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Title: Community Gardens as Commons - A Typology for Self-Governed Food Production Networks

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Abstract

Urban agriculture has become a rapidly growing international movement. The amount of types of agricultural activities is as diverse as the cities, places or people that are involved in this movement. One type of urban agricultural activities is urban gardening, where subunits like community gardens exist. Even within this smaller unit a high diversity exists. Urban spaces, diverse in location (e.g. rooftops, airfields), size (a few square meters up to hectares), ownership, use rights distribution or legal status become new collective gardens, constructed out of a variety of urban resources (e.g. knowledge, infrastructure, financial means, recyclable material, manpower). However, what all community gardens have in common is their collective characteristic. Although community gardens are thus often listed as urban commons, they lack further scientific examination.

The purpose of this study is to build a typology of community gardens based on the degree of collectivity they reach and show causalities between certain characteristics of community gardens (e.g. size of the area, size of the community, management, participation, rules) that make the individual types distinct.

In previous research, we could already show that various degrees of collective resource use exist. In our current research, we want to explore collectivity in more detail and add the criteria: *permanence, fairness and trust*, *social meaning*, *rules compliance, problems,* and *success*.

With the help of an online survey we collected data from 113 community gardens throughout Germany and show diverse degrees of collectivity. By examine causalities, preliminary results indicate that size of the total community (involving gardeners that participate irregularly) do not have a significant impact on collectivity of community gardens.

Finding causalities will lead to better understanding of collective action in community gardens and the new and urban commons movement. It will further assist gardeners and city planners to establish, design, and encourage urban networks managed as self-organized regimes that in turn can contribute to more social and sustainable cities.

Keywords: urban agriculture, community gardens, collective action, commons, typology

1. Introduction

While food production in urban areas has always played a significant role throughout history, in the last three decades the importance of urban agriculture and urban gardening has increased, to become a growing international movement (Ferris, Norman, & Sempik, 2001; Smit, Nasr, & Ratta, 2001a, 2001b).

While growing food in cities is not new, it is the way of food production, the diversity, creativity, and the collective action. Regarding this, the focus of our research is on collective action in community gardens. We understand community gardens as collective part of urban gardens. While urban gardens further are part of urban agriculture.

Community gardens are, established, organized and managed by communities with different aims and motivations. Especially in developed countries, community gardens provide not only locally-produced food for urban residents (McIvor & Hale, 2015; Pourias, Aubry, & Duchemin, 2016) but also provide additional benefits (Armstrong, 2000; Guitart, Pickering, & Byrne, 2012; Lohrberg, 2016) such as agricultural knowledge and education, community cohesion and development, new experience inherent to democratic forms of governance, well-being, ecosystem services or green infrastructure (Barthel, Folke, & Colding, 2010; Bendt, Barthel, & Colding, 2013; Foster, 2011; McClintock, 2010; McClintock, Mahmoudi, Simpson, & Santos, 2016; McIvor & Hale, 2015; Nettle, 2014; Saldivar-Tanaka & Krasny, 2004; Spilková, 2017; Vejre & Simon-Rojo, 2016). All those benefits play a role in the increasing popularity of community gardens.

Community gardens are also an example of the *commons movement* due to their collective characteristic. Commons are complex institutions in which land and other resources are used collectively by self-governance and rules that are self-restrictive and self-sanctioning (de Moor, 2015). Understanding community gardens as commons can be very helpful in structuring garden management, and institutions in the surrounding community. There is considerable literature on the operation of commons that can be drawn upon. Community gardens can be classified as *new commons* which are described as shared resources that have recently evolved (Hess, 2008), and further as *urban commons* which are collectively shared urban resources (Foster, 2011).

In addition to that, the characteristics of the gardens that qualifies them as commons are highly diverse, with their structures and types of organization ranging from self-organization

by the gardeners with low or no formal obstacles to formal management by an association (Barthel et al., 2010; Bendt et al., 2013; Colding et al., 2013; Rosol, 2010).

Drawing on the gardens collective characteristic, we want to better understand how community gardens differ in their collective action, and how collective action is influenced by further characteristics of the community garden, such as the area (e.g. size, legal status) or the community (e.g. size, heterogeneity) of the garden project. Thus, the paper aims to explore various degrees of successful collectivity and it´s causalities.

Despite the international importance of community gardens, there is a recognized general lack of statistics and academic research on the topic (Bendt et al., 2013; Guitart et al., 2012; Lohrberg, 2016). Although studies on new and urban commons is an emerging field, and community gardens are often listed as examples of such commons (Colding & Barthel, 2013; Eizenberg, 2012; Hess, 2008; Linn, 1999), only a few studies actually examine community gardens in this respect (Colding et al., 2013; Foster, 2011). To continue research in this area, we develop criteria to examine and measure successful collectivity. We therefor collect data from community gardens throughout Germany and present causalities of successful collective action.

2. Diversity of Community Gardens

This chapter gives an overview of the multifaceted aspects of community gardens. Since there is no standardized definition for the term community gardens (Guitart et al., 2012; Rosol, 2010), we will propose one, highlighting the aspect of collective action.

Community gardens often emerge as bottom-up initiatives and their collective character is essential to their creation (Drake & Lawson, 2015; Nettle, 2014; Rosol, 2010; Simon-Rojo et al., 2016). They show various aims, motivations, structures and forms of organization, and further differ e.g. in size, location and services they offer to the community.

In contrast to private gardens, community gardens are sometimes called public gardens in reference to aspects of ownership, access, and degree of democratic control (Ferris et al., 2001). But, although many community gardens have public access, some have access restrictions, as for instance limited access hours. A closer look reveals that the ownership of the land being used can likewise be public, collective, or private.

In general, we understand community gardens as collective urban gardens. Further, we understand urban gardens as part of urban agriculture.

Drawing on Mougeot (2006) and Randolph (2011) who explore and define urban agriculture, the above characteristics lead us to define community gardens as follows: diverse places collective run and situated in urban areas, where food and nonfood plants are grown for individual or public needs by using unused or underused urban spaces and resources to in turn generate resources, services and products for the urban area.

Since those gardens are managed, organized and used collectively in different ways and extent they can be properly considered as commons.

The collective aspect of community gardens, is further what sets them apart from allotment gardens (in Germany known as *Schrebergärten*). Allotment gardeners have private, individual used garden plots and use only a few goods collectively, like path-ways, a clubhouse or playgrounds. These common goods are sometimes – but not always - open for the public while the individual garden plots are not (Bendt et al., 2013). Therefor these traditional gardens are not part of our research interest.

3. Current Scope of Community Gardens in Germany

The fact that community gardening is relatively new and a fast growing movement may account for the notable absence of systematic data on community gardens, whether on a national or international level (McClintock et al., 2016; Thompson et al., 2003). In Germany, 619 community gardens are listed in the most comprehensive database available (Stiftungsgemeinschaft anstiftung & ertomis, 2017). The dynamic growth of community gardens may also be derived from this data set (Fig. 1). Most of them can be found in the federal states of Berlin (75), Bavaria (93) and North Rhine-Westphalia (NRW) (87).

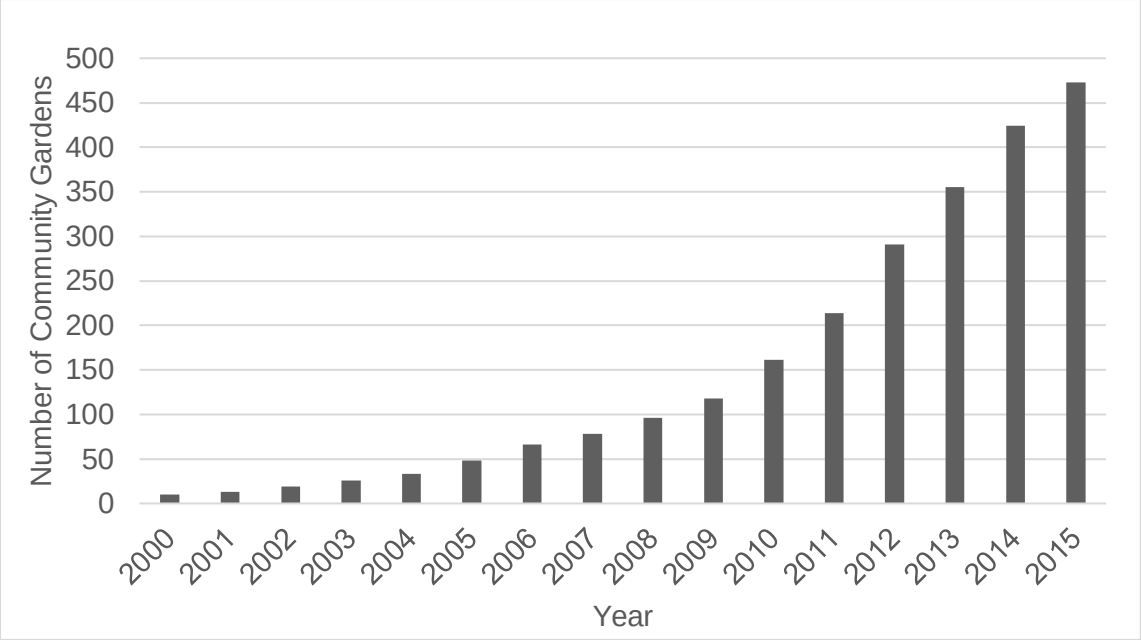

Fig. 1 Number of Community Gardens in Germany, 2000-2016
Source: Own figure following anstiftung und ertomis (2016)

4. Research Design and Method

The research design consists of three steps: selection of criteria to determine the degree a community garden is successfully managed as a commons; case study selection and garden survey; analyses of data to examine causalities between the degree of collectivity and further characteristics of the community garden project.

4.1 Criteria Development

To understand why, to what degree and under which circumstances community gardens are successful managed as commons, our study is based on a literature review, on several prior research projects (Armstrong, 2000; Bendt et al., 2013; Hess & Ostrom, 2006; Opitz, Berges, Piorr, & Krikser, 2016; Ostrom, 2009; Pourias et al., 2016; Rosol, 2010), as well as on own experience as an urban gardener.

Since community gardens could be considered commons based on their collective use of diverse resources, one criteria for determining community gardens as commons should examine what exactly is used collectively and to which degree. To examine collective action in more detail and draw conclusions on the performance as commons 6 additional criteria were identified: social meaning, fairness and trust within the community, permanence (of the project and group), rules compliance, problems, and success (Fig. 2). In addition, we developed 5 criteria affection successful collective action. These criteria are: community,

area, management, participation, and rules. All criteria are defined by diverse variables (Tab. 1 & 2)

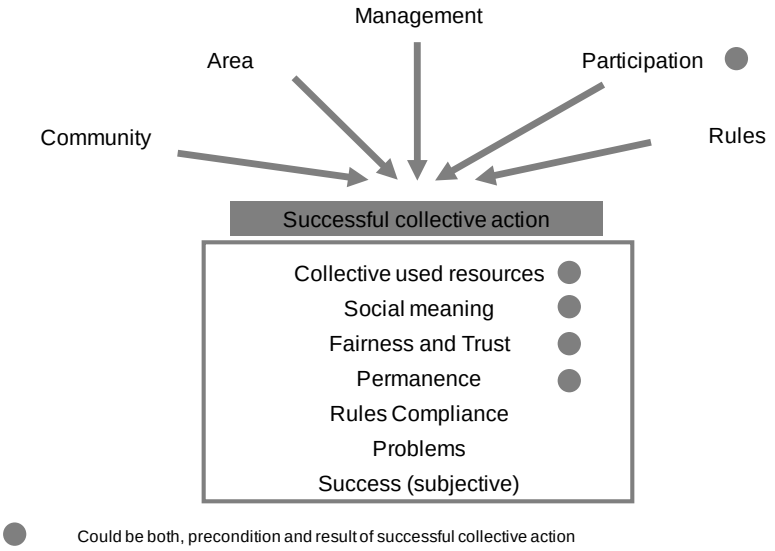

Fig. 2 Successful collective action and its affecting criteria (preliminary ideas)
Source: Own Figure

Tab. 1 Criteria and Variables affecting successful collective action

Criteria	Community	Area	Management	Participation	Rules
Variables	Founder	Access rights	Management right	Preconditions to participate	Flexibility
	Size	Access restriction	Management group	Participation: harvesting	Sanctions
	Heterogeneity	Ownership	Management form	Participation: management	Monitoring
	Communication	Legal status			Community size rules
					Access rules

Tab. 2 Criteria and Variables determining successful collective action

Criteria	Collective used resources	Social Meaning	Fairness and Trust	Permanence	Rules Compliance	Problems	Success
Variables	Style of use of 28 variables	Garden as social area	Fairness and trust within the group	Year of foundation and fluctuation within the group	Rules compliance within the group	Problems social interaction	Personal Success
						Problems joint resource use	Success Garden

4.2 Case Study Selection and Survey

Community gardens were selected through the online database of *anstiftung und ertomis* that currently lists 619 community gardens in Germany (Stiftungsgemeinschaft anstiftung & ertomis, 2017). The database offers information of gardens location, year of foundation, homepage, email address, size of the area, and additional information about the garden project. We collected further information such as: size of the city where the project is located or timeliness of the project (to check if gardens are still existing and active).

We excluded activities of gardening that appeared to be single public beds, guerilla gardening activities, with no characteristics of community gardens, and projects that can be characterized as closer to parks than gardens (e.g. >10.000 square meters). Since we also focus on urbanized areas we excluded gardens in cities with less than 20,000 inhabitants. We further selected productive urban gardens where vegetables and fruits are grown. Overall, we identified 411 gardens suitable for our investigation.

We used a questionnaire with predominantly closed questions or semi-open questions; the latter were included in order to discover additional criteria. The online questionnaire was directed to leaders or at least members of the core group of a garden, from whom we expected to have well-founded knowledge to answer specific questions. Prior research ensured that questions were easily understood and that the wording did not suggest any particular answer.

Of 411 questionnaires sent out, 113 completely-filled questionnaires returned (response rate of 27 %).

5. Results

In the following, we will present preliminary results of our study focusing on the criteria community size and successful collective action.

5.1 Gardens Community

The diverse structures of community gardens as mentioned above in turn leads to divers communities as well. For example, in public access gardens, we may find residents using the garden for recreation but they may not participate as gardeners. They therefore belong to an ‘external user group’. In addition, there is may a garden community which includes gardeners, participating as volunteers sometimes more irregularly. We call this group ‘total group’. Typically, there is a ‘core group’ of gardeners (regularly participating gardeners), as

well as a ‘leader group’ which may consist of the board members of an association or the garden founders.

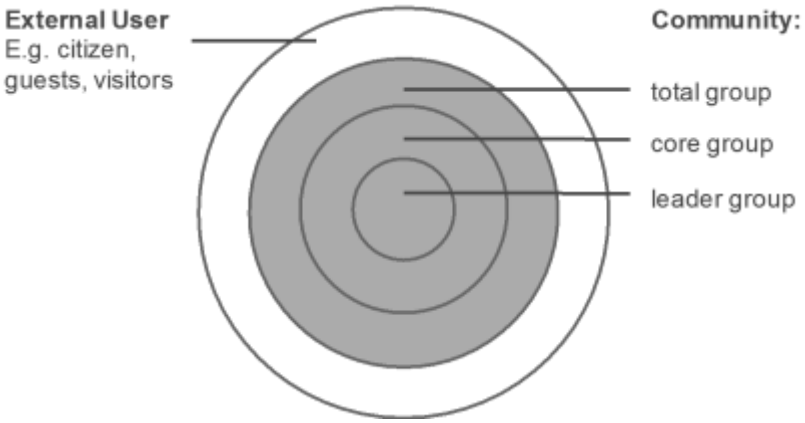

Fig. 3 User Groups of Community Gardens
Source: Own Figure

Some gardens encompass all of these groups while others are less hierarchically structured. Additional criteria like ‘community size’, ‘management form’ and ’participation level’ - in their combination – allow us to deduce how many persons in a garden project are users, respectively. Moreover, they allow us to determine the involvement of the community in decision-making processes. Since the size of ‘external user’ is difficult to determine we only collect data about the community size including ‘total group, ‘core group’ and ‘leader group’. The following table presents the results of our study of the 113 community gardens examined.

Tab. 3 Size of Garden Communities (n=113)

Group	Number of Participants	Number of Gardens n=113 (%)
Total group	0 - 15	28 (25)
	16 - 30	44 (39)
	31 - 60	23 (20)
	61 - 100	9 (8)
	> 100	8 (7)
	Don´t know/ missing	1 (1)
Core group	0 - 5	20 (17)
	6 - 10	52 (46)
	11- 30	35 (31)
	31 - 50	3 (3)
	>50	3 (3)
Leader group	0 - 2	33 (29)
	3 - 4	48 (43)
	5 - 6	22 (19)
	7 - 8	7 (6)
	>8	3 (3)

As expected, Table 3 shows that the size of the community differs widely and ranges from small communities with less than 15 gardeners to communities with more than 100 participants. Looking at our data in detail, the size of 'total group' engaged in a community garden project ranges from 7 to 400 gardeners. However, the size of the total community is mostly up to 30 gardeners.

Within the core group, sizes ranges from 2 two to 82 gardeners, nevertheless Table 3 shows that mostly up to 10 people belong to a core group. Two gardeners also mentioned that core group and total group are one and the same.

Regarding the leader group, data show that sizes ranges from 0 to 12 leaders. Mostly, leader groups in community gardens consists of 2 up to four gardeners (Tab. 3). Our data further indicate, that in 5 of 113 examined gardens no leader group exist.

In further research, we want to elaborate on causalities within the diverse group size. Preliminary results show, that in gardens with smaller communities (total group <15) the share (percentage) of gardeners belong to the core relative to the total group, is higher than in communities with more than 100 participants. We assume that the share of the leader group and core group relative to the total group size is much more important for successful collective action than group sizes in general.

Additional variables determining the criteria ‘community’ such as: heterogeneity of the community, founder of the garden project (bottom-up or top-down), or communication within the community (see Tab. 2), need to be examined.

5.2 Successful collective action in Community Gardens

We define successful collective action through the criteria: collective used resources, social meaning of the garden project, fairness and trust, permanence, rules compliance, problems, and success (Tab. 2)

Preliminary results of our study concern the criteria problems and success

Tab. 4 Problems in Community Gardens

Variables	**Number Respondents n=113 (%)**					
	1	2	3	4	5	Don´t know
Problems social interaction	0 (0)	11 (10)	34 (30)	27 (24)	39 (34)	2 (2)
Problems joint resource use	0 (0)	3(3)	24 (21)	28 (25)	56 (49)	2 (2)

Note: 1 = very often, 2= often, 3= neither often nor rarely, 4= rarely 5= very rarely

Tab. 5 Success in Community Gardens

Variables	**Number Respondents n=113 (%)**					
	1	2	3	4	5	Don´t know
Personal success	0 (0)	2 (2)	21 (18)	53 (47)	36 (32)	1 (1)
Success of the garden project	0 (0)	0 (0)	15 (13)	60 (53)	36 (32)	2 (2)

Note: Success (subjective) 1= very low, 2= low, 3= neither low nor high, 4 = high, 5 = very high

Table 4 and 5 shows, results of our study regarding problems and success in community gardens examined. In 58 percent of the examined community gardens problems regarding social interaction are rarely or very rarely (Tab. 4). Problems mentioned by the gardeners (open question) were a lack of community spirit and disagreements about gardening. Regarding the joint use of resources even 74 percent of the community gardens answered that problems evolve rarely or very rarely (Tab. 4). Mentioned problems are little neatness (e.g. dirty tools) and problems regarding agreements and communication.

Gardeners were further asked to estimate the success of the garden and their personal success (Tab. 5). 79 percent estimated the success of the community garden as high or very high. In

open questions gardeners often mentioned that the garden is successful because meetings and exchanges are taking place. Public interests towards the garden project are further seen as an indication for success. Even 89 percent of the gardeners said that their personal success is high or very high. This is because they met new people, socialize, and fill other people with enthusiasm.

Our data show that problems and conflicts in community garden are rarely and even in gardens were problems evolve ‘often’, there seems to be no connection between the success of these gardens, although further researches are necessary.

5.3 Typology

To determine the collectivity of a community garden each criterion: collective used resources, social meaning of the garden project, fairness and trust, permanence, rules compliance, problems, and success based on values ranging from 1 to 5. These diverse criteria and values are used to calculate the level of collectivity, ranging from 1 to 5.

Tab. 6 Preliminary Results of Collectivity in Community Gardens

Successful Collectivity	Number of Gardens n= 113 (%)
>= 1; <= 2	0 (0)
>2; <= 3	4 (3)
>3; <= 3,5	15 (13)
>3,5; <= 4	46 (41)
>4; < = 4,5	39 (35)
>4,5; <=5	9 (8)

Note: Results based on preliminary ideas

The preliminary results of the collectivity in community gardens examined are presented in Table 6. Our data show, that all gardens reach values of successful collectivity higher than 2, most of them even higher than 3. Our results therefor indicate diverse degrees of collectivity, whereby collectivity is not only giving information about collective action within a community garden but rather their performance.

To examine what exactly influences successful collective action we have to elaborate on causalities regarding the collectivity and further characteristics such as the size of the community. By looking at the collectivity the garden reachs and their sizes of the community

(total group) there seems to be no connection (Fig. 4). Even those gardens with more than 100 participants reach values of collectivity higher than 3, although detailed statistical analyses are necessary.

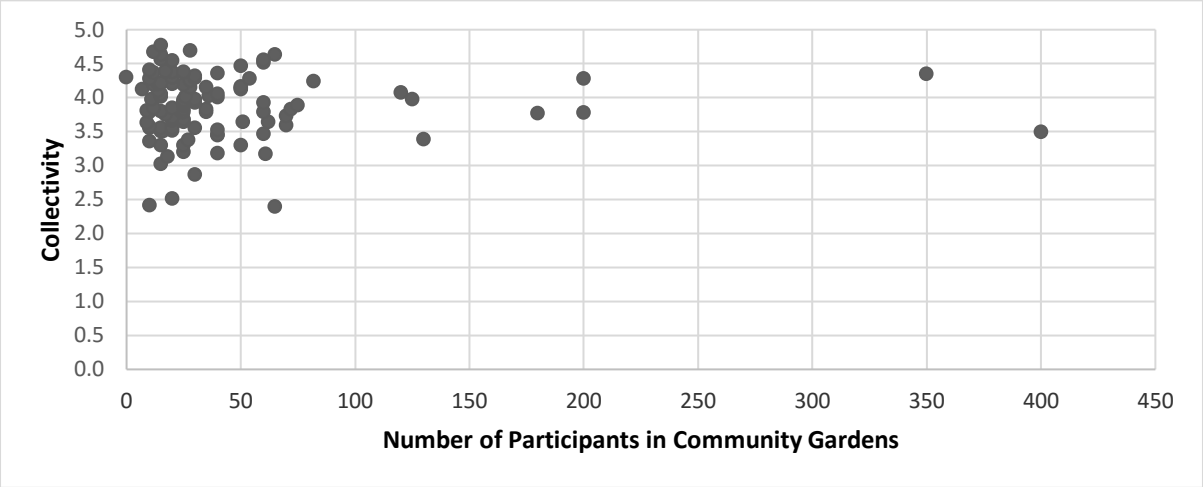

Fig. 4 Community Gardens Collectivity and Size (n. 113)

6. Conclusion and Outlook

Community gardening is an ongoing international movement and a prime example of urban (and new) commons. To appreciate the diversity of community gardens, a large number of criteria is needed to capture their characteristics in a detailed way. Since community gardens differ not only in size of the community, the area, management or bundles of rights hold by the gardeners but also in their collective action, we elaborate on diverse degrees of collectivity. Since we also want to draw conclusions on their performance we not only consider what exactly is used collectively, but further criteria such as permanence of the garden project or fairness and trust within the community, problems and success. We further want to illustrate the causalities of the degree of collectivity and certain characteristics of community gardens (community, area, management, participation, rules) that make the individual types distinct.

We initiated a survey throughout Germany. The results from 113 active community gardens enables us to develop a typology of community gardens based on their collectivity and examine causalities between collectivity and further characteristics of these gardens. Thereby gardens can reach values ranging from 1 (no successful collectivity) to 5 (very successful collectivity).

We assume that aspects such as size or heterogeneity of the community will not have a significant impact, rather the share of the core group or leader group relative to the total group size, or aspects of participation and management are influencing successful collective action.

References

Armstrong, D. (2000). A survey of community gardens in upstate New York: Implications for health promotion and community development. *Health Place, 6*(4), 319-327. doi:10.1016/S1353-8292(00)00013-7

Barthel, S., Folke, C., & Colding, J. (2010). Social–ecological memory in urban gardens: Retaining the capacity for management of ecosystem services. *Global Environmental Change, 20*(2), 255-265. doi:10.1016/j.gloenvcha.2010.01.001

Bendt, P., Barthel, S., & Colding, J. (2013). Civic greening and environmental learning in public-access community gardens in Berlin. *Landscape and Urban Planning, 109*(1), 18-30. doi:10.1016/j.landurbplan.2012.10.003

Colding, J., & Barthel, S. (2013). The potential of 'Urban Green Commons' in the resilience building of cities. *Ecological Economics, 86*(2013), 156-166. doi:10.1016/j.ecolecon.2012.10.016

Colding, J., Barthel, S., Bendt, P., Snep, R., van der Knaap, W., & Ernstson, H. (2013). Urban green commons: Insights on urban common property systems. *Global Environmental Change, 23*(5), 1039-1051. doi:10.1016/j.gloenvcha.2013.05.006

de Moor, T. (2015). *The dilemma of the commoners: Understanding the use of common-pool resources in long-term perspective*. New York: Cambridge University Press.

Drake, L., & Lawson, L. J. (2015). Results of a US and Canada community garden survey: shared challenges in garden management amid diverse geographical and organizational contexts. *Agriculture and Human Values, 32*(2), 241-254. doi:10.1007/s10460-014-9558-7

Eizenberg, E. (2012). Actually existing commons: Three moments of space of community gardens in New York City. *Antipode, 44*(3), 764-782. doi:10.1111/j.1467-8330.2011.00892.x

Ferris, J., Norman, C., & Sempik, J. (2001). People, land and sustainability: Community gardens and the social dimension of sustainable development. *Social Policy & Administration, 35*(5), 559-568. doi:10.1111/1467-9515.T01-1-00253

Foster, S. R. (2011). Collective action and the urban commons. *Notre Dame Law Review, 87*(1), 57-133.

Guitart, D., Pickering, C., & Byrne, J. (2012). Past results and future directions in urban community gardens research. *Urban Forestry & Urban Greening, 11*(4), 364-373. doi:10.1016/j.ufug.2012.06.007

Hess, C. (2008). *Mapping the new commons*. Paper presented at the twelfth biennial conference of the International Association for the Study of the Commons, Cheltenham, UK.

Hess, C., & Ostrom, E. (2006). A framework for analysing the microbiological commons. *International Social Science Journal, 58*(188), 335-349. doi:10.1111/j.1468-2451.2006.00622.x

Linn, K. (1999). Reclaiming the sacred commons. *New Village, 1*(1), 42-49.

Lohrberg, F. (2016). Urban agriculture Europe: Agriculture interacting with the urban sphere. In F. Lohrberg, L. Lička, L. Scazzosi, & A. Timpe (Eds.), *Urban agriculture Europe* (pp. 8-13). Berlin: Jovis Verlag.

McClintock, N. (2010). Why farm the city? Theorizing urban agriculture through a lens of metabolic rift. *Cambridge Journal of Regions, Economy and Society, 3*(2), 191-207. doi:10.1093/cjres/rsq005

McClintock, N., Mahmoudi, D., Simpson, M., & Santos, J. P. (2016). Socio-spatial differentiation in the sustainable city: A mixed-methods assessment of residential

gardens in metropolitan Portland, Oregon, USA. *Landscape and Urban Planning, 148*(2016), 1-16. doi:10.1016/j.landurbplan.2015.12.008

McIvor, D. W., & Hale, J. (2015). Urban agriculture and the prospects for deep demoracy. *Agriculture and Human Values, 32*(4), 727-741. doi:10.1007/s10460-015-9588-9

Mougeot, L. J. A. (2006). *Growing better cities urban agriculture for sustainable development*. Ottawa: International Development Research Centre (Canada).

Nettle, C. (2014). *Community gardening as a social action.* Farnham: Ashgate.

Opitz, I., Berges, R., Piorr, A., & Krikser, T. (2016). Contributing to food security in urban areas: differences between urban agriculture and peri-urban agriculture in the Global North. *Agriculture and Human Values, 33*(2), 341-358. doi:10.1007/s10460-015-9610-2

Ostrom, E. (2009). A General Framework for Analyzing Sustainability of Social-Ecological Systems. *Science, 325*(5939), 419-422. doi:10.1126/science.1172133

Pourias, J., Aubry, C., & Duchemin, E. (2016). Is food a motivation for urban gardeners? Multifunctionality and the relative importance of the food function in urban collective gardens of Paris and Montreal. *Agriculture and Human Values, 33*(2), 257-273. doi:10.1007/s10460-015-9606-y

Randolph, J. (2011). *Environmental land use planning and management* (2 ed.). Washington: Island Press.

Rosol, M. (2010). Public participation in post-fordist urban green space governance: The case of community gardens in Berlin. *International Journal of Urban and Regional Research, 34*(3), 548-563. doi:10.1111/j.1468-2427.2010.00968.x

Saldivar-Tanaka, L., & Krasny, M. E. (2004). Culturing community development, neighborhood open space, and civic agriculture: The case of Latino community gardens in New York City. *Agriculture and Human Values, 21*(4), 399-412. doi:10.1007/s10460-003-1248-9

Simon-Rojo, M., Recasens, X., Callau, S., Duzi, B., Eiter, S., Hernández-Jiménez, V., . . . Vejre, H. (2016). From urban food gardening to urban farming. In F. Lohrberg, L. Lička, L. Scazzosi, & A. Timpe (Eds.), *Urban agriculture Europe* (pp. 22-28). Berlin: Jovis Verlag.

Smit, J., Nasr, J., & Ratta, A. (2001a). Urban agriculture: Food, jobs, and sustainable cities. Chapter 1: Cities that feed themselves. Retrieved from http://jacsmit.com/book.html

Smit, J., Nasr, J., & Ratta, A. (2001b). Urban agriculture: Food, jobs, and sustainable cities. Chapter 2: Urban agriculture yesterday and today. Retrieved from http://jacsmit.com/book.html

Spilková, J. (2017). Producing space, cultivating community: the story of Prague´s new community gardens. *Agriculture and Human Values*, 1-11. doi:doi:10.1007/s10460-017-9782-z

Stiftungsgemeinschaft anstiftung & ertomis. (2017). Die urbanen Gemeinschaftsgärten im Überblick (Overview of urban community gardens). Retrieved from http://www.anstiftung-ertomis.de/urbane-gaerten/gaerten-im-ueberblick

Thompson, K., Austin, K. C., Smith, R. M., Warren, P. H., Angold, P. G., & Gaston, K. J. (2003). Urban domestic gardens (I): Putting small-scale plant diversity in context. *Journal of Vegetation Science, 14*(1), 71-78. doi:10.1111/j.1654-1103.2003.tb02129.x

Vejre, H., & Simon-Rojo, M. (2016). Introduction. In F. Lohrberg, L. Lička, L. Scazzosi, & A. Timpe (Eds.), *Urban agriculture Europe* (pp. 16-17). Berlin: Jovis Verlag.

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