Tracing regime influence on urban community gardening: how resource dependence causes barriers to garden longer term sustainability

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Abstract

This article explores how resource dependence leads to barriers to urban community gardening. Nine barriers to urban gardening were identified: finance, space, organizational structure, water, external damage, soil, communication, interpersonal issues, and participation issues. Using process tracing and grounded theory, we found that these barriers could be divided into three groups: primary, secondary, and participation barriers. Primary barriers are caused and directly influenced by the regime, whereas secondary barriers are the result of decisions and actions taken while addressing the primary barriers. All of these barriers cause frustration and affects the ability of the gardens to retain and acquire new members. This affects the longer term sustainability of the gardens and their potential to contribute to an urban governance transition.

Keywords: urban gardening, community gardens, transitions, resource dependence

1. Introduction: urban community gardens and transitions

Urban community gardens (UCG) are increasingly populating our urban spaces [Stiftungsgemeinschaft anstiftung ertomis (2016)]. They have positive impacts such as community development [Peters (2008)], building social capital [Alaimo et al. (2008)], providing space for physical activity [Saldivar-Tanaka and Krasny (2004)], contributing to healthy body weights [Zick et al. (2013)], providing urban residents contact with nature [Maller et al. (2006)], as well as economic benefits [Draper and Freedman (2010)]. Moreover, UCGs provide habitats for a variety of plants and animals and fulfill important climatic functions in urban areas as they mitigate the urban heat island effect

[Dihlmann (2003); Crossan et al. (2015); Bauduceau et al. (2015)]. The three case studies in this analysis come from Berlin which has been called "the German capital of community gardens" [Meyer-Renschhausen (2010)] and the number of UCGs in the city has blossomed since the early 2000's [Stadtacker (2016)]. The government of Berlin has recognized the importance of urban gardening in both the guidelines for sustainable development [Senatsverwaltung für Stadtentwicklung und Umwelt (2016a); Senatsverwaltung für Stadtentwicklung und Umwelt (2016b)] and their development plan for climate [Senatsverwaltung für Stadtentwicklung (2011)].

Academics have discussed the rise of UCGs in terms of transitions in urban governance and the urban landscape [Bell and Cerulli (2012)]. This is because UCGs are community-based grassroots initiatives and such initiatives have the potential to spark transitions [Seyfang and Smith (2007); Seyfang (2010); Middlemiss and Parrish (2010); Smith et al. (2013); Seyfang and Haxeltine (2012); Hargreaves et al. (2013); Becker (2017)]. UCGs are usually social gardens in that they are participatory and focused on the community [Müller (2011)]. They are spaces where new ideas and alternative practices can be explored and improved upon [Kemp et al. (1998); Geels and Schot (2007); Markard and Truffer (2008)]. Such a transition would ask the UCGs to change the regime, the dominant rules and norms that are enforced by regime actors. Regime actors are actors that, whether purposefully or not, reinforce and protect that regime.

However, despite the positive impacts of UCGs, their growth in numbers, the recognition of the importance of UCGs, and academic literature discussing their potential to facilitate transitions, a transition has not yet been achieved. Thus, in this article we ask the overall research question: what are the barriers to urban community gardening and how do these barriers prevent an urban gardening transition? To answer this overall research question, several subquestions will be answered:

1. What are the barriers to urban community gardening?
2. What are the causes and effects of these barriers?
3. How do the barriers threaten an urban community garden's longer term sustainability?
4. What can be done to alleviate or reduce these barriers and what role do they play in preventing a transition in how we use urban spaces?

Thus to answer these questions, we will first review the multi-level perspective and resource dependence theory [Pfeffer and Salancik (2003)]. Sec-

ondly, we will describe the selection of case studies as well as the grounded theory [Glaser and Strauss (2009); Strauss (1987); Strauss et al. (1996)] and process tracing [Beach and Pedersen (2013)] methods used. In section 4, the results will be presented including the primary barriers, secondary barriers, and participation barriers. Lastly, we will explore the implications of the findings for transitions as well as how to alleviate some of the barriers in section 5.

2. Transitions and resource dependence

We employ the framework the multi-level perspective [Geels (2002); Geels and Schot (2007); Geels (2004)] to understand the position of UCGs in an urban gardening transition and the relationship between UCGs and the regime. The multi-level perspective is a framework for understanding socio-technical transitions [Geels (2002); Geels and Schot (2007)]. It consists of three levels of increasing structuration [Geels (2004); Verbong and Geels (2007)] and institutionalization [Fuenfschilling and Truffer (2014)]: the niche, the regime, and the landscape. An urban community garden is a niche, a site of innovation and alternative practices somewhat protected from the regime [Kemp et al. (1998); Geels and Schot (2007); Markard and Truffer (2008)]. In being a niche the UCG does the work of insitutionalizing and supporting their vision of a change [Becker (2017) and Becker et al. (2017)]. A regime is "... a coherent configuration of technological, institutional, economic, social, cognitive and physical elements and actors with individual goals beliefs or values" [Holtz et al. (2008)] and consists of the municipalities, developers, funders, and other actors who enforce and reproduce the status quo. The landscape is the cultural, environmental, and historic backdrop in which both the regime and niche operate [Grin et al. (2010); Rotmans et al. (2001)]. In order for a transition to occur it is the niche that must replace or become a part of the regime [Geels and Schot (2007)] through, for example, changing rules or practices. Such a transition could have both positive and negative aspects.

Niches such as UCGs sometimes rely on regimes for various resources, which allows the regimes to shape the niches [Becker et al. (2017)]. According to resource dependence theory, a theory on organization interdependency, UCGs dependent on the regimes will use the least restrictive method of minimizing their dependence, attempt to reduce uncertainty, and attempt to increase their independence [Pfeffer and Salancik (2003); Davis and Cobb (2010)]. Resource dependence theory will be used in this article to explain

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how regimes are able to influence the UCGs and create barriers within the gardens.

3. Methods

To answer our research questions we used grounded theory [Glaser and Strauss (2009); Strauss (1987); Strauss et al. (1996)] and process tracing [Beach and Pedersen (2013)] on semi-structured interviews from three case study UCGs. Pseudonyms were chosen for the UCGs to maintain the anonymity of interviewees and gardens: Neighborhood Garden, Public Park Garden, and Social Enterprise Garden (table 3). The case study gardens were selected from Districts that did not border with Brandenburg (the rural state that surrounds Berlin) to ensure that the gardens were urban. All of the gardens had to be established in or before 2013. Gardens were specifically selected that had different organizational structures and were willing to participate in the interviews. The gardens range in size from around $1200m^2$ to $1850m^2$ and range in age from 3 to 12 years since their founding.

Table 1: Designated name and description of each case study.

Pseudonyms	Description of the garden
Neighborhood Garden	Between 10 to 20 members. The object of this garden is to offer a place for neighbors to grow vegetables, fruit, herbs, and flowers. The garden has a loose organizational structure and its history has been marked by a struggle to find a suitable space for the garden.
Public Park Garden	Around 200 members. The goal of this garden is the cultivation of raised beds by neighbors and offering education on organic gardening. The garden offers workshops and cooperates with preschools, schools, and other institutions. Its organizational structure is stricter than the Neighborhood garden and its history has been one of growth in participant numbers.
Social Enterprise Garden	Around 100 members. The aim of this garden is to positively impact the surrounding neighborhood. The garden has the strictest organizational structure and attempts to raise money through some of its activities.

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The eleven semi-structured interviews (table 2) conducted with intervie-
wees from the gardens consisted of questions on the barriers faced by the
gardens, how they tried to overcome the barriers, and who helped them in
overcoming the barriers. The interviews were recorded and transcribed in
German. Additionally, field notes were taken during and immediately af-
ter seven participant observations and further questions were answered by
interviewees in three email conversations (table 2). All interviews and obser-
vations were conducted between July 2015 and April 2016. All interviewees
gave informed consent before the interviews were conducted.

Table 2: Designated name and description of each case study.

Garden	Name	Role	Description
Neighborhood Garden	Interview 1	Garden treasurer	Interview
Neighborhood Garden	Fieldnotes 1		Fieldnotes
Neighborhood Garden	Interview 2	Runs website and public relations	Interview
Neighborhood Garden	Fieldnotes 2		Fieldnotes
Neighborhood Garden	Interview 3	Administration and public relations	Interview
Neighborhood Garden	Fieldnotes 3		Fieldnotes
Neighborhood Garden	Fieldnotes 4		Fieldnotes
Neighborhood Garden	Fieldnotes 5		Fieldnotes
Neighborhood Garden	Fieldnotes 6		Fieldnotes
Neighborhood Garden	Fieldnotes 7		Email conversation
Public Park Garden	Interview 4	Garden member	Interview

Public Park Garden	Fieldnotes 8		Fieldnotes
Public Park Garden	Interview 5	Member, public relations, and administration	Interview
Public Park Garden	Fieldnotes 9		Fieldnotes
Public Park Garden	Interview 6	Garden board member	Interview
Public Park Garden	Fieldnotes 10		Fieldnotes
Public Park Garden	Interview 7	Member and in charge of water supply and composting	Interview
Public Park Garden	Fieldnotes 11		Fieldnotes
Public Park Garden	Fieldnotes 12		Fieldnotes
Public Park Garden	Fieldnotes 13		Fieldnotes
Social Enterprise Garden	Interview 8	Executive director	Interview
Social Enterprise Garden	Fieldnotes 14		Fieldnotes
Social Enterprise Garden	Interview 9	Organizing events and running the cafe	Interview
Social Enterprise Garden	Fieldnotes 15		Fieldnotes
Social Enterprise Garden	Interview 10	Head gardener	Interview
Social Enterprise Garden	Fieldnotes 16		Fieldnotes
Social Enterprise Garden	Interview 11	Garden board member in charge of networking	Interview
Social Enterprise Garden	Fieldnotes 17		Fieldnotes

Social Enter-prise Garden	Fieldnotes 18		Fieldnotes
Social Enter-prise Garden	Fieldnotes 19		Fieldnotes
Social Enter-prise Garden	Fieldnotes 20		Email Conversa-tion
Social Enter-prise Garden	Fieldnotes 21		Email Conversa-tion

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Grounded theory [Glaser and Strauss (2009); Strauss (1987); Strauss et al. (1996)] was done on the interview transcriptions and field notes using QDA Miner Lite 4 [Provalis Research (2016)]. Memos were written throughout the analysis. Barriers to gardening and attempted solutions were identified by the interviewees. Moreover, process tracing was also done on the data to better understand the causes of the barriers. Process tracing is a method of following the data between cause and effect [Collier (2011)] including the mechanisms that move the process along between the variables [Beach and Pedersen (2013)]. In this article, process tracing is used most prominently in figure 1 and allows us to analyze how one barrier causes another and the mechanism through which this occurs.

4. Examining and tracing the barriers to garden longer term sustainability

Through using the methods described above, we located nine barriers to urban gardening (listed in table 3) and traced the causes and effects of the barriers (figure 1). Based on analyzing the data, the barriers were divided in three groups: primary barriers, secondary barriers, and participation barriers. These groups and individual barriers are further described in the subsections of this article.

Table 3 lists the barriers described by the interviewees along with the gardens affected, as well as efforts to solve or mitigate the barriers by different actors. These actors include members of the gardens, other grassroots or community-based initiatives, and regime actors. The initiatives can include

local organizations within the garden's network such as other community gardens or neighborhood non-profits whereas the regime actors include government officials and larger organizations such as national organizations. What is clear from table 3 is that for some of the barriers the gardens received more external assistance than for others. For the finance, space, and organizational structure barriers (the primary barriers) there was significant external support from both other community groups and regime actors. The secondary barriers were more mixed with the soil and water barriers receiving direct inputs specifically from regime actors, while the other secondary barriers (externally-caused damage, communication, and interpersonal issues) were mostly handled internally by the gardens. The gardens also had support in dealing with the participation barriers; however, this assistance was more an attempt at mitigating the barrier than direct help. This was because the external actors helped the gardens through supporting them in acquiring new members rather than through helping the garden retain existing members.

Table 3: Description of barriers to UCGs identified by interviewees as well as affected gardens and attempted solutions

Barriers to urban community gardening identified by interviewees	Description	Gardens affected	Attempted solutions by gardens	Attempted solutions by other grass-roots and community-based initiatives	Attempted solutions by regime actors
Finances	Difficulty acquiring the means to pay for gardening activities	All three gardens, although particularly the Social Enterprise Garden	- Asked for donations - Members invested personal money - Affiliation fees - Raised money through gardening activities - Took on jobs from companies	- Passed on jobs to the garden	- Did not ask for rent - Donations

Space	Difficulty finding a location or uncertainty about the ability to stay at its location	All three gardens	- Raised awareness through demonstrations and flyers - Lobbied for a space - Networked - Contacted decision makers - Applied for space	-Helped them move - Supported them during workshops - Argued against construction planned for their space	- Provide them with space - Press coverage of their eviction - Connected garden to other regime actors that could provide space
Organizational structure	The difficulty of having and working with a particular organizational structure	All three gardens	- Core group met for plenums - Distributef tasks among members/specialized groups - Organized regular meetings - Reduced unnecessary tasks - Improved communication	-Another niche actor took over as their legal form - Another garden advised from the beginning - Offered meeting space and offices	- Offered meeting space and offices

Obtaining water	Difficulty acquiring enough water or uncertainty over enough water for the garden	The Neighborhood Garden and the Public Park Garden	- Connected to a nearby water pump - Managed water communally - Paid for water - Purchased water tanks - Paid for permanent water connection		- Provided water during certain times of the year/for a particular number of years - Organized water point - Provided funding for water connection

Externally-caused damage	Includes damage done to the garden by individuals external to the garden including theft, vandalism, garbage, and damage caused by dogs and their owners	The Neighborhood Garden and the Public Park Garden. The Social Enterprise Garden was only slightly affected	- Used locks on shed - Repaired items - Stored items in fenced area - Improved infrastructure - Communicated with potential perpetrators in person and through information boards - Communicated problems with District office - Had opening hours - Had a fence - Raised beds -Installed additional trash cans		- Provided fenced area - Cleaned once a year

Soil	Having to work with or manage alternatives to poor quality or non-existent soil	All three gardens	- Internally communicated - Added and organized enrichment of soil - Used raised beds - Purchased soil - Developed compost - Individual gardeners enriched their soil	- Provided information on where to get soil	- Provided with nutrients/ compost - Provided funding

Communication	Difficulty delivering information to members and partners	All three gardens	- Plenums and working group meetings - Emails -Updated website - Introduced communication rules at meetings - Weekly newsletter - Organized workshops on communication - Major focus of the management - Instructions had to be confirmed via email - Hierarchy - Simplified the number of means of communication - Hired a mediator - Found someone to focus on this problem (intern)	- Prepared a workshop on communication	

Interpersonal Issues	Inability or difficulty managing and incorporating people with mental health conditions or people with different views of the garden	The Neighborhood and Public Park Garden	- Internal communication - Kept record of participants - Expelled certain members - Conducted interviews and work trials - Put up a fence - Hired a mediator		

Participants	The barrier of participants includes issues of both retaining the members that the gardens have and acquiring new members to replace those members that have left	All three gardens, although the Public Park Garden did not have difficulty acquiring new members	- Updated and promoted via website, workshops, and other events - Had someone present in the garden - Networked - Informed new members of time commitment - Specialized work groups for the issue - Distributed workload - Employed people when possible	- Shared experience on how to get people involved - Used network to promote garden	- Sponsors connected them to other grass-roots initiatives - Promoted gardens

Figure 1 shows the causal chain of the regime influence on the urban community gardens and the gardens' longer term sustainability. The regime begins the causal chain and the numbers next to the lines with arrows are mechanisms that move the process of causation forward [Beach and Pedersen (2013)]. The regime can be either active or passive in starting this process. An index of mechanisms is listed on the right of the figure. Barriers to gardening are variables that arise between the regime and the ultimate effect, the participation barriers. However, figure 1 does not show all of the relationships between the barriers, specifically how the presence of some barriers can make other barriers worse, for example, the cost of water can exacerbate

the existing financial barrier. This is because the financial barrier pre-existed
the water barrier and thus cannot be said to have caused the financial bar-
rier. Moreover, addressing some barriers will help mitigate other barriers.
However, figure 1 focuses solely on the cause and effect relationship between
the barriers. Other relationships between these obstacles are mentioned in
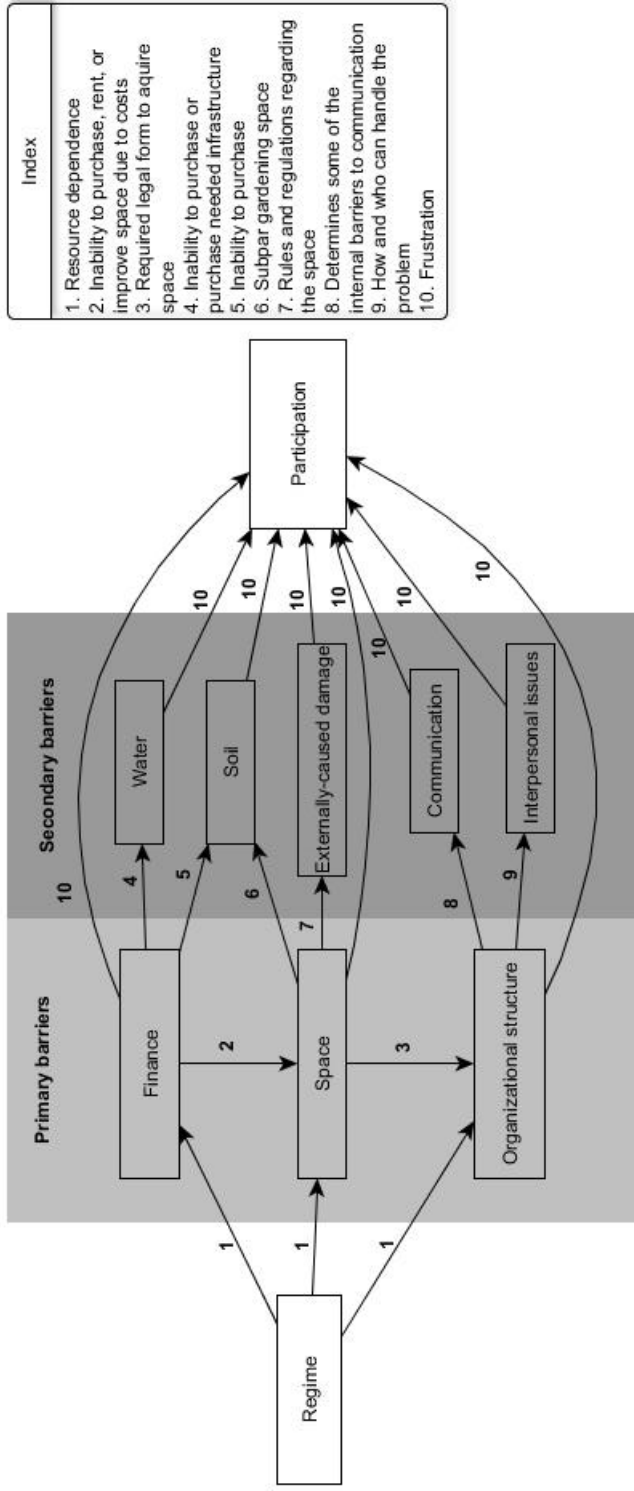their descriptions that follow.

Figure 1: Process tracing the process of how the barriers in urban gardening influence garden longer term sustainability

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1. Resource dependence
2. Inability to purchase, rent, or improve space due to costs
3. Required legal form to aquire space
4. Inability to purchase or purchase needed infrastructure
5. Inability to purchase
6. Subpar gardening space
7. Rules and regulations regarding the space
8. Determines some of the internal barriers to communication
9. How and who can handle the problem
10. Frustration

Primary barriers

Secondary barriers

Regime

Finance

Space

Organizational structure

Water

Soil

Externally-caused damage

Communication

Interpersonal issues

Participation

Primary barriers

Primary barriers arise early in the history of the gardens and are defined here as those barriers that are the result of and heavily influenced by the regime. The primary barriers are space, financing, and organizational structure. The regime is able to influence the gardens and cause these primary barriers because the gardens must rely upon the regime for resources. This is particularly seen in the space and organizational structure barriers as the gardens were somewhat effective in reducing their dependence for the financial barrier.

Firstly, finances influence the ability of the gardens to gather resources and conduct tasks related to their work that require money such as aquiring tools for the garden or holding certain events. For the finance barrier, the UCGs were mostly successful in reducing the resource dependence on the regime and after some initial donations and assistance in set up, the Neighborhood Garden and Public Park Garden were able to largely operate without funding from the regime. The Social Enterprise Garden, however, was particularly concerned with finances as it had fixed ongoing costs and aimed to host many events, and continued to rely on the regime for funding. As one interviewee explained, "Another problem or challenge is certainly finances, especially our project that is to be understood as a social enterprise. We have an idealistic mission, but at the same time we want to be economic" (Interview 11). The garden attempted to raise money through some of its activities, although some of its streams of income can be inconsistent. The pressure to produce income to meet fixed costs led to overwork and a focus on finances. This was to the detriment of other activities within the garden causing some members to leave. All three gardens undertook activities to improve their financial situation of which most did not involve the regime, such as asking for donations, charging membership fees, charging rent for garden beds, receiving money from external stakeholders, and selling produce. Consequently, the Neighborhood Garden and Public Park Garden had few ongoing costs and thus felt they were able to meet their needs through available means of financing. Conversely, the members of the Social Enterprise Garden also felt the barrier was overcome, however the garden still constantly worked to address finances as they attempted to earn enough money to pay for their activities. As one interviewee described, "A big problem is always finances, especially under the heading of self-sufficiency" (Interview 8).

The issues of finding a space and finance are closely related. In fact two of the gardens, the Neighborhood Garden and the Social Enterprise Garden,

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had to move location because they could either not afford to purchase the space or afford to improve it. As one interviewee described, "A big problem in the beginning was the relocation because of the fire protection measures. That was connected to financing as we could not afford it [the measures]" (Interview 8). In general all three gardens have faced difficulties in acquiring and keeping space for their garden. The barrier of space includes the broader lack of available green space as a result of the historic landscape in Berlin and the current regime pressure to develop current brownfield locations and available green spaces which often are the types of locations that host UCGs. This low level of available space and pressure on the space makes it difficult for gardens to find adequate locations. Thus, finding space for a garden can take a great deal of work including raising awareness, networking, presentations, and lobbying officials. Moreover, at some point all three gardens had to rely on local government and all three gardens at the time of the interviews resided on property that was owned by a department of the local government. Moreover, the different spaces came with different constraints that led to secondary barriers. Their reliance upon the regime for space led them to taking poor quality space with these constraints which can be counterproductive to the longer term sustainability of the garden. Chief among these constraints was uncertainty over being able to keep the space which negatively affected the gardens. The Public Park Garden, for example, did not have a contract for their space; meanwhile the Social Enterprise Garden was located on a site that was allocated for development. As one interviewee explained: "[w]e don't have a lease contract... [a]nd that also means that this area itself is legally not documented. That also means that it is an area that is still under negotiation." (Interview 5).

Thirdly, the organizational structure of the gardens and the difficulty in balancing the need for structure with democratic participation affected all three gardens. It is influenced by the regime through the gardens reliance on the regime for the resource of space. All three gardens had to have a legal form of organization in order to cooperate with the local municipality for their space. The process of applying for and maintaining a legal form of organization subjects community-based organizations such as UCGs to requirements and pressures to conform to certain organizational structures [Becker et al. (2017)]. The decision of which legal form of organization to take influenced the organizational structure of all three gardens: the Neighborhood Garden's decision to belong to a larger umbrella organization allowed it to maintain a looser and more democratic organizational

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structure whereas both the Public Park Garden and the Social Enterprise Garden had legal forms that required stricter organizational structures. For the Neighborhood Garden, however, the looser structure made it difficult for the garden to require members attend meetings and thus the garden relied on a small group of active members to organize. This led to communication problems and risks the longer term sustainability of the garden if members of the small organizational team leave. The Social Enterprise Garden had the strictest required structure and it therefore had to fill certain positions within their ranks. This led to difficulties in maintaining direct democratic decision-making structures. Meanwhile the Public Park Garden had experienced both a loose structure in its early days when too little organization led to mismanaged garden beds and people joining without applying, and a more strict structure which led interviewees to comment that too much management can drive members away. One interviewee described the problem "The wish and aspiration to work communally is usually quite big, but if there are certain positions to fill there are not too many people who are willing to take it on." (Interview 6). The organizational structures of community-based initiatives such as UCGs have repercussions for communication, a secondary barrier, and the spread of new ideas within the initiative (Haussmann and Becker (2017)).

Secondary barriers

The secondary barriers are those barriers that are caused as a result of the primary barriers and decisions made while addressing those barriers. This could be seen in the secondary barriers water and soil where as a result of the decision to address the primary barrier of finance through raising funds through their gardening activities, the Social Enterprise Garden was able to overcome these secondary barriers. These barriers are less directly influenced by the regime; however, regime actors do play a role in mitigating some of the barriers.

Firstly, two of the gardens (Neighborhood and Public Park Garden) experienced a barrier around the acquisition of water. This problem of accessing water resulted from issues of finance, as one interviewee described, "[T]he provision of water is difficult as the costs for it increased. This puts more pressure on our [garden]" (Interview 4). The Neighborhood Garden relied on the District for water. The District turned off the water every winter and did not turn it back on until June the following year. This led to issues with watering plants in the springtime. However, the garden was afraid to

approach the District to turn the water on earlier because they were afraid the District would ask them to pay for the water. The Public Park Garden initially used a nearby water spot illegally before a state owned company secured water for them. However, the garden had to pay for this new water source, a financial burden that the garden was not able to fully meet, leaving parts of the garden unwatered during hot summers. "Then there was the aspect of the water supply. We could no longer get it [for free] from the fire hydrant, but instead had to organize hoses. That was also very expensive for the garden." (Interview 4). Ultimately all three gardens relied on the regime to secure the water resource for them: the Neighborhood Garden through the District-provided water, the Public Park Garden through the state-owned company, and the Social Enterprise Garden through applying for and receiving funding.

One of the barriers to urban community gardening that resulted from gardens having to accept lower quality spaces was that all three gardens had poor quality soil at some point and two of these gardens were still actively dealing with this barrier at the time of the interviews (Neighborhood Garden and Public Park Garden). Problems with the soil included sandy soil, unfertile soil, contaminated soil, and working in locations without readily available soil. As one interviewee described, "The soil on the property is not very fertile. Berlin used to be swamp land and the soil is pretty dry and sandy." (Interview 2). This barrier was exacerbated by communication and management issues as gardens attempted to cope with this barrier through enriching or bringing in soil. For example, some gardeners were not told they needed to enrich the soil in the Neighborhood Garden. Moreover, the Public Park Garden failed to acquire enough good quality soil for all of its gardeners. However, the garden had to put off purchasing new soil until there was certainty on whether they could stay in their location due to the costs of acquiring the soil. The Social Enterprise Garden was able to use investment money put into the garden to purchase good quality soil.

All of the case study gardens had experienced barriers to gardening regarding damage to the gardens caused by external individuals. This barrier was the result of poor quality space that had constraints that impact negatively the gardening projects. Particularly the Neighborhood Garden and the Public Park Garden resided on spaces that did not allow them to erect fences around their gardens. This was because they were on public spaces and the municipality required them to be open to the public to visit at all times. For example, one interviewee explained, "as a public garden we also

have the problem that there are people in the garden during the evening and night who do not behave in favor of the project" (Interview 7). The Social Enterprise Garden, however, was able to avoid this type of damage because they have been permitted to build a fence around their garden. The damage done to the gardens falls into four categories: theft, vandalism, damage done by dogs, and litter. Theft was reported by all three gardens and items that the interviewees reported stolen include: their harvest, plants, and materials. Vandalism was a problem for both the Neighborhood and Public Park Garden including damage done to furniture, plants, gardening materials, water tanks, sheds, as well as individuals urinating and graffiti. Such damage made it difficult for the gardens to conduct their day to day business. For example, damage done to the chairs in the Public Park Garden made it difficult for the group to sit together for workshops. These issues also affected the gardens financially if items had to be replaced or rebuilt. Many items were damaged repeatedly as one interviewee described, "the door of our hut... has been broken three times already. We did have a gardener who affectionately repaired it, but when it happened the third time he took out the door for good" (Interview 4). Both the Neighborhood Garden and the Public Park Garden experienced issues related to dogs such as feces, urine, and the digging-up of garden beds, as well as dog owners threatening gardeners. Moreover, both gardens experienced issues with litter being left throughout their gardens including drug needles. The combination of litter and dog issues led some gardeners at the Neighborhood Garden to fear contamination of the garden beds and led them to plant flowers instead of edible plants as described by one interviewee: "I had the goal of cultivating vegetables, and also being able to eat it. This idea I have totally discarded due to the circumstances... [because]things get destroyed, dogs are running around, [as well as] the dog's feces and the garbage ..." (Interview 3). The gardens attempted to mitigate the issue through activities such as using locks, repairing broken items, working with raised beds, and installing additional trash cans.

All three gardens experienced difficulties with communication, particularly intraorganization communication. Interviewees from two gardens (Neighborhood Garden and Social Enterprise Garden) mentioned that it was difficult to get members to attend meetings, which were a major source of information within the gardens. Interviewees also mentioned disagreements among members over what information needed to be shared (Public Park Garden and Social Enterprise Garden). All of the gardens had issues with the volunteer nature of their members and thus delays in reading and re-

sponding to emails. As one interviewee from the Neighborhood Garden explained, "[w]e use emails and plenums as means of communication, but we have people who do not use them. Some of them do not want to use them and others, especially older people, do not want to learn how to use emails anymore" (Interview 1). Interviewees from both the Public Park Garden and the Social Enterprise Garden commented that finding the right balance in terms of amount of information to provide members was difficult with some commenting that too much information as overwhelming and too little led to complaints. Communication issues led to lower productivity (Neighborhood Garden and Social Enterprise Garden), the discouragement of new members (Public Park Garden and Social Enterprise Garden), and tensions among members (Public Park Garden and Social Enterprise Garden). As one interviewee stated, "[c]ommunication is definitely a problem because certain things failed because people did not communicate" (Interview 8). However, interviewees commented that communication is improving in the Public Park Garden and the Social Enterprise Garden and both gardens were able to use their more strict organizational structure to organize their communication.

Interviewees from two gardens, the Neighborhood Garden and the Public Park Garden, reported interpersonal problems as a major barrier for their garden. Both gardens had difficulty managing and coping with people with mental health conditions and those that the interviewees felt were not complying with the groups' aims. Both gardens were generally open to whoever wished to be involved in the garden, although the Neighborhood Garden was more so with a loose organizational structure whereas the Public Park Garden had more control over membership as new members had to apply for a garden bed. Nevertheless, for the Public Park Garden the issue led to a crisis that almost destroyed the garden with members threatening to leave if it was not handled. This situation ultimately led to most of the management board resigning, the offending individuals excluded, and several other members voluntarily leaving. As one interviewee from the Public Park Garden explained, "[t]here were people who had psychological difficulties and the managing committee had problems to show those people limits. This led to disputes among the board that then later resigned." (Interview 5). The Neighborhood Garden, moreover, had frustrated members and potential new members scared away. The gardens used communication, workshops, and mediation in an attempt to deal with this barrier, however, individuals leaving either voluntarily (Neighborhood Garden) or being expelled (Public Park Garden) was the ongoing solution in both gardens. However, the

Social enterprise Garden appeared to have mostly avoided this barrier by conducting interviews and one-day work trials. They were able to do this due to the strict organizational structure they decided upon when facing the organizational structure barrier.

Participation and garden long term sustainability

The last type of barriers, participation, was the result of the frustration and disenchantment of members of the three gardens because of the primary and secondary barriers. The regime had the least direct influence on this barrier and instead was only able to mitigate the barrier through promoting the garden to potential new members.

Firstly, all three gardens faced issues with retaining members as a result of the frustration from the previously described barriers. One interviewee explained, "I did not have the time and nerves any longer to be active in the garden because of the numerous problems" (Interview 3). For both the Neighborhood Garden and the Public Park Garden; a major cause of members leaving was the low quality space and the resulting associated problems, specifically the regular damage to the gardens. The Neighborhood Garden also lost members due to its long hunt for a space and multiple moves and was experiencing a decline in membership at the time of the interviews. Issues of time commitment have caused a loss of members in both the Public Park Garden and the Social Enterprise Garden. In the Public Park Garden it had done so in terms of the time commitment required to take care of the garden beds and participate in the organization. In the Social Enterprise Garden it had done so in terms of overwork of its members on the many events and workshops that the garden undertakes to deal with the financial barrier.

Secondly, in order to mitigate the loss of members, the UCGs can recruit new members to replace those lost. The Public Park Garden experienced fewer issues with the participation barriers. This is because even though members were leaving, enough new people were interested in the garden to replace them. However, both the Neighborhood Garden and the Social Enterprise Garden faced issues in convincing new people to join their gardens as a result of the barriers. For the Neighborhood Garden this was largely the result the lack of appeal of the garden because of the soil issues and damage done to the garden. Interviewees commented that the garden had to solve its other problems before tackling the issue of recruiting new members. The Social Enterprise Garden, on the other hand, had issues in recruiting enough new members to carry out all of its planned tasks resulting in overworked

members. While the Neighborhood Garden did not actively work to recruit new members, both the Public Park Garden and Social Enterprise Garden conducted activities such as workshops and events to reach out to potential new members. However, even though new members could replace those that left, the loss of the knowledge and experience that those leaving take with them could negatively affect the gardens. Moreover, on top of these issues in recruiting new members, interviewees also mentioned that interest in the gardens has decreased with age. "In the beginning of the project... there were numerous people who wanted to join and help. In the second season however the number of people involved declined" (Interview 8).

The barriers of participation can directly influence the longer term sustainability of the UCGs. This is because while other barriers, such as space, make it difficult to do urban gardening, solutions can often be found at least temporarily to mitigate those barriers. Moreover, even if a temporary mitigation measure cannot be found, with participants the garden can network, lobby, raise awareness, etc. until a solution is found. However, without members the garden no longer exists and the barriers cannot be overcome. One interviewee summed up this argument when asked how important it was to solve the issue of theft in the garden: "[i]t would be extremely important as people are leaving the garden because of it, it is threatening our existence" (Interview 5).

5. Discussion and conclusion

Our analysis shows that primary barriers lead to secondary barriers to urban community gardening. Both the primary and secondary barriers cause the participation barriers which threaten the longer term sustainability of the gardens. This has the potential to threaten any positive transitions related to the UCGs. This is because the garden would need to advocate for their vision of an urban landscape in order to change the regime. Thus, because resource dependence and the primary barriers are the cause of those problems (as shown in figure 1), organizations seeking to help gardens should focus on these two issues. Such assistance would not only address the causes, but also potentially increase the long term sustainability of the UCGs. As changing the regime is the very definition of a transition [Geels and Schot (2007)] this remains the goal.

The regime and regime actors, moreover, play a role as one of the causes of the barriers to urban community gardening, as well as a role in the miti-

gation of many of these barriers (table 3). The UCGs were most successful in reducing the primary barrier finance through means that mostly involved reducing their dependence on the regime, for example through raising their own funds. The UCGs were less successful in reducing their space and organizational barriers. However, since it is the regime that is the cause of the primary barriers through resource dependence, it can be presumed that the regime actors may be able to reduce some of their effects. For example, to mitigate the space barrier municipalities could improve the situation for gardens by decreasing the rules on the spaces provided to the gardens by municipalities. Such activities would have the additional benefit of reducing related secondary barriers. To address the resource dependency and primary barriers, regime actors can:

1. Encourage UCGs to diversify their means of acquiring resources. This could be done, for example, by facilitating networking events or using grant money to encourage gardens to think about how they will deal with resources.
2. Make available permanent spaces to UCGs. Finding permanent space was difficult for the gardens and making more permanent spaces available to the gardens would increase their longer term sustainability. It would also encourage them to spend time and money upgrading those spaces.
3. Making it easier to apply for and maintain a legal form of organization would lessen this burden for the UCGs. It would also make it easier for the UCGs to acquire a legal form that would allow them to collect money.

In the interest of saving effort and resources, this analysis suggests that gardens themselves should focus on the primary barriers as it is these barriers that influence the barriers that follow. Moreover, the findings indicate that the gardens should be cautious in the way they address the barriers as this has repercussions for the later barriers in the causality chain. The findings of this article indicate which barriers a new garden is likely to face and a list of attempted solutions by the case study gardens, allowing those interested in founding a garden to make a better informed decisions.

Additionally, this article suggests that regimes and resource dependence on regimes play an important role in barriers to transitions both in terms of causing the barriers and mitigating them. However, while the barriers located

in this article were at least indirectly related to the regime, future research may find other causes of barriers to UCGs such as internal group dynamics or conflicts between political agendas. Moreover, though this analysis has focused om UCGs in particular, a similar analysis could be completed for other types of community-based initiatives to explore similarities between the barriers experienced by the different types of initiatives.

6. Acknowledgements

7. Bibliography

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