

Subsistence Urban Agriculture: Key Externalities and Way Forward

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Abstract

In the past few decades, urban areas have surpassed rural areas in food insecurity and poverty rates in the Asia Pacific. As a result, many of the urban poor have started to grow their own food as a way to feed their families and use the income saved to cover non-food household needs. However, in most cities, their efforts are not recognized in policies or supported. This policy brief identifies public health and food security implications of this lack of public oversight on urban farming. Policy recommendations on managing the negative externalities of urban agriculture and best practices for getting urban agriculture on the policy agenda are discussed.

Introduction

Between 1980 and 2010, cities in the Asia Pacific grew by around one billion people.¹ This urbanization process was accompanied by high rates of hunger and poverty. A third of the region's urban residents lived in dilapidated conditions and lacked basic access to adequate shelter, clean energy, safe water and sanitation.² Urban areas also surpassed rural areas in rates of food insecurity.³ During the 2007-2008 food crises, the urban poor was disproportionately impacted. The urban poor can spend up to 60%-70% of their income on food purchases; high prices of food hindered their ability to access food.

To cope, many of the urban poor have been growing their own food – such efforts of farming within and around cities are defined as urban agriculture. Case studies around the world found that urban agriculture can increase food self-sufficiency of the urban poor⁴, cash savings from producing food that normally would have been purchased⁵ and employment opportunities for those directly involved in food production as

¹ "Eradicating Poverty and Promoting Prosperity in a Changing Asia-Pacific," *United Nations Economic and Social Council*, (February 2017).

² "The State of Asian and Pacific Cities 2015," *United Nations Human Settlements Program and United Nations Economic and Social Commission for Asia and the Pacific*, (2015).

³ "Asia and the Pacific: Regional Overview of Food Insecurity," *United Nations Food and Agriculture Organization*, (2016).

⁴ "Urban Agriculture: Improving Food Security and Environmental Health of Cities," *United Nations Economic and Social Commission for the Asia Pacific*, (April 2012), http://un-csam.org/publication/PB2012_1.pdf.

⁵ Prain, Gordon and Dubbeling, Marielle. "Urban Agriculture: A Sustainable Solution to Alleviating Urban Poverty, Addressing the Food Crisis, and Adapting to Climate Change," *RUAF Foundation*, (December 2011).

well as those involved with the rest of the value chain⁶. For instance, a study done in the city of Yaoundé, Cameroon found that low-income households grew 27% of the leafy vegetables they consumed. In addition, on average, everyone received more than 20% of the vegetables they ate as gifts from family and friends. A multi-city study conducted in Bangalore, Nairobi, Lima and Accra reported that a high percentage of respondents said that savings coming from own food production enabled them to cover for other non-food household needs (Bangalore 56%; Nairobi 70%; Lima 73%; Accra 80%).⁷ For employment opportunities, the FAO estimated that the urban agriculture program in the Democratic Republic of the Congo helped increase low-income family income from US\$50 a month to US\$300.⁸

While some countries such as China, Vietnam and the Philippines have embraced urban agriculture, most countries do not formally recognize these efforts in their policies. Without proper oversight, the externalities that urban agriculture can have if improperly managed or not well located can have negative public health and food security implications. Therefore, formally recognizing urban agriculture in policies to actualize urban agriculture's benefits for the urban poor and manage its externalities should be an imperative for governments.

⁶ "Sustainable Livelihoods," Green Cities, Accessed September 1st, 2017,

<http://www.fao.org/ag/agp/greencities/en/whyuph/livelihoods.html>

⁷ Prain, Gordon and Dubbeling, Marielle, "Urban Agriculture: A Sustainable Solution to Alleviating Urban Poverty, Addressing the Food Crisis, and Adapting to Climate Change," *RUAF Foundation*, (December 2011).

⁸ "Horticulture feeds Democratic Republic of Congo cities," *United Nations Food and Agriculture Projects*, Accessed September 1st, 2017, <http://www.fao.org/in-action/horticulture-feeds-democratic-republic-of-congo-cities/en/>.

Key Externalities

Spread of diseases from using unsafe water sources for growing plants

The competition for water in urban settings can be acute. As a result, many urban farmers resort to using alternative sources of water such as wastewater from bathrooms, sinks and toilets. If not managed properly, there can be negative public health implications because of the presence of chemicals, bacteria and parasites. For instance, before urban agriculture became supported and regulated in Jordan, urban farmers were unaware of the negative health implications of using untreated wastewater. The farmers surveyed reported high incidences of stomach aches, skin diseases and other ailments.⁹

Products grown from accidental use of contaminated soil

At a glance, most urban soils seem fine to use but they actually can harbour dangerous chemicals. Former parking lots often carry Polycyclic Aromatic Hydrocarbons (PAHs), petroleum products, metals or surfactants. High-traffic spots contain lead from vehicle exhaust. Recently demolished buildings may leave behind lead-based paint chips, debris or dust and asbestos.¹⁰ Accidentally inhaling these contaminants or consuming produce grown from contaminated soils can lead to illnesses.

Products containing excessive fertilisers and pesticides

Governments tend to focus on extension services and training for rural areas, not urban areas. Many urban farmers therefore

⁹ Surani, E, "Research influence on policy: the greywater reuse case of Jordan; final report," (2003).

¹⁰ Kessler, Rebecca, "Urban gardening: managing the risks of contaminated soil," *Environmental health perspectives*, 121, no. 11-12 (2013): A326.

can lack adequate farming knowledge to properly use fertilisers and pesticides. This poses health risks for farmers. Additionally, these chemicals can accidentally leak into drinking water and contaminate it, or end up in exceptionally high levels in the vegetable produce.

Increased food insecurity among displaced urban farmers

Urban development intensifies competition for land between industrial, residential, commercial and other land uses. Because many urban farmers informally use municipal or private land to grow crops, they are often displaced. For the urban poor engaged in farming, many of these plots supply the family's produce for the year. Displacing these urban farmers can jeopardize their food security.

The findings above demonstrate that inaction from policymakers on urban agriculture can have negative public health, food security and social stability implications. However, making urban agriculture illegal robs cities of the potential to make strides in food security and employment for the urban poor.

The following best practices gleaned from a literature review of case studies from RUAF and the UN FAO provide insights for cities on how to manage the externalities of urban agriculture and build the case for urban agriculture to be included in the policy agenda.

Managing the Externalities of Urban Agriculture

Risk management of urban agriculture will need to complement new policies to properly support its growth. The key issues of urban agriculture fall within two categories: mismanagement of inputs (water, chemicals and contaminated soils) and consequently the quality of produce, and improper location.

1. Focus on greywater and low-tech, low-cost treatment interventions

Wastewater is broadly defined into two categories: 'blackwater' and 'greywater'. Blackwater, wastewater from flush toilets, can supply most of the nutrients such as phosphorus and potassium required for food production. However, it requires establishing infrastructure to properly manage toxins and poses larger risks of food contamination. Greywater such as wastewater from kitchens, bathroom sinks and showers has the greatest potential to be re-used for irrigation purposes because of its ability to be cleaned through low-tech, low-cost systems. Studies show that there are many low-tech, small-scale greywater treatment units that can be adopted by low-income communities.¹¹ For example, using sand, gravel sand filters, soil filters or strainers can safely filter greywater. These interventions combined with training can mitigate the risk of water contamination. In Jordan, for example, the installation of low-cost treatment units alongside strong community education allowed urban farmers to safely water gardens with greywater from kitchens and showers.¹² Thus, treating greywater for urban agriculture is a cost-effective and sustainable way to re-use limited water resources in cities.

¹¹ O. Cofie, Olufunke, Keraita, Bernard and Drechsel, Pay, "Options for Simple On-Farm Water Treatment for Developing Countries," *World Health Organization, the Food and Agriculture Organizations of the United Nations, the International Development Research Centre or the International Water Management Institute*, (July 2010). http://www.who.int/water_sanitation_health/wastewater/FLASH_OMS_WSHH_Guidance_note4_20100729_17092010.pdf

¹² "Sustainable Livelihoods," *Green Cities*, Accessed September 1st, 2017, <http://www.fao.org/ag/agp/greencities/en/whyuph/livelihoods.html>

2. Support urban-specific farming extension services and farming co-operatives

Farming extension services and farming co-operatives in rural agriculture have long enabled farmers to share best practices and disseminate information. However, because of its urban environment, urban agriculture uses different technologies and is exposed to different risk factors because of its close proximity to large numbers of people. Efforts to develop extension services and promote farming co-operatives for urban agriculture will need to accommodate these in order to be effective. For instance, technical advice should emphasize proper management of health risks and ecological urban farming practices. Well-formed urban farming co-operatives can take up roles in farming training and extension and negotiate better access to land and access to credit.

3. Develop safety measures for contaminated urban soils

Important aspects of soil contamination are the level of contaminants in the soil, sites with previous commercial or industrial history, the presence of contaminants on produce and internal contaminants that cannot be washed off. Examples of practical measures arising from policy imperatives to manage these aspects can include periodically testing of agricultural soils where the risk is the highest (close proximity to industry, highways, etc.), setting soil safety standards and zoning areas that are high-risk for contamination. Encouraging people to use raised vegetable beds and wash produce thoroughly can also mitigate some contamination risks.¹³

¹³ Brown, Kate H., and Andrew L. Jameton, "Public health implications of urban agriculture," *Journal of public health policy*, (2000).

4. Create a land inventory to identify under-utilized land options for urban farmers

Even in highly urbanized areas, there can be a surprisingly amount of under-utilized land spaces that can be used for urban agriculture on a temporary or permanent basis. Land inventory projects in Chicago USA, Cienfuegos Cuba, Piura Peru, Dar es Salaam Tanzania, Rosario Argentina and Cagayan de Oro Philippines¹⁴ allowed all the stakeholders involved gain a better overview of the current state of urban agriculture and the potential for spaces to be zoned for urban agriculture.¹⁵ For example, in Rio de Janeiro, 44% of land was found to be vacant.¹⁶ This land inventory can better identify land that is suitable for urban agriculture. Table 1 has a review of policies that can help with land ownership and tenure.

¹⁴ Zeeuw, Henk, Dubbeling, Marielle, Veenhuizen, René and Wilbers, Joanna, "Key Issues and Courses of Action for Municipal Policy Making on Urban Agriculture," *RUAF Foundation*, (2007), <http://www.ruaf.org/sites/default/files/Municipal%20policies%20and%20strategies%20on%20urban%20agriculture.pdf>

¹⁵ Christine Eigenbrod, Nazim Gruda, "Urban vegetable for food security in cities. A review," *Agronomy for Sustainable Development*, Springer Verlag/EDP Sciences/INRA, (2015).

¹⁶ Zeeuw, Henk, Dubbeling and Dubbeling, Marielle, "Cities, Food and Agriculture: Challenges and the Way Forward," *RUAF Foundation*, (September 2008), <http://www.alnap.org/resource/7815>

Table 1: Land Ownership and Tenure Policy Recommendations¹⁷

Policy Recommendations	Policy Examples	Country
Establish incentives for landowners to give vacant lots in longer leases for urban agriculture	Increased municipal taxes on idle urban land and reduced taxes for landowners who give the idle land for urban agriculture.	City of Rosario, Argentina
Create a land bank that brings those in need of land with those in need of temporary or permanent land leases	Founded a Municipal Agricultural Land Bank that connects farmers seeking land with land owners who want to lease out their land.	City of Rosario, Argentina
Give producer associations control over the land lease to speed the process	Gave the local Association of Gardeners (7,200 members) over 250 ha land from the city. The association then rented out the land to its members.	Amsterdam, Netherlands
Integrate urban agriculture with climate change adaptation strategy planning	Zoned all its wetlands and low-lying valleys for urban agriculture to reduce flooding risks.	City of Freetown, Sierra Leone

¹⁷ "Courses of Action for Municipal Policies on Urban Agriculture," *RUAF Foundation*, (October 2006).

Policy Recommendations	Policy Examples	Country
Designate permanent agriculture zones	Established a Permanent Agricultural Zone that extends over five peri-urban boroughs where farming is protected through legislation as the primary and best use of land. ¹⁸	Montreal, Canada
Provide temporary leases of vacant municipal land	Created the “Adopt-A-Lot” policy, which allows for the interim use of public and private property for community benefit. This policy provides a special no-fee city permit and an expedited land use approval process that allows normal zoning regulations and requirements to be waived. ¹⁹	Escondido, USA

¹⁸ Haberman, Daniel, Laura Gillies, Aryeh Canter, Valentine Rinner, Laetitia Pancrazi, and Federico Martellozzo, "The potential of urban agriculture in Montréal: a quantitative assessment," *ISPRS International Journal of Geo-Information* 3, no. 3 (2014): 1101-1117.

¹⁹ Twiss, Joan, Joy Dickinson, Shirley Duma, Tanya Kleinman, Heather Paulsen, and Liz Riveria, "Community gardens: lessons learned from California healthy cities and communities," *American journal of public health*, (2011).

Getting Urban Agriculture on the Political Agenda

With waning budget and attention toward agriculture, policymakers may find it difficult to build the case for a new type of agriculture that requires specific policies and support. Policymakers who were successful in overcoming these challenges aligned urban agriculture benefits with national priorities and involved multi-sector stakeholders through the entire process. These efforts are summarized below.

1. Align urban agriculture benefits with high-priority needs on the government's agenda

Policymakers have found that aligning urban agriculture's benefits of employing and feeding the urban poor to address challenges of poverty and hunger to be successful in building political support. For instance, in Brazil, urban agriculture's ability to employ the urban poor built a strong case to have it included in social assistance programs as an alternative income-generating activity.²⁰ Another example is Sierra Leone's challenges with food insecurity; almost half of the country's households were classified as food insecure during the lean season.²¹ Urban agriculture became viewed as a key strategy to feed the urban poor and it was incorporated into Sierra Leone's "Operation Feed the Nation" program.²²

²⁰ Zeeuw, Henk, Dubbeling and Dubbeling, Marielle, "Cities, Food and Agriculture: Challenges and the Way Forward," *RUAF Foundation*, (September 2008). <http://www.alnap.org/resource/7815>

²¹ "Sierra Leone Comprehensive Food Security and Vulnerability Analysis," *World Food Programme*, (August 2011).

²² Zeeuw, Henk, Dubbeling and Dubbeling, Marielle, "Cities, Food and Agriculture: Challenges and the Way Forward," *RUAF Foundation*, (September 2008). <http://www.alnap.org/resource/7815>

2. Establish a multi-stakeholder forum to build political momentum

Adequately addressing the externalities of urban agriculture will require collaboration across agencies. If the agencies operate in silo-s, building consensus can be difficult. Policymakers interested in urban agriculture should establish a multi-stakeholder forum that can break these silo-s and facilitate communication between agencies. Other countries such as Kenya²³, Brazil, USA, and Canada²⁴ were able to advocate for urban agriculture policies by having a strong forum of urban agriculture and local food champions that spurred dialogue between civil society actors, farmers and government leaders.

3. Use a multi-stakeholder policy planning process

A multi-stakeholder policy planning process that involves municipal authorities and civil society actors during the planning process is widely promoted in different sectors of development such as rural development and water management. This process has gained traction because it tends to achieve greater success in implementation. The process is particularly well suited for urban agriculture where local food production and other supply chains, distribution, health, economic and environmental and resilience aspects need to be taken into account. RUAF has tailored this for

²³ Gore, Christopher, "Advances in Urban Agriculture Policy in East Africa: Learning Through Comparison, *RUAF Foundation*, (September 2016).

<http://www.ruaf.org/sites/default/files/UAM%2031%20p35-37.pdf>

²⁴ Cabennes, Yves and Marocchino, Cecilia, "Some Challenges to Integrating Food into Urban Planning: Lessons from the Field," *RUAF Foundation*, (September 2016).

<http://www.ruaf.org/sites/default/files/UAM%2031%20p10-12.pdf>.

urban agriculture and implemented a multi-stakeholder policy planning process in 20 cities around the world.²⁵

4. Include multi-functional land use case studies to counter “budget constraints” arguments

Alongside providing fresh produce, urban agriculture can use other functions of the city and combine these functions in one area. This supports the financial sustainability of urban agriculture by opening up opportunities to increase revenue and reduce costs. If policymakers support such land use, they can create cost-effective policies on urban agriculture amid budget constraints. For instance, in Thailand, aquaculture was combined with other revenue-producing recreational activities such as fish restaurants, boating, etc.²⁶ To lower costs, cities such as Minneapolis, USA and Billings, USA²⁷ began integrating community gardens with parks where the maintenance and labour costs are shared with the city and community gardeners.

²⁵ Zeeuw, Henk, Dubbeling and Dubbeling, Marielle, “Multi-Stakeholder Policy Formulation and Action Planning on Urban Agriculture,” *RUAF Foundation*, (September 2011).

<http://www.ruaf.org/sites/default/files/UAM%2025-Multi-Stakeholder%20Policy%2018-20.pdf>

²⁶ Zeeuw, Henk, Dubbeling and Dubbeling, Marielle, “Multi-Stakeholder Policy Formulation and Action Planning on Urban Agriculture,” *RUAF Foundation*, (September 2011).

<http://www.ruaf.org/sites/default/files/UAM%2025-Multi-Stakeholder%20Policy%2018-20.pdf>

²⁷ “Community Gardens,” The Billings Parks and Recreation Department, accessed September 1, 2017, <http://www.billingsparks.org/community-gardens/>.

Conclusion

As food prices are expected to become more volatile in the future, ensuring the food security of the urban poor is paramount. Policymakers have the opportunity to harness urban agriculture which is already an effective but informal survival mechanism of the urban poor. If ignored, the opportunity to make gains in food security and employment outcomes are missed and the ungoverned externalities of urban agriculture can pose human health and food insecurity risks. Formally recognizing urban agriculture in policies will take creative alignment with other national priorities, but case studies show that a focus on engaging multiple stakeholders throughout the whole process can build political support. Proper risk management should complement these efforts. By taking such a twin-track approach, cities can make strides in bolstering the livelihoods of the urban poor.

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