Assessing and Communicating the Risks and Benefits of Community Participation in Urban Agriculture

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Overview

The prospects and promise for urban agriculture to help improve access to healthy foods, foster productive community collaborations, create opportunities for economic development, and even beautify city environs are great. The wave of renewed excitement in urban agriculture is capturing the hearts and minds of home gardeners, entrepreneurs, researchers, educators and their pupils, community organizations, and policy-makers alike – and, as can be seen throughout the volumes of this text, positive impacts are being made across the country.

Admittedly, some of the most exciting aspects of urban agriculture activities and initiatives are where the boots hit the ground: digging in the dirt and planting the seeds; interacting with community members; and harvesting the literal fruits (and vegetables!) of your labors. But, just as a wise entrepreneur will have a business plan, an instructor will have a lesson plan, a home gardener will map out her planting arrangements, and a researcher may prepare a detailed project proposal or needs assessment, anyone taking a leadership role in urban agriculture should engage in whatever planning activities may be needed (before getting to the "fun stuff") in order to increase the odds of a successful venture and make the most out of the available resources.

One such front-end activity is a *risk assessment*, which can be as informal as a homeowner surveying his yard for hazards and removing them before joining a community yard-share program; or as formal and thorough as the EPA following

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strict guidelines in the evaluation and mitigation of a hazardous waste site. Either way, the purpose is to identify, characterize, and minimize the risks in a given area or under a particular scenario. A *risk* is the chance of a harmful effect – to humans and/or an ecological system – through exposure to an environmental stressor (EPA 2015). These environmental stressors can be categorized as physical (e.g., UV radiation), chemical (e.g., an unidentified solution in a barrel on an abandoned lot), mechanical (e.g., the slip of a saw while building a fence), biological (e.g., the *Salmonella enterica* bacterium found in poultry manure), or psychosocial (e.g., stress-inducing fear caused by land use conflict) in nature. In the event that there may be risks to the public and/or the public voices concern about the potential for risk, communication throughout the risk assessment and management process will be very important – to the quality of the risk assessment, to aligning perception with reality, and to the public's acceptance of the findings.

Of course, risk assessment is not the only methodology appropriate for assessing the risks and/or impacts of community participation in urban agriculture. For example, in the application of current risk assessment methodologies to the realm of urban agriculture, only the risks are considered – but, of course, there may be a host of benefits that could actually (and likely) result in net positive effects on human health (Leake et al. 2009). Thus, if both negative *and* positive potential health impacts are of interest, a health impact assessment (HIA) might be a more useful approach. In contrast to a risk assessment (which can occur before or after an exposure, only focuses on adverse outcomes, and emphasizes the quantification of risk), an HIA is meant to be conducted prior to the implementation of a policy, program, or initiative; assesses both the positive and the negative potential impacts quantitatively as well as qualitatively; and provides recommendations on how to maximize the benefits and minimize the risks. Further, although not discussed in this chapter, several other methodologies can also be particularly useful in the assessment of urban agriculture and are worth noting, including *needs assessment*, *community food assessment* (*CFA*), *and program evaluation*. A common, critical component to all of the methodologies mentioned is stakeholder engagement and communication.

Urban Agriculture and Potential Risks to Human Health

The potential health benefits of community participation in urban agriculture are great, including improved nutrition and diet-related health outcomes, increased opportunities for physical activity and associated cardiovascular effects, and the positive mental health impacts of nature contact and social interaction. In order to maximize these benefits, any risks associated with community participation in urban agriculture must be minimized. The most commonly cited potential risks are those from exposure to chemical hazards from such sources as pre-1978 paint (lead), high traffic areas [lead, zinc, polycyclic aromatic hydrocarbons (PAHs)], treated wood (arsenic, chromium, copper), burning waste (PAHs, dioxins), deposited coal ash from power plants (molybdenum, sulfur), petroleum spills at residential/

commercial/industrial sites (PAHs, benzene, toluene, xylene), and some pesticides (e.g., lead, arsenic, chlordane). Contaminants may come from past land use practices as well as from those currently farming the land. If contaminant concentrations are great enough, and the opportunity for exposure via inhalation, ingestion, and/or dermal sorption exists, then there is the potential for adverse health impacts, and the contaminants should be removed or avoided through adaptive measures (e.g., the use of lined, raised beds surrounded by mulch and filled with clean soil brought in from off-site).

Biological contaminants such as bacteria and viruses are another food safety and health concern. The use of untreated surface water for watering or uncontrolled runoff, for example, could introduce such biological contaminants as Hepatitis A, *Giardia*, *Shigella*, *E.coli*, *Salmonella*, *Cryptosporidia*, *Toxoplasma*, and Norovirus to an urban agriculture site. Animal feces could also introduce *Salmonella*, *Compylobacter*, *E. coli*, *and Cryptosporidia*. Efforts should be made to avoid unregulated sources of water when possible, and good agricultural practices should be employed (e.g., fencing gardens to keep out animals, thoughtful location of compost bins, and washing tools, hands, and the harvest with clean water). Stinging insects including mosquitoes (which can also carry viruses), bees, wasps, ants, and spiders also qualify as biological hazards.

As mentioned previously, the most common physical hazard to participants of urban agriculture is ultraviolet radiation. Long hours in a garden can lead to sunburns and increase one's risk of skin cancer, particularly if skin is not covered or sunscreen is not applied. Other relevant physical hazards may include loud noise (from high traffic areas, for example), high temperatures and humidity (which can lead to heat stroke), and lightning. Mechanical hazards include repetitive movement (e.g., bending down to weed), poorly designed equipment (e.g., a row tiller that is difficult to control), and improper lifting (e.g., using one's back muscles instead of legs when lifting a heavy bag of mulch). And lastly, there are the least well-characterized hazards in urban agriculture – those that are psychosocial in nature. Such hazards might include stress over making harvest goals or payroll, boredom from repetitive work, conflicts between community members with different plans for urban space (e.g., threats from those engaging in illicit activities after being forced off an area to be cleared for gardening), or stress due to real or perceived environmental contamination. Psychosocial stress can lead to depression, chronic anxiety, and post-traumatic stress disorder (PTSD).

Resources that provide guidance on urban agriculture hazards, site assessment, remediation, and best practices abound, including the The Johns Hopkins Center for a Livable Future "Soil Safety Resource Guide for Urban Food Growers", the EPA "Brownfields and Urban Agriculture: Interim Guidelines for Safe Gardening Practices", the UC Davis handbook on "Food Safety for School and Community Gardens", and your local cooperative extension office. Of utmost importance is understanding the history of the urban agriculture site, obtaining assistance from experts when needed, and minimizing exposure to the hazards that may be present.

Assessment Examples

The process of assessing and minimizing the risks will vary depending upon the situation, the available resources, and any applicable regulatory requirements (which are often regional). Most of what community garden organizers will need to know can be found in the resources listed in the immediately preceding section. But, for additional details, consider the following examples that have been selected to provide a range of scenarios, both in terms of environmental stressors and the type of action that's appropriate:

Example One: A Formal Risk Assessment Within a Protracted Evaluation of Soil Contamination

The process of risk assessment is generally comprised of the following steps:

1. *Hazard identification* – contaminants and potential associated health effects are identified
2. *Dose-response assessment* – health effects at different exposure levels are characterized
3. *Exposure assessment* – the extent and magnitude of population exposure is characterized
4. *Risk characterization* – the extra risk to the exposed population is quantified
5. *Risk communication and management* – risks are communicated, mitigated, and monitored

In some instances, the process of risk assessment is linear and "stand alone", while in others it may be flanked by other monitoring activities conducted prior to the initiation of the formal risk assessment or conducted after the risk assessment to fill in identified gaps in understanding and/or address continued community concern. The duration of a risk assessment will depend upon the anticipated severity and extent of contamination, the availability of data and resources, and the level of public concern and participation. Oftentimes, a risk assessment will occur within the context of environmental justice concerns when the exposures of interest occur disproportionately in low-income, minority neighborhoods.

One example of a protracted assessment embroiled with legitimate concerns over environmental justice can be found in the community of Midway Village in Daly City, California. The Midway Village low-income housing complex is comprised of 150 units of residential housing within 35 townhouse-style buildings, occupying approximately 14 acres of land. Also connected to the property is a baseball diamond and a daycare center. Adjacent to Midway Village is a former manufactured gas plant (MGP) that produced light gas components from heavier oil, as well as PAH-containing tars and lampblack, between 1905 and 1916. In the mid-1940s, contaminated soils from the MGP were used to grade the property where Midway

Village now stands (Salocks 2006). Decades later, in 1980, the company that owned the MGP site discovered significant quantities of soil contaminant residues, reported it to regulatory officials, and began hauling away the contaminated soils for disposal as hazardous waste. The extent of contamination and its possible spread to the adjacent Midway Village property was subsequently investigated, and elevated levels of PAHs in the soil were characterized. Between 1989 and 2003, the California Environmental Protection Agency's (Cal/EPA) Department of Toxic Substances and Control (DTSC) oversaw the investigation and cleanup of contamination at the Midway Village site. During this 14-year time period, ~800 soil samples were collected and analyzed, as well as samples of groundwater and air, with a cumulative sampling density of 45 samples/acre. The initial compounds of interest were PAHs, but were expanded to include cyanide compounds, phenolic compounds, volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), and naphthalene. In the early years of the investigation cement patios were installed in residents' backyards, and the community was advised not to allow children to play in the soil or to grow food directly in the ground. In 1993, the only formal risk assessment for Midway Village was presented, along with target soil clean-up levels. This risk assessment informed a Remedial Action Plan that required the capping of soils contaminated at levels above the clean-up goals. Capping involved the addition of 2 ft of: "clean" surface soil, the installation of additional patios and asphalt walkways, and sealing of building foundations (Salocks 2006). At the urging of residents, additional testing, capping, and excavation continued into the early 2000s, until 2003 when all remediation activities were concluded. Although the original risk assessment and subsequent reviews of the remediation conclude that the clean-up activities adequately protect public health, residents remain concerned about potential exposures (particularly under housing units) and cite a laundry list of adverse health outcomes (from skin rashes to cancer) that they attribute to contaminant exposure in Midway Village. Citing the findings of the risk assessment, resident requests for relocation have been denied by housing officials (Learner 2007).

Although the letter of the law was followed, a risk assessment was conducted, and remediation activities were completed, the safety of residents of Midway Village remains hotly contested. And while it's unlikely that all disagreements about the appropriate response to protect public health could be resolved, improved risk communication strategies could have minimized the mistrust between the residents and the regulatory agencies, and possibly increased mutual acceptance of proposed remediation strategies. For example, when the first cement patios were installed, workers arrived in personal protective equipment to minimize contaminant exposures – but residents claim all they were initially told was that workers were coming to beautify the community and install a new drainage system (Learner 2007). This apparent lack of clear communication at the beginning of community assessment activities jeopardized productive stakeholder engagement from the very outset and contributed to significant psychological stress on the community.

The take-home messages from this example for a participant or leader of an urban agriculture project are (1) learn the history of a site before acquiring land and planting the first seed; (2) formal risk assessments can be lengthy; and (3) active community participation is necessary to ensure that residents' concerns are addressed.

Example Two: Health Impact Assessment (HIA) of Proposed Urban Agriculture Projects and Legislation

An HIA is a combination of procedures, methods, and tools that characterize and evaluate the potential positive and negative effects of a proposed policy, plan, or program on the health of a population. In light of the identified effects, an HIA also provides recommendations on how to maximize positive impacts, minimize negative impacts, and monitor the impacts over time. The purpose of an HIA is not to advocate for the approval or disapproval of a proposed action, but to provide information for informed decision-making and promote the protection of public health. Practitioners of HIA emphasize the importance of highlighting health disparities, social determinants of health, transparency of the process, and stakeholder engagement – all of which apply to the three general types of HIA ("desk-based", "rapid", and "comprehensive"), defined as a function of the time required to complete the HIA and the depth of inquiry. Much like risk assessment is a stepwise process, so too is HIA (SPWG 2011):

1. *Screening* – decide whether an HIA is needed, feasible, and relevant
2. *Scoping* – decide which health impacts to evaluate and select evaluation methodology
3. *Assessment* – through the use of data, research, and analysis determine the magnitude and direction of potential health impacts
4. *Recommendations* – provide recommendations to manage the identified health impacts and improve health conditions
5. *Reporting and Communication* – share the results and recommendations
6. *Monitoring* – track how the HIA affects the decision and its outcomes

The field of HIA has its roots in the assessment of urban transportation planning and natural resource development, but there is a growing body of literature where HIA has been applied in the realm of urban agriculture. Three examples of such HIAs supported through The Pew Charitable Trusts Health Impact Project are briefly described here:

1. The Adams Park HIA was conducted in 2013 and addressed the proposed renovation of Adams Park, a 68 acre greenspace in a low-income, predominantly African American district of Omaha, Nebraska. Proposed renovation objectives included the creation of an urban farming and community gardening center, and potential impacts of particular interest centered on access to healthy foods,

opportunities for physical activity, public safety, and education. The HIA provided insights into the relationships between vacant land and crime; served to engage community members in planning activities; and was used to leverage funding.

2. At the time this chapter was written, the Benton County Health Department in Corvallis, Oregon was conducting an HIA to assess the potential impacts of a City Council zoning proposal to expand urban agriculture (including small livestock operations) within city limits. The findings will be of use to the City as officials evaluate options to create new healthy food production opportunities and fill existing gaps in food access.
3. In 2012, an HIA was conducted on a proposed piece of legislation written to introduce intense urban farming to Cleveland, Ohio. The proposed legislation incorporated livestock, community gardens, hoop houses, and market gardens. Primary intended goals of rezoning were improved access to healthy foods, increased community cohesion, expanded economic opportunities, and the productive use of vacant land. Potential adverse effects addressed in the HIA were associated with exposure to animal waste, carcinogenic pesticides, and excessive noise and odor. Findings of the HIA were meant to inform amendments to the pending legislation and enable informed decision-making.

It's important to note that the categories of inquiry addressed, and the methods applied, in risk assessment and HIA need not be limited to full-scale, costly assessments with a lengthy timeline. Anytime that environmental hazards and community interests are (formally or informally) considered and addressed as a component of an urban agriculture planning process, the odds are increased for community buy-in, the promotion of public health, and project success. Evidence to support this claim is provided in the following Example Three.

Example Three: Community-Level Assessment of Soil Quality

The Food Project is a community organization based in eastern Massachusetts that focuses on engaging a diverse group of youth and adults in building a sustainable urban food system. Participants farm over a total of approximately 40 acres of urban land, producing food for community supported agriculture (CSA) farmshares, farmers markets, and food banks. The Food Project also supports several community programs and provides food growing training resources. One service provided by The Food Project is soil lead testing. According to their website, the organization has conducted soil testing on 125 neighborhood gardens, then assisted the gardeners in interpreting findings and using them to inform garden plans (including excavation and/or raised beds, if necessary). Clear communication and discussion of the results is key to maintaining community trust and ensuring that urban gardeners are comfortable with adapted, safe gardening methods on impacted land. In fact, soil lead remediation studies have become a community participation opportunity in and

of themselves. In the early 2000s, volunteer gardeners reserved a quarter of their garden plots as part of an organized study of phytoremediation potential. Such opportunities for soil testing and experiments collectively serve to reduce exposures to contaminants, increase access to healthy, locally grown produce, and encourage active participation in community improvement efforts – all of which can have the added benefits of increased perceptions of self-sufficiency, self-efficacy, and empowerment.

Admittedly, soil sampling techniques can be intimidating and soil analyses can be cost prohibitive, particularly to individual homeowners who might not live in an area where local organizations can provide assistance. In this case, urban gardeners are often encouraged to contact their local cooperative extension office to obtain sampling guidance (including the collection of composite samples to reduce the total number of samples, strategic sampling of land areas most likely to be contaminated, and limiting analyses to "indicator" contaminants) and/or adopting urban gardening strategies on the general assumption that contaminants may be present.

Communication of Assessment Activities and Findings

An important piece of assessment is presenting and discussing risk-related information with others. When considering gardening in the city, there may be a variety of risks you need to address – and two important aspects of risk communication, regardless of the hazards of interest, include: (1) preparation and (2) implementation. At its core, risk communication is about productively talking with others about risks. A well-developed risk communication effort is built upon listening to others and understanding your audience. Make sure you are communicating in a relevant manner that engages with your audience.

Risk communication efforts can come in all kinds of approaches. Just because "risk communication" sounds formal does not mean that you need to develop a highly polished professional web site or print publication. Informal person-to-person conversations occurring in gardens, community centers, public libraries, front porches, dining room tables, etc., can effectively present information and build important relationships.

This section includes an overview of risk communication preparation and implementation. After an initial introduction to these topics, each topic is discussed in more detail. Finally, a resources section provides other sources you may want to read. Risk communication is a large area of research, and this short introduction to risk communication presents some of the key concepts. Readers with a particular interest in HIA should also note that stakeholder engagement and communication is a critical feature of a well-conducted impact assessment, from beginning to end. Although not specifically explored within the context of this chapter, several excellent resources on the topic of stakeholder engagement have been put together by members of the Society of Practitioners of Health Impact Assessment (SOPHIA) and many of the following risk communication concepts also apply.

Risk Communication Preparation

Make sure to take plenty of time to plan out your risk communication strategy. You may want to focus on the following three topics and ask yourself the questions listed below. These questions will help focus your thoughts. With gardening in cities, you may be interested in communicating about a variety of topics, from preventing gardening pests, to avoiding frost damage, to reducing potential exposure to soil contaminants. Perhaps you will end up needing two different types of risk communication efforts, or you may be able to use a single approach.

Risk Communication Preparation Questions

1. *Message*

   What information do you want to share with others?
   What is the central message?
   Why is this message necessary?
   What is the goal of your risk communication effort?

2. *Audience*

   Who is the target audience?
   What is the best way to reach people? (phone, email, in-person, etc.)
   Are there other audiences you should be considering?

3. *Communicating – Connecting Your Message With Your Audience*

   How will the message reach the intended audience?
   Who will be presenting and sharing this information?

Risk Communication Implementation

Once you know your message, audience, and how you will connect your message with your audience, you may want to take these three additional steps before you start sharing your risk communication message.

Risk Communication Implementation Questions

1. *Collaborators*

   Are there any organizations/individuals that share an interest in this communication?
   Are there key individuals within these groups that will help share the message?

2. *Boundaries*

   Have you prepared adequately to address obstacles as they arise?
   How much do you know about the topics in your risk communication effort?

3. *Preparation/Pre-testing*

   Have you pre-tested your communication strategy?
   Are people hearing what you are trying to say?

Risk Communication Preparation In-Depth

Now that the above questions have jump started your thinking about risk communication, let's go back through each of the topics and consider them more thoroughly.

1. *Message*

Planning your message is the first step and sets the tone for your entire risk communication strategy. You are probably thinking about risk communication because there is some topic or set of topics that you really want to talk about with others. You need to think about what you want to say and identify what you hope to achieve through your risk communication efforts. You need to be realistic about these goals because you might not have the ability to follow up with people to assess whether or not your message got across. For example, it might be preferable for you to administer both a pre-message and post-message questionnaire to see whether or not people have heard and been impacted by your communications – but you might not have the resources to conduct both surveys. If not, you may wish to thoughtfully design a single survey that captures the information you've deemed most important, realizing that a survey can serve to both deliver your message and collect feedback on the message.

When you identify your key message goals you may find out that there are other groups with similar goals in mind. Also, you may find out that other people have already communicated about your particular issue of interest. Try to be as specific as possible on the issues for which you want to communicate, and provide tangible steps for people to think about or take action. Providing information in a frightening manner with no recommendations for what people can do to mitigate the risks will reduce your ability to be successful in risk communication.

There can be all kinds of risk-related messages pertinent to urban agriculture. On one hand, mixing multiple messages together could be confusing to your target audience, or there might be ways for a single message to approach two issues at the same time. For example, a message about the safe use of compost could highlight the benefits of compost to plant growth, while also introducing the concept of soil contaminants within the context of the protective properties of organic soil amendments.

2. *Audience*

Once you have an idea about what you want to say, you will need to identify to whom you want to communicate this message. Your risk communication message needs to be specific and you need to be clear about your target audience. For example, presenting a risk communication message to all gardeners in all cities across the country may be much more challenging than trying to reach as many gardeners as possible within your specific town, city, county, or region.

Next, you will want to brainstorm the best way to reach this audience. This could involve using a variety of communication formats, such as person-to-person meetings, e-mails, social media, posters, mailings, and so forth. Pay close attention to the language format of your strategy as well. This could include providing information in multiple languages and fulfilling American with Disabilities Act (ADA) regulations. Make sure to try and fully understand the best ways to reach your audience.

Finally, you will want to consider what your audience thinks about the issue you are communicating. Just try to put yourself in your audience's mind. What do they know about this issue? Do they perceive the hazards of concern as a risk to their health? Directly related to this issue is that you must understand what your audience currently knows about the communication topic. Do they know a lot or are they unfamiliar with the topic? How your audience understands the issue will affect how you present the information. Remember that technical information does not need to be "simplified" to the point that it loses all of its meaning for a general audience. You can use accessible, clear language and concepts to present complex technical information.

3. *Communicating – Connecting Your Message With Your Audience*

Now you will want to identify how to present your message to the intended audience. What is the delivery mechanism of your message? Delivery could occur via email or the post, a Twitter or Instagram campaign, or in-person door-to-door conversations. You will want to consider how well a particular delivery mechanism can carry your type of message; which type of audience will be reached; and the resources you will need to utilize the selected delivery approach. Having a well-developed risk communication message and a target audience is not enough. You need to think critically about how your selected method(s) of communication takes the information to your audience – and if recipient feedback is needed, you will need to consider if your message delivery approach facilitates two-way communications.

Two additional aspects to consider are the timing of communication efforts and visual presentation. How long will the message be communicated? For example, is there a month during which gardening health risk awareness messaging is critical (perhaps in April/May)? Or can your particular message be effective any time of the year? For example, are you developing a continual resource for gardeners, such as weekly/monthly meetings or a web presence? With respect to visual presentation, you will want to design the message to be aesthetically pleasing and easy to digest. If you are sharing information via email or the post, you will need to carefully

consider layout, strategic use of graphics, and readability. If you are speaking with others in-person, consider how you will present the information and how you will present yourself. Will you be visiting people at their homes and/or making presentations to larger groups? Addressing these types of issues will help you better connect your message with your audience.

Regardless of your communication approach, you must consider if people will perceive you as a trusted source. Trust is a crucial factor in risk communication. A lack of trust can make audience members ignore communicators and/or do the opposite of the risk communication message.

Risk Communication Implementation In-Depth

Next, let's review the implementation section more thoroughly.

1. *Collaborators*

There are a lot of groups interested in urban agriculture. It's likely there are many people who share similar goals with you and are interested in getting information out to the public. Collaborating with others can be time consuming but can also strengthen your message by drawing from multiple subject matter experts, pooling resources, and demonstrating agreement from multiple reputable groups. For example, if the risk communication message comes from a large group of collaborators that includes non-profits and city officials, a broader audience may be compelled to pay attention and take your message seriously. Ask yourself if there are any other organizations/individuals that share an interest in your communication topics. Are there key individuals within particular groups that could help spread the message? Alternatively, if your target audience is small, your message is simple and non-controversial, or your resources are large enough, you may not need to recruit collaborators.

2. *Boundaries*

Even the most thoroughly planned out risk communication effort will have some challenges and possibly impassable boundaries. These challenges may take many different forms, and you will be better prepared for effective risk communication if you anticipate potential obstacles. For example, how much do you know about the topic of your risk communication effort? How much do others know, such as the "experts," on this given topic? If your audience begins to ask detailed questions regarding the content of your message, you should be able to satisfactorily answer their questions or direct people to places where they can find more information. Don't be afraid to say "I don't know", but you must be prepared to direct the inquirer to someone who *does* know or explain why an answer is currently unavailable. Of course, you must be reasonably knowledgeable about the topic at hand and avoid the excessive use of qualifying statements. You can quickly lose trust with people if you present yourself as a person knowledgeable on a subject area, but then are unable to adequately respond to questions.

3. *Preparation/Pre-testing*

You may have your risk communication message ready to go, but before you distribute it to everyone you will want to pilot test your message with a smaller segment of your audience. Even if you have worked with a group of people throughout all steps of the process, you will want to get feedback from someone outside of this team. Is your message presented and understood in the way that you want it to be? A well-crafted message will likely need to go through several drafts to make sure it is being presented in the manner you intend. A misunderstood risk communication strategy can add to uncertainty and confusion about the topic of interest.

As part of your final preparations and pre-testing you need to know the geographic area in which you are communicating. For example, if you are working in an area where soil does not contain soil contaminants above levels of concern, and you start communicating about the hazards of soil contaminants, this could be quite disruptive to local gardeners. You may potentially scare people about an issue that does not directly apply to them. Alternatively, if you want to tell everyone about the best and safest ways to grow tomatoes, but no one likes to grow tomatoes in the area, people will likely ignore your message. You need to make sure that your risk communication message is relevant to people for them to take notice and listen.

Concluding Thoughts

While participation in urban agriculture has the potential to strengthen food systems and promote community health, no one can deny that growing food in an urban environment may come with risks posed by a suite of chemical, biological, physical, mechanical, and psychosocial hazards. But, by thoughtful application of risk and health impact assessment methodologies – formally or informally, from the top down or by the grassroots, and with community input – the risks can be effectively minimized. Risk minimization is only half of the process, however. These risks and the strategies to reduce the risks must be effectively communicated to the public, ideally with two-way dialogue that builds trust and mutual agreement on the best way forward.

Resources

This two-volume set on urban agriculture is a great resource for information and references for topics that you may to communicate about with others. The following are some additional resources you may want to consider if you would like to learn more about risk communication. Risk communication is a large field and there are many other resources you will likely find through your own searching.

Books

Fischoff B, Brewer NT, Downs JS (eds) (2011) Communicating risks and benefits: an evidence based users guide. Available from: http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm268078.htm

Lundgren R, McMakin A (2009) Risk communication: a handbook for communicating environmental, safety, and health risks. Wiley, Hoboken

Web Sites/Web Resources

ADA best practices kit for state and local governments, chapter 3, general effective communication requirements under title II of the ADA (available as HTML or PDF) http://www.ada.gov/pcatoolkit/chap3toolkit.htm, http://www.ada.gov/pcatoolkit/ch3_toolkit.pdf

American with Disabilities Act http://www.ada.gov

Environmental Protection Agency (EPA) (2015) About risk assessment. https://www.epa.gov/risk/about-risk-assessment#whatisrisk. Accessed 5 Apr 2016

EPA's 7 cardinal rules of risk communication http://www.epa.gov/care/library/7_cardinal_rules.pdf

FoodRisC Resource Centre: a resource centre for food risk and benefit communication http://resourcecentre.foodrisc.org/

Leake JR, Adam-Bradfor A, Rigby JE (2009). Health benefits of 'grow your own' food in urban areas: implications for contaminated land risk assessment and risk management? Environ Health 8(Suppl 1):S6. doi:10.1186/1476-069X-8-S1-S6

Lerner S (2007) Midway village: public housing built on contaminated soil. The Collaborative on Health and the Environment. http://www.healthandenvironment.org/articles/homepage/789

"Minimum Elements and Practice Standards, Version 3.0" describes best practices in how HIAs should be conducted. "Guidance and Best Practices for Stakeholder Participation in HIA" describes engagement techniques, case studies, and guiding principles. Both can be found at http://hiasociety.org/?page_id=31

Salocks C (2006) Review of the 2001 investigation and cleanup of the midway village residential complex in Daly City, California. Integrated Risk Assessment Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. http://www.oehha.ca.gov/risk/pdf/MidwayVillageReport111406.pdf