Indicators for Urban Agriculture in Toronto: A Scoping Analysis

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Toronto Urban Growers

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Executive Summary

When Toronto Public Health (TPH) identified a considerable gap in Toronto-specific data on the impact of urban agriculture (UA), Toronto Urban Growers (TUG) was commissioned to engage Toronto-based practitioners and key informants on identifying the most relevant and measurable indicators of the health, social, economic, and ecological benefits of urban agriculture. The overall objective of the work was to develop indicators that a wide range of stakeholders could use to make the case for making land, resources and enabling policies available for urban agriculture.

The process started with a desk study of recent attempts to create indicators to measure urban agriculture in other jurisdictions. Indicator experts were interviewed to identify effective strategies and common pitfalls for developing indicators. The preliminary research informed the development of a set of draft indicators and measures, which were reviewed by Toronto-based practitioners in one-on-one interviews and a focus group. This feedback was used to further refine the indicators and measures and to develop data collection tools for each measure. A subset of the practitioner group gave additional feedback on the feasibility of the data collection tools, leading to a list of 15 indicators and 30 measures recommended for use. The review also identified additional indicators for further development beyond the scope of the current project and a short list of indicators not recommended for use.

The diversity of urban agriculture was flagged as a complicating factor in developing widely applicable indicators, as UA initiatives vary according to type of organizational structure, focus of activities, size and capacity to collect data. Specific indicators such as improved mental health and social cohesion are difficult to assess, while even a seemingly straightforward statistic such as the amount of food grown is challenging to quantify and aggregate. This report also identifies key audiences for the indicators and how they might be used. For governmental audiences, rigorous data that emphasizes both the importance of UA to constituents and the capacity of UA to help achieve the goals and objectives of specific government initiatives is crucial. Valid indicator data is equally valuable to engage private and institutional landholders and to increase public support among residents and consumers.

The report concludes by remarking on the need for partnerships between the City of Toronto and urban agriculture practitioners to start using the recommended indicators to collect data for the 2017 season and to simultaneously continue

working on the more complex indicators to create a complete suite of tools. While individual organizations and businesses can collect data for their own funding and land use proposals, support for broader-impact strategies and enabling policies will only be possible if a city-wide picture of the critical role of urban agriculture is clearly established.

1. Introduction

The City of Toronto and in particular, Toronto Public Health (TPH) has a long history of supporting food security and urban agriculture (UA) initiatives. Recently, TPH has been a strong supporter of the Toronto Agriculture Program.

This work springs from key informant interviews in 2014 that occurred between TPH and decision makers concerning urban agriculture in Toronto. These interviews with local stakeholders (including funders and decision-makers), resulted in TPH hearing that local data is important for building a case for support for UA initiatives.

TPH contracted Toronto Urban Growers (TUG) to develop and pilot indicators to measure the health, social, economic and ecological impacts of urban agriculture. The benefits of urban agriculture by category are summarized in Appendix A. TUG was asked to create user profiles to demonstrate how key audiences would use the indicators, hold stakeholder consultations to assess pilot indicators, develop data collection strategies, pilot indicators at UA sites in Toronto and develop an evaluation plan.

The indicators are intended to be used both by City staff to assess citywide impacts, and by urban agriculture practitioners to demonstrate the benefits of their programs to a variety of audiences.

1.1 Key terms

Many definitions exist for urban agriculture that attempt to encapsulate this ever-changing and multifunctional activity. This report uses the simple definition from the TUG website: "Growing food by cultivating plants and raising animals in and

around cities".[1] Other definitions are more elaborate – see for instance the one used by the Design Trust (2012: 13), which states:

> Urban agriculture can be defined as growing fruit, herbs and vegetables and raising animals in cities, a process that is accompanied by many other complementary activities such as processing and distributing food, collecting and reusing food waste and rainwater, and educating, organizing, and employing local residents.

Finding all-encompassing language is challenging.[2] For instance, capturing all UA practitioners is not a simple task. Urban agriculture includes businesses, non-profit organizations, unincorporated associations (such as community garden groups), institutions (schools, universities, and hospitals), municipal programs and private growers. We refer to urban agriculture organizations to capture the range of entities that were contacted. Some were non-profit organizations, businesses or institutions. The term program refers to ongoing clusters of activities with a coherent set of goals and objectives. One urban agriculture organization may have a number of programs, projects and sites.

Finally, many approaches and understandings exist when speaking of indicators and measurements. Indicators can be equated with goals, or the benefits of an activity. An example of this could be eating more healthy food as a goal that can indicate health improvements in a population. Therefore measures are needed to provide data that will demonstrate how the goal is accomplished, such as the number of servings of fresh fruit and vegetables consumed on a daily basis. Data collection tools are the methods for gathering the measure data, such as a daily food diary or questions on a survey.

1.2 Criteria for urban agriculture indicators

A large number of indicators have been developed (and in some cases used) to measure urban agriculture and its impacts in a variety of contexts. For this project, a central purpose of our work has been to narrow this long list of

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[1] http://www.torontourbangrowers.org/what-is-urban-agriculture.

[2] Other broad definitions include the one proposed in the landmark book *Urban Agriculture: Food, Jobs and Sustainable Cities* (Smit et al. 2001). See an analysis of definitions of urban agriculture in the introduction to Chapter 1, available at http://www.jacsmit.com/book/Chap01.pdf.

possibilities to a shorter list of indicators and measures most relevant to Toronto urban agriculture practitioners and City staff. To achieve this, we used the following primary criteria.

1. The measures are easy for practitioners to use and provide relevant information on urban agriculture practices in Toronto. The data should be collected with a minimal commitment of time, effort and resources. Clear data collection tools will increase the amount of data compiled and reduce errors.

2. Collecting and compiling the data will not incur undue costs. There may be instances where the usefulness of the data outweighs the cost and difficulty of collection.

3. Invasiveness and impact on UA project participants is minimal.

4. The indicator is relevant to practitioners and matches their capacity to collect data.

5. The indicator is connected to outcomes for advancing urban agriculture in Toronto and correlates strongly to the interests of key audiences.

6. The indicator is well suited to local (Toronto) aspects of urban agriculture.

7. The scope of indicators is varied, addressing individual, organizational, community and citywide impact.

2. Literature Review

As a starting point, literature on indicators, non-specific and specific to urban agriculture was researched. Many publications influenced the course of the project.

The Urban HEART @Toronto report (Centre for Research in Inner City Health Toronto, 2014) contains useful information on indicator testing and validations.

Challenges of data collection including timelines are highlighted, indicating the strengths and weaknesses of using indicators.

Categories found in the Canadian Community Health Survey (CCHS) – 2015 were helpful in framing questions dealing with demographics.[3]

Indicators were also included in the Cole et al. (2015) submission to the Canadian Institutes of Health Research competition on Population Health Intervention Research to Promote Health and Health Equity. The participatory approach to indicator creation advocated for is important for further work. Garden indicators were initially created to capture social and economic aspects of urban agriculture in low-income, racialized communities.

Mamen (2005) discussed the launch of an indicators project concerning the California food system. The article identified the goals of a sustainable food system and listed indicators that could be used to uncover quantitative data. The need for cross-cutting indicators was also addressed.

Of the existing literature dealing with urban agriculture, the Design Trust (2012) work on New York City is probably the most well-known and referenced work. As part of this initiative, the Five Borough Farm project developed a metrics framework for assessing urban agriculture. Indicators are proposed for the areas of this study: health, social, economic and ecological. This was followed by the publication of a data collection toolkit (Design Trust, 2014), which details how the broader impacts of UA can be measured and reported.

In 2013 the City of Seattle explored how urban agriculture could be measured (Puget Sound Regional Council, 2013). Common statistics that were collected are stated along with a discussion of selecting data indicators and measurements. More recently, a group of organizations in Montreal have banded together in the Récolter Montréal project to create 40 measures for urban agriculture, focusing on educational activities, community gardens productivity and practices, economic value of produce, seed production and farmers' markets metrics.

Some early work related to the City of Toronto was carried out by Zawar (n.d.). This report, prepared for Toronto Public Health, examined what needs to be

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[3] http://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&a=1&&lang=en&Item_Id=238890#qb245369.

considered when developing indicators for measuring the health impacts of urban agriculture. More recently, the Toronto Region Conservation Authority's Socioeconomic Metrics project, led by Gladki Planning Associates also provided valuable insights.[4] The Parkdale People's Economy project created broader well-being indicators in partnership with Parkdale residents[5].

The impacts of urban agriculture were captured in a literature review undertaken at the University of California Davis (Golden, 2013). The construction of indicators and measures were influenced by the social, health and economic impacts that were found by the literature review.

Although indicators are not specifically mentioned, Santo et al. (2016) reviews studies on the benefits of urban agriculture and assesses the validity of each claim. Santo is particularly critical of the environmental benefits of local food. The article focuses on US studies and may not be transferable to a Canadian city.

Appendix B contains a Toronto Public Health (2017) report entitled A Health Evidence Review of Urban Agriculture with a literature review, results of interviews with key informants in Toronto and a case study of the Black Creek Community Farm.

3. Methodology

Existing indicators projects

In order to ensure that this project built on prior work, we began by investigating two types of relevant background materials. On one hand, we sought to discover what work has already been done on UA indicators globally. Of a number of sources found, the most developed was the Five Borough Farm Data Collection Toolkit. We also conducted a more focused search of other work within Southern Ontario that dealt with urban agriculture as well as other urban food aspects.

Feedback on indicators and measures

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[4] http://www.gladkiplanning.com/2016/02/691/.
[5] https://parkdalecommunityeconomies.wordpress.com/2016/04/04/parkdale-wellbeing-indicators/.

To complete the analysis of literature on the subject, we also reached out to four experts who were involved in indicator work related to urban food systems and urban agriculture. Based on these interviews, we received some inputs that helped guide us in developing indicators, measures and data collection tools, as well as processes for obtaining practitioner feedback.

The TPH Steering Committee also gave initial feedback on the first set of indicators and measures.

This first round was also informed by an analysis of key audiences. It identified both who would use the indicators and what types of information would be most relevant to key decision-makers (see Section 5).

From the expert feedback, a long list of draft indicators and measures was sorted into three lists: priority indicators, indicators that are potentially useful but aren't within the project scope, and indicators that are not recommended.

We obtained feedback on the draft indicators and measures from 15 stakeholders, including urban agriculture practitioners and academics, through individual interviews and a focus group. Stakeholders were given an opportunity to comment on the deferred and not recommended lists if they thought these should be included. A final list of indicators and measures for piloting with UA organizations was established and data collection tools were developed for each measure.

Throughout the report we refer to the people who gave us feedback at all stages as key informants and respondents. A practitioner refers specifically to people working directly in UA activities who reviewed the data collection tools. We describe people participating in UA activities as participants.

Trialing the data collection tools

Since it was clear that many of the essential pieces of data would have to be contributed by the organizations themselves (rather than the City, outside researchers, or networks such as Toronto Urban Growers), it was crucial early on to reach out to the most pertinent organizations, and to those that may be most amenable to being involved in such data gathering effort. The choice of potential

sites included the following considerations: a mix of type and size of organization (non-profit, educational institution and business), prior data collection and capacity to collect data.

We asked practitioners directly responsible for overseeing UA activities at seven sites across the city to review the data collection tools. Practitioners were given a survey of 34 questions designed to measure the pilot indicators and were asked to comment on the clarity of the questions and the feasibility of collecting the data. Data was not actually collected. Comments on the questions were consolidated into one table (Appendix C).

Evaluation

Two types of evaluation were designed for the project. The survey of 15 stakeholders on the draft measures and data collection tools provided the first evaluation, looking at the clarity and feasibility of the tools. The second evaluation was designed to be implemented after the data collection tools were tested in the field. A series of questions for the site contacts was drafted to assess the effectiveness of the tools in the field for a future phase of the indicator project. The questions are as follows:

- Did the data collection go as expected? Why or why not?
- Were data collection targets met?
- Were instructions for collecting data clear?
- Did participants find the surveys clear and easy to answer?
- Did participants refuse to answer questions or otherwise refrain from participating? Were any reasons given?
- Was it difficult to quantify a measure? Why?
- Were you able to collect data consistently (where applicable)?

Recommendations and next steps

The feedback from the consultation process led to a final set of recommended indicators, measures and data collection tools. The report concludes with suggested next steps that Toronto Public Health may consider for implementation in 2017, in partnership with other key actors in Toronto.

4. Results

It is evident that a large number of indicators and measures could be useful for assessing the extent of urban agriculture in Toronto and its impact on the city and its residents. However, for the scope of this project, choices were made among this list for the purposes of this project. Three tables present our recommendations regarding the selection of indicators, measures and data collection tools.

Recommended indicators within the project scope

Section 4.2 includes the indicators and measures that were reviewed by key informants and adapted based on their feedback. A graphic summary of the indicators is located in Appendix D. Data collection tools are included in Appendix E1.

Recommended indicators outside of the project scope

Given the constraints of the project, not all of the potentially useful measures could be fully included in the feedback process. Some data collection tools were not difficult to develop, but it wasn't feasible to test them because they require collecting data across the growing season. Other indicators were deemed important by key informants for determining the impact of urban agriculture in Toronto, but are challenging to measure reliably. They require more research and development than the present project could offer.

These indicators and measures were adapted based on initial consultations with stakeholders but were not reviewed by practitioners. (See Appendix E2).

Indicators not recommended

Appendix E3 includes commonly-used indicators and measures that are not recommended at the present time because they didn't meet the project criteria. The Appendix table includes the rationale for non-inclusion for each indicator.

4.1 Recommended indicators

The indicators and measures below were reviewed by key informants and practitioners and deemed to be relevant and feasible to implement. The indicators are grouped into four different categories: baseline data, economic, social and environment.

Indicators vary according to the optimal timeframe for measuring. Does measurement take place on a one-time basis, over a period of time (season, year) or on an annual or semi-annual basis? Feedback from key informants emphasized that some indicators will be more meaningful if they can be measured as changes across time.

Indicators will also vary in utility applied on a citywide basis, where numbers from a range of UA projects are compiled, or assessed on a project level.

The following table lists only the indicator category, indicator and measure. Data collection tools for each indicator and measure are listed in Appendix E1.

Table 1 – Recommended Indicators					
	Category	**Indicator**	**Measures**	**Timeframe** One-time, over period of time or longitudinal	**Scope of Application** Citywide (CW) or project (P)
1.	Baseline measures	Type of organization	# of different types of organizations	One-time Longitudinal	CW
2.	Baseline measures	Type of urban agriculture practiced	# of different types of agriculture	One-time Longitudinal	CW
3.	Baseline measures	Type of urban agriculture practiced	# of types of facilities	One-time Longitudinal	CW
4.	Baseline measures	Type of urban agriculture practiced	# of types of land tenure	One-time Longitudinal	CW
5.	Baseline measures	Diversity of urban agriculture products	# of products grown by UA projects	One-time	CW
6.	Baseline measures	Participation rate	# of people participating in UA	One-time Longitudinal	CW & P

7.	Baseline measures	Participation rate	Amount of time spent in UA activities	One-time	CW & P
8.	Baseline measures	Participation rate	% of people in types of UA programs	One-time Longitudinal	CW & P
9.	Baseline measures	Participation rate	# of projects maintaining wait lists # of people waiting to access UA programs and plots	One-time Longitudinal	CW CW & P
10.	Baseline measures	Participation rate	# of people in different roles	One-time Longitudinal	CW & P
11.	Economic	Local economic development	Total revenue generated from sales of food	Over one year Longitudinal	CW & P
12.	Economic	Local economic development	# of growers supplementing their income with produce sales	One-time Longitudinal	CW
13.	Economic	Job readiness/pathways to employment	# of UA programs offering training in employment-related skills	One-time Longitudinal	CW
14.	Economic	Job readiness/pathways to employment	# of people the farm/garden has trained in employment-related skills	One-time Longitudinal	CW
15.	Economic	Job readiness/pathways to employment	# of types of skills taught	One-time	CW & P
16.	Economic	Job readiness/pathways to employment	# of population subsets trained by UA organizations	One-time	CW

17.	Social	Supporting and developing leadership	# of UA participants in leadership roles	One-time Longitudinal	CW & P
18.	Social	Equity and inclusion	% of marginalized people represented in leadership/decision-making roles	One-time Longitudinal	CW & P
19.	Social	Equity and inclusion	# of people from marginalized communities employed in UA	One-time Longitudinal	CW & P
20.	Social	Bringing people together/social cohesion	# of opportunities for diverse people to work or socialize together	One-time	CW
21.	Social	Increased social capital – organizations	# of collaborations formed through UA project	One-time Longitudinal	CW & P
22.	Social	Increased social capital – organizations	# of organizational or program objectives achieved through collaborations	One-time	CW & P
23.	Social	Increased social capital – organizations	Duration of collaborations	One-time	CW & P
24.	Environment	Planting practices leading to improved soil, water, air quality	Number of UA projects with composting	One-time Longitudinal	CW
25.	Environment	Planting practices leading to improved soil, water, air quality	Number of UA projects using organic soil amendments	One-time Longitudinal	CW
26.	Environment	Planting practices leading to improved soil, water, air quality	Number of UA projects using organic pest control methods	One-time Longitudinal	CW

27.	Environment	Storm water management and water conservation	# of UA projects collecting rainwater	One-time Longitudinal	CW
28.	Environment	Water conservation	# of UA projects using efficient watering practices	One-time Longitudinal	CW
29.	Environment	Increased and diversified urban green space	# (sq. footage) of unused/underused land placed into food production	One-time Longitudinal	CW & P
30.	Environment	Increased biodiversity	# of UA projects that grow native/pollinator plants	One-time Longitudinal	CW

4.2 Discussion of indicators, measures and data collection tools

Capturing the diversity of urban agriculture

Many of the key informants flagged the concern that not all indicators are relevant to all types of urban agriculture. Variability existed on a number of dimensions:

Type of organization: For-profit and non-profit organizations, as well as unincorporated associations and individual growers tracked divergent kinds of data and conceptualized impact differently.

Focus of UA activities within the organization: Indicators gained or lost relevance depending on whether the organization focused on food production, education, training, social development or greening initiatives.

Capacity to collect data: The size and administrative and operational practices of organizations will have an impact on their ability to implement indicator tools.

As a result, a toolkit needs to contain a range of indicators that can be applied as appropriate. Decisions about relevance should be made by the practitioner, as a researcher without sufficient knowledge of the organization can make incorrect

assumptions (such as deciding that a for-profit business is not interested in social indicators).

Challenges in quantifying measures

Quantifying food produced

Many respondents identified both the importance of quantifying the amount of food grown and the difficulty of doing so in a meaningful way. Regular weighing of produce can be an onerous task for growers, especially if it is not done consistently. Then there is the question of interpretation - what does a pound of herbs mean compared to a pound of tomatoes? Quantity also doesn't address the value of food. Some foods are more costly to purchase regardless of weight or volume, others have greater nutritional, cultural or personal value. For both citywide and organization level data, respondents also asked for clarity on which growers would be included. Would data be collected from backyard and balcony growers?

One practitioner suggested addressing this issue by tracking groups of produce with similar weights (such as greens and herbs, tomatoes, squash). Other projects have offered growers weight charts with estimates of set quantities of produce (such as the weight of an average cabbage or a milk crate of eggplants).

Quantifying number of people participating

A straightforward question about how many people participate in an urban agriculture organization required a number of clarifying questions. Participants have varying levels of involvement, so respondents wanted to know if they should count occasional visitors. This question was clearer when it was situated after questions about level of participant involvement. Some respondents had the capacity to track low levels of involvement, others did not. The total number may be skewed in larger organizations where individuals participate in more than one UA activity and are counted twice.

Where respondents indicated they couldn't offer specific numbers, they were able to estimate proportions (such as None, Very few, Almost half, Half, More

than half, Almost all, All). Proportions may have limited value as evidence with some audiences.

Assessing impacts of UA on mental health

A number of UA practitioners interviewed identified improved mental health as a key motivator for participation in urban agriculture activities, in some cases surpassing the importance of access to the food itself. This is a notoriously difficult phenomenon to measure accurately. Mental health is a very broad term with the potential for multiple interpretations, ranging from clinical diagnoses to vague, highly subjective emotional states such as mood or stress level[6]. Many key informants cited the unreliability of self-reporting and the inability to establish causal links between UA activities and improved mental health. Others were concerned that this could be a sensitive topic to raise with participants in a survey setting and could only be raised in a context of trusting relationships, which would only be present in a limited number of UA organizations. Some respondents suggested that mental health was far too complex a subject to be addressed by an indicator project.

At the same time, the impact of participating in gardening activities has been extensively researched. Buck (2016) conducted a review of relevant research and found a number of studies and other research reviews showing a positive correlation between gardening and mental health, particularly for children and seniors. Buck acknowledges the concerns of validity within individual studies, but suggests that with a significant number of studies reaffirming the same correlations, the body of evidence as a whole makes a compelling case for the impacts of UA initiatives.

One promising approach is the data collection tool used by Five Borough Farm. It asks gardeners to assess their mood before and after gardening on a number of occasions over a period of time to strengthen the likelihood that positive mood changes are linked to the garden and not to external conditions. The tool focuses on mood, rather than diagnoses to avoid stigmatizing respondents.

Defining marginalized populations

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[6] Stress levels can be objectively monitored through cortisol levels in saliva (Buck, 2016), but this kind of test is not feasible in most urban agriculture settings.

When discussing marginalized populations in order to assess the impact of urban agriculture on equity issues, it is challenging to maintain a balance between allowing for the complexity of identity issues and creating clear categories for comparison and reliability of responses. Respondents emphasized the need to offer UA participants open-ended questions, particularly around gender identity, in order to self-identify accurately. Some respondents questioned the ability of organizational key informants to correctly identify participants' identity, indicating that only participant surveys that are designed and implemented with appropriate sensitivity can create an accurate picture. Respondents also highlighted the need to recognize intersectionality (how multiple identities and context impact on an individual's experience of marginality). While it was necessary for the scope of this project to group together categories of marginalization, experiences of marginalization can be different across categories and some loss of distinction occurs.

Social cohesion

Urban agriculture projects are often framed as places that create social cohesion by providing opportunities for people of diverse backgrounds to work together. Key informants indicated that the only way to assess this effect beyond the UA organization itself would be to conduct surveys outside in the wider community. It was also noted that some organizations that are mandated to work with specific populations may not be designed to bring diverse groups together and may be exclusionary places as a result.

Collecting demographic data about participating populations may reveal how many diverse groups are represented in UA activities, but will not reflect the degree or quality of interaction between groups. To get a better picture of the quantity of interactions at any given organization, a question on the number of opportunities for social interaction was trialed. Practitioners reported that it may be a difficult measure to gauge accurately.

Economic indicators

An indicator assessing the number of jobs created by urban agriculture is not included because there was general agreement that, although the field does

present as-yet barely tapped opportunities for entrepreneurs, the number would not be compelling at this point in time. A more compelling picture is created through looking at a spectrum of economic activity that includes skills development and income supplementation for low-income earners. Practitioners thought it would be interesting to track the number of people selling produce they grew outside of the context of a full-time business. As selling food is not permitted in some locations, it might be difficult to collect that data.

Education and training

Feedback from practitioners led to a more diverse categorization of education and training. Distinctions were made between activities with children and schools, professional training and certification programs and more general adult education (such as workshops). Practitioners also emphasized the importance of both formal (classroom or curriculum-based) learning and informal (hands-on, in situ) learning and mentoring and the full range of skills that can be acquired – food production, employment-related and social aptitude.

One key informant pointed out the distinction between assessing what programs teach and what their participants truly learn. Participants may not give reliable answers about skills learned, so it is important to conduct proper program evaluations to test what information and skills trainees retain. This was beyond the scope of this project to develop.

5. Key audiences

In order to select the best indicators of urban agriculture (UA), it is important to identify the key audiences that will use them and how they will be used.
- Who are the actors who can positively impact urban agriculture?
- How can urban agriculture help to achieve their objectives?
- How can UA indicators make a case for support?

This section will analyze how different audiences can be targeted for different indicators.

Key audiences can be classified into two types of actors, based on how they will use the indicators:

Transmitter audiences are those who already understand the benefits of UA and will use indicators to make the case for UA in the course of their work or improve their practices as a result of using this indicator. For example, a transmitter audience could be a non-profit organization involved in UA that is looking for a set of reliable indicators to help promote its programs to funders and supporters.

Receptor audiences are those who may not have much awareness of the impacts of UA. As they better understand the benefits of UA or realize the challenges UA practitioners face, they will likely demonstrate more supportive attitudes and behaviour. For example, a foundation would be a receptor audience. Quantitative and qualitative indicators will give them a deeper understanding of the challenges and potential of UA and may result in more funding being awarded to urban agriculture initiatives.

Key audiences and primary strategies

In order to identify the key audiences that can have an impact, it is important to understand the primary strategies that are needed in order to scale up urban agriculture and how each of the key audiences can support each strategy. These include:

- Development of UA-enabling policy (legislation, bylaws, regulations, best practices, purchasing policies, support services and coordination, such as the Toronto Agriculture Program)
- Expanded funding and in-kind support
- Improved access to land and growing space
- Increased public support for UA

To engage these audiences, it is also necessary to understand *why* they might want to support urban agriculture. How will UA help them accomplish their goals and objectives? The rest of this section provides some ways for using indicators strategically to target key actors that impact urban agriculture.

Government bodies

Generally speaking, government bodies are obviously well-placed to generate supportive policies and procedures, as well as supplying material supports such as

funding and land access. Government funding and policy initiatives can leverage broader support directly (through matching funds) or indirectly (by demonstrating the importance of urban agriculture to other funders, landholders and the general public). To appeal to government actors, it is critical to demonstrate two factors: the importance of urban agriculture to their constituencies and the ways that urban agriculture advances their program objectives, such as City initiatives like TO Prosperity, the Strong Neighbourhood strategy and Tower Renewal. Indicators for this audience must be developed with rigorous methodology to be compelling.

The following table offers more details about specific government divisions and departments. An additional chart assessing strategic actions and relevant indicator categories can be found in Appendix F.

Table 2 – Government Bodies		
City of Toronto Divisions	Strategic Actions	Most Relevant Indicators and How they are Used
Public Health, Food Strategy Team and Toronto Food Policy Council	Supportive policies, pilot projects to trial and document new initiatives, public education, skills development support (such as food handling)	Baseline data demonstrates demand for UA Social, economic indicators identify opportunities for future program development Some economic indicators can serve to assess progress on food waste and equity issues, food entrepreneurialism
Economic Development	Support of entrepreneurial development: navigating regulatory environment, linking to financial support and investment, business planning, skills development, incubator facilities	Economic indicators make the case for support for broadly-defined entrepreneurial development Social indicators point to need for skills development and pathways to employment

Parks, Forestry and Recreation	Land access and material resources, community programming, community garden start-up support	Baseline data demonstrates demand for UA Social and environmental indicators demonstrate broader impact of community gardens – social opportunities, leadership development, collaborations, equity, environment (soil and water quality, biodiversity, storm water management, waste reduction) Participation-related indicators inform future program planning
Environment and Energy	Public education and promotion of local food, funding, highlighting local initiatives, connecting to City environmental initiatives such as climate change, storm water management	Environmental indicators show progress in soil, water and air quality, biodiversity, storm water management, water conservation, increased diversity of green space
Real Estate	Land access, sample agreements and procedures	Data on waiting lists shows the need for converting under-used lands to green space
Planning	Enabling policy, navigating regulatory environment	Baseline measures and some economic indicators can serve to assess effectiveness of new policies, land use policies (including UA as

		a permitted use in zoning designations) and to identify new policies or changes in existing ones
Social Development, Finance and Administration	Developing innovative initiatives, navigating regulatory and administrative environments, linking to other City initiatives (such as Poverty Reduction Strategy)	Some social and economic indicators can help assess effectiveness of new policies, identify potential collaborations
Solid Waste	Material resources, promotion and education	Solid waste measures can guide food waste diversion and composting policies
Employment and Social Services	Skills development, UA participant support	Some social and economic indicators illustrate skills development and pathways to employment
Other Municipal Bodies		
Toronto Agriculture Program (TAP)	Identify and address gaps in enabling policy, promote cross-divisional collaborations and divisional goal-setting for UA	All indicators together can help identify gaps, priorities and best practices
Councillors and staff	Public education, funding such as Section 37, support for enabling policies	Indicators and their use vary according to priorities of councillor (social, economic, environmental or health)
School Boards (Public and Catholic)	Land access, skills development, community engagement models	Baseline and social indicators can engage diverse community members, identifying

		best practices for school initiatives Demonstrating impact to internal and external stakeholders
Toronto Community Housing	Land access, material supports, community engagement models	Engaging diverse community members, identifying best practices for school initiatives Demonstrating impact to internal and external stakeholders
Toronto and Region Conservation Authority	Land access, enabling policy (including lease agreements), community programming	Baseline data demonstrates demand for UA Social and environmental indicators demonstrate broader impact of community gardens – social opportunities, leadership development, collaborations, equity, environment (soil and water quality, biodiversity, storm water management, waste reduction) Participation-related indicators inform future program planning
Provincial Ministries		
Environment, Energy and Climate Change	Develop enabling policies – land usage, composting	Environmental indicators demonstrate impact of UA and build

		understanding of its unique aspects
OMAFRA	Develop enabling policies	Environmental indicators demonstrate impact of UA and build understanding of its unique aspects

For-profit corporations

Corporate social responsibility (CSR) is a powerful motivator to engage businesses in providing land access. The types of indicators relevant to companies will depend on their corporate culture and branding strategy, whether their focus is on environmental, health or social issues. CSR can be a motivator for developing local food purchasing policies, and companies may respond favourably to social and economic indicators that show strong community economic development impacts and support for entrepreneurialism. Companies looking to develop programs for their employees to improve retention and job satisfaction may be motivated by social and health indicators that make the case for community building and improved well-being. The environmental benefits of locally produced food, particularly the impact of reducing food miles on climate change, are currently in dispute (Santo & Kim, 2016) and therefore may not make a strong enough case with this audience.

Funders

It is clearly important to gain the support of granting bodies (including governments, foundations and corporations) as well as individual donors. The type of indicator relevant to this group will vary according to funder mandate and granting program objectives. This remains true for both funding and in-kind support.

Financial institutions providing loans are another, often forgotten, key audience. Farmers experience difficulties in obtaining loans for their businesses, urban growers with innovative business plans may have more success. Indicators emphasizing the potential for entrepreneurial success may help UA enterprises access loans and make the case for new and creative financing arrangements.

Landholders

Social and environmental indicators can convince property management companies, either with either rental or owned units, that offering space for growing food can assist them with resident satisfaction and retention.

Similarly, faith groups may become interested in creating community gardens in order to engage their congregations and build community. Non-profit organizations, health care facilities (such as community health centres and hospitals) and educational institutions can have similar interests in health promotion and social and equity issues, including the potential for outreach to marginalized populations.

The general public

As urban agriculture projects can either be shut down or significantly delayed if residents or local associations object to them, it is critical to the start-up of new projects to ensure that the general public understands the benefits of UA. With some variations, individual residents as well as Business/Neighbourhood Improvement Associations and Residents' Associations need to hear how UA can bring physical improvements, build community cohesion, create skills training and entrepreneurial opportunities and create attractive, publicly accessible green spaces.

6. Common urban agriculture types and applicable indicators

The following table is not prescriptive, but provides some suggestions for which indicators are a good fit for various forms of urban agriculture. Some UA projects will be hybrids of more than one type, such as community gardens with educational or therapeutic programs or commercial farms with a social enterprise element. The choice of indicators will be strongly impacted by the focus of the UA project and there will always be exceptions. For instance, some commercial farms will use environmental indicators in their marketing approach, school gardens may have a social enterprise component, and community gardens may or may not embrace equity and inclusion as a goal.

Table 3 – Urban Agriculture Types and Relevant Indicators	
Urban Agriculture Type	**Relevant Indicators** Bold typeface = highest relevance, Normal typeface = medium relevance
Community gardens	**Type of UA practiced** **Diversity of UA products** **Participation rate** **Supporting and developing leadership** **Equity and inclusion** **Bringing people together/social cohesion** **Increased social capital – organizations** **Planting practices leading to improved soil, water, air quality** **Storm water management and water conservation** **Increased and diversified urban green space** **Increased biodiversity** - Local economic development - # of growers supplementing income with produce sales
Allotment gardens	**Diversity of UA products** **Participation rate** **Planting practices leading to improved soil, water, air quality** **Storm water management and water conservation** **Increased and diversified urban green space** **Increased biodiversity**
Commercial farms	**Diversity of UA products** **Local economic development - Total revenue generated from sales of food** **Job readiness/pathways to employment** **Equity and inclusion** **Increased social capital – organizations** **Planting practices leading to improved soil, water, air quality** **Storm water management and water conservation** - Supporting and developing leadership - Increased and diversified urban green space

	• Increased biodiversity
School gardens	• **Participation rate** • **Job readiness/pathways to employment** • **Increased social capital – organizations** • **Planting practices leading to improved soil, water, air quality** • **Storm water management and water conservation** • **Increased and diversified urban green space** • **Increased biodiversity** • Diversity of UA products • Supporting and developing leadership
Training gardens	• **Participation rate** • **Diversity of UA products** • **Job readiness/pathways to employment** • **Planting practices leading to improved soil, water, air quality** • **Storm water management and water conservation** • **Increased and diversified urban green space** • **Increased biodiversity** • Supporting and developing leadership • Local economic development - # of growers supplementing income with produce sales • Bringing people together/social cohesion • Increased social capital – organizations
Therapeutic gardens	• **Participation rate** • **Equity and inclusion** • **Bringing people together/social cohesion** • **Increased social capital – organizations** • **Planting practices leading to improved soil, water, air quality** • **Storm water management and water conservation** • **Increased and diversified urban green space** • **Increased biodiversity** • Job readiness/pathways to employment • Diversity of UA products
Private gardens	• **Participation rate - # of people participating in UA**

	• **Diversity of UA products** • **Planting practices leading to improved soil, water, air quality** • **Storm water management and water conservation** • **Increased and diversified urban green space** • **Increased biodiversity** • Local economic development - # of growers supplementing income with produce sales

7. Additional recommendations

Further recommendations for the implementation of the indicators are as follows:

- The definition of urban agriculture should be as broad as possible, to capture the full range of benefits UA activities can provide. This will create a challenge when deciding on sample levels for consolidating data, as a large, granular and diverse sample may be needed to achieve both breadth of data and reliability.

- Many organizations collect a significant amount of data for their own purposes, including evaluations imposed on them by funders. However, such data is disparate, making consolidation with data from other organizations impossible. A data collection initiative needs to be developed to balance enabling comparability across cases with avoiding creating extra burdens for UA organizations.

- Developing valid measures for assessing challenging but important indicators is needed. Critical gaps that can be addressed in a next phase include:
    - Quantifying food by volume, diversity and value (monetary and non-monetary);
    - Analysing impacts on mental health; and
    - Developing methods for evaluating level of skills developed in formal training programs that will support an indicator based on skills learned.

- The recommended indicators were developed to suit a wide range of audiences. Additional work is needed to make the measures and data collection tools the most relevant for specific audiences and contexts.

8. Building a Case for Urban Agriculture: Next Steps

The direction from previous key informants is clear – while considerable evidence for the impact of urban agriculture exists in other jurisdictions, it is critical for decision makers to have local data that demonstrates local impact in order to prioritize urban agriculture. Local, timely data is also essential for planning effective, responsive urban agriculture initiatives.

Indicators can be tailored to compile credible evidence for a variety of impacts, including economic, environmental, social and health outcomes. They can demonstrate how urban agriculture supports the objectives of City of Toronto priorities and initiatives, such as Prosperity TO, the Strong Neighbourhoods Strategy and Live Green Toronto. Indicators can also be adapted to speak to a range of the key audiences who contribute to scaling up urban agriculture in Toronto. While valid indicator data is important to government policy makers and funders, it is equally valuable for engaging private and institutional landholders and to increase public support among residents and consumers.

Building a compelling case will need the collaboration of the City of Toronto as well as civil society organizations like Toronto Urban Growers and urban agriculture practitioners. While some of the data collected will be useful to individual organizations or businesses in their funding or land use proposals, creating a picture of urban agriculture outcomes city-wide will be critical for sparking investment in broader-impact strategies and enabling policies.

Indicators recommended by this project were identified by UA practitioners and key informants as measurable, relevant and vital for strong advocacy. Supported by the Steering Committee of the Toronto Agriculture Program, a partnership between the Toronto Food Policy Council and urban agriculture organizations can begin collecting data using the existing indicators in 2017. Work on the compelling but more challenging indicators can continue until a comprehensive set of indicators is completed. A partnership between the city and non-profit

organizations can most effectively source additional resources to support data collection with Toronto practitioners.

Detailed next steps are as follows:

Completing the development of an indicator toolkit
- Address critical gaps, including indicators listed in Appendix B3
- Incorporate indicators from existing projects that are not included in this report
- Identify partners to field test data collection tools

Laying the groundwork for collecting data
- Develop an appropriate sampling plan
- Determine where data collection will be housed on an ongoing basis
- Source funding and other resources for data collection and analysis

Developing a communications plan for the project
- Communicate to urban agriculture actors the existence of this project and its initial process, to identify potential participants and to start sharing the lessons from it.
- Once the indicators and measures are field tested, communicate to urban agriculture actors and to select other parties the initial results.
- After the indicators and measures are implemented more extensively, develop a wider communication strategy about the urban agriculture indicator project, including reaching out to key audiences.
- Integrate communication plan with completion of indicator toolkit since the way data will be used may have an impact on how it is collected and aggregated.

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Appendices

Appendix A - Benefits of Urban Agriculture

Multiple benefits of UA have been identified in recent years. These benefits can help guide the selection of UA indicators for Toronto. A partial overview of these benefits is provided in the following table.

Health	Improved access to healthy food, increased fruit and vegetable consumption, increased physical activity, engagement of marginalized people, decrease in diet/exercise-related illness, improved mental health and self-esteem, workplace and food safety, food health literacy
Social	Reducing isolation, social integration (safe places for diverse populations to work together, reducing stigma and breaking down stereotypes, social support networks, access to community resources), community safety, age-integrated spaces, youth engagement, team building, social skills development (self-organizing, teamwork, communication, group facilitation, leadership, community organizing), increasing equity and reducing inequality, perceived sense of safety/reduction in crime and consequent strengthening of residents' pride of place, empowerment and mobilization
Economic	Innovation and entrepreneurialism, pathways to employment (employment-related skills training and experience), development of social enterprises, increased affordability of food
Environ-mental	Reduction of carbon footprint, storm water management, air, water and soil quality, increased biodiversity, provision of pollinator plants, public access to greenspace, provision of green infrastructure, micro-climate regulation (Urban Heat Island), recycling of organic waste, increased resilience to climate change, citizen engagement and stewardship

Toronto Public Health - January, 2017

Background

Urban agriculture is a broad term which encompasses everything from backyard gardening to rooftop food growing to institutional gardens to urban farms and everything in between. These gardens can be found in parks, community centres, hydro corridors, on rooftops, balconies, churches, mosques, backyards, schools, hospitals and even indoors. They can be for profit or community skill building or an educational resource or a therapeutic space for health and wellbeing.

The interest in urban agriculture continues to grow in Toronto. Research exploring the health impacts of urban agriculture in the City of Toronto has been recently conducted and includes a literature review of the health evidence, key informant interviews with diverse stakeholders, and a case study of Black Creek Community Farm and the impact it has made on the health, wellbeing, social cohesion and economy of the area. The aim of this research is to determine the current impacts of urban agriculture in Toronto in regards to health, social, environment and economic impacts and the implications on policy development.

Review of Health Evidence

Urban agriculture creates important societal, economic, environmental and health benefits for the community[1]. As a health intervention, urban agriculture has the potential to offset public health expenditures from negative health outcomes[2]. To better understand the health impacts of urban agriculture, a literature review was conducted. The review included both peer-reviewed and grey literature published between 2000 and 2014.

Overall, the majority of evidence indicates that urban agriculture has positive impacts on self-reported healthy eating, access to healthy food and food security, social capital and cohesion and local and regional economic stimulation[3]. The benefits of urban agriculture are seen to outweigh the potential risks, which are considered reasonably easy to mitigate[3].

Most studies underscored the need for more rigorous and robust evaluations of the impacts of urban agriculture. There is a need for longitudinal studies that

utilize both quantitative and qualitative research tools to measure the association between urban agriculture and health[4].

Health Impacts

Multiple studies indicate a positive relationship between participation in urban agriculture and the increased consumption of fruit and vegetables [1, 5, 6, 7]. Participants in one study reported improved food access to culturally appropriate foods as a result of participating in urban gardening projects[8]. Self-reported increased physical activity through gardening is considered an important health benefit associated with urban agriculture[8, 9].

Studies found that a healthy diet from urban gardening could lead to a reduced incidence of obesity. Evidence indicates that urban agriculture has a positive impact on reducing chronic disease and obesity[10], through access to fresh food[6] and increased food knowledge[5]. Student participation in farm to school programs led to increased food literacy and knowledge[7]. Benefits to mental health such as improved mood and stress reduction is indicated through the benefits of green space[11, 12].

Research indicates a few potential health risks associated with urban agriculture including the spread of food-borne or communicable disease and the possibility of injury[13, 14]. These were often outlined as potential health risks that could be mitigated, including the contamination of food by toxins or microbes, or unsanitary conditions due to pest or rodent infestation[13, 14]. The likelihood of food-borne illness would be very small and related to produce not handled appropriately at or after harvest, and is mitigated by following proper food safety regulations [13].

Social Impacts

Studies have indicated positive impacts of gardening on building assets through social networks and increased social cohesion[7, 13]. Urban agriculture fosters healthy child and youth development by providing training opportunities, access to healthy food and through empowerment and the development of leadership skills[6].

Urban agriculture has been linked to a number of social factors that have a positive impact on health including; the inclusion of people of vulnerable populations such as newcomers or racialized communities[15], the creation of safe neighbourhood spaces[12], enhanced cultural connection and cultural exchange[10, 14], reduced isolation through age-integrated spaces[9, 16], and enhanced community engagement and development[15].

Economic Impacts

A large body of literature noted the economic benefits of community gardening through local and regional economic stimulation. Multiple studies found that urban gardening activities in the form of selling produce stimulated the local economy[1, 6, 7, 14]. However, it was observed that few studies quantified the financial value of the produce grown and associated entrepreneurial activities[6].

Urban gardening can also provide the opportunity to develop job skills related to food growing and preparation[17] and the ability to create and maintain jobs[7, 14, 18]. Poverty reduction through saving money on food costs and income generation from selling produce were found to be some of the major benefits of community gardening and urban agriculture[2, 6].

Environmental Impacts

The most frequent environmental health concern associated with urban agriculture is the exposure to contaminants such as lead[6, 19, 20]. The majority of the research on soil contamination and urban agriculture evaluated ways of mitigating the risks so that urban gardening activities could take place[21]. Research widely acknowledges the many benefits of urban agriculture and recommends that the practice should be promoted while taking measures to prevent exposure to contaminants[20, 21].

In addition, urban agriculture activities can lead to improvements to the environment, including better neighbourhood air quality[11, 13, 22], soil improvements[7, 9, 13, 23] food waste reduction[18] and stormwater management[9]. Urban agriculture is also seen to contribute to a healthy environment through promoting stewardship and sustainabilitiy[2, 24], habitat improvement through increased ecological connectivity and biodiversity[2], and improved conservation[22].

Key Informant interviews

Key informant (KI) interviews were conducted with 17 representatives of government, not-for-profit, funding, developer and community organizations in Toronto. Key informants were identified by members of the Healthier Harvest Research Consortium, a past group including researchers from Toronto Public Health (TPH), University of Toronto (U of T), Ryerson and York Universities and members of the BCCF Steering Committee who investigate, develop and communicate the health impacts of growing food at all scales in Toronto.

The KIs were identified based on the fact that their work or that of their organizations included urban agriculture as a focus or interest. KIs were selected in equal numbers by sector. The interviews were completed with the aim of furthering current understanding of decision makers' knowledge, attitudes and practices related to the emerging policy and practice of urban agriculture in Toronto. The key informants were asked their perspectives on the impacts of urban agriculture in Toronto, the barriers and opportunities for growth and the utility of quantitative evidence in the policy development for urban agriculture. The interviews took place between November 2013 and March 2014 and were conducted in-person.

Health Impacts

Key informants identified several positive health impacts of urban agriculture including increased access to food, increased physical activity, healthy eating, improved food security, built environment transformation and improved community mental health. The negative impacts they associated with urban agriculture were related to personal injury and food safety. These are similar impacts that have been noted in the literature.

Social Impacts

Key informants identified positive social impacts on community food education and literacy, as well as potential negative impacts including petty crime, and the risk of failure of the farm due to lack of commitment from partners. They noted challenges of engaging new immigrants, mediating conflicts between new and long-time residents, serving multiple interests/communities, community

commitment to justify investment, and the collaboration among sectors and levels of government. These challenges were all deemed surmountable.

Economic Impacts

Key informants noted positive economic impacts regarding property values, employment, training and entrepreneurship opportunities, and local economic development. The potential negative impacts or issues that potentially would be needed to be addressed included expense of remediation and investments, capacity and funding for non-profit agencies, municipal budget priorities, low profit margins in the food sector, expense of distribution infrastructure, managing insurance and liability risk and perception.

Environmental Impacts

Key informants listed positive environmental impacts such as built environment transformation, ecosystem services, productive uses of green spaces and environmental education and literacy. The potential negative impacts such as wildlife management, energy use, land use conflicts, waste management, soil contamination, pesticides and dog urine were mentioned. It was suggested that policy changes such as zoning and other land use regulations would make it easier to increase urban agriculture in Toronto.

Black Creek Community Farm Case Study

In the spring of 2013, Everdale in partnership with Food Share, Afri-Can Food Basket, Fresh City Farms, and the Toronto Regional Conservational Authority, established the Black Creek Community Farm on seven acres of urban land at Jane Street and Steeles Avenue. The farm is staffed and supported by community residents, and offers a site for learning and training as well as fruit- and vegetable-growing. Everdale's project vision is for improved food security through community capacity-building in primarily Black Creek and the surrounding neighbourhoods. The farm serves as an example of successful urban agriculture for other communities in Toronto, or even further afield.

Community Profile

The Black Creek Community has a higher incidence of high blood pressure, cardiovascular disease and diabetes compared to the city average[30]. It also lacks opportunities for physical activity and food access.

Black Creek and its surrounding neighbourhoods are not very walkable, with few pedestrian crosswalks and a high volume of vehicle traffic. Fresh, culturally appropriate, and affordable food is difficult to access [25]. There are few grocery stores where fresh food can be bought and these are clustered at strip malls and major intersections difficult to access by public transportation or by foot. In contrast, there are a high number of fast-food establishments and convenience stores in the area where unhealthy, inexpensive, and energy-dense food options are sold. Money spent on food often represents a significant proportion of monthly income in the Black Creek community, and food prices, particularly fish and produce, have been rising steadily in Ontario since 2010[26].

In 2014, Black Creek had the lowest equity score out of the 144 neighbourhoods in Toronto, based on a set of indicators including economic opportunities, social development, participation in decision making, physical surroundings and healthy living[27]. Some of the equity measures where Black Creek lagged behind the city average included lower income, lower education levels, higher unemployment rates and more single parent families[28]. These social determinants, particularly unemployment, income and education, are known to have a negative impact on health[29].

Awareness of the Farm

Interviews were conducted in a local mall to assess community awareness of the farm. This was completed in 2013, the first year of the farm. Overall, 33% of interviewees were aware of the farm and 12% had visited it. Almost 90% of interviewees were interested in visiting the farm and learning more.

In 2013 there were 1364 visitors who made 2188 visits to BCCF. The farm held two events in 2013 and had 415 guests visit on 26 pre-arranged tours. 41% of visitors to the farm in 2013 were adults 18-30 years old. In addition a large number of youth (under 18) visited and contributed to farm activities.

Overall the farm was found to be a welcoming environment and people identified an interest in having access to more training and leadership opportunities. They found the BCCF a great way to teach food skills and literacy, show the health benefits and improved access to local food. The interviewees would like more community outreach, more involvement of community members in farm decisions and increased community awareness. Interviewees indicated that is important for people working on the Black Creek Community Farm to reflect the racial and cultural diversity of the community around it.

Impacts of the Farm

The BCCF increased access to healthy nutritious foods in the area and also provided an opportunity for physical activity among the volunteers who participated in farming activities. In relation to employment, Black Creek Community Farm had 9 full time staff in 2013, and an additional 9 part time staff and staff from partner organisations. Over 2200 volunteer hours were contributed to the farm, and played an important role in the success of the farm's first year.

Over 75 varieties of 48 types of vegetables were grown at Black Creek Community Farm in 2013. Ranging from Ontario staples like beets, carrots, parsnips, potatoes and cabbage to vegetables that resonate more with the ethnic diversity of the Jane & Finch area – callaloo, okra, long & round eggplants, Szechuan chili peppers, sweet potatoes, and long beans. In total, approximately 15,000 pounds of produce was grown on the farm – with an estimated 32% of those vegetables being sold locally.

Conclusions

The review of evidence on the impacts of urban agriculture provides information to support urban agriculture as an activity that achieves multiple societal goals including: physical activity, food security, food literacy, local economic development, community building and engagement. Findings from key informants and the case study at Black Creek Community Farm support and complement the findings from the literature review of health evidence.

Strong leadership and support will aid the growth of urban agriculture across Toronto. Funding for agencies to support urban agriculture has been historically difficult to obtain and alternative funding sources should be explored to support further research into the benefits of urban agriculture. The further development of evidence of the impacts of urban agriculture would support the allocation of local resources for urban agriculture opportunities.

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Appendix C – Consolidated Feedback on Data Collection Tools

	Site Description	
	Questions	**Comments from Respondents**
1.	What is the structure of your organization? ___ Non-profit organization ___ Incorporated business or self-employed ___ Institution (such as a school, university or hospital) ___ Community garden ___ Other (specify)	"Primary structure" is better. Because what if we can fit in two option (ex. institution but also non-profit)? How about grassroots groups, food security networks, or other informal bodies?
2.	Rank the top three uses of your urban agriculture site (numbered one to three) ___ Food production – sales ___ Food production – individual use or community distribution (e.g. food bank) ___ Education (working with children, schools of all levels) ___ Training (formal training programs, internships or workshops, adult education) ___ Social/therapeutic ___ Greening/environmental ___Other (specify)	Good. However there are lots of projects involved and it's hard to pick top three! Therefore, instead of "rank top three", "rank all that is relevant" is better. "Education (for adult)" should be a Separate option just like "Education (children)". It should probably be separated from training. "Social" and "therapeutic" should be separated; "Environmental" is more like a motivator or byproduct, not really a use.
3.	What types of growing facilities does your project have? Check all that apply. ___ In-ground growing ___ Rooftop ___ Greenhouses ___ Containers (including balcony, vertical growing) ___ Hydroponics or aquaponics ___ Other (specify)	This question is fine but some definitions in an appendix might be necessary How about the size? Maybe I only have a tiny in-ground space but a large greenhouse, do we care about that information?
4.	Is the land: Privately owned __; Public __; Other __; Don't know __	Add "Mark all that applies". May have different plots that are owned by different sectors.' Include if land is owned or leased

5.	What fruit, vegetables and/or medicinal plants does your urban agriculture project grow?	Easy
6.	What is the total revenue ($) generated from sales of produce grown by your urban agriculture project in the past calendar year? Refer only to food grown on urban lands if possible. Under $1,000 $1,000-<$5,000 $5,000-<$10,000 $10,00-<$20,000 $20,000-<$30,000 Over $30,000	Total revenue = total receipts from the sale of any given quantity of a product. Easy, but needs a higher scale going to $100,000+ and some in between for larger businesses
	Project Participants	
7.	How many people in total participate in all of your urban agriculture activities?	Good. However, there are direct participants and indirect participants. For example direct participants are people who come to our market (number is easy to get); indirect participants are family members who did not come to the plots but still enjoyed the products and benefited from the projects (hard to get number, but should include an estimation). Hard to come up with a number! In addition, the question is kind of misleading… Do we count a person multiple times if he/she participate in multiple activities? What if someone has only showed up once when harvesting? To answer this question it might be necessary to include how we would like people to measure these numbers, as some groups measure and some don't.

		The leading group and some participants come regularly, and lots of informal participants for example residence may sometime show up at activities. Maybe ask how many people are leading the activities first, then ask total participants.
8.	If you have multiple types of UA activities, how many people are involved in each type of activity? ___ Food production – sales ___ Food production – individual use or community distribution (e.g. food bank) ___ Education (working with children and schools of all levels) ___ Training (formal training programs, internships or workshops, adult education) ___ Social/therapeutic ___ Greening/environmental ___ Other (specify)	Like question 2, add "Education (adult)" as well. Include category more clear about decreasing social isolation 'Nature appreciation' might be helpful for informal UA activities Complicated→ If food production or sales is included in this it becomes difficult to answer because you have people on the farms and then people working in warehouses, etc.
9.	Thinking of all of the people who participate in your urban agriculture project, what percentage of them falls into each category of involvement: ___ One-time or occasional visitors ___ At least once per month ___ Weekly (over the season) ___ More than once per week	Some groups gave a good measure for this but the same problems of keeping track arise as earlier stated Difficult to answer. How would I gather that percentage…I don't have that info on registration form.
10.	In your urban agriculture projects, please tell us the number of: ___ Part-time and seasonal employees ___ Full-time employees ___ Individual growers in commercial plots ___ Individual growers in community gardens ___ Individual growers in allotment gardens ___ Individual growers in backyards or balconies ___ Volunteers	Participant hesitated. Think question 8 and question 10 kind of overlap, but figured out soon. Add category for growers in commercial goods category

11.	Do you have any people employed in your urban agriculture project that would identify themselves as:	Don't like the wording of "Other than heterosexual or male/female binary gender". This group can be very sensitive, change the wording to "A member of LGBTQ / LGBTTIQQ2SA community" would be better.
	• Black • Indigenous/First Nations, Metis or Inuit • From another racialized group • Newcomers (in Canada < 5 years) • Having physical or mental health challenges • Other than heterosexual or male/female binary gender • Low-income and/or vulnerably housed • Speak English as a second language	Confusion: "Should people that fit in more than one categories be counted multiple times?" I had to explain one number for all categories. Confused at first but can answer it. Whoever completing this survey will be the one who identify them, and this person may not be able to know if participant is vulnerably housed. This person can only assume for example participants are indigenous, but they may not identify them this way. Not sure about the identifying process.
13.	Do you keep a waitlist for your project? ___ Yes ____ No If yes, how many were on the waiting list at the beginning of this year?	Multiple project, multiple waiting list. Provide a total number or a number for each project? Clarify if the waitlist is for projects, plots, etc. Complicated→ Some groups have an application pool each year and then throw them out and restart the next year rather than a wait list

	Social Indicators – Skills Development	
14.	Does your project compost organic waste on site? Yes__; No__; Not sure___	Maybe change it to "Does your ORGANIZATION…) Because one organization can have multiple projects, some compost organic waste on site and some do not. Maybe should also ask what type pf compost method
16.	Does your site use organic pest control methods? Yes__; No__; Not sure___ What kind?	Same with Q14, may have more than one site, better change "site" to "organization".
18.	Does your site use efficient watering practices? Yes __ No__ If yes, which of the following: ___ Spot watering ___ Drip irrigation ___ Sub-irrigated planters Other:	Also good to know about water collection. In appendix include definitions to clarify what each of these are. Some may be used but not initially planned this way
20.	Do you plant and native/pollinator plants in your urban agriculture project? Yes __ No ___ Don't Know ___	Same problem: may have more than one project.
21.	Does your project offer any formal skills development opportunities? Yes __ No __ If Yes, what kind: ___ Course/training program/certificate program ___ Workshops ___ Formal mentoring program (agreement to work as mentor/mentee, specific time frame, frequency of contact or objectives specified) ___ Internship ___ Other	Easy
22.	How many people have had formal skills development opportunities in each category over the past calendar year? ___ Course/training program/certificate program ___ Workshops ___ Formal mentoring program (agreement to work as mentor/mentee, specific time frame, frequency of contact or objectives specified) ___ Internship ___ Other	Easy
23.	Does your project offer informal skills development opportunities? Yes __ No ___	Easy

	If yes, What kind: ___ Hands-on experience ___ Informal mentoring/working with skilled growers ___Other (specify)	
24.	How many people have had informal skills development opportunities in your project over the past calendar year?	Similar with Q7, hard to answer but doable. Organizations may need to be told to include this in their measures. It would be helpful to give some of this information to groups in advance so they can measure for future years Easy→ Participant had difficult time identifying who was informal even when formal leaders were defined because they could not confirm numbers of people who were working together in some spaces
25.	What skills do you help participants develop? ___ Food production ___ Organic/ecological/sustainable production methods ___ Other environmental practices ___ Marketing/distribution ___ Food processing ___ Food safety ___ Business planning ___ Employment-related (such as punctuality, business communication, working with a supervisor) ___ Fluency in English (conversation, reading comprehension) ___ Social skills (communication, working constructively with others, working with people from diverse backgrounds, respecting others) ___ Other (specify)	Easy
26.	What segments of the population participate in your formal skills development programs? Select those which apply: ___ Youth ___ Newcomers ___ Vulnerably housed people ___ Low-income and/or vulnerably housed people ___ Non-English speakers ___ People experiencing physical or mental health barriers ___ Racialized people	Should add a category: Student. Maybe should also ask about segments participate in informal skills development program? May only know if programs are designed for specific

	___ Other	participants. Otherwise estimate may be possible

	Social Indicators – Leadership	
	Leadership can be demonstrated either in a formal role (garden coordinator, chair of garden committee, team leader, supervisor, manager, executive director, president) or in informal ways through leadership behaviours.	
27.	Does your urban project have a formal leadership structure? Yes ___ No __ If yes, which of the following roles are represented? ___ Garden Coordinator ___ Chair or Members of Garden Committee ___ Team Leader/Supervisor/Manager ___ Board Chair and Members ___ Executive Director or President ___ Other	Group may have those structure but are not labeled as above. People are organizing without this type of structures at ground level. How about we have a garden with 4 leaders. Does that count as formal? Maybe also describe the categories, so that we can learn what we have not been thought of.
28.	Of the people with formal leadership roles, How many of them identify in the following ways: • Black • Indigenous/First Nations, Metis or Inuit • From another racialized group • Newcomers (in Canada < 5 years) • Having physical or mental health challenges • Other than heterosexual or male/female binary gender • Low-income and/or vulnerably housed Speak English as a second language	One number for all categories. May need to ask as a proportion if precise numbers are not possible: None Very few Almost half Half More than half Almost all All Take out the word "formal" or replace it with "identified". Like this type of percentage!
29.	Examples of informal leadership include: • Providing advice to others on production issues • Providing advice to others on interpersonal or organizational issues • Making decisions related to project or group functioning (as opposed to decisions affecting only personal garden plot or job responsibilities) • Assisting and enabling others to participate in decision-making • Conflict resolution • Establishing good relationships between others in the project	Use "Other forms" instead of "informal".

	• Identifying issues and working towards solutions • Short, medium and long term planning Do any participants in your urban agriculture program demonstrate informal leadership skills? Yes ___ No ___ How many people in your urban agriculture project have demonstrated informal leadership?	
30.	Of the people demonstrating informal leadership behaviours on a regular, consistent basis, how many of them identify in any of the following ways: • Black • Indigenous/First Nations, Metis or Inuit • From another racialized group • Newcomers (in Canada < 5 years) • Having physical or mental health challenges • Other than heterosexual or male/female binary gender • Low-income and/or vulnerably housed • Speak English as a second language	Use "Other forms" instead of "informal".
Social Indicators – Other		
31.	Does your project offer opportunities for diverse people to work or socialize together? Yes__; No__; Not sure__ If yes, how: ___ Work sessions ___ Social events ___ Educational events ___ Other	Easy If community garden, people shows up and picking, does it counts as work session? Confused, hard to identify category, need to come back and think about it.
32.	How many collaborations has your organization formed or joined related to your urban agriculture projects? ____	This could be difficult to answer because there are direct and indirect collaborations Do we only care about collaboration that described above? how about community group? Networks? Grassroots?
33.	How long have each of the collaborations existed? New- less than two months 2-6 months __ 7 months-1 year __ 1-2 years __ 2-5 years __ > 5 years __	Again, could be difficult to measure depending on the formality of the collaboration

| 34. | Have your collaborations improved any of the following activities?
Yes ___ No ___
If yes, which:
___ Improved outreach/marketing
___ Improved service coordination
___ Improved access to resources for participants (info, services, supports)
___ Improved access to resources for project (funding, inputs, volunteers)
___ Reduced duplication
___ Other | What do you mean by reduced duplication? Within our project (internally) or with other organization / neighbourhood? |

Questions overall: Good, easy. But for groups that have informal leadership, some questions might be hard for them to answer.

INDICATORS FOR
URBAN AGRICULTURE (UA)
IN TORONTO

- Associated with positive physical and / or mental health benefits

Baseline Measures

TYPE OF ORGANIZATION
of different types of organizations

TYPE OF URBAN AGRICULTURE PRACTICED
of different types of agriculture
# of types of facilities
# of types of land tenure

DIVERSITY OF URBAN AGRICULTURE PRODUCTS
of products grown by UA projects

PARTICIPATION RATE
of people participating in UA
Amount of time spent in UA activities
% of people in types of UA programs
# of projects maintaining wait lists / # of people waiting to access UA programs and plots
# of people in different roles (staff, growers, volunteers)

Economic

LOCAL ECONOMIC DEVELOPMENT
Total revenue generated from sales of food
# of growers supplementing their income with produce sales

PATHWAYS TO EMPLOYMENT
of UA programs offering training in employment-related skills
# of people the farm/garden has trained in employment-related skills
# of types of skills taught
# of population subsets trained by UA organizations

Social

SUPPORTING AND DEVELOPING LEADERSHIP
of UA participants in leadership roles

INCREASED COLLABORATION
of collaborations formed through UA project
# of organizational or program objectives achieved through collaborations
Duration of collaborations

BRINGING PEOPLE TOGETHER
of opportunities for diverse people to work or socialize together

EQUITY AND INCLUSION
% of marginalized people represented in leadership/decision-making roles
# of people from marginalized communities employed in UA

Environmental

PLANTING PRACTICES LEADING TO IMPROVED SOIL, WATER, AIR QUALITY
of UA projects with composting
# of UA projects using organic soil amendments
# of UA projects using organic pest control methods

STORM WATER MANAGEMENT AND WATER CONSERVATION
of UA projects collecting rainwater
# of UA projects using efficient watering practices

INCREASED AND DIVERSIFIED URBAN GREEN SPACE
(sq. footage) of unused/underused land placed into food production

INCREASED BIODIVERSITY
of UA projects that grow native/pollinator plants

Appendix E1 – Recommended Indicators and Data Collection Tools

Category	Indicator	Measures	Data Collection Tools	Notes
Baseline measures	Type of organization	# of different types of organizations	What is the primary structure of your organization? ___ Non-profit organization ___ Incorporated business or self-employed ___ Institution (such as a school, university or hospital) ___ Community garden ___ Other unincorporated community group or association ___ Other (specify)	
Baseline measures	Type of urban agriculture practiced	# of different types of agriculture	a. What is the primary focus of your urban agriculture site? ___ Food production – sales ___ Food production – individual use or community distribution (e.g. food bank) ___ Education (working with children, schools of all levels) ___ Adult education (workshops or hands-on learning) ___ Training (formal training programs or internships) ___ Social (promoting interaction, reducing isolation, developing support networks, connecting to resources) ___ Therapeutic (providing support to people with specific health conditions or addictions, seniors, survivors of trauma) ___ Greening/environmental	

			___ Other (specify) b. What are other purposes of your urban agriculture site? ___ Food production – sales ___ Food production – individual use or community distribution (e.g. food bank) ___ Education (working with children, schools of all levels) ___ Adult education (workshops or hands-on learning) ___ Training (formal training programs or internships) ___ Social (promoting interaction, reducing isolation, developing support networks, connecting to resources) ___ Therapeutic (providing support to people with specific health conditions or addictions, seniors, survivors of trauma) ___ Greening/environmental ___ Other (specify)	
Baseline measures	Type of urban agriculture practiced	# of types of facilities	What types of growing facilities does your project have? Check all that apply. ___ In-ground growing ___ Rooftop ___ Greenhouses ___ Containers (including balcony, vertical growing) ___ Hydroponics or aquaponics ___ Other (specify)	

Category	Indicator	Measures	Data Collection Tools	Notes
Baseline measures	Type of urban agriculture practiced	# of types of land tenure	Mark all that apply. Is the land: Privately owned __; Public __; Owned __; Leased __;Other __; Don't know __	
Baseline measures	Diversity of urban agriculture products	# of products grown by UA projects	What fruit, vegetables and/or medicinal plants does your urban agriculture project grow?	Check off relevant selections on attached plant list (see the end of this appendix, p. 78 for the list)
Baseline measures	Participation rate	# of people participating in UA	How many people in total participate in all of your urban agriculture activities?	
		Amount of time spent in UA activities	Thinking of all of the people who participate in your urban agriculture project, what percentage of them falls into each category of involvement: ___ One-time or occasional visitors ___ At least once per month ___ Weekly (over the season) ___ More than once per week	

| | | % of people in types of UA programs | If you have multiple types of UA activities, how many people are involved in each type of activity?
___ Food production – sales
___ Food production – individual use or community distribution (e.g. food bank)
___ Education (working with children, schools of all levels)
___ Adult education (workshops or hands-on learning)
___ Training (formal training programs or internships)
___ Social (promoting interaction, reducing isolation, developing support networks, connecting to resources)
___ Therapeutic (providing support to people with specific health conditions or addictions, seniors, survivors of trauma)
___ Greening/ environmental
___ Other (specify) | |
| | | # of projects maintaining wait lists

# of people waiting to access UA programs and plots | Do you keep a waitlist for participants?
__ Yes, for spaces in a program
__ Yes, for garden plots (or other growing space)
__ No

If yes, how many were on the waiting list at the beginning of this year?
Number of people waiting for a space in a program:

Number of people waiting for a garden plot: | |

		# of people in different roles	In your urban agriculture projects, please tell us the number of: ___ Part-time and seasonal employees ___ Full-time employees ___ Individual growers in commercial plots ___ Individual growers in community gardens ___ Individual growers in allotment gardens ___ Individual growers in backyards or balconies ___ Volunteers	
Economic	Local economic development	Total revenue generated from sales of food	What is the total revenue ($) generated from sales of produce grown by your urban agriculture project in the past calendar year? Refer only to food grown on urban lands if possible. Under $1,000 $1,000-<$10,000 $10,000-<$30,000 $30,000-<$75,000 $75,000-<$100,000 Over $100,000	
Economic	Local economic development	# of growers supplementing their income with produce sales	Do any of the growers in your project sell the produce they grow (does not include people who are running a business)? Yes ___ No ___	

Category	Indicator	Measures	Data Collection Tools	Notes
Economic	Job readiness/pathways to employment	# of UA programs offering training in employment-related skills	Does your project offer any formal skills development opportunities? Yes __ No __ If Yes, what kind: ___ Course/training program/certificate program ___ Workshops ___ Formal mentoring program (agreement to work as mentor/mentee, specific time frame, frequency of contact or objectives specified) ___ Internship ___ Other	
		# of people the farm/garden has trained in employment-related skills	How many people have had formal skills development opportunities in each category over the past calendar year? ___ Course/training program/certificate program ___ Workshops ___ Formal mentoring program (agreement to work as mentor/mentee, specific time frame, frequency of contact or objectives specified) ___ Internship ___ Other	
		# of types of skills taught	What skills do you help participants develop? ___ Food production ___ Organic/ecological/sustainable production methods ___ Other environmental practices ___ Marketing/distribution ___ Food processing ___ Food safety	

			___ Business planning ___ Employment-related (such as punctuality, business communication, working with a supervisor) ___ Fluency in English (conversation, reading comprehension) ___ Social skills (communication, working constructively with others, working with people from diverse backgrounds, respecting others) ___ Other (specify)	
		# of population subsets trained by UA organizations	What segments of the population participate in your formal skills development programs? Select those which apply: ___ Youth ___ Newcomers ___ Vulnerably housed people ___ Low-income and/or vulnerably housed people ___ Non-English speakers ___ People experiencing physical or mental health barriers ___ Racialized people ___ Students ___ Other	
Social	Leadership	# of UA participants in leadership roles	Does your urban agriculture project have a formal leadership structure? Yes ___ No __ If yes, which of the following roles are represented? ___ Garden Coordinator ___ Chair or Members of Garden Committee ___ Team Leader/Supervisor/Manager ___ Board Chair and Members	

			___ Executive Director or President ___ Other How many people in your urban agriculture project fill a formal leadership role?	
	Equity	% of marginalized people represented in leadership/decision-making roles	Of the people with formal leadership roles, How many of them identify in the following ways: • Black • Indigenous/First Nations, Metis or Inuit • From another racialized group • Newcomers (in Canada < 5 years) • Having physical or mental health challenges • A member of LGBTQ / LGBTTIQQ2SA community • Low-income and/or vulnerably housed • Speak English as a second language	
	Equity & inclusion	# of people from marginalized communities employed in UA	Do you have any people employed in your urban agriculture project that would identify themselves as: • Black • Indigenous/First Nations, Metis or Inuit • From another racialized group • Newcomers (in Canada < 5 years) • Having physical or mental health challenges • A member of LGBTQ / LGBTTIQQ2SA community • Low-income and/or vulnerably housed • Speak English as a second language	Count the number of people who identify with at least one of these categories. If someone identifies with multiple categories, only count them once.

Category	Indicator	Measures	Data Collection Tools	Notes
Social	Bringing people together/social cohesion	# of opportunities for diverse people to work or socialize together	Does your project offer opportunities for diverse people to work or socialize together? Yes__; No__; Not sure__ If yes, how: ___ Work sessions ___ Social events ___ Educational events ___ Other	Diversity can refer to race, ethnic origin, language, socio-economic status, health status, gender
Social	Increased social capital – organizations	# of collaborations formed through UA project	How many collaborations has your organization formed or joined related to your urban agriculture projects? ____	Collabora-tions refer to joint initiatives between organizations, businesses, government departments or institutions to achieve commonly-held objectives. Collaborations can be formal (with a written agreement) or
		# of organizational or program objectives achieved through collaborations	Have your collaborations improved any of the following activities? Yes __ No __ If yes, which: ___ Improved outreach/marketing ___ Improved service coordination ___ Improved access to resources for participants (info, services, supports)	

			___ Improved access to resources for project (funding, inputs, volunteers) ___ Reduced duplication within project, between organizations or externally (across neighbourhood, city) ___ Other	informal (working together on an event or program)
		Duration of collaborations	How long have each of the collaborations existed? __New- less than two months __2-6 months __7 months-1 year __1-2 years __2-5 years __> 5 years	
Environment	Planting practices leading to improved soil, water, air quality	Number of UA projects with composting	Does your project compost organic waste on site? Yes__; No__; Not sure___	
		Number of UA projects using organic soil amendments	Does your site use organic soil amendments? Yes__; No__; Not sure___ If yes, What kind?	

		Number of UA projects using organic pest control methods	Does your site use organic pest control methods? Yes__; No__; Not sure___ What kind?	
Environment	Water management	# of UA projects collecting rainwater	Does your site collect rainwater? Yes__; No__; Not sure___	
		# of UA projects using efficient watering practices	Does your site use efficient watering practices? Yes __ No__ If yes, which of the following: ___ Spot watering ___ Drip irrigation ___ Sub-irrigated planters Other:	
Environment	Increased and diversified urban green space	# (sq. footage) of unused/underused land placed into food production	Did your urban agriculture project put previously underused space into production? Yes __ No ___ If yes, how much area (sq. footage) of underused land did your project place into food production?	Underused space refers to land or built space that is not used to its full potential (such as empty lots with no structures, rooftops that

				are safe for human activity but are unused, green space where pedestrian traffic is low)
Environment	Increased biodiversity	# of UA projects that grow native/pollinator plants	Do you plant any native/pollinator plants in your urban agriculture project? Yes ___ No ____ Don't Know ____	

Plant List

Vegetables			
Amaranth/callaloo		Leek	
Arugula		Lettuce	
Asian greens		Mibuna	
Beans (dried and fresh)		Mizuna	
Beets		mushrooms	
Bitter melon		Mustard	
Broccoli		Mustard greens	
Cabbage		Okra	
Carrots		Onions (green)	
Cauliflower		Onions (white)	
Celery		Peas (edible podded)	
Chard		Peas (shelling)	
Chicory		Peppers (green)	
Collards		Peppers (hot)	
Corn		Peppers (sweet red)	
Cress		Pumpkin	
cucamelons or mouse melons		Radiccio	
Cucumbers		Radishes	
Dandelion		Rapini	
Eggplant		Spinach	
Fennel		Sprouts	
Gourds		Squash winter	
Greens		Summer squash (zucchini & patty pan)	
Ground cherries		Tatsoi	
Hon Tsai Tai		Tomatillos	
Kale		Tomatoes	
Kohlrabi		Turnip	

Fruit			
apples		Nuts	
Blackberries		peach	
blueberries		pears	
Canteloupe		plums	
cherries, sour		raspberries	
cherries, sweet		rhubarb	
goji berries		sea buckthorn	
haskap		serviceberry/saskatoon berry	
melon		Strawberries	
mulberry		Watermelon	

Herbs			
Anise hyssop		marshmallow	
basil		mint	
borage		oregano	
calendula		parsley	
catnip		sage (garden)	
cedar		sage (white)	
chamomile		sorrel	
chervil		sweetgrass	
chives		thyme, English	
cilantro/coriander		thyme, Jamaican or broadleaf	
dill		tobacco	
Korean mint		violas	
lavender		yarrow	
lemon balm			

Appendix E2 – Recommended Indicators Outside of Project Scope

Category	Indicator	Measures	Rationale for Exclusion
Baseline measures	Equity & inclusion	% of marginalized people represented in UA projects	Data collection not within scope of project
Baseline measures	How much food is grown	Kilograms/pounds of produce	Needs to be tracked over season. Method for meaningful measure needs to be developed.
Economic	Entrepreneurial activity	# of new businesses/revenue generating projects started in the past year	Needs to be tracked over the course of one year.
Economic	Success rate of revenue generation through food sales	Net revenue for business/organization (gross revenue – costs)	Too difficult for respondents to compile in context of larger survey. May be possible as an independent project.
Economic	Savings resulting from growing food	$ value of produce grown in one year per household	Needs to be tracked over one growing season – variations in produce availability, variations in prices. Need to develop tracking tool. May be challenging to find growers willing to track data consistently.
Economic	Job readiness/pathways to employment	% of people who completed training or experience and went on to a job in the field	Some organizations have method for tracking, others do not. Need to develop tracking tool/sampling strategy.
Social	Enhanced leadership capacity	# of UA participants demonstrating informal leadership behaviours	Respondents can answer yes, but difficult to quantify. Is it meaningful to say that x percentage of UA orgs indicate that their participants demonstrate informal leadership skills?

Category	Indicator	Measures	Rationale for Exclusion
Social	Bringing people together and social cohesion	#/% of different groups (age, ethnicity, race, language, ability, socioeconomic status, gender) participating in UA projects	Data collection not within scope of project.
Social & Health	Increased social capital – individuals Reducing social isolation	% of UA participants who report reduced stress, improved mood and reduced sense of isolation from participating in UA project	Difficult to construct a valid self-reporting tool. See potential tools below.
	Improved mental health and well being	% of UA participants who report an increase in social connections from their involvement in UA	Same as above. Difficult to define social connections and assess strength of impact.
		% of participants reporting improved self-esteem from participating in UA project	Same as above.

Social & Economic	Increase in resources leveraged	# of volunteers
		
		$ value of cash donations
		
		$ value of in-kind donations
		
		# of sources of donations
			Respondents can provide answers but not easily.

Social/equity	increase in food skills/literacy in underserved communities	# of people participating in farm/garden programs or activities reporting that they a) sometimes, b) very often, or c) always read food nutrition labels at the supermarket # of people participating in farm/garden programs or activities that agree with the statement "I can change the things I eat"	Significant participant time/compliance required. Data is collected elsewhere.

Category	Indicator	Measures	Rationale for Exclusion
Health	Improves health and nutrition	# of different types of fruits and vegetables eaten from the garden	Significant participant time/compliance required. Data is collected elsewhere.
Health	Provides physical activity for all ages and abilities	number of hours per week engaged in physical activity in the garden	Already measured in Active Apartments Neighbourhood project. Requires pre/post testing to determine change in behaviour.
Health	Increasing healthy eating	#, % of healthy eating program participants consuming fast food once per week or less	Data is collected elsewhere.
Health	Increasing food literacy skills	#, % of healthy eating program participants that can identify where their food comes from (i.e. origin of food as plant-based)	Data is collected elsewhere.
Health	Safety of city-grown food	Testing of contaminant levels in food and soil, EMF plans	Beyond our scope, technical capacity required.
Environment	Improved waste management	Volume of organic waste collected for compost	Did not fit with project timeframe.
Environment	Water management	# (sq. footage) or proportion of rooftop area collected for rainwater harvesting	A process measure, not an outcome measure (water conserved would be the direct measure). Collecting city-wide is possible, but not in scope of project
Environment	Water management	water usage (per unit area or unit of food)	Possible to measure but requires dedicated, detailed measurements. Not likely to be collected consistently and accurately in projects with volunteers or casual staff.

Data collection tools needing further development

Category	Indicator	Measures	Data Collection Tools	Notes
Social	Enhanced leadership capacity	# of UA participants demonstrating informal leadership behaviours	Examples of informal leadership include: • Providing advice to others on production issues • Providing advice to others on interpersonal or organizational issues • Making decisions related to project or group functioning (as opposed to decisions affecting only personal garden plot or job responsibilities) • Assisting and enabling others to participate in decision-making • Conflict resolution • Establishing good relationships between others in the project • Identifying issues and working towards solutions • Short, medium and long term planning a. Do any participants in your urban agriculture program demonstrate informal leadership skills? Yes ___ No ___ b. How many people in your urban agriculture project have demonstrated informal leadership?	Respondents can answer yes, but difficult to quantify. Is it meaningful to say that x percentage of UA orgs indicate that their participants demonstrate informal leadership skills?

Social & Health	Increased social capital – individuals Reducing social isolation Improved mental health and well being	% of UA participants who report reduced stress, improved mood and reduced sense of isolation from participating in UA project	Five Borough Farm tool	
		In the context of a survey: Why do you participate in this program? Check all that apply, indicate the most important reason by writing 1. __ Access to fresh produce __ Learning a new skill __ Working with other people __ Learning from other people __ Getting outdoors __ Physical activity __ I feel less stress	

Appendix E3 – Indicators Not Recommended

Category	Indicator	Measures	Rationale for Exclusion
Economic	Job Growth	# of people employed by the farm/garden	Common indicator, but not particularly persuasive. Not many jobs created by UA
Economic	Job readiness/pathways to employment	What skills did the participants indicate they learned?	Self-reporting of skills learned not a reliable measure of skills actually acquired
Economic	Employee satisfaction	#/% of employees engaged in UA project #/% of employees expressing approval for the UA project	Small number of cases in Toronto at this time. Would need to develop a survey that compares satisfaction of employees before and after, or participating /non-participating employees. Survey not readily available.
Social	Increased sense of improved social mobility/economic status	Participant surveys	Difficult to measure, attribute change to UA intervention
Social	Safety	perception of safety - static and across time, garden participants & broader community	Neighbourhood safety is a powerful motivator for many audiences, but it is difficult to measure and establish causality
Social	Neighbourhood cohesion	% of people who report having positive interactions with diverse members of community as a result of participating in UA project	Difficult to measure reliably and attribute positive interaction to UA activities. Would need to survey beyond UA project.
Social	Equity & inclusion	# of adaptations made for people with disabilities	Number of adaptations alone seen as inadequate measure, as there is no guarantee that adaptation truly improves access. As so few gardens are fully accessible, this would not be a successful indicator of positive impact. Needs assessment required to assess level of accessibility.

Category	Indicator	Measures	Rationale for Exclusion
Environment	Energy management		Difficult to measure
Environment	Improved waste management	% of waste diverted from landfill by composting	Interesting but that means measuring other garbage as well, may be difficult to get projects to measure this consistently
Environment	Water management	# of UA projects planting drought-tolerant varieties	Most food crops are not drought-tolerant.

Appendix F – Key Audience Analysis: Government Bodies

H= high contribution, L= low contribution, P=primary focus, S=secondary focus	Policy	Funding/ resources	Land/ Space	Programming/ Training	Public support/ promotion	Health	Social	Economic	Environmental
City Divisions									
TPH	H	L		H	H	P	P	S	S
Economic Development	H	L	L	H			P	P	S
Parks, Forestry & Recreation	H	H	H	L		P	P		P
Environment & Energy	H	L		H	H	S	S	S	P
Real Estate	H		H					P	
Planning	H					P	P	P	P
Councillors & staff	H	Sect. 37		community events	H	varied			
SDFA	H	L				P	P	P	P
Solid Waste		L		L	L				P
Toronto Water	H	L	H						P
Employment & Social Services	H	H		H		P	P	P	
Arms-length bodies									
TDSB	H	L	H	H	H	P	P		P
TCDSB	H	L	H	H	H	P	P		P
Toronto Community Housing	H	H	H	H	H	P	P		P
TRCA	H	L	H	L	H		P		P
Other Government									
OMAFRA	H	H		H	H			P	P
MOECC	H								P
Ministry of Agriculture - Federal	H				H			P	P