Laura Cerrato recently completed her M.Sc thesis entitled “The role of civil society organizations and system relationships surrounding participatory organic nutrient waste cycling.” The following post is a summary of her case study evaluation of the urban *De Zuiderhof Voelkstuin* community composting initiative (*Compoststraat*) and its relationship to the city of Rotterdam and the Netherlands.

Background:

I embarked on a research exploration for my master thesis in the not-so far away Rotterdam, NL. However the place I conducted my research was in De Zuiderhof (DZ) garden allotment complex (*voelkstuin*) which was an oasis tucked away from the hustle and bustle you would expect to find in the second largest city in the Netherlands. Originally, allotment gardens provided a place for working class city citizens to grow food and increase their food security. Today DZ (as most allotment gardens in the Netherlands) are mainly used for recreational purposes. Each plot at DZ is between 200-300 square meters with a small cabin where residents are permitted to sleep for six months out of the year resulting in many using the space as a recreational getaway. And while it is still common to grow food on the plot, most residents do so for enjoyment rather than for food security.

Figure 1: Examples of urban agriculture at the De Zuiderhof allotment garden in Rotterdam.

My research brought me to De Zuiderhof (DZ) to explore the topic of organic nutrient waste cycling (ONWC) in urban areas where there was an existing urban agricultural component. The current system which addresses organic resources and waste in Dutch cities (and many other western European countries) is technocratic and linear; resources are trucked in to feed residents and what is not used is treated as waste to be disposed most commonly through large-scale, centralized treatment centers (typically incineration for Rotterdam). This is a far cry from the historic tradition of using organic waste cyclically; such as using plant waste, animal and human manure as compost, which provide nutrients and organic matter to nourish crops and build healthy agricultural soil locally. However realizations of a the problems which accompany a broken food system (e.g. cities as resource sinks, pollution from excess nutrient waste) has brought cyclic methods back to the limelight. This resurgence is accompanied by the understanding that supporting sustainable cities can be both beneficial and feasible in terms of environmental, economic and social sustainability. There are many civil society organizations (CSOs) across the globe addressing problems that have appeared alongside a broken food system. Many of

these CSOs are doing so in an agroecological fashion; focusing on a holistic and interdisciplinary approach to food system sustainability from farm to fork. In many instances these CSO's are also beginning to play pivotal roles in influencing political decisions (Scholte, 2004) and shifting existing technocratic regimes. However, most CSO's do not yet have a holistic approach that embraces organic nutrient waste cycling (ONWC) particularly as it relates to urban food system sustainability. In addition, although much research has been done around participatory organic nutrient waste cycling initiatives in the global south, this has not been so regarding the global north where there is an stronger technocratic approach to organic waste management.

To address this research gap the objective of this study was to determine opportunities and barriers for civil society organizations (CSOs) to increase the development and adoption of holistic and participatory forms of organic waste management involving urban agriculture at the community level where there was an existing technocratic waste regime. The two research questions which supported the study are:

1) How can a CSO encourage participation in a community level organic nutrient waste cycling initiative?

2) How is a CSO's ability to implement participatory organic nutrient waste cycling initiatives affected by the existing technocratic waste regime?

The actors mentioned in each research question can be seen as working within different, but likely overlapping, systems (internal (local community), external (city, regional, country, etc.). This research is therefore attempting to understand these different system actor relations in order to identify where there is room for improving the current situation (i.e. the research objective). The first research question looks at the interactions between two actors: the CSO facilitating the Compoststraat initiative and the DZ community (made up of individuals) at the local level. The second question addresses how the ONWC initiative is affected by the current technocratic waste regime, also insinuating multiple and overlapping system level relationships.

Methodology

In order to explore this topic in depth, I leaned on principles of agroecology and systems thinking for theoretical context. Agroecology is based on evaluating and building food systems holistically and recognizing that changing one element can have a beneficial effect on some aspects of the system, while degrading others (Gliessman). Agroecology is rooted within the concept of 'systems thinking' as it emphasizes "understanding of a phenomenon within the context of a larger whole […] to study the nature of their relationships" (Ison, 2008). These theories embrace the complexities found in this (and any) urban community and helped to identify its place and relationships within surrounding systems.

Qualitative methods of data collection included semi-structured interviews with DZ community members, government employees on the local, regional and national levels, CSO members working within urban agriculture and nutrient waste cycling in and around Rotterdam and one small/medium enterprise promoting urban gardening and civil maintenance. Participant observation and three physical 'work days' in the DZ garden complex were also important aspects of data collection. Data analysis

included coding and analyzing transcribed interviews and field observations and secondary source analysis of government documents, websites and grey literature.

A system map of the finished codes was drawn to assist in analysis and organizing the final themes that could be extracted from the collected data and is shown in **Error! Reference source not found.** below. The figure displays four main areas of focus for this study and their interactions.

1. **Internal system influence:** Influences directly affecting DZ residents which may affect their participation in the *Compoststraat* initiative (local). (Upper, red)
2. **External system influence:** Elements influencing the success of a community level composting initiative as discussed in stakeholder interviews. (Lower, blue)
3. **Potential CSO influence:** Where the internal and external systems converge showing overlapping themes. This is where the CSO can potentially have an influential role on both the external and internal systems. (Middle, purple)
4. **Communication** is a final theme which is visually expressed by the arrows in the figure. The arrows represent the potential that CSOs can have in influencing both internal and external entities. Although the arrows point in one direction, it should be noted that communication flow in both directions.

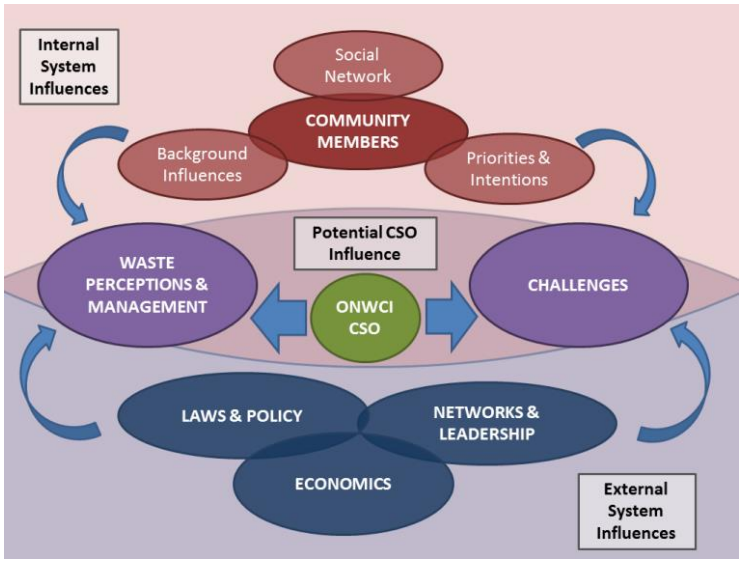


Figure 2: Community level ONWC initiative system map illustrating the relationships between internal and external systems and potential influential role of the facilitating CSO.

Findings

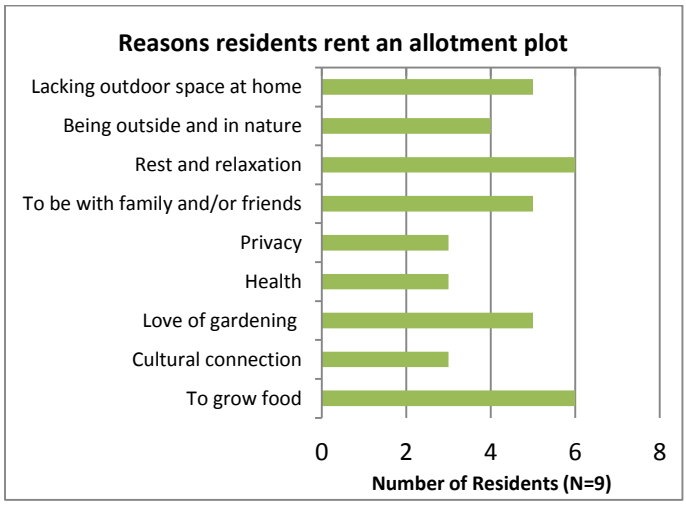
Internal System Influences: Community Exploration

The first area of exploration is the internal system, or the local DZ community as it relates specifically to the *Compoststraat* initiative. Five key areas were identified as influencing the ability of a CSO to facilitate an ONWC initiative for better or for worse.

1) *Community atmosphere*: The DZ community has a friendly air and this element can be used by a CSO to encourage community level cooperation for the ONWC initiative by building on the existing communication and knowledge sharing network. In communities where this is not the case, encouraging community engagement would require additional attention. Understanding the audience at hand and having the community feel connected and responsible for the initiative is an important element CSO's should not take for granted.

Figure 3: DZ has a friendly and neighborly atmosphere. Community members work together to accomplish tasks as needed, including garden maintenance within the compound (right) and at Compoststraat (left).

2) *Reason for having a plot*: A CSO should have a general understanding of the intentions and priorities of the residents in the community. There will always be some more interested than others whether for lack of time or lack of interest. Recognizing these differences and building on those that value an ONWC initiative is key to successful implementation.



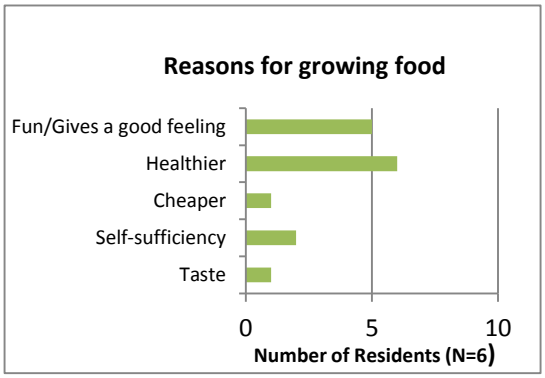


Figure 4: Reasons residents (N=9) listed for renting an allotment plot (left) and reasons for growing food as stated by the 6 residents who listed 'growing food' as a main reason for renting a plot (right)

3) *Communication* (resident-to-resident & leadership levels): Recognizing internal communication networks and what is expected and well received by the community members is essential in order to avoid exclusion and attract the most people. In cases of favoritism or difficulties communicating (language barriers, cultural differences) this proves to be an inhibiting force.

4) *Perceptions of organic waste*: Perceptions of organic waste are also areas that a CSO can use to build upon, such as in the DZ community where most residents are aware of and value ONWC. Perceptions

that act as an inhibitor, such as those surrounding humanure, must be addressed in a way that make the practice more familiar and acceptable by having those that are more receptive provide concrete examples for those less inclined.

Figure 5: Compoststraat (left) provides a concrete example of a way to dispose of organic waste more cheaply while keeping nutrients within the local cycle. Putting green waste in the dumpster to be incinerated (right) demands additional waste hauling costs, cost for purchasing finished compost for the gardens and has many other negative effects.

5) *Opinions regarding organic waste management*: This research has found that organic waste management techniques are mainly recognized as individual responsibilities which may make it difficult to implement a community level ONWC initiative, unless the benefits for both the community and the individual are recognized by all involved. Elements such as the existing technocratic treatment of waste without separation in most of Rotterdam could hinder the initiative by creating differences and disconnections between home and garden behaviors. Therefore, residents expect and need knowledge provided by the CSO implementing the ONWC initiative.

Internal & External System Influences: Leadership & Networks

This study has found there are many different roles a CSO must play in order to implement a successful community level ONWC initiative, on both the community and higher system scales. Playing a diverse set of roles helps to overcome obstacles and also takes advantage of the greatest amount of opportunities available. The CSO's degree of engagement may vary, however, depending on many aspects which should be determined through a process of exploration and familiarization with the community's needs. Some influencing factors may include but are not limited to internal elements such as the community (size, knowledge level, interest level), the CSO's own willingness and ability, and external elements such as the applicable laws and policies, governmental influences, the existing waste regime and the economic climate.

'Leadership' and 'Networks' are two themes which rose most consistently within this study and have been determined as essential elements to implementing successful initiatives by CSO's both in the internal (DZ community) and external (other CSOs and stakeholders in Rotterdam and the Netherlands) systems. Three different topics were found to be particularly necessary at numerous system levels fir CSOs implementing ONWC initiatives.

1) *Leadership role a CSO is **expected** to play*: This study found that the responsibility of both implementing and ensuring the continuation of an ONWC initiative falls on the CSO at both the internal and external system levels. In doing so, the CSO should meet or address the following topics of concern. Have or provide expert knowledge on the subject of ONWC, employ community engagement and organization skills (including but not limited to organizing education, labor, time, and continuity) and organize/maintain physical upkeep for the site (such as meeting aesthetic expectations, controlling supply and demand and monitoring product quality).

2) *Networking within and between system levels*: The CSO should have network connections, both as a recognized individual within the host community and with numerous external stakeholders such as other CSOs and SMEs employing similar initiatives, government officials, research entities, civic governance groups and lobbyists among others. By having open communication this study has shown ONWC initiative leaders have increased implementation success. This can take place through five characteristics determined in this study: a) direct connection to a place (or places) that will both produce and use the organic waste as addressing supply and demand is essential to an ONWC initiative's success, b) to increase awareness of the importance of ONWC initiatives and the larger system benefits (such as moving toward a circular economy), c) to exchange information and knowledge regarding best practices, mistakes, etc., d) to better understand or use applicable laws and policies to the initiative's advantage or to determine where existing policies may be unnecessarily difficult to achieve or not stringent enough and e) to have necessary economic support and contacts.

Figure 6: The Compoststraat facilitator has recognized the importance of networking within the larger, external sytems and is educating non DZ community members about Compoststraat.

3) *Waste perceptions and management*: The CSO should understand the perceptions of waste on both the internal, community level and the external, city level in order to best alleviate issues that may arise regarding what is considered organic waste and acceptable management practices. Understanding waste perceptions also enables the CSO to take advantage of opportunities that may be available if they are in favor of certain aspects of ONWC. Concerning waste management, understanding the existing waste regime (both their practices and their influence within the system) is also essential. The CSO will benefit from recognizing how the ONWC initiative will fit within or as a separate entity from the exiting

regime. This way the CSO can work to ensure that the initiative will operate effectively in parallel or conjoined with the existing regime while still maintaining the ability to change with time as necessary.

CSO's role in implementing ONWC initiatives: Challenges and solutions

This research has identified numerous supporting and inhibiting factors that could influence the success or failure of a participatory, community level ONWC initiative. For this case, the main inhibiting factors exist at the community level and although understanding this case study's relation to the existing technocratic waste regime is also significant. Therefore, findings regarding challenges and potential solutions have been divided into two categories.

1) *CSO's leadership role within the community:* This research has found that there are many potential challenges within the internal (community) system level which arise for a CSO implementing the ONWC initiative. It is it often the responsibility of the CSO to overcome challenges (e.g. community participation, leadership responsibilities, placement within a dynamic system and expectations from both the community level and the higher system levels) as they see fit.

Community participation is of course an overarching goal for a CSO looking to facilitate an ONWC initiative and particularly to have residents connect with the initiative in such a way that they are willing and eager to participate in and dedicate time and energy to the initiative. There are a five CSO responsibilities this research has identified as possible means toward such an outcome of which were addressed and during a 2.5 hour participatory community composting workshop which was held in the DZ community center (see images below): a) Encouraging individuals to accept responsibility can likely be increased with stronger connection to the initiative and recognizing individual and community returns, b) Encouraging inclusion among community members and willingness to work together can be fostered with social gatherings and activities which will increase familiarity and also responsibility for community members and community projects such as an ONWC initiative. c) Organizing community participation through education, connection and motivation consistently (whether locating economic or other forms of external support) can help transfer leadership to ensure continuity of the ONWC initiative. d) Ensuring safety and quality control can be done by overseeing the ONWC initiative site itself and empowering the community to assist with this task. If the initiative is too large for one person, connecting to a wider support network is one solution. For the DZ case, the community workshop participants addressed this issue by designating 'Compost Ambassadors' throughout the complex to provide points of contact for individuals wanting for more information about composting and *Compoststraat*, e) The CSO should network and connect to members within the city government as this can not only help to provide a greater understanding of the applicable laws and policies, but can also help to recognize when such laws should be altered to best support local ONWC initiatives. This can also widen the knowledge sharing network by including other CSOs and research entities.

Figure 7: Photos from the DZ Community Composting Workshop which facilitated community member interactions, interactions with external system stakeholders, future visions, action planning, ownership and knowledge sharing.

2) *Local and city level organic waste perceptions and management behaviors*: Challenges in this research have also been linked to ONWC initiatives being established within an existing technocratic waste regime (a dynamic and ever changing system) which relates directly to perceptions and behaviors toward organic waste and organic waste management. The potential effects of this at the local and higher system level are important to recognize for the ONWC initiative.

At the internal, community and external, city level, specifically regarding perceptions and behaviors, the following four suggestions have been found as potentially beneficial: a) Perceptions regarding waste are variable and addressing them requires time for behavior to change. This point however, depends on both the individual as well as the system in which the individual exists. As seen in this research, changes in behavior and perception can be encouraged through ONWC initiatives. This is because ONWC initiatives have the potential to provide concrete and well maintained examples that clearly portray benefits for individual users and the larger city system, b) Behaviors regarding waste are also variable at different system levels with lower (local) levels being directly influenced by the existing technocratic regime. Action helps to change behaviors and action with support (education, repetition, familiarity, discussion, etc.) can lead to successful ONWC initiative at the local scale and also help to influence the city scale policy, behaviors and perceptions. The city of Rotterdam is already moving toward altering its existing waste management system to treat organic materials as a distinct and separate waste stream. However, it will take time for city residents to become accustomed to the required behavioral and perceptual changes, c) Community level ONWC initiatives are more flexible than the large scale technocratic regime as infrastructure requires economic investment and time. Smaller, decentralized initiatives can then work either independently or within the existing technocratic regime framework and provide examples that support a 'new' form of waste treatment. This relationship also provides space for the existing regime to support the ONWC initiative as necessary. To do this communication networks must be open, knowledge must be shared in all directions and economic hindrances must be identified and avoided (or managed) appropriately, d) The elements of infrastructure can be inhibiting on a city scale when discussing waste management. In contrast, if smaller decentralized initiatives are managed alongside of larger ones with multiple levels of connections between them (such as street level ambassadors, community level leaders and city section compost masters), there will be more stable

support structures and greater success in spreading knowledge. This will help to make ONWC a familiar part of individuals' daily routines, while helping to make large scale changes for ONWC more feasible in the future.

More Information:

For more information on this topic please contact Laura Cerrato at cerrato.laura@gmail.com.

You can also access her completed master thesis by using the following link: http://brage.bibsys.no/xmlui/bitstream/handle/11250/221088/Cerrato_AgroecologyThesis_BW.pdf?sequence=1