

Composting in Chicago Community Gardens: A Social Analysis

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Introduction

This study is the first to explore the role of composting in Chicago community gardens. The project draws on prior research on Chicago community gardens titled “Community Gardens Count: Measuring Chicago’s Harvest” (the “Harvest Study”) completed by NeighborSpace and DePaul University in 2015 (Rosing, Helphand, and DeLorenzo 2019). The Harvest Study focused on gardens as assets of Chicago neighborhoods by measuring garden yields across Chicago and gathering data on where food goes and how it impacts communities. The Harvest Study also identified a number of challenges facing community gardens, including access to healthy soil. Accessing soil, gardeners informed Harvest Study researchers, is a costly component of gardening in Chicago and it is particularly challenging for low-income gardeners. Though some gardeners planted in existing soil, most expressed concern about toxicity levels and purchased soil from various commercial providers in the city. The necessity to replenish soil or add amendments was a predicament for gardeners without financial resources, often growing in communities where retail sources of fresh produce is largely scarce. This current study therefore emerges from the question ‘how can we understand the best ways to assist community gardeners in generating more compost and ultimately healthier food-producing soils?’

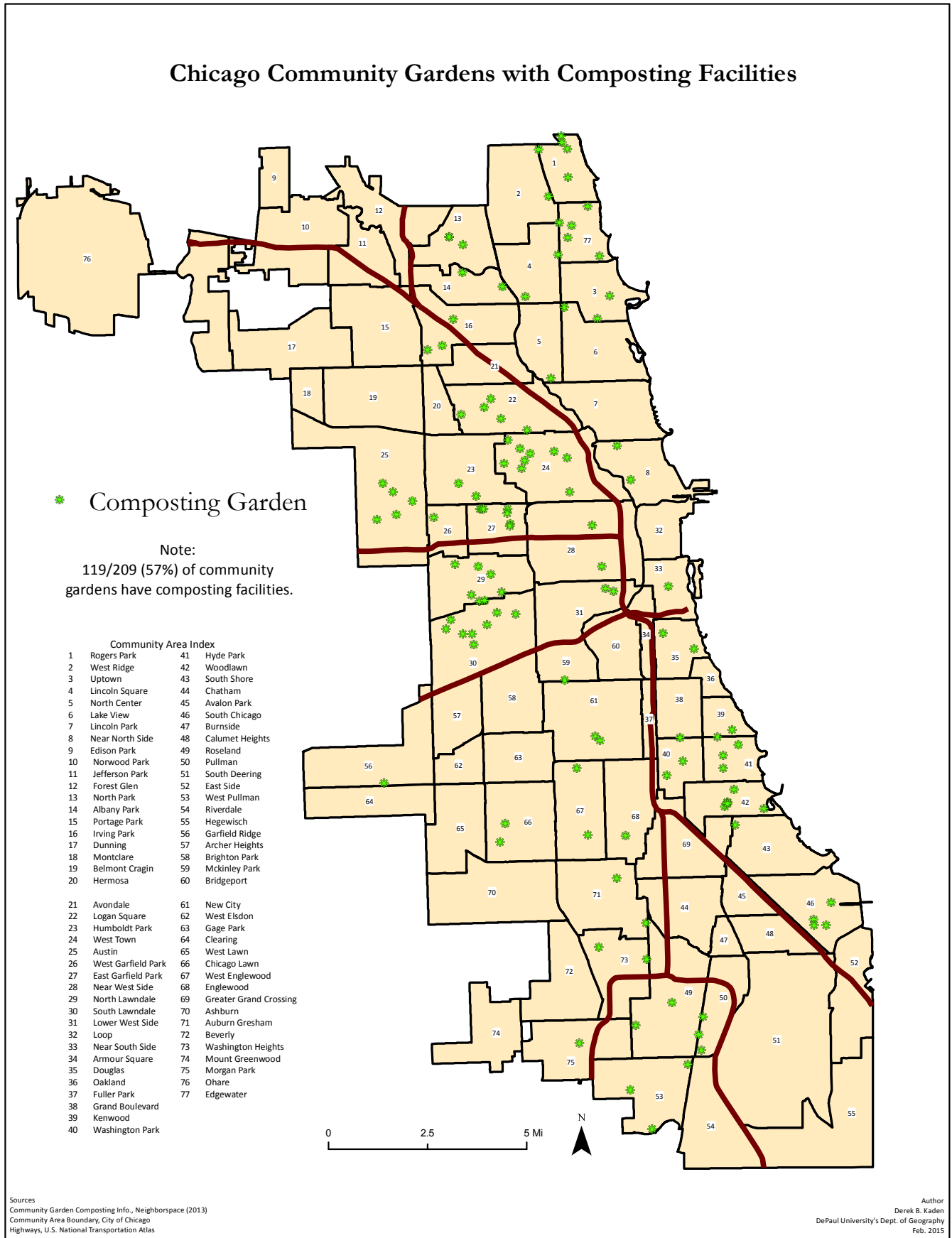
Between 2016 and 2018, drawing on data from the Harvest Study, DePaul researchers documented community gardens across the city that were attempting to compost on-site (See Figure 1). Out of 208 gardens researched in the Harvest Study, 119 or 57% were attempting to engage in some type of composting. These garden sites, the largest clusters located on the west, southwest, and southeast sides of the city, were conceptualized as assets to their community by attempting to produce soil locally. Researchers then reviewed the most current garden information available from the [Chicago Urban Agriculture Mapping Project](#) (CUAMP) to identify at least 120 community gardens in the city that were composting. The goal was to visit each of these gardens to learn how Chicago community gardeners were composting. From these site visits, a protocol was developed to interview gardeners and to learn more about their practice, where they learned to compost, and what beliefs they held about composting.

The goal of this study is to inform policymakers, funders, and educational institutions across Chicago on how to best support composting in community gardens. This goal is increasingly relevant given the 2015 [amendment to Chicago’s composting policy](#) that allows community gardeners and urban farms to legally accept food scraps and other organic materials from off-site locations. Thus, under certain conditions, Chicago residents can bring food scraps from kitchens to community gardens or urban farms to be composted, thereby expanding access to organic matter needed to produce nutrient-rich soils. In theory, this policy has the potential to expand composting in community gardens across the city. In practice, composting is both a social and biological process. This study focuses on the social, cultural, and behavioral aspects of composting in Chicago community gardens with the hope that insights spur additional institutional support of successful composting practices.

Given the importance of fresh produce for leading a healthy life, local policymakers and planners should take notice of the critical inputs that go into production of food in Chicago neighborhoods. Community gardens that successfully compost in the city provide an important ecoservice, diverting organic waste from landfills and producing food that increases wellness for residents. Garden composters consider food-growing spaces in the city to be an economic and public health asset, and are investing in them to improve food access and build healthier landscapes.

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Figure 1: Composting and Community Gardens



Community Garden Composting Policy in Chicago

North American cities are increasingly implementing policies in support of transforming local and regional food systems. These policies include support of municipal composting services focused on redirecting food scraps and other organic matter from residents into composting facilities, which serve a variety of practical uses. Few cities, however, have enacted policies that specifically address the compost and related soil demands of community gardeners and other small-scale urban horticulturalists. Such policies would prioritize waste reduction and recycling of food scraps through decentralization of composting across neighborhoods over more centralized composting systems that require costly, carbon-emitting municipal waste collection services.

The city of Austin, Texas, for example, offers one model of a municipally-supported effort to achieve zero waste through a multifaceted plan that balances curbside pick-up of food scraps and support for decentralized composting in backyards and community gardens. Through the [Austin Resource Recovery Department](#), residents are incentivized to compost on-site in backyards and gardens; compost training is provided for gardeners. Composting is not only allowed but encouraged on residential premises, community gardens, and urban farms with regulations that provide incentives to ensure controlling of rodents and odors. Rather than viewing compost as something to be solely regulated, residents are seen as agents in the production of compost as a service to and resource for the city. Chicago has made some headway in regards to policymaking that supports composting and local food production, but there is much to learn from cities like Austin.

Chicago's recent policy on composting in community gardens is in some ways unique. Transforming food scraps into soil through composting is a practice that, until recently, was impeded by city law that forbade growers from bringing off-site food scraps into growing spaces without a specialized permit. In 2014, a state-level advocacy group, Illinois Stewardship Alliance, spearheaded the passing of a state law permitting off-site food scraps to be brought onto farms and gardens. Then in 2015, the Mayor's office in Chicago agreed to support a similar ordinance and various advocacy groups began working with the city to formulate a policy proposal (Rosing and Block 2017, 35). The city subsequently passed an ordinance to expand composting in gardens and farms (City of Chicago 2015), which was then amended in 2017, to integrate a registration system for gardens and farms that sought to collect off-site food scraps. The policy uses a three-tiered approach to define local composting practice and related regulations. CUAMP.org was established as the online registry for garden and farm composters. The policy establishes distinctions between landscape waste generated on-site for use on-site, gardens that integrate organic waste or food scraps, and larger, more highly regulated commercial composting production. The city's Department of Streets and Sanitation was positioned to oversee the policy implementation and monitoring for each of three tiers outlined below in Table 1.

	Ingredients	In-Vessel	Size/Amount	End Use	Non-commercial/ commercial	Registration/ Recordkeeping in CUAMP.org
Tier 1 Garden Compost	Landscape waste generated on-site; no off-site organic matter	Not required	10 cy; up to 25 cy with approval	On-site use only	Non-commercial	No
Tier II Garden Compost	Landscape waste and limited (10%) organic waste generated off-site (food scraps)	Not required but food scraps must be kept contained until processed	10 cy; up to 25 cy with approval	On-site use only	Non-commercial	Yes
Tier II Urban Farm Accessory Compost	landscape waste, organic waste and livestock waste	Not required but must be kept contained until processed	up to 2% site's total acreage	Compost sold/used off-site must comply with IL-EPA standards	Commercial permitted	Permit required (Class III Recycling Facility Permit \$300/3 year) On-site inspection; records kept of organic waste and livestock waste received from off-site, and the amount sold

Table 1: Chicago Composting Standards (City of Chicago 2015)

Character and Quality of Chicago Soils

The existence of a composting policy that permits recycling food scraps in a large city like Chicago offers numerous opportunities for communal growers to build healthier soils. There are numerous reasons that Chicago should consider promoting local-level composting in neighborhoods. Not only does neighborhood-based composting promote local soil production for gardeners, but it improves the quality of Chicago soils in general. Compost production should be considered a public health initiative in that healthy soils improve the quality of life for all residents. Diverting organic material from households into gardens and farms that produce fresh local produce has a multitude of health benefits. As Chicago's unique urban agricultural landscape continues to expand, compost demands will continue to increase, especially given the variable quality of existing Chicago soils.

While Chicago soils are broadly characterized by the weathering of its geologic parent material, Niagara dolomite, they are far from uniform in character physically, biologically, or chemically. Historic and current land use has resulted in disturbance, flooding/desiccation, compaction and contamination of soils. Most city lots have undergone many iterations of use over time. In general, lots are built on constructed or blended soils imported from other places whether for building construction purposes or parks and gardens. There is no federal environmental regulation of top soil. Therefore, like many US cities, Chicago's soils are negatively impacted by tillage and cultivation, excavation, industrial and domestic wastes, road salt and deicing, storm water, compaction from machinery and human traffic, air quality, lack of mulching or perennial plant cover, and lack of other regenerative growing methods.

Given the variable conditions of soils across the city, the research for this study sought to learn about how Chicago community gardeners compost within varying geographically-, socially-, and culturally-defined spaces; whether or how they participate in neighborhood-based food-scrap composting. The vast majority of these community-based food producers build gardens on land that was otherwise vacant, on parkland, or on school properties. In producing compost, the gardeners offer a model for considering ways to rebuild Chicago soils through resident participation; they offer a model for diverting discarded food from landfills and converting it into soil that produces fresh produce, ornamental plants, and greenspace. In order to systemically understand their behaviors and beliefs, research protocols were established to learn what they currently know about composting, how they practice composting, and to what degree they could benefit from composting education.

Research Methods

The current study is built on "Community Gardens Count: Measuring Chicago's Harvest" (the "Harvest Study") which sought to better understand the multidimensional impact of community gardens on a large U.S. city. The Harvest Study measured the impact of community gardens on fresh food access in Chicago, specifically through measuring food production, distribution, and nutritional value within neighborhood contexts. The study provided the first comprehensive picture of how Chicago's communities organize to produce food communally. In doing so, the Harvest Study laid the foundation for further investigation. The Harvest Study sought to fill a gap in the literature on the role of local food production in creating healthier communities. Portions of the data were also integrated into a publicly accessible mapping tool, the Chicago Urban Agriculture Mapping Project (CUAMP.org), that provides a useful way to empower the public, researchers, community-based organizations, and urban planners and policymakers to further understand and support local food production in Chicago.

The current study drew upon the data in CUAMP, the majority of which was collected during the Harvest Study, to identify community gardens that were already engaged in composting. As in the Harvest Study, researchers defined a growing site as a "community garden" if it presented both internal and external community-fostering properties. Internal community fostering properties refer to the development of social ties among people who work together at the garden. External properties, on the other hand, refer to the impact that the garden has on the outside environment in the form of neighborhood improvement, beautification, food access, violence prevention, increase in property values, health benefits, and more. In Community Gardens Count, 208 gardens fell under the definition of food-producing community gardens, though a total of 260 gardens were input into CUAMP.

Utilizing CUAMP data, DePaul University researchers documented 120 gardens, representing 40 gardens from each of three geographic sectors of Chicago: Northside, Westside, and Southside. Between fall 2016 and summer 2017, researchers from the university visited each of the gardens to document and photograph composting practices. Narrative descriptions of the composting sites and related photos were input into a database and analyzed for patterns in composting practice. Subsequently, researchers interviewed twenty-nine gardeners selected through representative sampling from the 120 gardens distributed almost equally across the three aforementioned sectors of the city. A representative sample is a subset of a broader population and one that has characteristics of the larger population.

Interviews with community gardeners utilized an interview guide comprised of the below sixteen questions:

- When did you start composting in this garden? (alternative: How long have you been composting?)
- What made you start composting in the garden? (alternative: Why did you start composting in the garden?)
- How did you learn to compost?
- Have you worked with any individuals or organizations to learn about composting practices?
- Please describe how you compost in the garden.
- What are the benefits of composting?
- Are there any challenges you face in your composting process? If so, please explain.
- Describe who manages the composting process in the garden. Is there a leader or group of leaders?
- How do you ensure that gardeners understand how to compost?
- Do you offer any education or teaching of composting to other gardeners in the garden or to other gardens?
- Have you had any complaints about composting? If so, explain.
- Are there plans for future development of your composting program?
- What would you look for in a composting education program?
- What do you do with your compost?
- Do you accept or include food scraps from offsite (outside garden)?
- How do you think composting contributes to your garden?

DePaul researchers then transcribed and the authors coded the interviews using an inductive method. Codes were developed through reading a set of interviews, developing a codebook, reviewing the codebook as a group, making revisions to the codes, and finally fully coding all 29 interviews. The end result was identification of the primary themes emerging from the responses to each of the above questions.

Composting in Chicago Community Gardens

The 120 garden visits produced a set of general observations about community gardens that provided the groundwork for understanding composting practices across Chicago's community gardens. The resulting database of narrative descriptions and photographs yielded information about methods of composting and the qualitative state of garden composting during the time of the visit. This data was reviewed by researchers and provided an excellent starting point for further research and development of the above questionnaire. These findings included patterns such as (1) an apparent inadequate supply of carbohydrate-rich materials such as leaves, straw, hay, and sawdust and an abundance of unprocessed garden or green waste such as tomato vines and sunflower stalks; (2) a wide variety of composting methods that can be roughly divided into three categories: Earth Machine (passive process in which food waste and carbon are layered in an open-bottom vessel), tumbler (turning a vessel that mixes food scraps and carbon within), and three-bin system (food scraps and carbon in three adjoined wood-framed containers with screening; materials are moved in a three-stage process until compost reaches final product for garden use); and (3) varying use of signage to instruct or guide gardeners on composting. The below photo documentation provides a visual understanding of composting methods and signage use.

Community Gardeners' Perspectives on Composting

Following an analysis of the observational data, DePaul researchers surveyed gardeners who compost in 29 gardens across the north, south and west sides of Chicago. Researchers mostly followed the above questionnaire but allowed for narrative tangents to emerge and posed additional relevant probing questions. The coded results can be divided into the following areas: (1) composting knowledge; (2) compost implementation and practice; (3) perceived benefits of compost; and (4) challenges of community garden composting.

Composting Knowledge

Composting knowledge can be broken down into two categories: informal and formal. Informal knowledge is described here as not scientifically based or that which was acquired from others such as family members, friends, non-structured teaching sessions, or the internet and then tested through practice. Formal knowledge is described here as knowledge gained from formal, structured workshops taught by compost "experts" that relayed an advanced understanding of the scientific and biological processes that go into the creation of compost. We present these two knowledges without judgement, not giving preference to one type over the other. However, the distinction of informal or formal needs to be noted when analyzing the primary research question that aims to gauge *how* people understand and use compost in their gardens. As an illustration of the distinctions based on the above definitions,

formal knowledge about composting was mentioned 24 times, whereas informal composting knowledge was mentioned 42 times. Hence, it appears that the majority of Chicago gardeners are learning composting through less formal educational processes.

Formal Knowledge

The primary way that people reported receiving formal knowledge on composting was from workshops, taught by perceived compost “experts”. These experts ranged from organizations such as the Garfield Park Conservatory, Windy City Harvest, Green Corps, Growing Power, the Chicago Community Gardeners Association, or the Chicago Botanic Garden. Many gardeners reported receiving on-site training through farm internships. This “formal” training may also have been supplemented by reading books and understanding the scientific process behind composting (i.e., the biological way that food breaks down to become compost). One gardener who had been formally trained had this to say:

It’s not an intuitive process. It really isn’t. You have to learn how to compost because just the sheer ingredients with the browns and the greens and the nitrogen, you need to know all of that. I’ve taken a number of classes, I’ve taken a number of courses, I’ve worked with hundreds of gardens and gardeners, I’m a member of CCGA, I’m a NeighborSpace garden. So I’m kind of well-positioned to get all of this information through classes, presentations, workshops; and that was my learning curve.

Here, the gardener mentioned the courses, classes, and local associations that they have attended and are a part of to lend a formal air to their compost training. To this respondent, composting is something to be learned, not to be felt intuitively. Furthering this point, another respondent mentioned how students in their garden are encouraged to think about composting in scientific terms:

They use this thing that Bill Shores has put together [called] ‘Composting and the Urban Environment.’... I’ve used this book *Life In Soil*. This is extremely comprehensive. But, I really like for the student to know why they’re doing what they’re doing and to think about this as science... I like to get them on the microscope and thinking about this as a habitat for friends of the soil and not just garbage.

For the above interviewees, distinguishing compost as a “habitat” for microbes as opposed to “just garbage” requires teaching from compost experts and books.

Informal Knowledge

Compared to formal knowledge, informal knowledge about composting was expressed almost two times as often. We have classified informal knowledge as learning from a family member or friend in a less structured setting, watching videos on YouTube, or attempting to create compost on one’s own through experimentation. For example, when asked how they learned to compost, one gardener replied:

Just YouTube and doing it ourselves, really. You don't need a lot of time to learn it. I think it took longer to learn how to tie my shoes. There's people that do an excellent job at it. They'll monitor the pH, all that kind of stuff. This is just eyeballing. I certainly don't know the science behind it... Mostly I know composting works because of microorganisms, having the right environment to be able to transform plant matter into soil. Compost basically is the waste of all those microorganisms.

Here, the gardener is specifically delineating between “monitoring pH” as hard science, compared to their approach to composting, which is more “eyeballing” it. For such gardeners, learning how to compost seemed simple: they learned through practice and trial and error; they composted without formal training or a degree or certificate. Sometimes such gardeners learned from a variety of sources including knowledge transferred between gardeners. As one gardener noted:

Watching my grandpa really helped but then when I started doing it myself in college, I was smelling bad smells. I started thinking what’s going on? So, I just started just YouTubing and learning about it on the internet and talking to friends.

Other gardeners mentioned that they had grown up in a rural setting or with parents or grandparents that gardened or farmed. The knowledge these gardeners received was less through textbooks and formal training, but rather through on-site lessons where composting came to be understood as a natural or an obvious thing to do:

I was a part of a garden in Hyde Park, well in Woodlawn, and I just learned from the gardeners there and it was just a part of being a gardener. I mean it’s not like it’s rocket science or anything...

Numerous gardeners stated that composting is a natural “next step” when it comes to gardening; that it’s an obvious thing to do

when you care about the health of your plants. Such knowledge of composting contrasts sharply with the earlier sentiment of compost not being an intuitive process.

Compost Implementation and Practice

The “how” of composting can be split into a few distinct categories. Some gardens use a three-bin system, some use vermicomposting, and some use a tumbler or “Earth Machine” compost bin. Four gardens mentioned the use of a three-bin system, and one of these gardens mentioned the practice of layering compost:

So you want to have like your food products and then your browns and your greens and really I like the brown material, like cardboard, paper products, straw, all that's gonna be on top and that's gonna help essentially cook down. So with like a pitchfork, you would take it, you would turn over [about] once a week. Then you would kind of take the more broken down material, put it in the second bin, you know cover it again to encourage heat, and then by the time you get to your third bin, all of that should be pretty much broken down into a nice humus of soil.

The above gardener also made reference to carbon and nitrogen in the soil, intermingling these terms with colloquial ones like “browns” and “greens” to describe materials used to create a proper compost mixture. The precise ratio cited was 50:1 carbon:nitrogen, where in fact a more appropriate ratio is 25-30:1. Additionally, three gardeners mentioned the temperature of compost, and addressed issues of compost being too wet or dry and ways to combat those issues. Two gardeners mentioned the importance of sifting the compost.

Nine gardeners (almost 1/3 of those interviewed) mentioned that they use vermicomposting. In vermicomposting, worms are used to eat through food scraps or organic materials and produce castings. These castings are then applied to the soil. Many of the gardeners that employed vermicomposting do so on an informal basis, and did not mention the science behind their reasoning. For example, the below response was typical of how most gardeners viewed worm composting:

What I'm doing here is a little different I would guess than other gardens because I take that compost material out of the tumbler and I put it into a worm bin that I have at home. A garbage can with holes drilled in the side and let the worms eat that. It's basically pre-chewed food for them. They tear through it and they love it.

Of those interviewed, only one gardener specifically mentioned layering organic materials to create the proper balance of carbon and nitrogen. They noted, “In a compost bin you're piling organic matter and it's basically a balance of carbon and nitrogen and you need your nitrogen in order to break down that carbon. We're turning it manually.” Such sentiments may not necessarily be because gardeners do not understand the concepts of nitrogen and carbon; they may be due to the limitation of the interview questions which asked, in a more informal way, how people compost and how they teach others the importance of composting. Yet, there were clearly differences in what gardeners viewed as acceptable for a compost pile. The latter includes confusion or concern, as will be seen in a subsequent section, about accepting food scraps from off-site sources into composting systems.

Perceived Benefits of Compost

Whether one views composting as something to be trained in – formally or informally – or as a product of a “natural” or “obvious” process, there was widespread agreement by those gardeners interviewed that composting produces a myriad of benefits. These benefits can be broadly summarized into two categories: environmental benefits and economic benefits. Additionally, one gardener expressed the sentiment that compost built confidence; that by understanding and controlling what is put into the soil, one can be sure that the food that grows in the soil is safe to eat.

Environmental Benefits

Environmental benefits of composting were mentioned 47 times by interviewees. Oftentimes, respondents mentioned the benefit of keeping waste material out of the landfill:

I would say that when you know better, you try to do better. Composting is saving the earth, not sending stuff to the landfills... I think it's a more healthy practice.

These respondents understand the consequences of sending food to a landfill and view compost as a better alternative. Food waste or other organic material that goes to a landfill is oftentimes covered with non-biodegradable material. The food waste decomposes, but the gases that are released become trapped and turn into methane, a gas many times more powerful than carbon dioxide in contributing to climate change (IPCC 2018). Alternatively, as several of the gardeners expressed, nutrients from decomposed food

and yard wastes can be absorbed back into the soil to create a healthier living environment for plants. As one respondent explained:

Certainly [a benefit to composting is that there's] not waste in our waste system. Less garbage. Trying to reuse and recycle anything we possibly can. It's a huge savings in our waste system and our landfills and our water system. So many people are throwing things down their disposal that could be going into compost.

The above quote also references the sentiment that using compost can be cost-saving. For community gardens operating with minimal to no budgets, thriftiness is a necessity. That is, composting has both environmental and economic value. Gardeners also pointed out that compost helps feed people while educating them about the natural life cycle of food. Furthermore, compost is seen by many to be more beneficial than traditional chemical soil amendments. Compost is understood to be a nutrient-dense, rich material that changes the composition of the soil to be more hospitable to plant growth. One gardener observed the physical changes that come about from compost use:

We actually harvest all of the minerals, the nutrients, you know basically everything that's growing in the soil. We harvest all that and put it back. It helps with water retention. It helps texturally with the soil. It loosens it up and allows for breathing. It retains water really well and [retains] the nutrients for your garden.

Thus compost was understood by many as a returning of nutrients from decomposing organic material to enrich the soil and to ultimately feed plants. Composting was viewed as a natural way to enhance soil while avoiding costly chemical amendments, thus allowing for a higher level of economic independence.

Economic Benefits

Most gardens in this study are operated by volunteers with minimal to no budget. Funds received from grants may be designated for specific purposes, such as material for raised beds, tools, seeds, etc. Yet given the poor soil quality in Chicago, the cost of purchasing and amending soil can be a persistent burden and hinder garden development. Gardeners were quick to assert this economic challenge:

We want to produce food, and if we want to produce food then we have to care about the soil, and if we care about the soil then we have to add more living material to it. It's also cost effective for us. We don't want to be going out and buying that stuff, and also we don't want to be paying for the hauling away of organic material. It's better if we can utilize waste materials from the garden and consider them as a resource instead of a waste.

Referring to waste that is produced simply in the garden, the above gardener illustrates the belief that one can produce enough waste to justify the work that it takes to maintain compost bins and add compost as a soil amendment. Saving money and producing less waste were linked:

First of all, because we desperately needed soil so we needed carbon. We had nothing. And we had no money at all. So it was a matter of necessity to do it. And if we didn't compost what would we do with the waste?

Gardeners such as those above readily cited the economic benefit that composting provides them. When one has “nothing” to start with, compost can help create something that takes your soil from good to great. It not only adds environmental value to the soil but also monetary value, which is indeed helpful when one is starting with nothing. There is a soil justice component to composting, given the relatively high cost of store-bought compost and soils and, as will be explored later, the existence of inequity between gardens based on racial and economic segregation in Chicago.

Soil and Food Safety

Finally, given the cost of soil and compost, garden-based composting provides a level of confidence to Chicago gardeners. They can be certain about the quality of the materials that go into their soil. As a result, they feel better eating food that grows in their gardens:

The soil here in Chicago is so contaminated, it's really no telling what was on this land before we started farming here. So the benefits of it is we're knowing what we're planting our food in and we know what's going into it because we're putting all the inputs in.

The use of compost appears to offer a level of confidence to those who eat what they grow in Chicago community gardens, especially given widespread belief that soil in the city is contaminated with metals such as lead. Their concerns may be warranted. A recent study of soil lead levels in Chicago community gardens suggests that testing is essential for gardens both with and without

raised beds (Witzling, Wander, and Phillips 2011). Moreover, these same researchers found that areas nearby gardens may be causing contamination risks for crops, suggesting adjacent sites will possibly require some form of remediation to avoid health risks.

Challenges of Community Garden Composting

While the benefits of self-made compost are evident to Chicago community gardeners, there is no denying that creating compost takes time and resources. Many gardens may consist of individual plots that are tended to on a volunteer basis, without consistent scheduling. Monitoring what goes into the compost can quickly consume a head gardener's time and the amount of compost that is produced may end up being "not worth it." Large amounts of organic materials do not equal large amounts of compost, due to the decomposing nature of compost creation. There may also not be enough material going into a compost bin, especially if the garden does not accept material from off-site. That is, with a small amount of material going in, insufficient compost is produced for application to an entire garden and it therefore may feel too time-intensive to be worth the trouble.

Composting as Too Difficult or Not Worth It

While only one gardener in our study explicitly mentioned composting as being "not worth it," there were gardeners who chose not to have a composting program who expressed similar sentiments. When only one person oversees or takes responsibility for an entire garden, other responsibilities may take priority:

We have better sources. The garden compost is just kind of a pain in the ass. Turning it. No one wants to do that. And it's not enough. You hardly get anything from it. You get like this little tiny bit... It's a pain and it's not that much bang for the buck... If I think about 100% of my energy as going to the garden, I would say .01% goes to that mess.

Community Support

Another challenge that arose from interviewing garden composters included lack of understanding or support from the community. Although there was enthusiasm about composting among gardeners, many of those who were interviewed were also quick to point out that they were often alone in executing the day-to-day tasks associated with composting. Gardeners mentioned that a lack of understanding and support from the community is the main reason that the composting program in their garden was not at what they might consider optimal levels. Gardeners noted that people use compost bins as an extra garbage bin, discarding items that don't belong:

We were pulling out whole plants. It would take them years and years to break down if you put that giant zucchini plant in there... They would also put the plastic containers that the plants came in. It's like, 'it's not a garbage can!'... bags from Cheetos and stuff were in there as well.

Part of the challenge faced by gardeners from the community was the perception that compost will naturally attract vermin, such as rats. This concern was partly due to confusion about the source and destination of rodents:

I think it was 2015, for some reason there were rats everywhere... I've been here for 40 years now and I'd never seen rats running across a sidewalk or running out in the daytime. They were doing it that year and we were all just freaking out. We have a lot of restaurants nearby and they have dumpsters, but everybody was pointing fingers at everybody else, and some rats had gotten into our compost bin.

While rats couldn't be directly traced back to the above garden, and they may have been a result of poor dumpster maintenance by nearby restaurants, the existence of composting nearby created confusion. Community members may in such cases be looking to blame gardens for the rise in rat population because the garden is a new addition to the neighborhood, and/or because they have a general lack of understanding of how the garbage infrastructure in Chicago encourages a population of rats.

Even in a garden where there may be community support for composting, lack of people power is another barrier. Gardens are often staffed by volunteers and maintained on an ad-hoc basis. Several gardeners interviewed oversee spaces that consist of individual plots that are tended to by "owners" as needed. Some gardens have regularly scheduled "work days" while others are less structured. Some are locked and can only be unlocked by the head gardener while others are open to the public. Such characteristics make the dissemination of information on how to compost appropriately both scattershot and difficult to enforce. There may also be language barriers between gardeners, and lack of appropriate signage was cited nine times as a barrier to composting. Even if effective signage and language(s) are in place, gardeners may not realize their individual impact on compost practice:

We had signs posted. Our previous coordinator put signs that we put right next to it saying what to put in and what to not

put in. It doesn't necessarily change behavior... The people who don't know what it is won't necessarily stop to read the sign and get educated about it.

This lack of knowledge or unwillingness to change behaviors can be difficult to correct. This may be partly due to volunteers or community members not sharing the same value of composting as the head gardener. This challenge introduces potential for further community education to explain the multifaceted benefits of composting, as one gardener noted:

It's a learning process... when they throw the banana peel in there, the whole banana peel, you just have to tell them that they need to cut it up because otherwise it won't decompose in a timely manner. You just have to keep talking to them. Sometimes you tell them and five minutes later they just do the same thing or tomorrow you see the same, and you just have to keep doing it. It's just like teaching the elementary kids. You just have to continue – repetition.

The physical act of creating compost by chopping the material into proper pieces needs to be reiterated over and over. Lack of understanding of what is allowed and not allowed in a compost bin is an educative process that may take time and persistence. Plastic bags, “turned” compost, cooked meats, and oils are all not acceptable compostable items in gardens, but despite repeated attempts to correct community members, these items still find their way into bins. Unless the garden is constantly monitored, it is impossible to educate every member in the community as to what goes or does not go in the bin. The alternative would be to close the garden off to the community; many gardeners mentioned that they do not accept food scraps from the community due to these very concerns:

Some of them are really crazy because they throw in things like loaves of bread and sacks of oranges in a plastic bag as though they don't understand anything... Sometimes people leave their compost in like a bucket for two months and then they bring it here and it's gone anaerobic and it stinks.

Some gardens therefore only accept food scraps from participating gardeners, which of course limits their inputs and reemphasizes the lack of people power that gardeners face. Even if they may be willing to take the scraps from others in the neighborhood, time constraints limit their capacity to monitor the inputs on top of other tasks.

Sometimes the lack of understanding about compost may also take the form of over-enthusiasm similar to “wish-cycling,” wherein a person deposits an item in a recycling bin with the hope that the recycling facility will sort it out. As a gardener noted, “it's everything from over-enthusiasm – oh I'll just throw everything over there, the composter will take care of it – to people saying oh, I don't know what's going on.” Such lack of understanding of the process of composting, combined with a lack of time and resources, explains how composting may not become a priority for gardeners.

Additional time is needed for garden leaders to organize and disseminate information and for community participants to learn about gardening processes. As one gardener noted:

No, folks don't want to go to lectures. They don't want you to lecture them. If they ask you what's growing on their collard greens and you see whiteflies all over, tell them they have whiteflies on their collard greens and show them on Amazon where they can buy neem oil. That's what they really want to know, they don't want a lecture.

The above narrative highlights how people may be more interested in quick fixes to their plant problems and may not wish to be educated on the science of soil and plant production.

Municipal Government Support

Some gardeners interviewed for this study were fortunate to have a consistent stream of materials to use to create compost, but many others did not. Consequently, the latter often had to decide whether or not to accept food scraps and other materials from community members. By accepting food scraps from offsite, gardeners faced the abovementioned challenges: a lack of understanding by community members of the types of materials that can be composted, and insufficient capacity to carefully monitor the process to ensure good compost production.

The City of Chicago's regulations on what is acceptable to bring to a community garden to be composted were seen as a source of confusion among community gardeners. Municipal regulation was cited seventeen times as a barrier to why community composting is not more robust. Gardeners used phrases like “it's illegal,” “the city doesn't allow us to [accept compost],” “technically we're not supposed to,” and “we need to get a permit.” In one case, the gardener noted the following:

We did a training with someone from the University of Illinois Extension and he came and... mentioned that, yeah, you can't

actually use the compost that you make. Like if you have food or vegetable waste it's considered manure in the state of Illinois, which is absurd.

The perception that food scraps are considered “manure” was enough for this gardener to not take the chance and take food scraps or yard waste from off-site. The above narrative illustrates that gardeners were not well-informed about the City of Chicago legislation in 2015 that allowed off-site scraps to be brought to community gardens for compost. Prior to this law, it was indeed illegal for any type of compost to be spread on garden plots. Confusion about these types of ordinances and their consequences still existed at the time of this study and may still exist. For those who did integrate food scraps into composting, there remained confusion about what materials were allowable:

I think you're not supposed to have any animal products in your compost if you're composting... I think big heaps aren't even really allowed. That's what I've been hearing recently but I haven't looked into it entirely.

Moreover, restrictions caused consternation and frustration among gardeners who understood how to compost. Their lack of people power to monitor every scrap that comes into the garden led to resentment toward the bureaucracy that comes as part of the city ordinance:

Okay, I'll lay it bare. It was foolish for the city to dictate that. I've thought about it and I think what they're trying to do is stop maybe compost hoarders or unwatched bins that people would just dump into and it would become a big smelly mess of anaerobic bacteria and you know, rat food. But in a well-managed garden like this, that's not happening. I understand their concerns, and where that is coming from, but it's not appropriate across the board.

Gardens that are well-established in the community may have been successfully accepting food scraps, albeit illegally, for many years “off the record” and can now be penalized for failing to comply with legislation. The city may now levy a fine against a garden for failure to comply and if the garden has a limited or zero budget, the fine may be enough to put that garden out of business. The lack of gardener understanding of municipal composting policy and concerns about how the regulations might be applied suggest a need for more clarification, as well as solutions for how gardeners can safely and effectively accept food scraps from those in the surrounding neighborhood.

Discussion

Soil Justice in the City

This study highlights the challenges of recycling food scraps and landscape waste for use in local and urban food system development in a large U.S. city. The disconnectedness between capturing food scraps from the urban waste stream and the use of the latter for local soil and food production is illustrated in the challenges faced by community garden composters. In Chicago, the vast majority of food scraps are considered “waste,” placed in a garbage bin, and hauled away. Those who compost in community gardens in the city are outliers who convert what most residents consider waste into a valuable resource, environmentally, economically, and ultimately nutritionally through healthy food production. The majority of gardeners interviewed for this study understand their role as assets to the city, producing household foodstuffs and improving the quality of Chicago's soils while combating climate change. Yet outside of the 2015 city ordinance that permits use of off-site food scraps in community garden composting, few resources are offered to support and further educate community gardeners and other growers to be successful composters, to comply with the municipal policies, and, most importantly, to help the entire city assist in the remediation of Chicago soils.

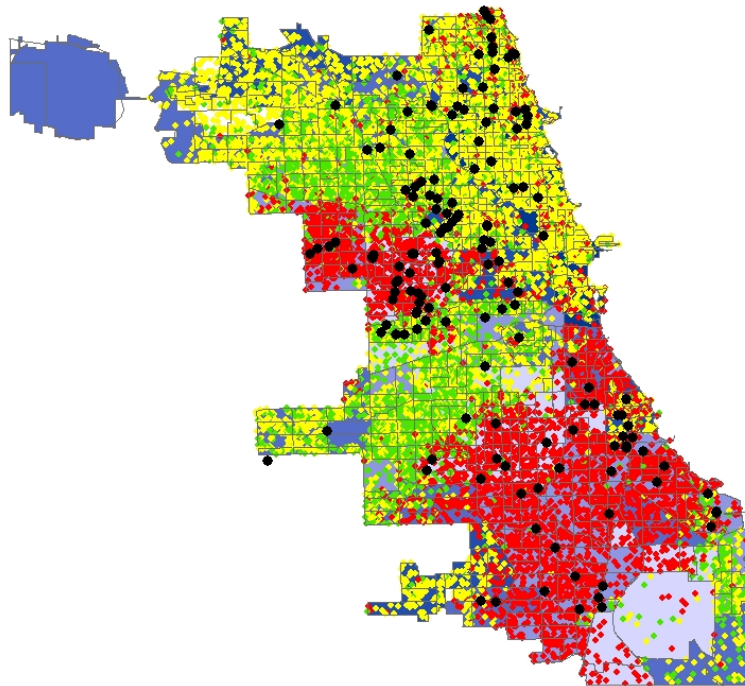
Given that Chicago does not have stringent policies regarding lead abatement and burial of construction and demolition materials, many gardeners expressed concern about lead and other contaminants in the soil. As a result, most produce food in raised beds, containers built above ground to encase soil. These beds require soil that is most often purchased. In addition, gardens often need to regularly purchase fertilizer or other soil amendments. One way to avoid costly ongoing soil and soil amendment purchases is to produce compost that can be converted into nutrient-rich soil.



Raised beds with purchased soil in newly constructed community garden; Photo by Howard Rosing. Used with permission of Enlace Chicago

Like all resources in Chicago, access to healthy soil in the city differs by neighborhood. The largest clusters of community gardens in Chicago are located on the west, south and southwest sides of the city in economically-distressed neighborhoods of color, many of which have limited access to fresh produce (Rosing, Helphand, and DeLorenzo 2019; Block, Kolak, and Wolf 2018). Furthermore, Figure 2 illustrates how the largest clusters of community gardens that compost are also in these same neighborhoods.

Figure 2: Chicago Community Gardens that Compost by Neighborhood Racial Demographics



Legend:

- Red: Majority Black/African American
- Yellow: Majority White
- Green: Majority Latinx

Map by Jacob Horn
Demographic data from U.S. Census Bureau 2010

The study highlights the importance of re-conceptualizing community gardeners, especially those who compost, as assets to the city. Many of these gardeners are working in areas that have undergone economic divestment and which struggle with the negative impact of post-industrial environmental contamination. The cost to these gardeners of purchasing soil and compost for raised beds and of remediating existing soils can be understood as a form of social and environmental injustice, given that gardeners pay the price of prior industrial or commercial activity that negatively impacts their neighborhoods. This negative externality is a cost that affects the whole of Chicago, but burden is taken on by communities that have been socially and economically marginalized as a result of decades of racial and economic segregation. Gardeners who compost in this study illustrated a great deal of understanding as to why composting matters and how to make it work. This knowledge, acquired by formal and informal educational processes, is an important foundation for further support of community garden composting in Chicago.

Chicago community gardeners have a strong sense of understanding the benefits of composting, socially, economically, and environmentally. They offer an opportunity to rescue organic matter – leaves, grass clippings, branches, brush, and garden waste – generally disposed of through purchased yard waste bags and picked up at a cost to be reintegrated back into local food production in areas that face economic hardship and limited access to fresh food. By diverting waste from landfills, their composting results in cost savings by: (1) not having to purchase soil amendments and (2) not having to pay for organic waste to be sent to landfills. Cities such as Austin, Texas are acutely aware of these costs and how composting can provide savings to the city government and residents. Chicago and its surrounding municipalities have an opportunity to learn from the challenges and successes of such programs and to find ways to build on successes of the city's existing community garden composters.

Beyond Fear, Doubt, and Misinformation

Concerns about rodents are often used to challenge communal composting in gardens and urban farms. Whether rats and other rodents can be traced directly back to compost may have little to do with whether gardeners are following successful composting practices. It is sometimes the case, however, that the mere perception of rats is enough to discourage community and municipal support for a local composting program. Similar to NIMBYism for not wanting landfills near where one lives, concerns about excessive smells and vermin like rats, coupled with a lack of understanding about how compost is produced, can make implementation of composting difficult.

Equally of concern, enthusiasm alone is not enough to make compost “work.” There needs to be a willingness to learn and be organized as an additional requirement. This study detects a disconnect between what people say they want (compost) and how it is executed; that is, via learning about compost. Gardeners and supportive community members may not have the time or patience to understand the makeup of compost, how it works most successfully, and its contribution to the health of the garden and food produced.

Building a culture in the city where compost is highly valued will take additional educational resources, as well as commitment to a long-term social change process and potentially to new composting policies. The study illustrates a need for further education of gardeners who perceive that composting is too labor-intensive of a process to be “worth it.” The fact that gardeners report a lack of understanding about what goes into a bin, or a lack of “quality material” going into a bin – which leads to limited output of compost – should not be a rationale to discourage composting. Instead, attributing these obstacles to a lack of quality material from the garden or surrounding areas and a lack of widespread information can tie into the goals of continuing urban compost education. The latter should include building broader awareness of the correct practices associated with Chicago's composting regulations regarding acceptance of off-site organic material and food scraps.

Recommendations

Recommendations from this study include:

- Development of a long-term, equity-based, strategic plan for neighborhood-based community composting in collaboration with Chicago community gardeners, local nonprofit advocates, and technical assistance providers.
- Development of a citywide community composter certification program that ensures community gardeners across all neighborhoods have the most accurate knowledge and skills for composting in the city.
- Consideration of how current composting policies can be further developed to leverage a greater impact on and support of composting in the city.

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