there is funding for those resources.

Perhaps the biggest challenge in creating a sustainable urban agricultural system is securing an adequate supply of labor. Sustainable gardens are built and maintained through human labor. Skilled mentors must be available to plan and design gardens for optimum production and pass on basic sustainable gardening techniques to urban residents. Currently, charitable contribution deductions are not permitted for time donated to organizations.

²⁵⁰ See Rev. Rul. 70-585, 1970-2 C.B. 115 (discussing purposes and activities aimed at combating community deterioration as charitable within the meaning of Internal Revenue Code section 501(c)(3)).

²⁵¹ I.R.C. § 170(c).

²⁵² Rev. Rul. 76-204, 1976-1 C.B. 152.

Establishing a deduction for time donated to urban agricultural projects would aid in securing the requisite labor supply. While such a deduction could potentially be subject to abuse, local governments could implement an effective system of checks and balances to minimize such abuse. Income tax deductions implemented to promote sustainable urban agriculture should be allowed “above the line”²⁵³ to encourage maximum participation.

B. State and Local Tools and Incentives

1. State Property Tax Exemptions

States could incentivize those urban landowners who wish to retain property rights to extend fixed term leases to urban agriculture programs by granting property tax exemptions for the tenure of the lease. Terms of five to ten years would allow communities to see the fruits of their labor. In the short term, tax revenues would decrease; however, any revenue losses could be recouped by increased property tax revenue that result from rising property values as well as the additional tax revenues that are generated by stimulated economies in urban areas. State and local governments would also benefit from lower costs for maintaining vacant properties and reduced crime prevention expenditures. Perhaps most significantly, states could reduce food benefit expenditures by replacing a portion of food stamps with produce vouchers redeemable at cooperative and food bank gardens.

2. State Income Tax Deductions

Many states currently follow the federal income tax system in allowing deductions for educational expenses, charitable contributions, and energy credits. States should also mirror all federal deductions and credits related to sustainable urban agriculture. Allowing such deductions above the line will ensure that all taxpayers

²⁵³ “Above the line” deductions are more beneficial to taxpayers as they reduce adjusted gross income and are deductible regardless of whether the taxpayer itemizes deductions or claims the standard deduction. See Tara Siegel Bernard, *Income Taxes: What You Need to Know*, N.Y. TIMES, Jan. 21, 2009, <http://www.nytimes.com/2009/01/21/your-money/taxes/primertax.html>; see also Michelle P. Ryan, Comment, *Paved With Good Intentions: The Legal Consequences of the Charitable Choice Provision*, 102 DICK. L. REV. 383, 404–05 (1998) (discussing revision of the I.R.C. to permit above the line deductions for charitable contributions to encourage charitable giving).

are incentivized to contribute resources to urban gardens, regardless of whether the individual taxpayer itemizes deductions.

VIII CONCLUSION

The U.S. food supply system faces a myriad of threats. While this Note primarily addresses threats related to sustainability, as our population continues to grow and the availability and quality of fertile farmland continues to decline, our future survival becomes increasingly imperiled. Growing awareness of the benefits of sustainable agriculture and urban gardening projects provide a starting point for a true organic sustainable agricultural revolution in the United States. The time has come for our government to take an aggressive role in establishing a sustainable urban agricultural program. Federal and state tax policies must be implemented to incentivize the acquisition and dedication of urban land for farming, to develop and support sustainable agriculture education programs, and to promote sustainable urban agriculture in general. Cuba's sustainable agricultural movement serves as a model for what we can accomplish, but we must not wait until we are faced with a food crisis like the one Cuba experienced in the 1990s to adapt to the rapidly changing food demands of the twenty-first century.

