Introduction to Urban Agriculture

compiled by Jack Kittredge from writings by Tom Philpott in Grist, Dr. Caroline Goodson, Jane Jacobs, the Guardian, Brette Jackson, Tammy LaGorce and Winnie Hu in the New York Times, and others

Urban agriculture, according to most definitions, is the practice of cultivating, processing, and distributing food in or around a village, town, or city. That locational aspect is crucial to distinguishing urban agriculture from generic agriculture, which most people associate with taking place in rural areas. Urban agriculture projects include: community gardens established on vacant land that’s cultivated and maintained within an urban neighborhood; school gardens cultivated and maintained on school grounds, and factor into the curriculum; entrepreneurial gardens that grow produce and flowers for profit; backyard gardens, windowsill gardens, and rooftop gardens that provide vegetables, herbs, and flowers to individuals and/or small families.

Prehistoric Origins

But the rural association with farming has not always been the case argues Jane Jacobs in her classic 1970 book “The Economy of Cities”. In work more recently confirmed by scholars such as Danish economist Ester Boserup, Jacobs says that the prehistoric importance to human survival of trade meant densely populated sites focused on exchange formed even earlier than agriculture was adopted. Materials like obsidian for making tools for hunting were involved in a robust economy that only later included items like edible seeds and young animals – the keys to domestication and agriculture.

When organized agriculture began to flourish, these ‘exchange sites’ grew dramatically, both in population and complexity. Eventually some agricultural work migrated to land surrounding these emerging cities but much agricultural work remained within cities over the millennia.

In what is now modern Mexico and Central America, for instance, the precursors to the Aztec Empire were supported by urban garden plots as early as the 14th century BC.

In medieval Italy the real marker of political power was control of food resources. According to Dr. Caroline Goodson at the University of Cambridge, more than military force, legislative authority, or religious ceremony, the ability to secure food supplies meant wealth, social status, and legitimacy. Much productive land was actually urban and these lands were highly valuable and carefully controlled. Households farmed lands within city-walls and there is little evidence for commercial food markets of rural produce. Charters documenting property transfers of urban cultivated land -- including domestic vegetable patches, independent fields within the city-walls, and orchards and vineyards between houses -- appear in documents of the late sixth century, rising in frequency up to the late eleventh or twelfth centuries, when population pressures meant that most farming moved outside the city.

Kitchen gardens and fruit tree groves were sited within walled cities in Europe during the Middle Ages. Such areas were often established by monasteries to help feed the monks living within. Produce was also sold in local markets to supplement the monasteries’ incomes. The plants and herbs they cultivated served both as food and medicine to their cities’ populations.

Cities Spawned CAFOs and Hothouses

Coming into modern times, in 19th-century New York City dairy farming proliferated. According to the University of California at Santa Cruz sociologist and food-studies scholar E. Melanie Dupuis:

“The mid-19th century, “swill” milk stables attached to the numerous in-city breweries and distilleries provided [New York City] with most of its milk. There, cows ate the brewers’ grain mash that remained after distillation and fermentation … As many as two thousand cows were located in one stable.

According to one contemporary account, the visitor to one of these barns “will nose the dairy a mile off … Inside, he will see numerous low, flat pens, in which more than 500 milch cows owned by different persons are closely huddled together amid confined air and the stench of their own excrements.”

Here we find evidence that today’s concentrated-animal feedlot operation originated in cities.

Of course cities didn’t just innovate techniques that would later become associated with large-scale, chemical-dependent agriculture, they also incubated sustainable ones. The so-called “French-intensive” method of growing vegetables — in which large amounts of compost continued on page B-2

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Urban Farming and Cities
by Jack Kittredge

The growth of community gardens, educational farms, school greenhouses, college plots, backyard growers, rooftop gardens and container operations in urban areas of the US indicates the current breadth of interest in producing food by city residents. Such a flowering has not been seen in many years. The history of agriculture in cities, however, goes back thousands of years and may surprise some readers. We have traced that history here.

There are of course clear difficulties with such growing in contemporary America, especially issues of soil toxicity and access to land, on both of which we have articles in this issue. The larger strengths and weaknesses of urban agriculture are also addressed here from an agro-ecological perspective.

One of the most striking features of this phenomenon, of course, is how heavily it is the work of people of color, primarily African-American but also Latinx communities. The demographics of marginalized groups in American farming are traced in another article, as well as their contributions to the science, technology, and business aspects of agricultural success.

Our features, one on urban farming in a historically African-American community in Brooklyn and one on a CSA focusing on front-line communities and racial justice activists in Providence and Boston, both illustrate the realities of raising food for urban residents with a special concern for being led by, and serving, people of color.

Many NOFA farmers and homesteaders, of course, are white and primarily rural. Even our gardening and landscaping members are far more suburban than inner city residents. Yet the realities of our work with soil, seeds, tools and weather are closely aligned, wherever we farm. The races of toxic chemicals, food safety, market regulation, economic viability, crop quality, even succession are very much the same.

It is our hope that with this issue urban, suburban, and rural growers will all see the common features that unite us. Such a consciousness, we feel, can help us forge an alliance in the work we need to do together to address the myriad ills of today’s food system.

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Swill Milk
are added annually to densely planted raised beds — is one of the most productive and sustainable forms of organic agriculture used today. And guess what? It developed not in the countryside, but rather within the crowded arondisements of 19th century Paris.

The French-intensive method hinges on a principle identified by Jane Jacobs, one that modern-day city residents (and planners) should take to heart: that cities are fantastic reservoirs of waste resources waiting to be “mined.” Like all cities of its time, 19th-century Paris bristled with horses, the main transportation vehicle of the age. And where there are lots of horses, there are vast piles of horse manure. The city’s market gardeners turned that fetid problem into a precious resource by composting it for food production and using it in beds and under large glass “cloches” to heat and fertilize vegetables. This recycling of the “transportation wastes” of the day was so successful and so extensive that the soil increased in fertility from year to year despite the high level of production. Paris’s market gardeners supplied the entire metropolis with vegetables for most of the year — and even had excess to export to England.

At the same time, in this country, farmers from all over the midwest would haul their hogs and cows to Chicago’s vast slaughterhouses, where they would be fed in pens while awaiting their fate. Operating for over a century, starting in the mid-1800s and not closing for good until 1971, this vast meatpacking enterprise at its height dominated the city. More meat was packed each day here than anywhere else in the world. According to the Chicago Historical Society, by 1900 the stockyards “employed more than 25,000 people and produced 82 percent of the meat consumed in the United States.”

Captain Gardener, and others in the midst of the potato patches.

Pingree developed a program to substitute labor for charity. He arranged for landowners to lend their properties to the local government, which were utilized by 945 families as gardens for produce—primarily, potatoes. The City invested $3,000 in “Pingree’s Potato Patches,” and showed a $12,000 profit a year later. Gardening became compulsory for those receiving government assistance. Soon cities such as Boston, Chicago, and New York subsidized similar gardening programs.

In 1891, Boston inaugurated the nation’s first school gardening program. Children were taught agrarian skills for work deemed less draconian than earning wages in factories. Incorporating gardening in the curriculum was believed to instill a strong work ethic, and teach “appropriate social behavior to immigrants, delinquents, and the infirm”.

At the start of World War I, Europe was in the midst of catastrophic food shortages and the need for food became the primary motivation for cultivating community gardens. Once the U.S. entered the war large tracts of land were prioritized for food to be exported overseas. To supplement food domestically Herbert Hoover, Director of the U.S. Food Administration, established a national gardening campaign. Americans enthusiastically plowed backyards, vacant lots, and municipal land. Slogans such as “Sow the Seeds of Victory,” rallied 5 million gardeners to produce an unprecedented $520 million worth of food. Gardening became a patriotic act.

The nature of community gardening changed with the onslaught of the Great Depression. Like vacant lot cultivation during the 1890s, the subsistence gardens in American cities during the 1930s were created in response to an economic crisis and intended to help meet residents’ immediate need for food. They were often supported through partnerships between municipal government and community organizations. By 1934, 2.3 million

Swill Milk

The Dakota Plan — Mayor Pingree, Captain Gardener, and others in the midst of the potato patches.

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sustainability farmers produced more than $36 million worth of food. In 1939 Roosevelt’s New Deal Program essentially exchanged federally supported gardens for USDA food stamps, regarded as a more “efficient” system to feed the hungry.

The first food stamp

Victory Gardens

When the United States entered World War II after the attack on Pearl Harbor in 1941, many Americans participated in a grassroots effort begun to rekindle the patriotic liberty gardens of WWI. At first the federal government was skeptical of supporting these efforts like they had before. Officials thought large-scale agriculture was more efficient. Citing the health, recreational, and morale-boosting effects of gardening, however, the government again supported a national gardening campaign during World War II.

After World War II — during which town and city gardens provided some 40 percent of vegetables consumed in the United States — city residents no longer needed to garden for their sustenance. The easy fertility provided by synthetic nitrogen fertilizer made the kind of nutrient recycling performed by Paris’s urban farmers seem obsolete and backwards at the same time that the rise of fossil fuel-powered transportation banished the horse from cities, taking away a key source of nutrients.

Food production became a “low value,” marginal urban enterprise, and planners banished it from their schemes. Supermarkets, stocked year-round with produce from around the world and a wealth of processed food, more than filled the void.

In urban communities throughout the nation, segregation laws placed a chasm between African American and white neighborhoods. The economic boom of the 1950s was the catalyst for “white flight,” as white urbanites retreated to the comfort and prestige of new suburbs. White urban communities shrank exponentially while African American communities swallowed, eventually extending into abandoned white neighborhoods that were once off limits. Services in these areas, such as supermarkets, followed the White dollar, leaving only small grocery stores, offering a poor selection of produce, liquor stores, and fast food chains.

Across the country, the postwar urban manufacturing base began to melt away in the 1970s, as factories fled to the union-hostile South, and later to Mexico and Asia. Meanwhile, the highway system and new development drew millions of white families to the leafy lawns of the exurban periphery. As the jobs and whites left the cities, so did the economic base sustaining the private food system.

The importance of gardens and food production in inner cities was highlighted as grocery stores slowly abandoned those areas. The exodus of grocery stores from African American urban neighborhoods dates from the 1960s and ’70s, when increasing violence and decreasing population prompted many businesses to flee. In the District of Columbia, for example, the number of chain grocery stores dropped from 91 in 1968 to less than three dozen in the 1990s. University of Connecticut agricultural economist Ronald W. Cotterill, who headed a 1995 study of the phenomenon, described the result of this process: “... poor Americans often must shop in small corner stores that charge as much as 40 percent more and offer a meager selection of fresh food. The “grocery gap” examined in the District and 20 other cities also has policy implications: Food stamps and other federal nutrition programs buy much less than they would in more affluent neighborhoods where supermarkets offer less expensive, fresher products.

In many of these cities we have two food distribution systems: one for people who have access to suburban outlets and one for those that don’t.”

Urban African Americans and Latinos of low socioeconomic status thus live in areas that lack sufficient sources of healthful foods. These communities, known as food deserts, are defined as areas where residents have limited access to healthy fresh nutrients, particularly if they are poor and have limited mobility.

According to the World Health Organization (WHO), “low fruit and vegetable intake is among the top ten risk factors related to [disease] and mortality”. The Centers for Disease Control (CDC) has reported that African Americans have a fifty-one percent higher instance of obesity than Caucasians, with Latinx following at twenty-one percent; both communities are also predisposed to type 2 Diabetes, cardiovascular disease, and certain cancers.

Since the 1960s and 1970s, however, people and grassroots organizations have also come together to build community gardens that promote environmental stewardship and revitalize urban neighborhoods affected by disinvestment.

Gardens of Soul Food

Urban food production had been slowly taken up by a population of new residents who had come to the city during and after the World Wars, seeking economic and personal opportunity. Six million African Americans, part of one of the largest internal migrations in history, left the rural South and moved into Midwest and Northern cities between 1916 and 1970, with the largest flows occurring during and after World War Two.

These residents changed the character of northern cities, bringing in a new immigrant population with rural backgrounds and tastes in food. It did not take long for urban land to again sprout gardens, this time filled with “soul” food.

Adrian E. Miller, author of “Soul Food: The Surprising Story of an American Cuisine, One Plate at a Time”, explains: “As people left the South, they did what any other immigrant group does: They tried to re-create home. If you think about immigrant food in this country, it’s usually the celebration of food of the old country. It’s not the day-in-and-day-out stuff, it’s usually the stuff they ate on special occasions that, now that they’re more prosperous here, they eat more regularly. That’s the story of soul food.”

In the Eight Mile-Wyoming area of Detroit, for instance, residents often raised chickens among their vegetable gardens. Corn was a common sight in the neighborhood, along with an informal system of community gardening. As one resident told a visitor, they had no trouble with people stealing from their garden because, “we just plant a little more than we need each year to take care of that.” Alternately, “if we run low, we just get a few [ears of corn] off of somebody else’s. We all know that. We don’t care. We’re friends out here!”

Turning Spoiled Food into Compost

But titanic amounts of the food that enters cities each year leaves as garbage headed to the landfill — a massive waste of a resource that could be composted into rich soil amendments, as Paris’
Although skeptical at first, the Federal government came to support Victory Gardening efforts in communities across the country, as seen in this poster from 1944-45. Herbert Bayer, artist. Library of Congress.

19th-century farmers did with horse manure. According to the EPA, fully one-quarter of the food bought in America ends up in the waste stream — 32 million tons per year. Of that, less than 3 percent gets composted. The rest, landfilled, slowly rots and emits methane, a greenhouse gas 21 times more potent than carbon dioxide. The EPA reports that wasted food in landfills accounts for a fifth of U.S. methane emissions: the second largest human-related source of methane in the United States.

In 1993, a former professional basketball player and corporate marketer named Will Allen purchased a tract of land on the economically troubled North Side of Milwaukee, Wisconsin. Allen hoped to use the space to open a market that would sell vegetables he grew on his farm outside Milwaukee. But then, working with unemployed youth from the city’s largest housing project, nearby Westlawn Homes, Allen soon began growing food right in Milwaukee.

Eventually, that effort would morph into Growing Power, now the nation’s most celebrated urban-farming project. Milwaukee’s Growing Power has turned the urban waste stream into a powerful engine for growing food. Most urban agriculture operations today are net importers of soil fertility — they bring in topsoil and compost from outside to amend poor urban soils. Growing Power has become a net exporter. In 2008, as the New York Times Magazine reported in a profile of founder Will Allen, Growing Power converted 6 million pounds of spoiled food into 300,000 pounds of compost. The organization used a quarter of it to grow enough food to feed 10,000 Milwaukee residents — and sold the rest to city gardeners.

**Growth of Community Gardens**

In many urban neighborhoods around the country, community gardens have fiercely loyal protectors who have mobilized in recent years as their city has targeted gardens as sites for affordable housing, and private developers have also eyed them for high end development.

In 2017 the New York City Parks Department’s Green Thumb program -- the nation’s largest community garden program -- grew to 553 gardens, up from 501 in 2009. Most of the gardens sit on city-owned or other public property, and are maintained by community groups and a dedicated corps of 20,000 volunteer gardeners.

**Global Urban Agriculture**

About 3.2 million New Yorkers, or 38 percent of the city’s population of 8.5 million, were born in other countries, according to an analysis of census data by Queens College. About half of those immigrants came from the Caribbean, Central America and South America.

A large percentage of the people involved in urban agriculture are the urban poor. Contrary to general belief they are often not recent immigrants from rural areas (since the urban farmer needs time to get access to urban land, water and other productive resources). Women constitute an important part of urban farmers, since agriculture and related processing and selling activities, among others, can often be more easily combined with their other tasks in the household. It is however more difficult to combine it with urban jobs that require travelling to the town centre, industrial areas or to the houses of the rich.

In much of the world urban populations who work in agriculture are significantly better nourished than their counterparts in non-farming households. In Kampala, where urban producers obtain 40 to 60 percent or more of their household food needs from their own urban gardens, children aged five years or less in low-income farming households were found to be significantly less stunted than children in non-farming families.

It is estimated by the UN that worldwide 200 million urban residents provide food for the market and 800 million urban dwellers are actively engaged in urban agriculture in one way or another. These urban farmers produce substantial amounts of food for urban consumers. A global estimate is that 15-20% of the world’s food is produced in urban areas.

Research on specific cities and products yields data like the following: in Hanoi, 80% of fresh vegetables, 50% of fruits, poultry and fresh water fish, as well as 40% of eggs, originate from urban and peri-urban areas; in the urban and peri-urban area of Shanghai, 60% of the city’s vegetables, 100% of the milk, 90% of the eggs, and 50% of the pork and poultry meat is produced; in Java, home gardens provide for 18% of caloric consumption and 14% of proteins of the urban population; Dakar produces 60% of the national vegetable consumption whilst urban poultry production amounts to 65% of the national demand. Sixty percent of all chicken consumed in Accra, 90% of the city’s fresh vegetable consumption is from production within the city.

Over 26,000 popular gardens cover 2438.7 hectares in Havana and produce 25,000 tons of food each year; a total of 299 square kilometres of urban agriculture produces 113,525 tons/year. Urban agriculture to a large extent complements rural agriculture and increases the efficiency of the national food system in that it provides products that rural agriculture cannot supply easily (e.g. perishable products, products that require rapid delivery upon harvest), that can substitute for food imports and can release rural lands for export production of commodities.

From its beginnings in prehistoric time, agriculture has been a part of city living. It has its own set of problems and opportunities, distinct from those of rural agriculture. And in the United States often its practitioners are women, the poor, marginalized populations and immigrants. Yet the quest to provide for yourself, to experience the mystery of life that farming requires, and to create healthy, tasty, nutritious food for your community and your family are the same no matter what kind of growing you do.

Although skeptical at first, the Federal government came to support Victory Gardening efforts in communities across the country, as seen in this poster from 1944-45. Herbert Bayer, artist. Library of Congress.
Commercial Farmland Access in Urban Settings

by Johanna Rosen, Equity Trust and Kathryn Ruhl, Land For Good

with contributions from Bob Wagner, consultant, Land For Good

Urban agriculture is a broad topic with a range of issues. Here, the focus is on how farmers get and hold land for commercial farming in urban areas. An “urban area” is typically a densely built environment. Most urban areas are within city boundaries, but cities can include more suburban settings with abundant open spaces. For example, Urban Edge Farm (UEF) is within the City of Cranston, Rhode Island. It occupies 20 acres, surrounded by scattered rural residences. While farms like UEF are subject to city ordinances, many of the other issues discussed here would not apply to UEF.

There are many types of urban agriculture. This article does not go into educational farms or training programs, community gardens, or backyard “self-provisioning” gardens. Operations that are not land-based, such as rooftop, controlled environment, and hydroponic businesses have different considerations, not covered here. Commercial farms are operated as businesses, typically by private entities. A commercial farming enterprise could be under the umbrella of a nonprofit organization that also engages in educational or other charitable programs. In fact, nonprofit urban farms appear to be more common than private commercial operations.

Urban agriculture of all kinds offers many social, health, environmental, and economic benefits—all of which have been widely discussed. Among the most substantial benefits are the positive impacts on community well-being, and expanding awareness of and engagement with food production and healthy food.

For commercial producers, urban settings can offer highly accessible and diverse markets, rewarding interactions with customers and neighbors, options for ancillary services such as educational programming, and an opportunity for urban dwellers to realize their farming goals. Commercial urban farms can range from small backyard plots to 10 acres or more.

Farming in urban settings presents some challenges distinct from rural farming. It requires sensitivity to the historical and current racial, socioeconomic, geographical, and cultural dynamics, often in complex, highly diverse areas. Other challenges are similar to those in non-urban settings, but with a different wrinkle. These can include soil quality concerns such as toxic contamination and rubble, theft and vandalism, and lack or cost of infrastructure such as water, fencing, and buildings. Urban farmers might also be concerned about air quality, equipment storage, and parking, depending on the layout and context of the urban farming setting. Urban farming requires creativity, determination, and diplomacy.

Land access is a common barrier for beginning and other farmers, and is uniquely challenging within urban settings. Availability, cost, parcel size limitations, specific location (e.g. proximity to markets or residence, neighborhood acceptance), and competing uses make secure tenure on appropriate urban parcels difficult. In general, most urban land is not affordable to purchase for most farm operations. And what’s affordable may not be suitable for farming. As with their rural counterparts, many urban farmers seek alternatives to buying land, such as leasing.

What are these land access and tenure challenges in more detail? How can you as a community-based farmer get onto and hold land? What innovations mitigate these challenges and promote access to land for urban farming?

Finding land

Land availability varies greatly by city, depending in part on its history, current conditions, and density of development. Who owns the land will impact its availability to farmers and any resulting use agreement. Often, vacant lots are seen as attractive for urban agriculture. But what is a “vacant” or empty lot?

Technically, a vacant lot is a parcel of land that has no buildings on it. Often, it is a neglected or abandoned parcel that may have had a building on it at one time. Lots that have been repurposed for community gardens or play space may still be considered “vacant” if these open spaces are not recognized. In many neighborhoods, informal uses are important to residents, and pocket open spaces might not be available for production. In addition to vacant lots, suitable open spaces for production could be found as part of a larger parcel containing buildings, recreation areas, and/or other activities.

Critical to the farmer’s tenure is who owns the parcel.

Land ownership can be divided into two main categories: private and public. Public land-holding entities can include municipal redevelopment authorities, housing authorities, parks departments, school departments, public utilities and transportation agencies, as well as state and federal agencies. Publicly owned land can also include historic sites, and land held by land banks.

Privately owned urban land may be held by individuals, investors, for-profit corporations, churches and other religious organizations, banks, private institutions such as some schools, colleges, and hospitals, and other charitable or educational nonprofits. There are also private utility and transportation companies that own urban land.

Finding available parcels and identifying their ownership may require a bit of effort. Some cities have land inventories that can be accessed online. For example, New York City maintains an inventory of city-owned land that is updated every two years. It identifies, among other variables, whether it is suitable for urban agriculture (of all kinds). Cleveland, Ohio has a Vacant Land Inventory for Urban Agriculture. Although they tend to be more community-oriented than farm business oriented, support organizations in many cities, part of the Land Access Advocacy Network, have online tools for identifying vacant land, such as Lots to Love in Pittsburgh, Pennsylvania, Grounded in Philly in Philadelphia, Pennsylvania, and 596 Acres’ Living Lots NYC.

 Farmers can call the city’s planning or zoning department to determine ownership, as well as to see if there are any easements or other liens on a parcel. Tax or property records will give you the owner’s name and possibly phone number and address. Most such records are online, but you may have to visit the appropriate office. Some private owners of vacant parcels may be absentee, and tracking them down may present a challenge. Consider asking neighbors for information.

Some cities have a land bank—a public or private entity that holds and disburses parcels, typically for future development. These are often vacant, abandoned, tax delinquent, or foreclosed properties. Many land banks are interested in selling properties they hold, sometimes at bargain rates. And while new land banks’ primary purpose is not related to agricultural uses, it may be possible to access property through a land bank for agriculture, possibly even with a dwelling and enough land for small-scale production. For example, a couple in Lansing, Michigan rents a residential parcel from the Ingham County Land Bank. They raise crops and bees on this land. They’ve expressed interest in purchasing the property, but the land bank does not currently have a process for such a transfer.

In addition to land bank disposition, cities often sell tax delinquent property through a sheriff sale or auction. Some cities have side-yard programs to make it easier for residents to acquire vacant lots adjacent to their homes.

Locating a suitable parcel requires more than a drive-by and finding the owner. Zoning and other city ordinances will determine what is possible onsite. Not all municipalities or neighborhoods are receptive to agriculture. Read below for more information about regulations.

**Holding land**

Urban commercial farmers face many of the same land tenure issues as producers in rural and suburban areas. Can you afford to purchase the land you want to farm? If not, can you obtain an adequately secure and affordable rental agreement? Municipal ordinances may determine the kind of tenure available and under what terms. As with rural farming, insecure tenure limits a farmer’s ability to make physical improvements, and puts farms at risk of losing not just access to the land itself, but also investments made in building relationships with neighbors, customers, and suppliers, improving soils, and installing infrastructure. The two main categories of tenure are ownership and tenancy.

**Ownership:** Most public land-owning entities can sell land they hold, but the process can be cumbersome and regulations control what a specific entity is allowed to do regarding disposition of real estate. In most states, disposing of state-owned land involves a state agency declaring a property in its jurisdiction “surplus.” This triggers a sequence of actions, starting with making the surplus property available to other state agencies, then county and town authorities, before it might be disposed of via a competitive bid process or public auction. This process can be lengthy. Similar procedures or other barriers may be involved at the municipal level.

**For example, in Philadelphia there’s “councilmatic prerogative,” which gives city council members the ability to make land use decisions, including disposition of public land, in their district, while in Detroit, Michigan, the city council must approve purchases over 10 acres. These practices give city council members power of discretion and
As an alternative to purchasing land, poultry on 13 acres purchased by the farmers within some examples is less common in an urban context, but there are as mentioned, private land ownership by the farmer process has delayed the business’ plans to expand beds. They are awaiting a response, and the long term has delayed the business’ plans to expand.

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In Boston, Massachusetts, We Grow Microgreens submitted an application through the City’s RFP process to buy city-owned land in the Hyde Park area to build a greenhouse, a high tunnel, and raised beds. They are awaiting a response, and the long process has delayed the business’ plans to expand.

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Some cities offer licenses or permits, rather than leases, for short-term use of public land. A license or permit is permission to use the property, rather than an actual leasehold interest in the premises. These are less secure for farmers, but may be the only legal or practical option. In a non-urban example, the Massachusetts Department of Agricultural Resources’ State-Owned Farmland Licensing Program makes state land available to farmers under 5-year licenses. These go out to bid, and are renewable.

Innovative models: Several innovative arrangements have been developed or hold promise to help urban farmers achieve secure land tenure. This is an emerging field; there are not a lot of examples and each effort is unique. These often involve nonprofit organizations. A nonprofit organization must have a charitable or educational purpose, but that doesn’t mean that it can’t engage in money-making activities such as selling farm products or collecting land rent.

Sanctuary Herbs of Providence is composed of a Hmong family making teas and herbal products at Urban Edge Farm. In this example, MALT leases property to a commercial farmer in an urban setting, directly to a commercial farmer in an urban setting, and tailored their ground lease model for GRuB Community Farm Land Trust purchased land to Community Groundworks, a nonprofit that manages a commercial CSA. It leases land that it owns to The Food Project, a nonprofit that leases land to nine small to medium-sized organic farms, both mentor farms and incubator farms, which operate independently and benefit from the shared site.

A nonprofit could also act as an interim owner while a plan for the farmer to purchase the land is developed. Lewiston, Maine’s New Roots Cooperative Farm was founded by four graduates of Cultivating Community’s New American Sustainable Agriculture Program with support from the Cooperative Development Institute. Maine Farmland Trust purchased a 30-acre farm property within the city limits of Lewiston on behalf of the New Roots Farm and worked with the farmers to develop an agreement with the farmers that will allow them to purchase the land at a future date and maintain secure access to the property in the meantime through a lease developed with support from Land For Good.

Lease

The Southside Community Land Trust (SCLT) has a 10-year ground lease from the State of Rhode Island on a 20-acre farm in Cranston. As the intermediary, SCLT subleases plots to several start-up commercial farmers at nominal rates. Cranston is a city, but the parcel is in a more rural setting. One attractive feature of this arrangement is that the farmers share equipment and infrastructure. Another is that they get support from SCLT.

Historically, community land trusts (CLTs) have focused on affordable housing, often by acquiring property and offering ground leases to homeowners. In this model, the nonprofit is a ‘friendly’ landlord. It can, for example, negotiate the master lease, create supportive subleases (provided they are consistent with the master lease), and facilitate sharing among multiple site users.

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The Madison Area Land Trust (MALT) in Wisconsin is a CLT that also owns residential and agricultural land. In this example, MALT leases land to Community Groundworks, a non-profit that manages a commercial CSA.

In Olympia, Washington, South of the South Community Farm Land Trust purchased land and tailored their ground lease model for GRuB (Garden-Raised Bounty), a nonprofit with a commercial enterprise.

Two nonprofits in Pittsburgh, Grown Pittsburgh and Allegheny Land Trust recently launched a joint venture, Three Rivers Agricultural Land Initiative.
uses the CLT model to “provide long-term security for existing community gardens and urban farms, and ensure that future urban agricultural expansion will be planned and conducted on protected land.”

There are also examples of nonprofits that are not CLTs, but have related missions and can play a similar role in protecting land and making it available to farmers. These nonprofits own land in rural areas or less dense areas within city limits, and provide ground leases to the farmers with owning the infrastructure.

Grow Food Northampton and North Amherst Conservation Trust are two nonprofits in western Massachusetts, created new nonprofits to hold farmland and make it available to commercial farm businesses using long-term ground leases. Equity Trust assisted with these and other agricultural ground lease projects, some involving conservation land trusts.

Ordinances
City zoning and other ordinances govern what land uses are allowed and where. Until recently, agriculture was not even contemplated as a land use in most cities, so regulations may be vague or unfriendly to farming. Increasingly, urban agriculture is welcomed by cities, and laws are changing. For the most part, the changes pertain to educational and community gardens, rather than commercial agriculture. That said, more and more cities are seeking ways to foster urban agriculture, including commercial farms. For example, the Conservation Law Foundation has worked with Portland, Maine, Cambridge, Massachusetts, and Central Falls, Rhode Island on ordinance revisions to support urban farming.

City zoning codes might prohibit certain farming activities such as keeping livestock or bees. They might limit the type, size, or location of farm-related buildings, signage, fencing, and compost piles, for example. They might allow commercial agriculture only in certain zones or areas of the city. For example, Rhode Island’s Urban Agriculture Code, Article 89, allows all land-based farms up to one acre in any zone (i.e. residential, commercial, industrial) in the city, while land-based farms larger than one acre are allowed by right only in industrial areas and are conditional in all other areas.

Special permits or conditions might be required for certain farm-related activities such as product sales. The Somerville, Massachusetts Urban Agriculture Zoning Ordinance requires soil testing (with the results of the soil test clearly posted at the point of sale) for product sales, and only fresh, uncut, and unprocessed produce grown on the premises can be sold. New Jersey’s Urban Agriculture Regulations, state laws related to water, agricultural nutrient management, and other relevant concerns also could impact urban land uses for farming.

Land protection
Removing the rights to develop farmland through a conservation easement held by Colonial Open Lands has been an important tool in areas where good farmland is threatened with development. Conservation easements are less likely to be used in urban areas where land is limited in size, and not given priority for easement programs. Nonetheless, they have been used in some urban agriculture projects. In urban areas, agriculture is often considered an irrelevant use, and given low priority in cases where the “highest and best use” of a parcel is not redevelopment, it may be necessary to find ways to protect the land for long-term agricultural use.

To protect the 12.5-acre Fairview Gardens, an innovative agricultural conservation easement was granted to the Land Trust for Santa Barbara County at the time of the purchase that ensures active use as a working organic farm and educational programs under the nonprofit organization, the Center for Urban Agriculture. Fairview Gardens was a farm long before the area developed around it and the City of Goleta, California was established.

Another historic farm, Five Fridgee Farms, located just outside Denver in the City of Wheat Ridge, Colorado, is privately owned by the farmer. Through a conservation easement held by Colonial Open Lands, the farm is protected for agriculture use forever: it cannot be subdivided or further developed.

Urban land also may be protected through outright (fee) ownership by a nonprofit land trust such as Neighborhood Gardens Association in Philadelphia (where the focus is on community gardens).

Site considerations
Infrastructure: Like their rural peers, urban farmers must consider their needs for water, storage, season extension, fencing, etc. Are these available on a parcel of interest? Can they be installed, and at whose cost? Are there any regulations that would hamper installation or use of infrastructure? What about parking and storage? Some municipalities, such as San Francisco, California and Philadelphia, offer a discounted water use rate for urban farms or waivers for storm water fees. Farmers in these cities have received assistance to subsidize or cover the cost of hooking up to the municipal water supply for farm use. Other cities, such as Detroit, provide permits to access water via fire hydrants.

Soil quality: Soil quality in urban settings is one of the most critical considerations. It’s important to ensure that the soil is not contaminated on the farm site. Contaminants can include lead from pipes and paint, leaks from underground fuel storage tanks, and, other hazardous substances. These may be rubble from old buildings buried on the lot. Depending on the type of contaminant, remediation may or may not be possible. Some urban farms capped the ground or raised beds with improved clean soil. Innovative remediation methods include planting sunflowers or growing mushrooms. With that method, the toxic residue must be safely removed from the site.

There are many resources that address urban soil quality issues, including the Soil Safety Resource Guide for Urban Food Growers from The Johns Hopkins Center for a Livable Future. Guidelines on testing and remediation can be found at www.urbanaglaw.org/soil or through your Extension service.

Housing: In urban settings, farmers are more likely to live off-farm unless they have a backyard farm. Affordable urban housing is addressed by many groups, programs, and policies, but access to affordable housing near the farm may be an issue for urban farmers. Living off-farm (for any farmer) may make emergency tasks, protection from theft and vandalism, and managing animals more challenging.

Scale and scaling up
Once urban farms are more established, they may face a choice to stay at the same scale, expand within their urban setting or migrate to peri-urban or rural land. Seeking a larger lot within the city may present similar challenges, and one experienced the first time around, only more so because larger parcels tend to be even harder to find. Farming on multiple parcels is another option that comes with its own set of logistical and other complications.

Farmers who want to move from tenancy to ownership, or onto ground independent of an intermediary organization will need to go through all the requisite research and negotiations.

Moving out of the city creates new considerations. Farmers who have been successful on urban plots will likely have to consider changes in their production practices, plant varieties, types of products, markets, equipment, and even residence. It may feel like starting over, with an additional learning curve. And obtaining land—and a new support system—outside of cities presents fresh challenges.

Sidewalk Ends Farm, based in Providence, Rhode Island, was founded on a 5,000 square foot lot through a handshake agreement with a private absentee landowner. After the first year, the farmers were unable to reach the landowner to explore protecting the land and increasing their security. They leased additional small, private urban and peri-urban parcels nearby. Farming multiple insecure urban lots proved frustrating to the farmers. After 3 years, they signed a 5-year

lease for a small hayfield in nearby Seekonk, Massachusetts. This allows them to more confidently build soil and infrastructure, and grow more food for more markets.

Race, equity, and urban land access
Due to discrimination and structural racism, people of color and immigrant farmers may confront additional barriers to land access. Many communities are eager to welcome urban agriculture, but the dynamics can play out very differently based on who seeks to farm there, and who serves as gatekeeper. Racism underpins many interactions in our society, often below levels of awareness. White privilege, language privilege, and familiarity with vocabularies of development or gentrification can open doors for prospective white urban farmers that may remain firmly closed for farmers of color. The ability to communicate and earn trust within a community is crucial in establishing any urban farm; good relationships with neighbors and elected officials can yield more flexibility as a farm tries to get established and build out its vision.

As with rural farming, urban agriculture often operates through informal agreements and handshake deals, where land opportunities arise through social networks. Farmers with limited proficiency with English or comprehension of local norms find it more difficult to move through the process of accessing land without outside support from a relevant organization. Despite these barriers, land availability is higher for people without language facility, the ability to “code-switch” in defense of their projects, or the social connections to make requests of authority figures.

Urban farming sometimes can lead to unintended effects and unforeseen consequences including gentrification. Urban agriculture is more likely to emerge in places with open and undervalued land such as post-industrial cities, poor/disinvested neighborhoods, and/or open and underdeveloped urban landscapes. While properties in these areas might be more accessible, and farms might be an initial asset to the community, they can also be (in some cases unwitting) agents of gentrification. Such transformation can lead to the displacement of residents the farm purports to serve by raising property values, and stimulating competing interests for land. Gentrification may also eventually displace urban farms in favor of “higher use” development options.

Conclusion
Adequate land tenure is essential to the success and expansion of urban agriculture. Despite some unique challenges, commercial farming in urban settings can offer multiple benefits to farmers as well as urban communities. Public and private landowners can be important partners in creating and mutually rewarding transactions to make urban land available for farming. The examples in this article provide models to those who seek to farm in urban settings.

Let clients & employers know you’ve got what it takes. Visit StewardUSAOrg/to become a Certified Sustainable Agriculture Professional (CSAP)
The Bedford-Stuyvesant neighborhood of the borough of Brooklyn in New York City is composed of about 150,000 souls. Dutch farmers were the original European settlers, but the region slowly developed from farms to villages to towns to a city because of closeness to Manhattan. By the 1870s rowhouses began to be constructed here and the neighborhood adopted its current look. After the completion of the Fulton Street IND transportation line in 1936, many people left an overcrowded Harlem for better housing options among Bed-Stuy’s historic brownstones. During World War Two a large influx of southern African Americans came to work at the Brooklyn Navy Yard and a resulting largely successful effort at ‘blockbusting’ by real estate agents and speculators to drive out whites left the neighborhood with a 85% black population by 1960. Over time it has become a center for Brooklyn’s African American culture.

By the early 2000s the area’s large stock of substantial rowhouses on tree-lined streets began attracting an ethnically diverse population of Afro-Caribbeans and foreign-born people, as well as gentrifying whites. According to the American Community survey in 2013, the population was 56% Black, 22% White, 19% Latinx, and 2% Asian. Perhaps this eclectic and cosmopolitan population base explains the look and feel of Bed-Stuy’s Hattie Carthan Community Garden and Farmer’s Market when I visited in October. The Community Garden is on the end of a block of brownstones and contains numerous plots for individual gardens as well as quiet public areas, picnic tables, and stretches of trees. It has been in existence since 1981. The Farmer’s Market, established in 2009, is on a narrow strip of land adjacent to the Garden. It serves as a site for community members to gather, buy and sell food, and take part in educational, spiritual, musical, artistic and cultural programming.

Perhaps the two pieces of land represent the needs of the community at the time they were established. The community garden is like so many other such facilities in densely populated American cities – a site from which private housing had disappeared and which residents, often from rural backgrounds, began using for growing food. Ultimately this activity became so popular that the city, having taken title for non-payment of taxes, allowed it to be formalized for that purpose and supplies such basic necessities as water.

The farmer’s market is a much more up-to-date space, once an abandoned lot where trash was dumped, now it is filled with murals, chicken coops, demonstration plantings, free libraries of kids books, composting spaces, display tables, rows of raw and processed produce for sale, live and recorded music, and costumed people. Or perhaps the two spaces have taken on the character of the two strong black women who established them.

Hattie Carthan (1900 – 1984) was a Bedford-Stuyvesant resident who loved trees. Mrs. Carthan led the charge to preserve a particular Southern magnolia tree, brought on a ship from North Carolina in 1885, that became a symbol of the neighborhood. The tree, rare in the northeast but protected from killing frosts by adjacent buildings and probably heat from the nearby subway, had grown to 40 feet in height. Carthan not only succeeded in having a wall built to protect this tree but also spearheaded the successful attempt to designate it an official city landmark in 1970. Noticing natural conditions in her neighborhood beginning to deteriorate, Mrs. Carthan began replanting trees there. She started the Neighborhood Tree Corps in 1971 as a way to teach young people how to care for trees, and the Green Guerrillas, a force behind the resurgence of the community garden movement. The organization began informally in 1974 with tactics as simple as throwing water balloons filled with seeds into abandoned lots; the positive response showed the overwhelming need for more green space in the inner city. In May 1998, the garden was named in honor of Mrs. Carthan.

Yonnette Fleming is another natural community leader. Born in Guyana, she came to the US at 15 years of age. She had grown up living on large family sugar, rice, and coconut plantations, and with a grandmother who still grew food and baked bread. But upon coming to America she got caught up in the dream of success for a time and worked as a financial broker on Wall Street. Since 2003, however, she has been active in urban gardening and farming. Currently vice president of the Hattie Carthan Community Garden farm, she is a raphacologist, ordained minister, plant and sound medicine practitioner, reiki master, healing circle facilitator, and herbal Wysewoman. She teaches a Food Justice course for the Farm School in NYC and is a member of the Farm School’s advisory board, considering herself a “social change activist”.

When I first met Yonnette she, along with others helping with the market, was wearing an orange and black face mask. "This is the Day of the Dead for us", she explained. "We have altars that were set up this morning. We are introducing children to their dead. My grandmother’s body is on that altar. She died at 106" (She shows me the urn with her ashes in it). "So the majority of the world is celebrating this time with All Souls, All Saints, everyone is celebrating. So we make a concerted effort to pay attention to this. We have land, so we have to have the ancestors, all the old gardeners who have spent 40 years of their lives here, you have to have them in memory. That is what we are doing today. Almost all of the world celebrates their dead now. Yeah! But you would never know it from where we are in this country – Halloween costumes, trick or treats, candy..."
Yonnette is proud that the Hattie Carthan Garden is known for its spirituality, not just its beauty and practicality. Other activities that illustrate this are:

• the Menstruation Hut -- a place for HER to celebrate the mystery of women’s blood and for cultivating and affirming life bearing abilities. (First Sunday of each month)
• Healing Circles -- weekly percussion circles that teach team work and cooperation through musical entrainment. (Sundays)
• Medicine making workshops. (Quarterly)
• Earth Day seed starting workshops free to the community. Each person leaves with plant starts. (April)
• Annual Plant Sale -- local gardeners, schools, block associations pickup plants for their gardens.
• Foods of the diaspora – a culinary festival celebrating the foods and music of the African diaspora, attracts hundreds of people into the garden space. (June)
• Southern food festival -- community gathers on lawn to celebrate Southern culture and blues band performs good old bayou blues classics to heal the broken hearted. (September)
• Labor Day Spirits come out to mambo – Afro Caribbean cuisine and west African drum and dance class is emphasized in market. Intergenerational Caribbean cuisine and west African drum and dance.
• Life and Death celebration -- community gathers to remember Death traditions and to cultivate ancestral bonds through deep reflections, art and music. (Late October)
• Farmy Folks soiree -- large hyperlocal dinner, demonstrating nourishing traditions to acknowledge the work and dedication of our supporters. Visioning with stakeholders and sharing lessons from the season. Failures alongside successes and aspirations. (Late November)

Of course the Community Garden and Market also run many education programs appropriate to raising food in the city.

“We have some composting systems behind the chicken coop,” Yonnette points out. “When the market is open we are also taking in compost from within a quarter mile radius. When people come to pick up their CSA basket of food, they can’t compost in the home they can freeze the waste and bring it back here. We turn it over and it goes back to the soil. That is part of the theme on the dead -- decaying and changing form.”

“Shortly we will be doing a vermicomposting workshop,” she continues. “Our compost is a mixture of animal manure, worm doo and plant matter. Our animals are hormone free and are cared for with herbal medicines, so we don’t worry about chemicals and drugs in the manure.”

“Two of these beautiful tablescapes,” she continues, “were created by me and the children this morning. The craftings conjure up memories. Here we have our juniper berries, our amaranth that reminds us of where we are from. Here is an amaranth that is from Guyana, all of the beautiful things that we have prepared for our dead. This in itself speaks a volume about culture and us. Over on this table, what we asked our community to do is either bring pictures or a representation of their culture for our dead table. If they have nothing, we encourage them to write notes. What we know about the dead realms is that the way is paved by the heart. In other words thinking, standing still, remembering. So that is what we are doing. And this is going to be built up all afternoon, and our ritual ends with the drums and a whole celebration and eating.”

Yonnette Fleming holds one of the hens at the Hattie Carthan Community Garden

Another practical program centers around the ‘Herban Farm and Apothecary’ that Fleming organized in 2011 on a neglected urban lot nearby. She studied plants and cell medicine for 10 years at the College for Indigenous Medicine and is a fan of their enormous restorative powers.

“A lot of things don’t grow here,” she admits, “but what does grow here we use a lot of. The reality is that people don’t even know what plants that grow here most. They are so busy weeding out what grows here they don’t know what it is. Yeah, so we run medicinal plant walks. Plants are outside of the codified system. We help to break that down.”

The herbal apothecary is loaded with freshly harvested medicinal herbs, herbal cosmetics and healing products crafted by Yonnette, who offers apothecary healing services such as Chakra re-balancing, energy healing, sound healing, aura cleansing, and reiki sessions. Groups focusing on dietary methods, percussion, plant dreams, sacred design, clearing land trauma, sacred mandelas and labyrinths are also available.

A number of young people have been engaged at the sites through Americorps or other programs. They do a variety of jobs, including running educational programs, and have expressed an interest in getting more involved in food and farming. African American-owned farms in the US have been on a historical decline for many years, but Yon has liked to counteract that reality by finding ways to make black ownership easier. To this end she has helped create the Farm School, a training program of the Just Food program to promote learning about different kinds of farming and how to get access to land.

There is also a tiny toots program, including their own curriculum in the garden in the back in which 2-year olds participate. They have a pizza garden and had a program on smoothies and how you make them. The chickens are there, and a little cow that you can move back and forth to make compost.

As an example of an educational program, while I was there Jeneé Granum presented a demo on how to make pumpkin fritters drawn from the recipe in Caribbean Vegan. By Taymer Mason. You cut a pumpkin or squash into sections, grate the meat into a bowl, add flour, a tablespoon of brown sugar or honey, a pinch of salt, cinnamon and nutmeg. After mixing the dry ingredients together, you add ¼ cup of milk, a teaspoon of vanilla extract, and mix the butter with the pumpkin meat. You put in a tablespoon of fritter and deep fry or bake it, dust with sugar and then eat. The fritters Jeneé made were delicious!

Another delicious product of the Garden is figs. They have about 7 trees, which were producing a lot of fruit this year. They import figs, but this is a good year. We will pick it, eat it, freeze it, and then make it into a jam. And if you have a chicken coop,” Yonnette points out. “When the chicken coop is used as a composting system, they will eat the waste and turn it into compost. We are working on a composting system that is made of old tires. We are using it as a container for composting and making it easier to transport. We are also working on a vermicomposting system that uses worms to break down the waste. This system is called a worm composter, and it is a great way to make compost. The worms consume the waste and turn it into compost. The compost is then used to fertilize the garden. We are also working on a composting system that uses bacteria to break down the waste. This system is called a composting system with bacteria, and it is a great way to make compost. The bacteria consume the waste and turn it into compost. The compost is then used to fertilize the garden.
Youthful community members learn about the food system at regular educational sessions. The entirety of the other site (Herban Farm) is maintained as a community project. It is infused with a spiritual energy – it’s an African indigenous, woman-led, people-of-color project.

“The neighborhood is changing now,” he continues. “It has been predominantly African American and low income. But there is tremendous gentrification now. You can see the public housing here and the yuppie coffee shops over here. There is lots of change. The idea of this project is that the community garden has lots of long time members who are African American from the South and have been in Brooklyn for awhile but come from rural backgrounds. You led a project a few years ago which captured their story from the context of a community garden which is really cool. People have individual plots but it is a collective endeavor. I like being a part of that. I’m from Washington D.C. and am obviously one of the people who is ‘gentrifying’ the neighborhood. But it has been really wonderful for me to come here and connect with what is going on. We have had some wonderful sessions here on Race and Equity, Access, and Power. I attended one right after the Charlottesville killing. We had people from 12 years old to 70 come out for that. A lot of people have been volunteering here over the years, contributing to the agriculture. I come every week and water a number of beds. I have a little garden plot in my backyard but I contribute as a community member to this project too.”

The role of African Americans in the leadership of the Garden, Market and Farm is central to Yonnette.

“The project here is an African-American led one,” she asserts. “It has always been for the 40 years it has existed. The older garden ran a kind of sterile narrative about who they were as though all things were equal. They did that for a long time. It’s a traditional community garden where everybody gets a plot. It is like everybody is there, we are all here, there is no racial justice narrative going. But when gentrification came on the community they got to the level that they realized the sterile narrative, although it seems like a friendly thing to do, is not how you cultivate community. We are a diverse community, naturally, and there are various power structures. Everything is different for everyone.

So in 2009 we began to clearly say that we are a people-of-color led project. That our work with...
the youth is on youth of color, to heal and repair themselves. Everything that we do has that sort of narrative.

“Our community is being gentrified currently,” she continues. “This is one of the last African American gardens left standing with African American leadership. That is a fact. How the leadership is dealing with that are internal strategies, some are ones I can share. One idea is adding a voluntary component to our membership so there is not a right-of-way into the garden. It serves as a speed bump. We ask for a year of voluntary help before you actually join the garden. When I added that to our bylaws (smiles) that was the winner! Many community gardeners come to meet me and the one thing they want is to keep it the way it is, how to keep the place African American, how to stack it without, yeah… We have a few whites who have earned membership now.”

Fleming’s concern with African American control may seem discriminatory to outsiders, but she feels that keeping her community in charge of the Garden they created is vital.

“It is important for historically oppressed communities” she states, “to have resources for healing and rights to land and territory. Every community needs resources and space for the production of fresh, clean, nutrient dense foods and to recognize the central role of land in culture, society and healing. Our gardens and farms are not just food production mills but serve as places that humanize and cultivate diversity.”

To that end, she argues, it is important to stress the strengths and assets of your community, not its weaknesses and needs.

“The work of community building and reconnecting to land,” she says, “like every process, begins with a desire to want something better for one’s community. Assessing the assets of one’s community is essential. Instead of using a needs-based only frame, every community should be able to map its assets and create change through establishing common ground and democracy. Engaging and educating us-ing popular education pedagogy helps us recognize each other’s function in community. Music and Art defies the trappings of language and are important to our collective healing.”

Also important to community education about what needs to be done, Yonnette suggests, is a recognition of the problems they face and an appreciation of the traditions they come from.

“People need to have a race/class analysis,” she says, “when they are trying to be a part of creating a more equitable and sustainable future. The food system is so bad in so many ways – unhealthy food, people profit from it who are far away from producing it, lots of waste, issues of race and equity… The kinds of classes we run help you understand all that and create alternative ways of farming – local, organic, collective.”

In keeping with the fall festival, this demonstration showed how to make pumpkin fritters.

One other consequence of year-round operation would be that the market could attract upstate farmers with winter crops, root vegetables, and preserved food. It would be an opportunity for them to reach a large urban market and a chance for the market to earn significant stall fees.

Yon is currently planning on building a classroom and herbal preservation structure on the farm and will be launching an indiegogo campaign to raise funds for it. Large teach-ins and herbalism intensive courses are among the programs which would be taught there.

Another goal Yon has is to install a solar electrical tree at the farm. Also to have a rainwater barrel system there and a pump to activate it so the water can be brought anywhere for use.

Mike works with the food justice program which takes care of policy and makes sure things are running correctly. Fleming envisions him coordinating letter writing and door-knocking campaigns generating support for the program. That could pay off in several ways:

Longer leases – not the 3-year type currently used for the market, but more like the 40 years, which the Community Garden has. That would enable significant investment in the sites.

EBT support – the city requires every single community-based market to have an EBT operator. If that could be changed, or a system set up to pay for such an operator, then SNAP benefits and other such programs would be easy to use and the vendors could all function easier.

School programs – Yonnette would like to have a chance to the schools for teacher awareness. The children are already coming to the site for services and teachers would benefit from such exposure themselves.

Health programs – Yon would like to have health professionals come at least one day a month to the farm. Her dad did that in Guyana. He had every public service program bring people to help on the farm – ministries of education, health, timber... “I think what we want to do,” she says, “is build up this project here, and the other herbal one, in terms of growing more, developing enterprises to use it and benefit people. We want to get people to build their skills while increasing community economic activity. It is great to grow your own food in your backyard or a plot here, but also help us build the community and cooperative economics.”

Recollecting, be it manure, garden clippings, or neighborhood kitchen waste is an fundamental principle for the Garden, as well as an important source of fertility.
### The Role of Marginalized Populations in American Farming

#### Historical Agricultural Demographics

Although early farm population figures are not reliable, we have good numbers from as far back as 1820 giving Americans in ‘farm occupations’ (2.1 million, or 72% of the workforce) and then again in 1850 (4.9 million, or 64% of workers). Once the census started counting the farm population, in 1920, the total was 32 million, or 30.2% of the national population. Careful Department of Agriculture estimates put the farm population peak in 1916, at 32.5 million, or 32% of all Americans.

Despite a general downward trend since World War I to its current level of 3.2 million, the farm population has had a few short surges, including one in 1933 when it grew to 31.2 million, or 24.9 percent of the United States population of 125.4 million. Were some of us driven back to the farm during the Depression, where at least we could eat?

#### Current Farmer Racial Demographics

The numbers of these farmers who are African Americans, however, is particularly low. In 2012, they represented fewer than 2 percent of the total farming population, despite an overall population accounting for about 13% of our people.

Although the farm population has been steadily diminishing for the last century, in 2012 (the last year for which there are reliable numbers) 2.1 million Americans still consider themselves principal operators of farms. This is down 4.3% from the number in 2007 (2.2 million).

Interestingly, however, this decline in principal farm operators is wholly among the white population (see “Minority Principal Operators, 2007 and 2012” table). Principal operators among all the non-white groups are on the increase: Hispanic operators grew by 21%, American Indian by 9%, Black by 9%, and Asian by 22%.

Most of these farms are still smaller than average (see "Share of Farms by Sales Class for Minority Operators, 2012 (percent of group)"). Most farms operated by people of color are where you might expect (90% of black farms are in 12 southern states; 76% of Latino farms are in the 6 states of Texas, California, New Mexico, Florida, Colorado and Washington; 80% of Native American farms are in the 7 states of Arizona, Oklahoma, New Mexico, Texas, Montana, California and South Dakota; and 54% of Asian American farms are in the 4 states of California, Hawaii, Florida and Texas).

#### Freedmen on Farms

Before the Civil War, abolitionists and those working to end slavery had no clear plans for how former slaves would transition to economic freedom in a non-slave economy. When victory by the North was imminent, however, this issue came immediately to the forefront. To what extent should government provide for a transition to wage labor rather than support the desire of many freedmen to have the means to be independent farmers?

There had been previous isolated opportunities for former slaves to acquire land. As early as 1862, Union generals subdivided some plantations of Confederate leaders for small farm settlements by former slaves. The government sold confiscated land on St. Helena Island and Port Royal, SC, in 1863 to a philanthropist-entrepreneur who produced cotton by hiring freedmen and arranged mortgage payment plans for those farmers to gradually purchase the land.

The first Freedmen’s Bureau Act in 1865 included plans for 40-acre tracts to be sold on easy terms from either abandoned plantations or to be developed on unsettled lands. But by late 1865, President Andrew Johnson terminated further initiatives by the Union Army for small farm settlements. In 1866, a second Freedmen’s Bureau Act was passed that lacked specific terms and actions for implementing 40-acre settlements.

Social scientists and economic historians have considered the government’s reluctance to implement a major land settlement program for the freedmen as a lost opportunity for small, independent farming. There were opportunities to provide small farms on government-owned or unsettled lands, but the extent to which land reform would have required seizure and breakup of plantations may have worked against adoption of such a policy. So the question remained, what to do with large plantations and how would they be farmed? By leaving the plantations intact, a demand for farm-operating wage labor was created.

Despite the early announcements of plans for land settlement programs, the work of the Freedmen’s Bureau focused instead on facilitating a transition from slave to various types of farm operation or labor relationships. During a 4-year period, the Bureau mediated agricultural production contract negotiations between planters and freedmen. In other words, national leaders decided that its appropriate role was to help former slaves become “free” in being able to offer labor and farm operating services. The demise of land distribution plans did not eliminate opportunities for ownership and independent farming, but its future depended on the extent of economic mobility, or what was called moving up the agricultural ladder.

Many freedmen were skeptical of operating as wage-workers out of concern that planters would establish a “free” labor variant of the factories-in-the-field system of slavery. The two general alternatives to wage labor were tenancy arrangements under rental contracts and sharecropping. Several southern states passed laws during the late 19th century establishing the status of payment terms and working relationships as subject to determination by private negotiations between the landowner and tenant worker, resulting in negligible differences between tenancy and sharecropping.

W.E.B. Du Bois estimated 19th century progress in land ownership by African American farmers at: 3 million acres in 1875, 8 million in 1890, and 12 million in 1900. The Census of Agriculture shows a steady increase in the number of farm operators owning land in the South from 1880 to 1890 and again in 1900, but does not distinguish between white and nonwhite owners until 1900. Census figures show 1920 as the peak year in the number of nonwhite owners of farmland in the South.

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Minority Principal Operators, 2007 and 2012

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<tr>
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Sharecroppers in North Carolina
In a period of economic mobility for about 25 percent of farm operators. In the early 20th century, there were instances of black farmers having achieved the status of landlords and becoming philanthropic community leaders.

During the 19th century there were some opportunities to establish farms on unsettled lands, but over the long run, most black farmers gained land through their working relationships with white planters. Landowners profited by offering tenant farm operators the incentive of having an opportunity to buy certain tracts of land in exchange for increased farming efficiency. The increased land ownership and prosperity of the first two decades of the 20th century, however, were not shared by a large majority of African American farm operators. Enactment of Jim Crow laws in the late 1890s empowered landlords and planters to try to extract more output from tenants and sharecroppers with less compensation. Oppressive farm operating contracts were easier to impose because the voting rights of African Americans were limited. Without the franchise, black tenants and sharecroppers had no legal or political recourse.

The purchase of farm and household supplies was financed by loans secured with crop liens from merchants, which put many farm operators into a persistent state of debt. In some southern states, a peonage system developed from laws on indebtedness that enabled planters to force some tenants to remain as operators on their plantations. Cotton grown by tenants and sharecroppers was usually sold for them or credited to their ‘furnishing’ accounts. So, even when these growers avoided peonage, they likely received lower returns because they lacked the power to monitor marketing transactions.

Census reports from 1900 to 1920 show an increasing number of tenant and sharecropper families in the South. By 1920, there were 369,842 tenants and 333,713 sharecroppers.

World War Two and the Push for Civil Rights

For many African Americans, the war offered an opportunity to get out of the cycle of crushing rural poverty. They joined the military in large numbers, escaping a decade of Depression and tenant farming in the South and Midwest. Yet, like the rest of America in the 1940s, the armed forces were segregated.

The Army accepted black enlistees but created separate non-white infantry regiments and assigned white commanders to them. The Army Air Corps’ African American fighter wing was completely segregated, training at the all-black university at Tuskegee, Alabama. The Navy segregated African American units and assigned them the most menial jobs on ships. And the Marines, at least initially, didn’t even accept African Americans. At every training base, black and white soldiers were kept apart—despite excellent performance records for black units.

The best known black unit, the Tuskegee Airmen, was assigned to North Africa and later to Italy. They flew 200 bomber escort missions over southern Europe without allowing a single bomber to be shot down by enemy fighters. Their longest mission took them over Berlin where they encountered new, faster jet fighters. They shot down two and damaged another five. The unit received two Presidential citations, and individual flyers received 150 medals.

After the war, when non-white soldiers returned home, they found a country that still did not grant them full rights. But a movement for the expansion of civil rights had been born. Some African American soldiers who had left farm jobs in the South decided not to go back. Instead they moved to cities, looking for new opportunities and new ways to use what they had learned in the armed forces. This movement represented an intensification of the Great Migration that began around the turn of the century.

Farming Innovation by People of Color

The creativity of farmers in designing useful tools, creating new varieties of crops, finding alternative markets, and engineering new ways to reduce labor and save time is well established. Of course many non-white Americans, regardless of their status, contributed to this effort and found ways to make farming more productive, easier, and sustainable. The best known of these was George Washington Carver, whose inventions and writings while a professor at Tuskegee Institute in Alabama are legendary.

George Washington Carver

Born a slave in 1864, Carver was orphaned at an early age and adopted by the Missouri couple who owned him, Moses and Susan Carver. George showed early promise and was taught by Susan to read and write since no local school would take black pupils. Eventually he left home and received a high school diploma in Kansas. He enrolled in Simpson College in Iowa, where he so impressed his teachers that they suggested he study botany at Iowa State University, where he was the first African American to enroll and stayed on for a master’s degree. Upon graduation in 1896, Carver was hired by Booker T. Washington, Tuskegee’s principal, to run the Institute’s agricultural department.

Tuskegee was founded as a “normal” school for “colored” teachers and aimed to teach the students, ex-slaves, in “skills, morals, and religious life”, as well as academic subjects. Washington urged teachers trained at the Institute “to return to the plantation districts and show the people there how to put new energy and new ideas into farming as well as into the intellectual and moral and religious life of the people”. Since virtually all ex-slaves were now still growing cotton “on shares” for their old masters, new ideas in farming were badly needed.

Carver was ideally suited to encouraging new ideas for southern agriculture. Repeated plantings of cotton, which required lots of nitrogen, had seriously depleted plantation soils. At the same time cotton prices, which had been steadily climbing before the Civil War, had declined. With the blockade of southern cotton during the war, production had been drastically increased in India and Egypt to supply European mills. Once the war was over these new sources continued to produce and the price of cotton fell. Add to that the infestations of the boll weevil in the monocropped cotton, beginning in 1892, which reduced production by up to 50 percent.

Carver promoted crop rotations to restore the soil, particularly with nitrogen-producing legumes like peanuts and soybeans. To encourage farmers to try these new crops, he devised over 400 products using the peanut, soybean, and sweet potato. By the time he died in 1943 Carver had met with Presidents Theodore Roosevelt, Calvin Coolidge, and Franklin Roosevelt, was friends with Henry Ford and Henry A. Wallace, had been dubbed in 1941 by Time Magazine as a “black Leonardo”, and was a member of the British Royal Society.

Andrew Jackson Beard

Beard (1849–1921) was born into slavery in Alabama and gained his freedom when he was fifteen. Beard remained on the plantation, becoming a sharecropper. He married Edie Beard (at age 16, by some accounts), with whom he would have three sons, he is recorded as having purchased an 80-acre farm near Center Point, Jefferson County, at some point during this period.

Largely self-educated, he invented, among other things, two kinds of specially designed plows, a flour mill, a type of rotary steam engine, and a device for the automated coupling of railroad cars that has been credited with saving many lives. In 2006, Beard was posthumously inducted into the National Inventors Hall of Fame in Akron, Ohio.

George Washington Carver

Henry Blair

Blair (1804–1860) is the first black man to be identified on a U.S. patent application. The identification of Blair as “a colored man” was an accident, as the U.S. Patent Office usually didn’t identify patent holders by race. Blair was a free man, but was illiterate, therefore he signed his patents with an “x”. At the time that his patents were granted United States patent law allowed both freed and enslaved people to obtain patents. In 1857 this law was challenged by a slave-owner who claimed that he owned “all the fruits of the slave’s labor” including his slave’s inventions. This resulted in the change of the law in 1858 that stated that slaves were not citizens and therefore could not hold patents. After the American Civil War, in 1871, the law was changed to grant all men patent rights.
Blair was awarded a patent in 1834 for a corn planter that had a compartment that held and dropped the seeds to the ground and rakes that followed to cover them with soil. He was awarded a second patent for a cottonseed planter in 1836. This invention worked by splitting the ground with two shovel-like blades that were pulled along by a horse. A wheel-driven cylinder followed behind which dropped the seed into the newly plowed ground. Blair had been a successful farmer for years and developed the inventions as a means of increasing efficiency in farming.

**George Crum**

According to legend, George Crum (1824–1914) was working as a chef in New York in the summer of 1853 when he came up with an all-new way to prepare potatoes. A patron had sent his French-fried potatoes back to the kitchen for being too thick and soft. To teach the patron a lesson Crum sliced a new batch of potatoes as thinly as he could, then fried them until they were hard and crunchy. To top them off he added plenty of salt. To his surprise the dish was a big hit and a new snack was born.

Lloyd Hall (1894-1971), an African American inventor with more than 100 patents, is credited with many of the meat curing products and preservatives used in food processing industries today. Hall's grandmother came to Illinois via the "Underground Railroad" at the age of sixteen. Hall graduated in 1912 from East Side High School in Aurora. After graduating school he studied pharmaceutical chemistry at Northwestern University, earning a B.S. and a Master's degree at the University of Chicago. After leaving university, Hall was hired by the Western Electric Company, after a phone interview. But the company refused to hire Hall after they discovered he was an African American.

Lloyd Hall devoted much of his life and efforts to food science curing meat. Hall also investigated the role of spices in food preservation. It was common knowledge that certain seasonings had antimicrobial properties, but Hall and co-worker Carroll L. Griffith found that some spices carried many bacteria, as well as yeast and mold spores. To counter these problems, in 1938 they patented a means to sterilize spices through exposure to ethylene oxide gas, a fumigant. Hall also invented new uses of antioxidants to prevent food spoilage, especially the onset of rancidity in fats and oils. Aware that unprocessed vegetable oils frequently contained natural antioxidants such as lecithin that slowed their spoilage, he developed methods of combining these compounds with salts and other materials so that they could be readily introduced to other foods.

**John Parker**

John Parker (1827–1900) owned three of the seventy-seven patents issued to African Americans by 1886. He was born in Norfolk, Virginia in 1827, the son of a slave mother and white father. Thus legally born into slavery, at the age of eight John was forced to walk to Richmond, where he was sold at the slave market to a doctor from Mobile, Alabama. While working at the doctor's house as a domestic servant, John was taught to read and write by the doctor's family, although the law forbade slaves' being educated. He asked one of the doctor's patients, a widow, to purchase him. After taking title to him, she allowed him to hire out to earn money and he purchased his freedom from her for $1,800 in 1845.

He is best known for patenting a portable tobacco screw press, used for cutting tobacco, and a harrow or pulverizer. Parker was also a "conductor" on the Underground Railroad. From his home in Ripley, Ohio, Parker helped more than one thousand slaves receive their freedom, despite a $1,000 bounty placed on him by slaveholders.
Norbert Rillieux

Norbert Rillieux (1806–1894), a Creole inventor from New Orleans, was the natural son of the owner of a large sugar plantation and Constance Vivant, a half-black “free woman of color”. As a boy the precocious Rillieux showed an interest in engineering, and his father sent him to France for his education. By the age of 24 Rillieux was an instructor in applied mechanics at the Ecole Centrale in Paris. Around 1830, Rillieux published a series of papers on steam engines and steam power. Widely considered to be one of the earliest chemical engineers, he revolutionized sugar processing with the invention of the multiple effect evaporator under vacuum. Rillieux’s great scientific achievement was his recognition that at reduced pressure the repeated use of latent heat would result in the production of better quality sugar at lower cost.

The success of his evaporator apparently made Rillieux, according to a contemporary, “the most sought after engineer in Louisiana,” and he acquired a large fortune. But as the Civil War approached, the status of free African Americans deteriorated with the imposition of new restrictions on their ability to move about the streets of New Orleans and other draconian laws. While his invention no doubt enriched sugar planters, Rillieux was still, under the law, “a person of color” who might visit sugar plantations to install his evaporator but who could not sleep in the plantation house.

Booker T. Whatley

Booker T. Whatley, an Alabama horticulturist, author, and Tuskegee University professor, examined efficient farming practices that allow the small farmer to make a decent living. His book, “How To Make $100,000 Farming 25 Acres” (1987), explored his ‘ten commandments of farming’ that assist the farmer in minimizing unnecessary costs, limiting wastes, and maximizing income and farm space with smart crop selection. He also continued the use of soil regeneration techniques supported by George Washington Carver, a faculty member of the previous generation. His work continues to be a guide for small farmers towards success and sustainability.

One of Whatley’s commandments was the importance of what he called a Clientele Membership Club. Members of this club pay an initial membership fee to the farm. In return, they receive the right to pick fresh produce. This ensures a constant cash flow into the farm, while saving on time and labor. Dr. Whatley identified this as an essential aspect of a successful farm in the 1960’s and 70’s. Today, this marketing approach has evolved significantly but is commonly referred to as community supported agriculture (CSA) and has become quite popular.

Urban Agriculture and Social Interaction

Although the Great Migration and other immigration flows in the US were largely away from rural life and farming toward cities, African Americans, like so many other migrants, did not easily give up their attachment to gardening and raising traditional foods. Whether in backyard plots or more organized community efforts, agriculture and food production continued in the city.

In areas of mixed ethnicities these projects can provide an opportunity to bring individuals together. Stronger communal bonds promote healthier, successful gardens, and strengthen neighborhoods overall. Such projects can be utilized to bridge the divide between racially disparate communities. Numerous attempts, for instance, have been made to ease tensions between African Americans and whites. The rift between the two groups is believed in part to stem from a lack of positive contact. Community gardening projects offer a distinct situation for racial integration, as individuals enter freely into this activity, making the environment more genuine. These gardens offer leisure spaces where individuals of diverse races socialize through their own volition.

Additionally, urban farming projects have the added advantage of beautifying urban communities and curtailing crime, all of which has positive effects on a neighborhood’s real-estate value. Research shows that in “New York City gardens had a statistically significant positive impact on residential property within 1000 feet of the garden, an impact that increased over time. More importantly, this impact was highest in the lowest income neighborhoods”.

A study in low-income neighborhoods in Flint, Michigan revealed that the confinement of gardening projects, clubs or neighborhood associations—that facilitate the gardens by developing fundraisers, block parties, etc.—created opportunities for neighborhoods to have greater interaction with each other, since some members actively garden, while others act as administrators. This division secures communal solidarity that keeps the gardens productive, thus greatly benefiting the community as a whole.

Urban Land Rights and Gentrification

Urban agriculture projects are often executed on privately owned land considered of little value in low income, underutilized districts. Communal gardening is employed in poor communities as a system to augment food shortages, and to embellish neglected and depressed areas. Paradoxically once they flourish, the beauty and transformative equality of garden neighborhoods engenders interest by developers, looking to build market properties during periods of urban renewal and gentrification. Despite the sweat equity and guardianship that communities are willing to invest in their gardens, the longevity of these projects often depends on the largesse of local governments or private investors.

In the 1990s New York City’s Giuliani administration took on several gardening communities in a battle over land rights that changed the nature of privatized spaces in the city’s public arena. When the 1970s economic crisis left low income front-line areas devastated and abandoned, community members started grassroots campaigns to convert city-owned vacant lots into viable green spaces, providing a food source to impoverished people. Further, they reduced drug activity and other crimes, and colorful flowers and vegetable gardens became an antidote to urban blight. During the economic boom of the 1990s, Mayor Giuliani made plans to auction off 114 community gardens, and use the land to address a housing shortage. The garden communities contested his decision, citing that their gardens sustained destitute communities during the ensuing economic downturn. Further, they engendered urban revitalization. Giuliani remained recalcitrant, invoking his right to what was legally municipal property. So garden communities throughout the city coalesced and filed a class action lawsuit and advocates from various boroughs formed a coalition, transforming community gardens into “unity gardens.” In the end, many of the gardens were purchased and preserved by private land trusts.

Land rights issues illustrate that during periods of fiscal crisis, marginalized communities turn to gardening projects on borrowed land and become constituents in beautifying the urban landscape. But until these spaces are seen as essential permanent components of urban communities, land rights challenges will continue to threaten their life span.

In 2006, Los Angeles’ South Central Farm (SCF) was destroyed. This 14-acre urban farm was cultivated and maintained by a Latinx community for twelve years on vacant but privately owned land, producing vegetables, fruits, and medicinal plants in one of the most impoverished areas in the county. The SCF became the lifefood of the community and when a heated legal battle between one of the original owners and the local government threatened its existence, the community rallied in an attempt to hold on to what was, de facto, theirs. But a community of poor, many illegal, Latinx immigrants were ill suited to use litigation to further their efforts. In the end the farm was bulldozed for a Walmart distribution warehouse, which was never built.

Conclusion

Urban agriculture creates opportunities for integration between different racial groups in neutral spaces where physical closeness allows these groups to find common ground based on their similar desires to improve their neighborhoods. But successful projects rely on communal dedication and require local governments to commit to their safekeeping.
Community Based Bioremediation: Grassroots responses to urban soil contamination

by Scott Kellogg

The past 150 years of industrial processes have left a legacy of toxicity in the soils of today’s urban environments. Exposure to soil based pollutants dispropor- tionately affects low-income communities which are frequently located within formerly industrialized zones. Both gardeners, who come into direct contact with soil, as well as those who eat the products grown in the soil are at risk to exposure from industrial contaminants. Options for low-income communities for remediating contaminated soils are limited, with most remediation work being carried out by costly engineering firms. Even more problematic is the overall lack of awareness and available information regarding safety and best practices with soils.

In response to these challenges, a grassroots movement has emerged that seeks to empower urban residents with the tools and information necessary to address residual industrial toxicity in their ecosystems. Focusing on methods that are simple and affordable, this movement wishes to remove the barriers of cost and technical expertise that may be otherwise prohibitive. This paper will give an overview of case studies of organizations that have been successful in imple- menting these strategies.

1. Soils and Cities

Soil is a living network. It is teeming with billions of microorganisms engaged in diverse ecological relationships with each other, much like humans in a city. Healthy soil is the foundation of nutritious food production, and arguably therefore of civilization itself. The relative sustainability of societies throughout his- tory can often be attributed to how they treated their soils. Cultures with practices that regenerated the health of their soils persisted, while those cultures that de- pleted their soils either collapsed or were forced to move elsewhere.

Despite the fact that cities have been historically built in regions with high soil fertility to support their populations, the health of soils in today’s cities is rarely considered by residents or planners. Soils rich in organic matter have been cleared in order to expose the firm mineral soils below, deemed more suitable for development. Even more problematic is the overall lack of awareness of the potential risks involved, as well as better defined best practices with soils.

Cities historically have served as centers of industry: manufacturing, smelting, and refining businesses have been commonly located in urban areas. As a conse- quence of this, many pollutants produced as by-products of these industries over the past two centuries have concentrated in the air, soils, and waters of urban ecosystems. Exposure to these toxins presents serious health risks to both humans and non-humans living in the city environment. As some of these pollutants may persist for centuries, their impact will extend long into the future.

As an issue, urban soil contamination has gained a particular amount of attention recently as interest in urban agriculture and community gardening has increased. Community gardens are defined as being areas of land utilized for food produc- tion by (typically) urban-dwelled with limited access to land. There are currently an estimated 18,000 community gardens in the US and Canada alone. Such ef- forts may have the potential to provide city residents with a significant amount of their nutritional needs, and improve the overall quality of urban life for many.

Because gardeners are coming into direct contact with potentially contaminated soils, inhaling their dusts, and growing food in them, they are at a high risk of harmful exposure. Low-income urban populations are at particular risk, as pollut- ing industries are more likely to be situated within low-income neighborhoods. Additionally, negligent landowners are less likely to have carried out lead paint remediation in poorer neighborhoods, which may continue to impact the soils and the health of communities to this day.

There is a tremendous amount of uncertainty in regards to the health concerns asso- ciated with urban gardening. Complicated interactions between contaminants, soils, plants, and people create difficulties in making general statements regarding the safety of urban gardening. Frameworks for doingproper risk analysis that take all these complexities into account have not been developed to date.

Despite these uncertainties, there are many benefits to urban agriculture and com- munity gardening and the practice as a whole should be encouraged. Along with the development of urban agriculture, however, there needs to be a heightened awareness of the potential risks involved, as well as better defined best practices for urban gardeners to use to protect themselves from soil contaminants, and for addressing their long-term remediation.

In recognition of this issue, US EPA has drafted a number of documents that sug- gest best management practices for urban agriculture. These contain suggestions...
these management practices suggested by governmental agencies are likely effective at protecting gardeners from direct exposure to contaminated soils. They are, however, palliative: making no suggestions as to how to permanently address the toxic soils. Covering contaminated soils with groundcovers, while practical as a short-term solution, are in effect “sweeping the problem under the rug”: numerous toxins will persist in the environment and can once again become a risk if they are disturbed and unearthed.

In order to address soil contamination in a meaningfully sustainable way, techniques need to be employed that are capable of degrading contaminants into their harmless components, or permanently sequestering them so that they will pose no risk to future gardeners. In keeping with an ethic that values soils as both precious and vulnerable, such long-term strategies are required. Bioremediation may be one possible method of achieving these goals.

Bioremediation

In instances where relatively low levels of contamination are present, it may be possible to degrade toxins or to render them immobile using a technique called bioremediation. Bioremediation is the process of using the biological properties of living organisms to clean up toxic substances from the environment, to degrade, immobilize, or sequester environmental toxins. One significant advantage of bioremediation is that it is considerably less expensive than conventional treatments, and can be performed “in-situ” with minimal disruptive techniques. Perhaps the greatest benefit of bioremediation, however, is that it is a sustainable method of soil remediation. By cleaning soils in situ, it makes it possible for future generations to make use of them again.

While bioremediation shows great promise, significant barriers still lie in the way of its wide scale implementation by non-specialist community members. High-end ranking among these are the cost of doing soil analysis in laboratories, and an overall low level of scientific literacy among the public. For these reasons, bioremediation has remained a technique used nearly exclusively by professional engineers.

In response, a grassroots movement has emerged that desires to empower urban residents with the tools and information necessary to address residual industrial toxicity in their ecosystems. Focusing on methods that are simple and affordable, this approach seeks to remove the barriers of cost and technical expertise that may be otherwise prohibitive. This movement envision’s community-based bio-remediation as a form of citizen science, where the tools for data collection, soil analysis, and degradation of toxins is put into the hands of community members most affected by toxicity. In this regard, citizen bioremediation acts as a form of generative justice, putting the technical and scientific means of addressing soil toxicity into the hands of historically marginalized populations who have suffered a disproportionate burden of toxic exposure. Generative justice is furthered through citizen bioremediation by constructing mutually symbiotic relationships between humans and non-humans: by providing microbes, fungi, plants, and worms with ideal environmental conditions and a food source, humans are in return given detoxified and nutritionally enhanced soils. This human/microbe symbiosis works to promote healthier urban ecosystems overall.

Critics of the idea might question why one would go to the trouble of developing this bottom-up bioremediation approach when large-scale industrial remediation techniques are already available? The importance of citizen-based approaches is better understood when seen through the lens of human and non-human value circuits. Industrial remediation techniques are efficient at removing contaminants from the environment at a significant cost. However, the enormous costs, physical disruption, and social disturbances created by them. In contrast, citizen bioremediation is characterized by methods that enhance a community’s ability to generate and circulate value. By becoming familiar with basic composting and urban gardening practices and tools, everyone can participate in the circular means of soil remediation. Furthermore, the microbial cultures used in the process can be maintained and shared, similarly to how a traditional sourdough starter is passed on between families. In this sense, the value of these microbial cultures and bio-remediation knowledge can be continually circulated within a community. This generative justice approach is markedly different from the conventional approach of hiring experts to fix problems at great expense and leaving them with no lasting tools for continued empowerment.

A community-based approach to bioremediation is in many ways contrary to the goals and assumptions that are fundamental to the discipline of environmental engineering. For example, the assumption that uncertainty is desirable, that the cost of uncertainty is discounting and expert knowledge is superior. These variables are reduced. A generative justice approach would necessarily be complex in nature, involving high levels of uncertainty and low levels of control. In this regard, it could be thought of as a post-normal approach to bioremediation, an approach that neither relies on certainty and expert knowledge. Professional engineering services are prohibitively expensive to the majority of urban residents, and contamination is widespread. There is therefore an imperative to develop solutions for the relatively low-cost, non-proprietary methods for monitoring and remediation. In situations such as contaminated urban environments, where risk and need is high, the question is how to best move ahead despite high levels of uncertainty.

The intention of this article is only to be an exploration of the idea of bioremediation as a tool usable to promote generative justice, not an in-depth technical review of bioremediation practices themselves. As there are inherent risks involved in any bioremediation processes that persist when carrying out bioremediation processes, anyone with serious interest in undertaking them would need to carry out significant additional research. With this stated, however, concerns over risk should not be used to shut down discussion and careful experimentation with bioremediation technologies.

Take phytoremediation, for instance. It’s a technology using plants that accumulate high levels of certain elements or compounds. Once accumulated the toxic materials are removed along with the plant from the site and disposed of in a way suitable to the toxins involved. It is a complicated, highly significant process, and has yielded varying results. At no point would I make the claim that it is a fool-proof method capable of remediating lead-contaminated soil in every instance. With this said, however, the technology has been useful in many cases. A google scholar search for “phytoremediation” will reveal numerous recent studies demonstrating the effectiveness of the method. Clearly it has enough potential that research funding is still being put towards it. So while it is not a panacea, I believe it’s worth mentioning phytoremediation action so that it might be considered as one among other potential tools for bioremediation.

To exclude phytoremediation from the conversation simply because there is not a clear scientific consensus about its effectiveness and that it might result in people being harmed is simply to miss the point, to suggest that people have not been taught to fish because they might possibly fall in the water and drown.

The citizen bioremediation movement is focusing on two primary aspects: soil testing and contaminant degradation/immobilization.

Testing

The cost of soil testing make it prohibitively expensive for the majority of people. Standard soil tests offered by cooperative extensions typically test only for soil macronutrients (NPK), lead (Pb) and occasionally other metals. Testing beyond these basic parameters is prohibitively expensive, as each contaminant, both organic and heavy metal, must be tested for individually. Such comprehensive soil testing can be carried out by engineering firms as phase II environmental assessments, typically at a fee of several thousand dollars. US EPA recommends doing extensive background research on any potential site in order to narrow the range of possible contaminants.

The high cost of soil analysis not only makes it difficult to get a precise reading on the existing extent of soil contamination on a site, but also as to whether or not a particular remediation strategy is effective in reducing contaminant levels. Below is a description of some low-cost techniques that may be useful in providing some raw data in regards to contaminant levels in soils.

Bioassays are a technique used by organizations in locations where laboratory facilities are unavailable, or too expensive. Using this technique it’s possible to gauge soil contamination levels based on plant germination rates or earthworm mortality. While incapable of giving precise measurements of soil toxicity, the technique is simple and affordable enough to give rough approximations to the concentrations of toxins within a particular soil sample that would be toxic to the organism in question.

Public Labs, a non-profit organization dedicated to the promotion of citizen-based environmental monitoring and analysis, has developed a prototype for a “DIY spectrometer”. The S40 device enables users to take crude measurements of contaminants in soils and water, obtaining a spectrographic signature of contaminants that can be compared to those taken by others and shared online. By cleverly using open source design, this spectrometer can be further modified, elaborated, and put back into circulation by its users. X-ray fluorescence, or XRF, is a technology that allows for nearly instantaneous on site readings of a wide range of soil contaminants. While the tool itself is quite expensive (in the range of $10,000), there may be the possibility of it becoming more affordable over time, or of it being “hacked” in a fashion similar to public lab’s DIY spectrometer. It may also be possible for a community to collectively purchase an XRF and have it be available for public use, or to arrange with an institution possessing one to use it in specific situations.

4. Bioremediation for Contaminant Degradation/Immobilization

The term “low-intensity” is often used in discussion of the technologies which best fit community-based organizations. Here we can see how generative models are suited for soils. As discussed, we emphasized that personal safety take priority over any cleanup endeavor - there is a fine line between citizen empowerment and endangerment. As insufficient information is given in this article as to how to carry out bioremediation processes, anyone with serious interest in undertaking them would need to carry out
Intensity methods rely upon the metabolic processes of naturally occurring biological organisms in order to remediate contaminated soils. Acceptable uses of microorganisms include using air pumps for culturing of naturally occurring bacteria or microorganisms in compost tea, the use of machines for turning or aerating compost piles. Due to its limited accessibility, low intensity bioremediation methods have limited applicability in treating contaminated groundwater.

Adherence to the above criteria will ensure practices that are both fit for purpose, cost-effective, environmentally friendly, and socially and politically acceptable. Bioremediation methods that meet the listed criteria are more likely to be successfully used by community-based organizations. Methods that are simple and affordable will have a broader scale applicability and replicability.

In many cases, the naturally occurring organisms used can be collected from wild sources or can be purchased at relatively low costs from nurseries, mushroom spawn, or worm suppliers without any specialized training. Of course, some methods are desirable in that they are less likely to expose people to potential contaminants in soils or other sites as only the top 12 inches of soil are those which the majority of people will come into contact with, either through passive recreation or through gardening activities. In keeping with the sustainability goals of low intensity, low-tech remediation, it is important that the use of renewable energy sources be encouraged. In community-based bioremediation, the use of natural techniques are particularly favored in favor of “wild cultivation” methods because non-sterile methods are more broadly applicable. The vast majority of the world’s population will never have access to sterile conditions, therefore for any method to have wide ranging impact it needs to be implemented without being reliant on sophisticated infrastructure. For instance, in a handful of wind farm there are likely billions of microorganisms representing an incredible diversity of species (many of which cannot even be lab cultured or identified). The assumption is that out of these soils are put to use by some means to degrade certain toxins are likely present. What may also be of interest is that a number of naturally occurring fungal species are tolerant fungal species that can be grown in the farm. A future goal is to create a graphic novel that would explain the concepts of mycoremediation with simple didactic images.

A short list of community-based bioremediation techniques include:

- **Microbial remediation**: use of naturally occurring microorganisms that are capable of degrading pollutants and the immobilization of heavy metals. All of the above techniques employ microorganisms, bacteria, yeasts, or fungi. Non-organic pollutants such as hydrocarbons. As an estimated 20% of soil microbiota possess the ability to degrade hydrocarbons, microbial remediation primarily involves introducing soil bacteria if they are not already present, and providing them with moisture, oxygen, and a carbon source. Such techniques may be usable by an urban gardener to facilitate the cleanup of oil spills in soil resulting from automobile oil spills.

- **Phytoremediation**: a term used to define a wide range of techniques involving the use of plants for environmental remediation. These can range from phytoextraction (uplifting metals from soil using “hyper-accumulating” plants) to phytodestruction (the use of plants with demonstrated biological properties to degrade metals). The natural biological effect of this diversity is that otherwise untreatable contaminants can be degraded through tools of natural-born detoxification. If a number of Microorganisms are given the appropriate conditions, they will colonize and decontaminate the area, a long-term remediation strategy, and is not used in all instances because mostly residents want to begin gardening immediately. In its past, Worcester Roots has recommended that people arm themselves with high lead levels, simply be excavated and disposed of, believing that remediation efforts would be unnecessary.

The Worcester Roots Project is an excellent example of a community based organization making use of low-intensity bioremediation techniques for the purpose of cleaning up contaminated soils in their city. The program has developed techniques using kenaf, a locally grown plant, as an oil absorbent. Dehydrated and pressed into flat sheets, the kenaf mats are then transported elsewhere for microbial degradation. By training local residents in the techniques for running kenaf nurseries, CE-RASE has devised a means for people to earn income while simultaneously empowering them with the knowledge for cleaning up contamination affecting their communities and lands. Such methods employing human, plant, and microbial agency are prime examples of generative justice.

- **Mycoremediation**: Mycoremediation involves the use of fungi and fungi to facilitate the decontamination of organic pollutants in soil. Fungi produce powerful enzymes that have been demonstrated to be capable of degrading some of the most persistent organic pollutants, including PAHs. Mycoremediation can take the form of actively growing litter decomposing fungi through soil, or by spreading mushroom substrate over a contaminated area.

5. Examples of applications

Below are a few case studies of grassroots organizations that have initiated community based bioremediation programs.

5.1 The Worcester Roots Project

The Worcester Roots Project is a youth-led organization based in Worcester, Massachusetts, and was founded in 2001. Through their Toxic Soil Busters program, Worcester Roots focuses on community lead safety education and remediation programs. In conjunction with the City of Worcester’s lead abatement program, the group receives contracts from the city to conduct site investigations and remediation at residential properties. Regular tasks carried out by the group include carrying out extensive soil testing, with lead being the primary contaminant of concern. Upon receiving results tests, the group develops a plan of action based upon the revealed lead levels.

For sites with elevated lead levels where residents are wishing to garden, the group will assist in the construction of raised garden beds, lined with landscape fabric. The fabric prevents plant roots from being able to access contaminated soil beneath, but leaves all possible access to through the garden bed. Ground covers, consisting of materials such as woodchips or gravel, are put down in between garden beds so as to prevent people from coming into contact with contaminated soils. In some instances where high levels of lead were found in the soil, Worcester Roots has employed phytoremediation technology in order to reduce levels to safe ranges. This was the case when they used phytoremediation include geraniums, irish moss, and corn. The group made the deliberate choice not to use chemical agents in order to facilitate phytoremediation, fearing that their use would mobilize toxic metals and result in them leaching into groundwater. Phytoremediation, the group admits, is a long-term remediation strategy, and is not used in all instances because mostly residents want to begin gardening immediately. In its past, Worcester Roots has recommended that some areas with extreme high lead levels, simply be excavated and disposed of, believing that remediation efforts would be unnecessary.

The Worcester Roots Project is an excellent example of a community based organization making use of low-intensity bioremediation techniques for the purpose of cleaning up contaminated soils in their city. The program has developed techniques using kenaf, a locally grown plant, as an oil absorbent. Dehydrated and pressed into flat sheets, the kenaf mats are then transported elsewhere for microbial degradation. By training local residents in the techniques for running kenaf nurseries, CE-RASE has devised a means for people to earn income while simultaneously empowering them with the knowledge for cleaning up contamination affecting their communities and lands. Such methods employing human, plant, and microbial agency are prime examples of generative justice.

6. Conclusion

The generative justice approach to citizen bioremediation greatly increases the capacity of a local community to address the persistent pollutants found in its soils in a manner that lessens their dependence on expensive industrial technologies and equipment. Through greater sharing of techniques and information, citizen bioremediation could play a significant role in promoting the agendas of both the environment and social justice movements. Through forming mutually beneficial partnerships between humans, plants, fungi, and microbes in the process of bioremediation, we can create opportunities for socio-ecological health to be re-established. It is my intention that this article can in provoking a broader conversation about the challenges, strategies, and opportunities for achieving this.
Urban Agroecology:
Principles and Potential
by Miguel A Altiere, Clara I. Nicholls, Paul Rogé and Joshua Arnold
reprinted from Urban Agriculture, November, 2011

In light of climate change, failings in industrial agriculture, energy crises and demographic pressure, and as multinational corporations increase their control of the food system, a significant rise in food prices, if not food shortages can be expected. This situation is compounded by the fact that by 2030, 60% of the world’s population will live in cities, including 56% of the world’s poor and 20% of the undernourished. Today, a city with 10 million people or more, over 6,000 tonnes of food has to be imported every day, traveling an average of 1,000 miles. Given these scenarios, urban agriculture (UA) is becoming a major sustainable alternative for food security on an urbanised planet. Urban production of fresh fruits, vegetables, and some animal products, near consumers, improves local food security, especially in underserved communities. By improving access to fresh, nutritious food, UA can help in combating childhood obesity, diabetes, and poor nutrition that are prevalent in many urban communities.

In response to food insecurity, UA has spread rapidly. From 1990-2005 UA increased in developing countries by 3.6% annually. In the United States, UA has expanded by >30% in the past 30 years. One reason for this is the fact that UA can be very productive, providing an estimated 15–20% of global food. However, an important question remains, what level of food self-sufficiency can cities obtain through UA? A survey with the goal of providing 300g/day per capita of fresh vegetables, found that 51 countries have insufficient urban area to meet the recommended nutritional target. In addition, UA would require 30% of the total urban area to meet the global demand for vegetables. More optimistic estimates have calculated that, for example, Cleveland, Ohio, with its population of 400,000, has the potential to meet 100% of urban dwellers’ fresh vegetable needs, 50% of poultry and eggs, and 100% of consumed honey. These estimates suggest that self-sufficiency could be achieved, depending on how UA is designed and managed (i.e. crop arrangements, production practices used, size of plots). Urban farmers do not always optimise crop planting density or diversity, thus modifications of cultural practices to enhance yields are necessary. Agroecology can help realise the productive potential of UA by providing key principles for the design of diversified, productive, and resilient urban farms.

Agroecological principles

Agroecology uses well-established ecological principles for the design and management of diversified urban farms where external inputs are replaced by natural processes such as increasing soil fertility and enhancing biological pest control. Agroecological principles (Table 1) are applied by way of various practices. These lead to optimal recycling of nutrients and organic matter turnover, closed energy flows, water and soil conservation and balanced populations of pests to their natural enemies, all key processes in maintaining UA productivity.

The integrity of an urban farm relies on synergies between plant diversity and a soil rich in organic matter and soil biota. Soils with high organic matter and active soil biological activity exhibit good soil fertility and beneficial organisms that prevent pathogens and insects. Integration of soil, water, and pest management practices constitute a robust pathway for optimising soil quality, plant health, and crop production.

Table 1: Agroecological principles for the design of biodiverse and productive urban farms

<table>
<thead>
<tr>
<th>Principle (LER)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enhance the recycling of biomass, optimising organic matter decomposition and nutrient cycling</td>
<td>LER &gt; 1.3 in combinations of lettuce and mizuna, tomatoes and beans, broccoli and fava beans, and kale and arugula.</td>
</tr>
<tr>
<td>2. Enhance functional biodiversity – natural enemies, antagonists, soil biota, etc., by creating appropriate habitats.</td>
<td>No significant differences were found in lettuce yield across treatments with different plantings.</td>
</tr>
<tr>
<td>3. Provide the most suitable soil conditions for plant growth, by managing organic matter and by enhancing soil biological activity</td>
<td>No significant differences were found in lettuce yield across treatments with different plantings.</td>
</tr>
<tr>
<td>4. Minimise losses of energy, water, nutrients and genetic resources via conservation of soil and water resources and agro-biodiversity</td>
<td>No significant differences were found in lettuce yield across treatments with different plantings.</td>
</tr>
<tr>
<td>5. Diversity species and genetic resources at the field and landscape level</td>
<td>No significant differences were found in lettuce yield across treatments with different plantings.</td>
</tr>
<tr>
<td>6. Enhance beneficial biological interactions among agro-biodiversity components promoting key ecological processes</td>
<td>No significant differences were found in lettuce yield across treatments with different plantings.</td>
</tr>
</tbody>
</table>

Crop rotations

Crop rotation is the practice of growing a sequence of different groups of crop species (legumes, root crops, fruit crops, and leaf crops) in the same area for many seasons. By dividing the garden in 4 plots (each planted to each group of crops), every successive year each group moves to the next plot clockwise. Basic rules include alternating between legumes and non-legumes, never planting crops of the same family consecutively, and alternating crops of deep and shallow roots. Legumes increase available nitrogen in the soil, even after they are harvested, for future crops. Including legumes in crop rotations reduces the need for external nitrogen inputs. Rotating plant families reduces soil-borne diseases like verticillium wilt and soil-dwelling insects.

Agroecological soil management

Agroecology promotes a series of soil-health-improving management practices such as complex crop rotations, intercropping, minimum tillage, cover cropping and use of a variety of organic amendments. These management practices, increase inputs of SOM, decrease losses of carbon, maintain soil coverage, decrease soil disturbance and encourage beneficial organisms. Improved soil properties resulting from such practices have added benefits such as more available water, less compaction, enhanced nutrient availability, and the production of growth-promoting substances, which promote growth of healthy and productive plants.

Most crops grown on compost-amended soils have positive yield response. In our studies, we have found that average yield (weight/plant) of tomatoes amended with one application of 12 t/ha (4.8 tonnes/acre) compost was 25% and 38% greater than plots amended with 6 t/ha (2.5 tonnes/acre) and un-amended controls. Moreover, organic soils exhibit high populations of antagonists that suppress many soil-borne diseases.

A main challenge for urban farmers is to access animal manure as a source of Nitrogen. We have found that average yield (weight/plant) of tomatoes amended with one application of 12 t/ha (4.8 tonnes/acre) compost was 25% and 38% greater than plots amended with 6 t/ha (2.5 tonnes/acre) and un-amended controls. Moreover, organic soils exhibit high populations of antagonists that suppress many soil-borne diseases.

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from polycultures at significantly higher rates than from monocultures. Moreover, generalist natural enemies tend to be more abundant because they can utilise a greater variety of hosts available in diverse garden systems, and their action usually results in lower herbivore population densities.

Mixed crop systems can also decrease pathogen incidence by slowing down the rate of disease development and by modifying environmental conditions so that they are less favourable to the spread of certain pathogens. Moreover, many intercrops are often superior to monocrops in weed suppression, as intercrop combinations can exploit more resources than sole crops. This suppresses the growth of weeds more effectively through greater pre-emptive use of resources.

Water conservation and use efficiency

Farmers need water to irrigate their crops and provide drinking water to their animals or fish. In the event of water shortages or decreasing quality of the available water sources, urban producers can access sources such as wastewater, greywater, or harvested rainwater, and apply such water via irrigation more efficiently than can rural producers. In areas of water scarcity, productivity should be measured per unit of water (weight or volume), with the goal of irrigation systems reaching efficiency values > 60%.

In rainfed regions improvements of rainwater capture, selection of drought tolerant varieties, alternative tillage systems, and mulching are critical to secure good harvests. Addition of organic amendments to the soil is vital as many studies show that SOM enhances water retention. Depending on the soil type, it is estimated that for every 1% increase in SOM, the soil stores 1.51 of water per square meter. Organically rich soils usually contain arbuscular mycorrhizal (VAM) fungi, which are of particular significance under water stress conditions so that they are less favourable to the development and by modifying environmental conditions.

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**Conclusions**

Examples from productive urban farms around the world suggest that self-sufficiency in terms of vegetables could potentially be achieved at the level of a community or city. Well-designed urban farms can be up to 15 times more productive than rural holdings. In Cuba, an area of just one square meter can provide 20kg of food a year (200 tomatoes (30kg) per year, 36 heads of lettuce every 60 days, 10 cabbages every 90 days and 100 onions every 120 days). But this requires the application of agroecological principles to guide the intensive cultivation of a diversity of vegetables, roots and tubers, and herbs in relatively small spaces.

It also requires that citizens have access to sources of green biomass and/or manure as nutrient sources. Some cities provide weekly residential collection for plant debris and food scraps. In 2010, the city of Berkeley, California, collected 4,614 tonnes of residential food and green waste and 6,500 tonnes of food scraps from commercial customers. This material is processed by a private composting company, which at the end of each month from February to October makes freely available 80-120 cubic yards of compost to residents.

Agroecological designs feature well-planned crop diversity, complemented by organic soil management. Together these comprise an effective agroecological strategy to improve nutrient cycling and soil fertility. They also limit nutrient and water losses, reduce impacts of pests, diseases and weeds and enhance overall productivity and resilience of the cropping system. But diversifying urban farms per se does not necessarily mean that they are being managed agroecologically, unless the collection of crops chosen interact biologically. Many urban farms are diversified in response to food security or market demands. Such farms do not reach full potential as the crops do not interact with each other synergistically, necessitating external conventional or organic inputs of fertilisers or pesticides. The key is for researchers and practitioners to find the right combinations of crops that complement each other to achieve overyielding.
Farming for Racial Justice

by Jack Kittredge

Watered by the adjacent Taunton River, the 17.4 square miles of flat bottomland making up the Massachusetts town of Berkley between Boston and Providence was considered excellent agricultural soil by the original Wampanoag, Narragansett and Massachusetts inhabitants. Artifacts going back 8000 years have been unearthed at local sites, indicating how they lived in inland longhouses and planted in these fields for much of the year, venturing to exposed coastal areas in the summer to harvest seafood. Dighton Rock, a 40-ton boulder now displayed in a Berkley state park, was once submerged in the Taunton River but visible at low tide. It is covered with ‘petroglyph’ markings many believe were created by these ancient Native Americans over years of habitation.

Although the town’s population is now overwhelmingly suburban and white (96%) some agriculture still exists on undeveloped parcels. On one leased 16 acre site, fringed by million dollar homes set off by a high fence, 3 acres are in vegetables, chickens, ducks, emus, quail and goats. Those products are marketed on-site and at 6 CSA drop-off sites in Boston and Providence, 35 and 25 minutes away respectively. The farmer behind this endeavor is Kohei Ishihara, a Japanese-American committed to providing food that nourishes people, particularly Asians and other non-white people who are themselves involved in racial or economic justice work.

“I grew up in Maryland in a predominantly white neighborhood in Rockville,” he relates. “I felt generally white. But being biracial, I felt some prejudice. The other thing that really got me thinking about social change was coming out as a gay man as a teenager. I saw that experience growing up. Being able to feel, as a biracial, a part of the community but later when I was struggling with issues of sexuality to give me a framework for understanding other folks who are facing different kinds of oppression, whether it is anti-black racism or something else.

“I went off to college,” he continues, “with this commitment to dedicate my life to making change. So at Brown I majored in ethnic studies, or studying ethnicity from a multidisciplinary perspective. At the time in Providence there were a lot of gang killings of young Cambodians. Over 50% of the young men drop out of high school. On top of that, after 2011 there was a diplomatic agreement made between Cambodia and the US providing that all these Cambodians that came here as refugees could face deportation. So there was a lot of fear in the community. That was the impetus to start the Providence Youth Student Movement. We started it as a youth activist group and the first campaign was against deportation.”

Kohei feels that farming has an important role to play in community organizing.

“In Providence,” he recalls, “we would often say ‘food brings people together’. But often our community would be coming together around Dunkin Donuts! Or around food gotten from Stop and Shop! So if food does bring people together, what does it mean if that food is grown ecologically, is restorative, and is raised with the people eating it? In that context food has an even more powerful dimension.”

Growing up, Ishihara did not connect to local or fresh food. It was only later, following his love of plants and ethnic foods, that he got into farming. Before starting his ‘Movement Ground’ farm he worked for three years on farms in Raynham, Massachusetts, where he learned the practices he uses.

The vision of the farm, Kohei says, is to connect people and empower them through a connection to land.

“For 15 years,” he explains, “I was doing community organizing in Providence. I kind of turned to farming because I felt really grounded by it. You are in sync with the weather cycles, you can work outside; that you can feed people really restored and empowered me. When I was trying to contemplate whether I wanted to get into farming it didn’t make complete sense to me because I wanted to stay connected to the work that I used to do. Which was around equity and process. I started to think: ‘Well, if I can stay connected with people who are on the ground doing social justice work?’

“I thought,” he continues, “that maybe I should make a profit and split some of the profit with them. But once I did the budget I saw that was not going to work! Then I thought: ‘Well, what resources do you have as a farmer?’ If you worked as a farmer you know there is so much excess produce. So that is a huge resource. But also what is a big resource to people in cities who are poor is just access to land - having a place to go to on land. So land and food are what I can offer people. Then it started to make sense to me that maybe I could run a farm operation that serves the same purpose to other people as it does to me. I can help people build community, have a deeper connection to their food, and a lot of members could have a chance to work and be on land. So the idea was helping to build community among social justice communities in Rhode Island and Massachusetts by uniting them through their food.”

Most of Kohei’s members had never belonged to a CSA before. They are often people who have been involved in racial or social justice work and not really focused on food or nutrition. The CSA delivers to sites in Providence and Boston that are connected to the social justice-minded organizations in those cities. In Dorchester it is coordinated through the Asian American Resource Workshop, for example, which shares a building with the Vietnamese Aid Center -- an organization in Fields Corner of young Asian professionals who are interested in supporting community organizing and social justice issues within the Asian American community. In Providence his site with the most members is at the Providence Youth Student Movement, which does Cambodian, Laotian and Hmong youth organizing.

“A lot of my CSA members,” he beams, “are members of those groups. I grow a lot of Asian food for them. I have chickens, ducks, emus, quails, and goats. Ducks are really central to Asian cuisine, and you don’t see many of them at farmers markets. Nobody will slaughter them, because their feathers are hard to pluck. So we do it here. We got the mobile processing unit and some detergent for the hot water to cut the oils. It made a big difference.

“Ducks are not as popular as chicken,” he continues, “and people are afraid to cook them. They think it is hard to cook one. But about 15% of the population loves duck. So I have a very enthusiastic set of buyers. And I only did 100 ducks. So I’m the only place you can buy a Massachusetts duck! Emus were kind of a mistake. I already do chicken, duck and quail eggs, so I wanted to do emu eggs. But they kept escaping.”

Ishihara gets $8 a dozen for his chicken eggs. He feeds them organic grain, which is expensive. He also wanted to try raising turkeys. Of course turkey isn’t Asian, but he said he just wanted to try it. He raised 40 in 2017.

Every week his CSA members receive five vegetable items as well as a half-dozen eggs, if they...
Asian egg noodle soup was just one of the many ethnic dishes Kohei prepared for members. He had also been a community organizer and CSA members. She met Kohei when he was doing a good example of one of the Movement Ground Farm's projects: building a farm with a social justice perspective of the whole food chain different. We have all these young people involved -- people who never visited a farm before. Their whole experience with food was just getting it at a supermarket. I've seen many young people change their attitude about organic food. They thought organic was bad, something they didn't want. But now, seeing all these people involved with the land it has been amazing. Watching plants grow changes people. I remember one time my neighbor asked why I was collecting all the trash left behind in my garden. I said 'this is my home'. I started gardening at a time of day when a slew of people walked by on the sidewalk. They asked what I was doing, and then they started respecting my space and not throwing trash there. They even thanked me for gardening! I felt that was my contribution."

I caught up with Kohei and about 100 members and their guests at the annual farm Harvest Celebration. Rescheduled from September because the farm work was just too intense then, this early November date worked for all and delivered a beautiful Sunday fall day. "This event is a barbeque I organize every year," says Kohei, turning pieces of quail, duck and sweet potato ('Asian favorites', he grins) on a large grill which he converted from an oil tank. "It is our time to celebrate the CSA and our members. I should have done it earlier, in September, but I was too busy and pushed it back."

The celebration, with tours, games, and a massive feast of farm meat and vegetables plus plenty of beer and lovingly made spicy Asian wraps and egg noodle soups, is free to CSA members. They get two free tickets for each CSA they join, qualifying a family joining for the summer, fall and winter to receive six tickets. Others can come if they pay at the street before entering the farm.

“This morning we had a number of other farmers here,” Kohei reports, “and started with a barter event. It was nice not to use money but to build community. One family that came was of fishermen. They bartered their strippers and bass and cod. Several farmers came with various products, cranberries, chicken, pork, yogurt. At 10% discount to those who sign up for all three seasons. They also let members opt to schedule meat distribution. For example, on one summer week they may get some meats. It is awesome that they made that decision. Other people come and say ‘This is great. I’m going to continue eating meat.’”

One of the treats Kohei arranged for the celebration was for people to meet his parents. His father, Michio, came to the US in 1968 when he was 23. “In the mid 60s in Japan,” he recalls, “we had major student demonstrations against the US/Japan peace treaty. It meant that we were under the protection of the US’s nuclear power. So in our constitution, we declared that we would not have an army. At the time Marxism was very strong in the colleges. I was in my junior and senior years at college. We would throw rocks at police and we barricaded the graduation ceremony. My father said: ‘why don’t you go to the United States and see what is happening there. You are not going to school anyway, you are not studying.’ So I said ‘okay’.

“I came to the United States as a graduate student,” he continues, “In those days you had to have a sponsor to come to the US who would sign for you and take care of any financial problems. My father had a connection with a man who would sign for me, so I went to the University there. I was not very much aware of the problems here, but I certainly learned about the Vietnam War and race problems that year!”

Michio ended up with an advanced degree in economics and a job at the World Bank, hence Kohei’s childhood home in Rockville. His mother, Melody, is a musician who sings and plays the piano. She and Michio met during his days at the University of Missouri. These days she visits nursing homes and offers music and art therapy to help needy people who don’t even have family members left visiting them.
One of the realities that Kohei mentions often is that farming takes more time than he anticipated—which makes it difficult for him to achieve the larger goals he originally intended.

"I would like to do more workshops and educational events," he says, "but I’m learning farming consumes all your time! I don’t have time to do other stuff like a newsletter, or workshops. I feel education is crucial for a CSA. But how do you have time to educate people about what vegetables they are getting and how to use them? I did a weekly blog for a while, but I couldn’t keep it up. That stuff is really important to giving people the full experience. The economics of the farm are not important to me so long as they are sustainable.

"I realize I need money," he continues, "to get other people to help doing all this stuff! I have good people who can help. I have summer help on the farm, and one person who is still working with me now. But it is too much! The interest is there among members, but I haven’t yet figured out my sustainable model to make it all work.

"I love the idea of a CSA," he concludes. "I think it is great. But I also love being at a farmers market. Running a CSA is not sustainable, unless you are a crazy workaholic. The main difficulty is trying to grow 80 different vegetables. They all have different harvest dates, storage requirements. So I’d eventually like to learn about partnering with other farms. Then instead of growing 80 things, maybe I could grow 30. And make it a little bit more sustainable. Focus on 30 things I’m good at and have the machinery for."

Kohei wonders if perhaps starting a non-profit may be the best way to avoid burnout or bankruptcy. In a way it is a false economy, he feels, but if that is what he has to do, he’ll do it. His long term goal has evolved to having a strong non-profit which can do social justice work – ideally a retreat center which could have programs and enable people to stay on site and participate in the growing too – and eventually finding a good partner who can run the farm operation.

Of course such a goal would require purchasing the land, which means a significant capital investment and also land which is suitable for these purposes but also not as close to urban areas and their housing-driven land prices as he is now.

He is now setting up an exploratory committee to help figure this all out. His parents are onboard with the idea and have sold their Mendocino, California home to raise capital. They hope to live at the new location. His sister, who is currently doing a residency in California, is mostly on board too, which would enable them to tap into a doctor’s line of credit!

Kohei would like to buy the land privately, run the farm on it, and raise money for the retreat center and non-profit work.

“But we need to find the land first, of course,” he says. “I want access to the Providence and Boston markets, even if I have to be an hour and a half away. I figure once a week we could drive an hour and a half not too much harder than a half hour. If I find the perfect land and it is 2 hours from Providence, I’ll go that far if I have to.”

Racial Justice work is important to Kohei, such as this successful effort to pass a racial profiling law to provide police oversight.
Members of Bedford-Stuyvesant’s Hattie Carthan Community Garden attend event at their nearby Herban Farm and Apothecary

This newspaper contains news and features about organic food and farming in the Northeastern US as well as a Special Supplement on Urban Agriculture.