Youth civic engagement in urban agriculture education: A rapid scoping review

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Abstract

Urban agriculture education is increasingly used to foster civic engagement among youth, but little is known about this impact. To start closing this gap, we analyzed peer-reviewed journal articles that focus on civic engagement outcomes among high school-aged students in urban agriculture education in the U.S. Using a rapid scoping review, we identified 10 relevant research articles published between 2004 and 2018. These articles show that urban agriculture education programs engage youth in direct civic actions that benefit communities. For example, young participants of these programs created community gardens and donated food. In addition, these programs can prepare youth for future civic engagement, including by enhancing their understanding of social justice and community assets, and by building their leadership skills. Thus, urban agriculture education programs can be instrumental in fostering current and future youth civic engagement.

1 Introduction

Urban agriculture can promote civic life (McIvor and Hale, 2015), empower communities to address food justice and other local issues (Cohen and Reynolds, 2015), and cultivate citizenship and equity (Poulsen, 2017). Because urban agriculture has the potential to nurture active citizens, a growing number of informal educators and school teachers are using urban agriculture education to strengthen civic engagement among youth. By doing so, urban agriculture educators can prepare youth to transition into adulthood as responsible, contributing and civically engaged members of their communities who participate in public affairs, community building, and problem solving (cf. Camino and Zeldin, 2002; Flanagan and Levine, 2010; Travaline and Hunold, 2010).

Urban agriculture educators and researchers can use various definitions of civic engagement. These definitions often highlight community service, collective action, political involvement, and social change (Adler and Goggin, 2005). Examples include:

- *Civic engagement means working to make a difference in the civic life of our communities and developing the combination of knowledge, skills, values, and motivation to make the difference. It means promoting the quality of life in a community, through both political and nonpolitical processes* (Ehrlich, 2000, p. vi),

- *Civic engagement describes how an active citizen participates in the life of a community in order to improve conditions for others or to help shape the community's future* (Adler and Goggin, 2005), and
- *Civic engagement can be defined as the feelings of responsibility toward the common good, the actions aimed at solving community issues and improving the well-being of its members and the competencies required to participate in civic life* (Lenzi et al., 2013).

These and other definitions (e.g., Adler and Goggin, 2005; Macedo, 2005; Einfeld and Collins, 2008) emphasize that through civic engagement, citizens address public issues beyond their self-interests. Scholars distinguish between *individual* and *collective* forms of civic engagement. Individual civic engagement is based on personal interests and attention to issues such as giving money to charity and recycling. Collective forms improve local communities through activities such as volunteering and work with community-based organizations (Ekman and Amnå, 2012). Other authors agree with this distinction but observe a continuum of various actions between individual and collective forms of civic engagement. Each of these forms can also be characterized by frequency, duration, intensity, and incentives (Adler and Goggin, 2005). Further, some authors consider civic engagement such as participation in community-based organizations as a different phenomenon from political actions such as voting, demonstration, signing petitions, and contacting political representatives (Ekman and Amnå, 2012). Another group views political actions as one form of civic engagement (Macedo, 2005; Metzger et al., 2018), or considers civic service and political action as distinct yet mutually reinforcing factors (Sherrod et al., 2010).

Civic engagement overlaps with civic involvement, civic participation (Putnam, 2000), political socialization, civic service (Sherrod et al., 2010), public leadership, community engagement, and community building (Jacoby, 2009). All these terms are associated with citizens addressing public and community problems. Given these terms and heretofore mentioned definitions, we use an all-encompassing view of civic engagement that includes individual and collective forms of civic actions, social involvement, activism, and formal political participation. This view may address various dimensions of social, environmental, and other community issues. Specific urban agriculture education programs, however, are likely to use a narrow definition of civic engagement and foster only some of its aspects, such as nonprofit volunteerism, political activism, or community-based environmental stewardship.

In addition to involving youth in civic engagement actions during programs, urban agriculture educators can foster precursors of their future civic engagement in contexts both related and unrelated to urban agriculture. Scholars suggest four general predictors of civic engagement (Bobek, Zaff, and Lerner, 2009): social cohesion (reciprocity, trust, bonding), civic skills (ability to be involved in civil society), civic commitment (desire to make positive contributions), and civic action (actual participation in betterment of communities). These predictors resonate with the idea that young people become civically engaged if they learn about and address local issues through collective actions in schools and community organizations. Other factors contributing to civic engagement include knowledge of politics, government, power, human rights and justice; and identities of active participants in community life (Orr, 2020). Such factors also include empathy, emotion regulation in stressful situations, prosocial moral reasoning, and a capacity to reason about a community's future welfare (Metzger et al., 2018). Finally, educators can foster youth civic engagement through youth-adult partnerships, coaching, dialogues, and a gradual increase of youth responsibilities in planning and implementing civic actions (Camino and Zeldin, 2002), and by

involving youth in activities and organizations where participation in civic affairs is a social norm (Flanagan and Levine, 2010). It is reasonable to assume that many of these factors of civic engagement can be fostered through urban agriculture education.

While community leaders and educators view urban agriculture as a catalyst of urban ecological citizenship and community leadership in addressing food equity and other issues (Travaline and Hunold, 2010; Poulsen, 2017), urban agriculture educators intend to engage youth in civic life. However, little is known about the nature and extent of the impact of urban agriculture education programs on youth civic engagement. To start closing this gap in a US urban context, this research answers the question: *What evidence exists about the impact of urban agriculture education on youth civic engagement*?

2 Methods

Using the scoping review methodology (Arksey and O'Malley, 2005) and PRISMA review guidelines (http://www.prisma-statement.org), we identified peer-reviewed English-language scholarly journal articles that explore the impact of urban agriculture education programs on civic engagement among high school-aged students in the United States. The research questions, eligibility criteria, information sources, and search strategy were developed a priori according to the research question, and a pre-registered protocol is available on Open Science Framework (https://osf.io/4dyzv).

We developed a comprehensive search strategy with the assistance of a Cornell University librarian, and we performed the search in six databases: Scopus (Elsevier), CAB Abstracts (Web of Science), Web of Science Core Collection (Web of Science), ERIC (EBSCO), GreenFILE (EBSCO), and Agricola (EBSCO). We used the search terms "civic engagement," "urban agriculture" and "youth," as well as their synonyms and overlapping terms (see Appendix A for full search details). Whereas we generated synonyms and overlapping terms for "urban agriculture" and "teens" ourselves, we used four highly cited articles (Youniss et al., 2002; Adler and Goggin, 2005; Einfeld and Collins, 2008; Ekman and Amnå, 2012) to identify search terms that reflect different aspects and variations of "civic engagement."

The initial search in all six aforementioned databases was conducted on March 9, 2020. Combined records from six database searches (n = 1045) were exported to the Covidence review management system for deduplication and application of inclusion criteria (Figure 1). After the duplicates were removed (n = 791), both authors independently applied the inclusion criteria to titles, abstracts, and keywords. Studies were eligible for inclusion if they met the following predetermined criteria: (1) describe the impact of urban agriculture, (2) report outcomes of urban agriculture related to youth civic engagement or similar factors, (3) involve high school-aged students, (4) be conducted in the U.S., (5) be published in English, (6) present original research, and (7) be conducted in urban settings. Conflicts that arose during independent inclusion were collaboratively resolved, and eligible articles (n = 54) were downloaded as full-text PDF files. Thereafter, both authors independently applied the same inclusion criteria to the downloaded full-text articles, and, after new conflicts were collaboratively resolved, the final set of articles that satisfy all inclusion criteria was determined (n = 10).

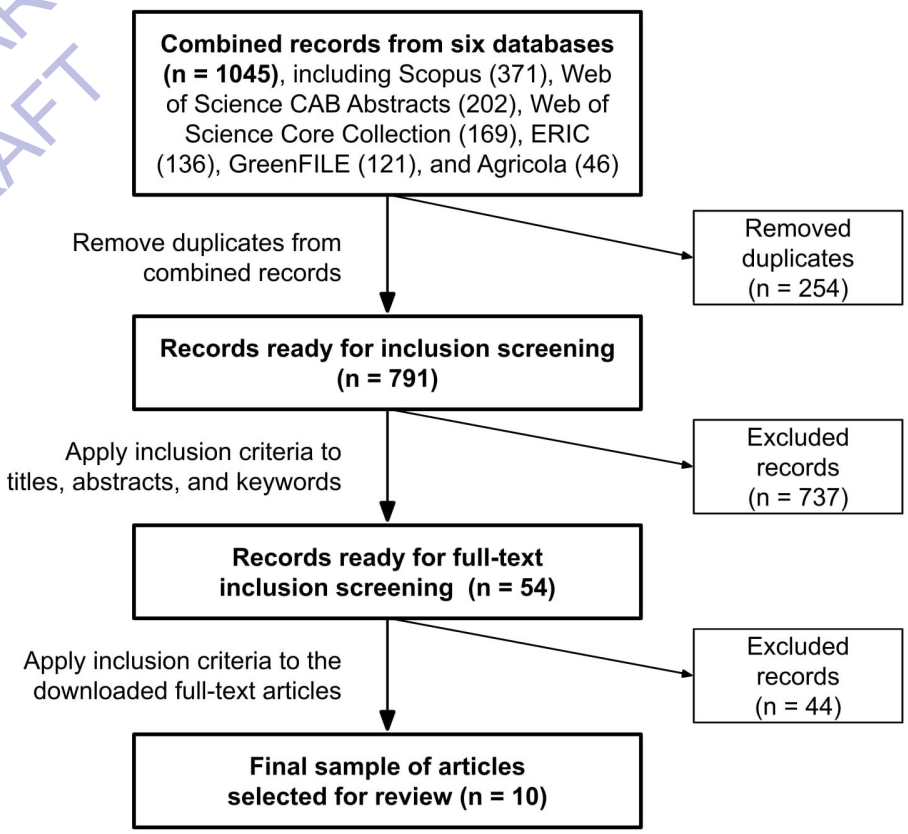

Figure 1. Search results diagram.

While reading the final set of included articles, we created summaries of every program, including a brief program description, location, and participants' demographics; we also identified which research methods were used to measure or describe civic engagement outcomes, and searched for any outcomes that may contribute to youths' civic engagement. Then, to make sense of these civic engagement outcomes, we classified them using emerging categories. All selected articles were independently read and analyzed by both authors of this review. The results of article analysis were compared, and the authors reached a consensus through several discussions.

3 Results

The final sample includes 10 academic journal articles published between 2004 and 2018. They describe nine different urban agriculture education programs. The results from the analysis of all articles is presented in Table 1, including program summaries, research methods, and civic engagement outcomes. While searching for civic engagement outcomes in these articles, we found that they fall into two categories. First, articles show how youth become involved in direct civic actions that benefit communities (e.g. students create a community garden and donate food during their urban agriculture education program). Second, articles demonstrate how urban agriculture education programs strengthen youths' competencies that can contribute to their future civic engagement (e.g. leadership skills and understanding of social inequality).

149 **Table 1.** Civic engagement outcomes of urban agriculture education programs.

Research articles, and described programs	Research methods	Civic engagement outcomes mentioned in research articles	
		Civic actions conducted by youth	**Civic engagement competencies developed among youth**
Voluntad, Dawson, and Corp, 2004 A garden education program in a community garden developed on a vacant lot in Pendleton, OR.	Pre/post Likert-scale surveys of leadership and communication, and testimonials of 35 youth participants.	- Creation of a community garden. - Food donation to homebound seniors and food banks.	- Ability to collaborate with community members. - Leadership and communication skills.
Kennedy and Krasny, 2005 A garden-based science education program offered through a high school in Sacramento, CA.	Anecdotal evidence.	- Co-designing a garden to teach youth about native plants. - Donation of vegetables to a local food bank.	- Awareness of neighborhood assets, including food availability and natural areas.
Ceaser, 2012 A farming program at an alternative high school in New Orleans, LA.	Ethnographic observations and group interviews of 10-20 students.	- Building compost piles, greenhouses, aquaponics, and rain catchment systems. - Creating a farmer's market.	- Understanding of inequality, food insecurity, and environmental racism. - Organizational skills to repair damaged communities and improve access to healthy food. - Self-efficacy in enacting pro-environmental behavior.
McCabe, 2014 A community garden program employing youths in a high-poverty neighborhood of Lawrence, MA.	Anecdotal evidence.	- Converting abandoned lots and brownfields into gardens. - Preventing urban youth violence and improving neighborhood safety.	- Ability of at-risk youths to become contributing members of their communities.
Hatchett et al., 2015 A five-month paid urban farming and cooking internship offered through a community-school partnership in Chicago, IL.	Work history survey, demographic survey, and focus groups with several 15-18-year-old youths and adult staff.	- Improving food access in low-income communities through farm stands and markets. - Developing healthy food habits for self and family.	- Teamwork skills. - Understanding of urban agriculture, community engagement, and community health promotion in low-income neighborhoods. - Intergenerational respect and collaboration.

Weissman, 2015 Youth programs in several urban farms in Brooklyn, NY.	Participatory observations of youth and adults, and interviews with adult farmers, activists, leaders, and participants in six urban farms.	- Promoting alternative food networks (AFNs), such as farmers' markets, community supported agriculture, and urban farming.	- Entrepreneurial skills to promote alternatives for conventional agro-food. - Readiness to participate in alternative food networks. - Youth empowerment, political organizing, and leadership skills. - Understanding of neighborhood problems and solutions.
Sonti et al., 2016 An urban agriculture internship program organized by a food justice organization at an urban farm in Brooklyn, NY.	Survey of 50 former program interns, who were 13-18 years old at the time of their internships.	- Promoting the stewardship of public green spaces in the community.	- Sense of community connection and responsibility. - Awareness of social, environmental, and political issues. - Decision-making, public speaking, self-efficacy, confidence, management, and communication skills.
Fifolt, Morgan, and Burgess, 2017 An urban farming nonprofit partnered with public schools teaching urban agriculture and nutrition in Birmingham, AL.	Semi-structured focus groups of students, including 9 middle school-aged and 4 high school-aged students, and their parents.	- Nurturing positive connections among students, peers, instructors, and families. - Helping families adopt healthier cooking. - Community outreach, including selling produce in an area formerly known for crime.	- Connection with peers, parents, and communities through meaningful interactions at urban farms. - A sense of becoming change agents in communities. - Teamwork and conflict resolution skills.
Pierce et al., 2017 A summer nutrition, health, and farming program in an urban farm in Baltimore, MD.	Pre- and post-program surveys (on physical activity, stress, and nutrition), interviews, and focus groups of 36 ninth and tenth graders; and parent interviews.	- Healthy behavior and cooking skills are passed from students to their parents and community.	- Self-efficacy. - Leadership and job skills such as cooperation, teamwork, and financial literacy.
Delia and Krasny, 2018 An urban agriculture internship program in Brooklyn, NY (the same program as described in Sonti, et al., 2016).	Interviews with 9 returning 15-18-year-old interns, and analysis of a researcher's field observations and reflections.	- Contribution to local sustainable agriculture and economic development by growing and selling food.	- Positive youth development, including competence, contribution, critical consciousness, and leadership. - Understanding of environmental, food systems, and social and food justice concepts.

150

3.1 Programs

These nine described urban agriculture education programs were spread across the continental U.S. Some of them were specifically located in communities with high poverty (Sonti et al., 2016; McCabe, 2014; Fifolt et al., 2017). These programs were led by nonprofits, community-based organizations, and high schools, often in partnership with one another or with community gardens and urban farms. They offered students unpaid internships, paid youth employment programs, vocational training, and youth development and science education programs. These programs used hands-on activities to teach youth agricultural skills. Most of these programs also taught students about other related topics, such as nutrition, health, leadership, community organizing, and positive life skills.

All programs included high school students (ages 14-18); some articles did not report age yet described participants as “high school students" or “employed youth” (Voluntad et al., 2004; Kennedy and Krasny, 2005; Weissman, 2015; Fifolt et al., 2017). Besides high school-age teens, these programs often involve younger children (e.g. Sonti et al., 2016), young adults (e.g. Ceaser, 2012; McCabe, 2014) and older community members as participants, volunteers, and organizers (e.g. Weissman, 2015), whose data was not included in this research. Though three articles reported little or no data on participants’ demographics (Voluntad et al., 2004; Fifolt et al., 2017; Kennedy and Krasny, 2018), some programs included mostly African-American/Black students (Ceaser, 2012; Hatchett, 2015; Pierce, 2017), or culturally and ethnically diverse populations as in most other programs. Except for one program intended for male youths (McCabe, 2014), most programs included participants of different genders.

3.2 Impacts and Methods

Whereas the selected articles described different impacts of urban agriculture education programs, we analyzed only their reports about the impacts on civic engagement. One article explored the impact on “civic engagement” per se (Sonti et al., 2016), and another explored related “community engagement” (Hatchett et al., 2015). However, other articles described program impacts that reflect specific aspects or examples of civic engagement. Four papers (Kennedy and Krasny, 2005; Ceaser, 2012; Fifolt et al., 2017; Delia and Krasny, 2018) explored the educational success of programs, including impacts that echoed civic engagement such as students displaying increased connections to communities or donating time/resources to community organizations. Other articles were concerned primarily with such impacts as community safety and stability (McCabe, 2014; Weissman, 2015), physical and mental health (Pierce et al., 2017), and various life skills (Voluntad et al., 2004), yet they also described impacts related to civic engagement such as improving teamwork skills and creating community gardens.

To explore these impacts, researchers used various methods. Out of the 10 included studies, five relied on qualitative data, including from focus groups (Fifolt et al., 2017; Hatchett et al., 2015), ethnographic observations and interviews (Ceaser, 2012), participatory observations (Weissman, 2015), and narrative inquiry (Delia and Krasny, 2018). Three studies used Likert Scale surveys, which were combined with open-ended survey questions (Sonti et al., 2016), participant interviews (Pierce et al., 2017), or review of aprticipants’ testimonials. The two remaining articles did not report their research methods; thus, to not overestimate their research rigor, we assumed they used anecdotal evidence such as informal observations (Kennedy and Krasny, 2005; McCabe, 2014).

3.3 Civic Engagement: Actions and Competencies

Results show that urban agriculture education programs involve youth in civic action (Table 1, column 3) and foster competencies that can lead to future civic engagement (Table 1, column 4). Through civic actions, for example, students create community gardens and greenhouses, construct rain catchment systems, donate fresh food to seniors and food banks, establish farmers' markets in underserved communities, and/or improve public green spaces (e.g., Voluntad et al., 2004; Ceaser, 2012; McCabe, 2014). In several programs, youth also helped friends, peers, parents, or other family members adopt healthier cooking and eating behaviors (e.g., Hatchett, et al., 2015; Fifolt et al., 2017; Pierce, et al., 2017). In other words, reviewed urban agriculture education programs provided opportunities to practice civic engagement through civic action and possibly political organization (Weissman, 2015), which positively influenced people and communities outside these programs. However, students' role in initiating and leading these civic engagement actions is unclear.

Further, we found that civic engagement competencies developed through urban agriculture programs can be organized into two broad categories. First, youth developed an *understanding* of social justice, food insecurity, and environmental problems in their neighborhoods (e.g., Ceaser, 2012; Sonti et al., 2016), as well as understanding of community assets and solutions for problems (Kennedy and Krasny, 2005). Second, youth developed *leadership skills* such as decision-making, collaboration, teamwork, public speaking, and conflict resolution, as well as self-efficacy and stronger ties with peers and parents (e.g., Hatchett et al., 2015; Weissman, 2015; Fifolt et al., 2017; Delia and Krasny, 2018). In addition, articles mentioned other outcomes such as the development of pride and ownership of their communities (McCabe, 2014) and a sense of responsibility to make positive changes (Sonti et al., 2016). All of these factors may help youth become civically engaged in the future.

4 Discussion

Urban agriculture sites and urban agriculture education programs that promote social justice, community wellness, and youth development are widespread in the U.S. (Reynolds and Cohen, 2016; Palmer, 2018; Salin, 2018; Russ, Armstrong and Krasny, 2022). However, we found only 10 papers published between 2004 and 2018 that, according to our search criteria, view civic engagement or similar concepts as outcomes of such programs. These papers suggest that urban agriculture education programs can contribute to civic engagement among youth through two interrelated approaches: (1) involving youth in direct civic actions, and (2) strengthening youth competencies that can lead to future civic engagement.

In the reviewed urban agriculture education programs, youth participated in civic actions that, according to Ekman and Amnä's typology (2012), reflect the collective form of civic engagement. For example, students worked together to build gardens, support farmers' markets, and donate vegetables (Voluntad et al., 2004; Kennedy and Krasny, 2005; McCabe, 2014). In addition, youth adopted healthy nutrition themselves and promoted it in their own families during some programs (Hatchett et al., 2012; Fifolt et al., 2017; Pierce et al., 2017), which resembles an individual form of civic engagement. Further, whereas political actions are sometimes considered a form of civic engagement (Macedo, 2005; Metzger et al., 2018), reviewed programs rarely involve students in activism or formal political participation. However, it is possible that youth in other similar programs sign petitions, contact political representatives, and participate in organized protests related to social justice and environmental issues.

With one exception (Hatchett, 2015), the role of civic actions in promoting future civic engagement was not discussed in the reviewed articles, yet this role can be explored through and enhanced by different theories. For example, civic actions in the described urban agriculture education programs resonate with the *social development model* (Rossi et al., 2016), in which young people gradually assimilate civic engagement values, competencies, and behaviors through interactions in communities and organizations. Echoing this model, analyzed urban agriculture education programs involve youth in civic action projects that are likely to contribute to their civic values and behaviors while strengthening ties among youth, urban agriculture programs, families, and communities. These programs also reflect the *community of practice framework* (Wenger, 1998), which describes the development of practice and participants' identities in social learning contexts. In light of this framework, youth who took part in urban agriculture civic actions were likely to develop certain civic identities such as "I am a healthy nutrition advocate" or "I am a social justice problem-solver," especially in programs where they became increasingly more responsible for civic actions.

At the same time, while programs were developing certain civic engagement competencies (knowledge of issues and assets, and leadership skills), it is unclear why educators decided to foster these specific civic engagement competencies and whether this choice was based on behavioral theories. Some civic engagement competencies in these programs are reflecting the theory of planned behavior (Ajzen, 2002). For example, frequently mentioned leadership skills are related to perceived behavioral control. However, we did not find evidence of changing social norms or youth attitudes toward civic engagement as a program outcome, which would be consistent with the theory of planned behavior. Other behavioral theories are also available for planning and exploration of civic engagement resulting from these programs, such as the theory of self-determination, which discusses intrinsic and extrinsic behavior motivations (Ryan and Deci, 2000), and the theory of norm activation, which links norms and a sense of responsibility to concrete action (Schwartz, 1977). Finally, program impact on youth civic engagement can be strengthened by nurturing specific predictors of civic engagement mentioned in publications, such as knowledge of politics (Orr, 2020), social cohesion (Bobek, Zaff, and Lerner, 2009), and imagination about a community's future (Metzger et al., 2018).

4.1 Limitations

This study has several limitations. First, we reviewed urban agriculture programs only in the U.S., yet similar programs in other locations may involve youth in different types of civic actions and promote different civic engagement competencies. Further, although we included a wide range of alternative terms in our search strategy (see Appendix A), our rigorous search process may have excluded some other relevant research articles. In addition, we focused only on journal articles and disregarded gray literature, which could have provided richer data, though potentially not as reliable. Furthermore, while the quality of empirical research was acceptable in most reviewed articles, two of them produced only anecdotal evidence. Finally, we have not found any articles showing whether urban agriculture education made a lasting effect on youth civic engagement or helped them become civically engaged in other contexts.

5 Conclusion

Many educators are using or plan to use urban agriculture education to foster youth civic engagement. The number of related empirical studies is still limited; future research should explore the relationship between urban agriculture education programs and youth civic engagement in

different contexts, with different populations, in longer timeframes, and by using rigorous research designs. However, available studies already demonstrate a link between urban agriculture education programs and youth civic engagement. These studies describe how youth become civically engaged during urban agriculture education programs and show that many of these programs intend to foster youth understanding of local issues and solutions as well as leadership skills. To increase the effectiveness of these programs, educators may want to cultivate among youth a cluster of other civic engagement precursors, which can be found in behavioral theories and civic engagement frameworks. Deliberate choice of civic activities and program outcomes can make urban agriculture education an important factor in fostering civic engagement in urban communities.

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Appendix: Database Search Strategies

1.1 Search Summary

Database name	Platform	Date of search	Number of results
1. Scopus	Elsevier	3/9/20	371
2. Web of Science CAB Abstracts	Clarivate Analytics	3/9/20	202
3. Web of Science Core Collection	Clarivate Analytics	3/9/20	169
4. ERIC	EBSCOhost	3/9/20	136
5. GreenFILE	EBSCOhost	3/9/20	121
6. Agricola	EBSCOhost	3/9/20	46

Total records = 1045

Total records after deduplication = 791

Supplementary Figure 1. A summary of the search strategy over six databases.

1.2 Search Terms and Syntax

1.2.1 Scopus (Elsevier)

Date of Search: March 9, 2020
Number of results: 371

TITLE-ABS-KEY indicates title, abstract, and keywords. Curly brackets are used for phrases, except for phrases with asterisks, which have quotation marks around them.

1. TITLE-ABS-KEY({urban agriculture} OR "aquaponic*" OR {aquaculture} OR "aeroponic*" OR {animal husbandry} OR {beekeeping} OR "city farm*" OR "community garden*" OR "container garden*" OR {digital agriculture} OR {greenhouse} OR {high-tech agriculture} OR "hydroponic*" OR "microgarden*" OR "pocket garden*" OR "rooftop garden*" OR "rooftop farm*" OR {urban agroforestry} OR "urban farm*" OR "urban garden*" OR {urban horticulture} OR "urban soil*" OR "vertical farm*" OR "vertical garden*")
2. TITLE-ABS-KEY({civic engagement} OR “active citizen*" OR advocacy OR {associational involvement} OR "boycott*" OR {citizen engagement} OR {citizen participation} OR "civic activit*" OR {civic competence} OR {civic development} OR {civic education} OR {civic order} OR {civic responsibility} OR "civic skill*" OR {civil participation} OR "collective action*" OR "communal activit*" OR "community activit*" OR {community building} OR {community service} OR {consumer participation} OR {democratic citizenship} OR "democratic practice*" OR efficacy OR {electoral participation} OR "empower*" OR “engag*” OR "individual action*" OR "multicultural competenc*" OR {organizational involvement} OR "party activities*" OR "petition*" OR "political action*" OR {political activism} OR "political behavior*" OR {political engagement} OR {political involvement} OR {political leadership} OR "political movement*" OR {political participation} OR "political process*" OR {political representation} OR "political voice*" OR "protest activit*" OR {protest behavior} OR "service activit*" OR {service learning} OR {service-learning} OR {social engagement}

OR {social involvement} OR {social justice} OR "social responsibilit*" OR "voluntary association*" OR {voluntary work} OR "volunteer program*" OR "volunteer*" OR "youth develop*")
3. TITLE-ABS-KEY(youth* OR adolescent* OR teen* OR "high school*" OR "secondary school*" OR "young adult*" OR "student*")
4. 1 AND 2 AND 3

1.2.2 Web of Science CAB Abstracts

Date of Search: March 9, 2020
Number of results: 202

TS on the Web of Science platform indicates title, keywords, and abstract.

1. TS=("urban agriculture" OR "aquaponic*" OR "aquaculture" OR "aeroponic*" OR "animal husbandry" OR "beekeeping" OR "city farm*" OR "community garden*" OR "container garden*" OR "digital agriculture" OR "greenhouse" OR "high-tech agriculture" OR "hydroponic*" OR "microgarden*" OR "pocket garden*" OR "rooftop garden*" OR "rooftop farm*" OR "urban agroforestry" OR "urban farm*" OR "urban garden*" OR "urban horticulture" OR "urban soil*" OR "vertical farm*" OR "vertical garden*")
2. TS=("civic engagement" OR "active citizen*" OR "advocacy" OR "associational involvement" OR "boycott*" OR "citizen engagement" OR "citizen participation" OR "civic activit*" OR "civic competence" OR "civic development" OR "civic education" OR "civic order" OR "civic responsibility" OR "civic skill*" OR "civil participation" OR "collective action*" OR "communal activit*" OR "community activit*" OR "community building" OR "community service" OR "consumer participation" OR "democratic citizenship" OR "democratic practice*" OR "efficacy" OR "electoral participation" OR "empower*" OR "engag*" OR "individual action*" OR "multicultural competenc*" OR "organizational involvement" OR "party activities*" OR "petition*" OR "political action*" OR "political activism" OR "political behavior*" OR "political engagement" OR "political involvement" OR "political leadership" OR "political movement*" OR "political participation" OR "political process*" OR "political representation" OR "political voice*" OR "protest activit*" OR "protest behavior" OR "service activit*" OR "service learning" OR "service-learning" OR "social engagement" OR "social involvement" OR "social justice" OR "social responsibilit*" OR "voluntary association*" OR "voluntary work" OR "volunteer program*" OR "volunteer*" OR "youth develop*")
3. TS=(youth* OR adolescent* OR teen* OR "high school*" OR "secondary school*" OR "young adult*" OR "student*")
4. 1 AND 2 AND 3

1.2.3 Web of Science Core Collection

Date of Search: March 9, 2020
Number of results: 169

TS on the Web of Science platform indicates title, keywords, and abstract.

1. TS=("urban agriculture" OR "aquaponic*" OR "aquaculture" OR "aeroponic*" OR "animal husbandry" OR "beekeeping" OR "city farm*" OR "community garden*" OR "container garden*" OR "digital agriculture" OR "greenhouse" OR "high-tech agriculture" OR "hydroponic*" OR "microgarden*" OR "pocket garden*" OR "rooftop garden*" OR "rooftop farm*" OR "urban agroforestry" OR "urban farm*" OR "urban garden*" OR "urban horticulture" OR "urban soil*" OR "vertical farm*" OR "vertical garden*")
2. TS=("civic engagement" OR "active citizen*" OR "advocacy" OR "associational involvement" OR "boycott*" OR "citizen engagement" OR "citizen participation" OR "civic activit*" OR "civic competence" OR "civic development" OR "civic education" OR "civic order" OR "civic responsibility" OR "civic skill*" OR "civil participation" OR "collective action*" OR "communal activit*" OR "community activit*" OR "community building" OR "community service" OR "consumer participation" OR "democratic citizenship" OR "democratic practice*" OR "efficacy" OR "electoral

participation" OR "empower*" OR “engag*” OR "individual action*" OR "multicultural competenc*" OR "organizational involvement" OR "party activities*" OR "petition*" OR "political action*" OR "political activism" OR "political behavior*" OR "political engagement" OR "political involvement" OR "political leadership" OR "political movement*" OR "political participation" OR "political process*" OR "political representation" OR "political voice*" OR "protest activit*" OR "protest behavior" OR "service activit*" OR "service learning" OR "service-learning" OR "social engagement" OR "social involvement" OR "social justice" OR "social responsibilit*" OR "voluntary association*" OR "voluntary work" OR "volunteer program*" OR "volunteer*” OR “youth develop*”)

3. TS=(youth* OR adolescent* OR teen* OR “high school*” OR “secondary school*” OR “young adult*” OR “student*”)
4. 1 AND 2 AND 3

1.2.4 ERIC

Date of Search: March 9, 2020
Number of results: 136

TX on the EBSCO platform indicates “text”, or the full text of the snapshot on EBSCO (title, abstract, keywords, authors).

1. TX(“urban agriculture" OR "aquaponic*" OR "aquaculture" OR "aeroponic*" OR "animal husbandry" OR "beekeeping" OR "city farm*" OR "community garden*" OR "container garden*" OR "digital agriculture" OR "greenhouse" OR "high-tech agriculture" OR "hydroponic*" OR "microgarden*" OR "pocket garden*" OR "rooftop garden*" OR "rooftop farm*" OR "urban agroforestry" OR "urban farm*" OR "urban garden*" OR "urban horticulture" OR "urban soil*" OR "vertical farm*" OR "vertical garden*")
2. TX("civic engagement" OR “active citizen*" OR "advocacy" OR "associational involvement" OR "boycott*" OR "citizen engagement" OR "citizen participation" OR "civic activit*" OR "civic competence" OR "civic development" OR "civic education" OR "civic order" OR "civic responsibility" OR "civic skill*" OR "civil participation" OR "collective action*" OR "communal activit*" OR "community activit*" OR "community building" OR "community service" OR "consumer participation" OR "democratic citizenship" OR "democratic practice*" OR “efficacy” OR "electoral participation" OR "empower*" OR “engag*” OR "individual action*" OR "multicultural competenc*" OR "organizational involvement" OR "party activities*" OR "petition*" OR "political action*" OR "political activism" OR "political behavior*" OR "political engagement" OR "political involvement" OR "political leadership" OR "political movement*" OR "political participation" OR "political process*" OR "political representation" OR "political voice*" OR "protest activit*" OR "protest behavior" OR "service activit*" OR "service learning" OR "service-learning" OR "social engagement" OR "social involvement" OR "social justice" OR "social responsibilit*" OR "voluntary association*" OR "voluntary work" OR "volunteer program*" OR "volunteer*” OR “youth develop*”)
3. TX(youth* OR adolescent* OR teen* OR “high school*” OR “secondary school*” OR “young adult*” OR “student*”)
4. 1 AND 2 AND 3

1.2.5 GreenFILE

Date of Search: March 9, 2020
Number of results: 121

TX on the EBSCO platform indicates “text”, or the full text of the snapshot on EBSCO (title, abstract, keywords, authors).

1. TX(“urban agriculture" OR "aquaponic*" OR "aquaculture" OR "aeroponic*" OR "animal husbandry" OR "beekeeping" OR "city farm*" OR "community garden*" OR "container garden*" OR "digital agriculture" OR "greenhouse" OR "high-tech agriculture" OR "hydroponic*" OR "microgarden*" OR "pocket garden*" OR "rooftop garden*" OR "rooftop farm*" OR "urban agroforestry" OR "urban

farm*" OR "urban garden*" OR "urban horticulture" OR "urban soil*" OR "vertical farm*" OR "vertical garden*")

2. TX("civic engagement" OR "active citizen*" OR "advocacy" OR "associational involvement" OR "boycott*" OR "citizen engagement" OR "citizen participation" OR "civic activit*" OR "civic competence" OR "civic development" OR "civic education" OR "civic order" OR "civic responsibility" OR "civic skill*" OR "civil participation" OR "collective action*" OR "communal activit*" OR "community activit*" OR "community building" OR "community service" OR "consumer participation" OR "democratic citizenship" OR "democratic practice*" OR "efficacy" OR "electoral participation" OR "empower*" OR "engag*" OR "individual action*" OR "multicultural competenc*" OR "organizational involvement" OR "party activities*" OR "petition*" OR "political action*" OR "political activism" OR "political behavior*" OR "political engagement" OR "political involvement" OR "political leadership" OR "political movement*" OR "political participation" OR "political process*" OR "political representation" OR "political voice*" OR "protest activit*" OR "protest behavior" OR "service activit*" OR "service learning" OR "service-learning" OR "social engagement" OR "social involvement" OR "social justice" OR "social responsibilit*" OR "voluntary association*" OR "voluntary work" OR "volunteer program*" OR "volunteer*" OR "youth develop*")
3. TX(youth* OR adolescent* OR teen* OR "high school*" OR "secondary school*" OR "young adult*" OR "student*")
4. 1 AND 2 AND 3

1.2.6 Agricola

Date of Search: March 9, 2020
Number of results: 46

TX on the EBSCO platform indicates "text", or the full text of the snapshot on EBSCO (title, abstract, keywords, authors).

1. TX("urban agriculture" OR "aquaponic*" OR "aquaculture" OR "aeroponic*" OR "animal husbandry" OR "beekeeping" OR "city farm*" OR "community garden*" OR "container garden*" OR "digital agriculture" OR "greenhouse" OR "high-tech agriculture" OR "hydroponic*" OR "microgarden*" OR "pocket garden*" OR "rooftop garden*" OR "rooftop farm*" OR "urban agroforestry" OR "urban farm*" OR "urban garden*" OR "urban horticulture" OR "urban soil*" OR "vertical farm*" OR "vertical garden*")
2. TX("civic engagement" OR "active citizen*" OR "advocacy" OR "associational involvement" OR "boycott*" OR "citizen engagement" OR "citizen participation" OR "civic activit*" OR "civic competence" OR "civic development" OR "civic education" OR "civic order" OR "civic responsibility" OR "civic skill*" OR "civil participation" OR "collective action*" OR "communal activit*" OR "community activit*" OR "community building" OR "community service" OR "consumer participation" OR "democratic citizenship" OR "democratic practice*" OR "efficacy" OR "electoral participation" OR "empower*" OR "engag*" OR "individual action*" OR "multicultural competenc*" OR "organizational involvement" OR "party activities*" OR "petition*" OR "political action*" OR "political activism" OR "political behavior*" OR "political engagement" OR "political involvement" OR "political leadership" OR "political movement*" OR "political participation" OR "political process*" OR "political representation" OR "political voice*" OR "protest activit*" OR "protest behavior" OR "service activit*" OR "service learning" OR "service-learning" OR "social engagement" OR "social involvement" OR "social justice" OR "social responsibilit*" OR "voluntary association*" OR "voluntary work" OR "volunteer program*" OR "volunteer*" OR "youth develop*")
3. TX(youth* OR adolescent* OR teen* OR "high school*" OR "secondary school*" OR "young adult*" OR "student*")
4. 1 AND 2 AND 3