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Editor's note: *The study, "Global assessment of urban and peri-urban agriculture: irrigated and rainfed croplands," can be downloaded here: http://iopscience.iop.org/1748-9326/9/11/114002/article*

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First Global Estimate of Urban Agriculture Reveals Area Size of the EU that's Boosting Food Security in Cities

Study finds irrigation more common on city farms than rural farms, intensifying water demands in sprawling urban zones

COLOMBO, SRI LANKA (13 November 2014) — Food production globally is taking on an increasingly urban flavor, according to a new study that finds 456 million hectares—an area about the size of the European Union—is under cultivation in and around the world's cities, challenging the rural orientation of most agriculture research and development work.

"This is the first study to document the global scale of food production in and around urban settings and it is surprising to see how much the farm is definitely getting closer and closer to the table," said Pay Drechsel, a scientist at the International Water Management Institute (IWMI) and co-author of the study, which was published in the November 2014 issue of the journal *Environmental Research Letters*.

The analysis, a collaboration between IWMI, under the CGIAR Research Program on Water Land and Ecosystems, the University of California-Berkeley, and Stanford University, is the first global assessment to quantify urban croplands and document the resources they consume, namely water, which has both environmental and food safety implications.

The authors said their goal was to highlight the role of urban farming in the quest for food security and sustainable development, given the largely rural focus of most agriculture research and policy work. In addition, they wanted to spotlight the starkly different view of urban farming one finds in the developed and developing world.

"We see this dichotomy where urban farming in wealthy countries is praised for reducing emissions and enhancing a green economy, while in developing countries, it can be regarded as an inconvenient vestige of rural life that stands in the way of modernization," Drechsel said. "That's an attitude that needs to change."

Urban agriculture and food security
Drechsel and his colleagues note that urban agriculture, in addition to contributing to food security, puts marginal lands into productive use, assists in flood control, increases income opportunities for the poor and strengthens urban biodiversity.

Overall, the researchers found that 456 million hectares of land (about 1.1 billion acres) is being farmed in urban proximity. Most of that land lies just outside the city proper—within 20 kilometers—but 67 million hectares (about 166 million acres) is being farmed in open spaces in the urban core. These findings buttress previous studies documenting that up to 70 percent of urban households in developing countries are engaged in some type of farming and food production.

Related studies also have revealed that urban farms don't typically grow "calorie rich" cereals like wheat or rice. Rather, they most often produce high-value and nutritionally important perishable crops like fresh vegetables. In sub-Saharan Africa, for example, urban farmers supply up to 90 percent of the leafy salad greens consumed in the region's rapidly growing cities.

"In urban areas of Ghana, everyday there are about 2,000 urban vegetable farmers supplying greens to 800,000 people," Drechsel said. Moreover, most of these farmers irrigate their fields with highly polluted water, he said. In Accra, for example, up to ten percent of household wastewater is indirectly recycled by urban vegetable farms.

"These farms are now recycling more wastewater than local treatment plants," Drechsel said.

Irrigation and water usage on urban farms

The study finds that within cities alone there are about 24 million hectares of land under irrigation, and 44 million hectares that are rain fed. Those numbers are larger than respective total area under rice in South Asia, the cultivated area under maize in sub-Saharan Africa, or the cultivated croplands of the *cerrados* and *llanos* in Latin America and the Caribbean. Going forward, the researchers note the prospect of "irrigated urban croplands playing a larger role in more densely populated and/or increasingly water scarce regions such as South Asia."

The researchers observe that water usage by urban farms is not just a water recycling opportunity, it also can potentially become a food safety concern. For example, while irrigation allows consumers to get vegetables in the dry (lean) season, it also potentially exposes them to pathogens that can be present in the poorly treated water. But the researchers said the food safety issues, while important, can be addressed to maintain the many valuable and underappreciated contributions of urban farms.

A new portrait of urban farming

The richly detailed portrait of urban farming presented in the study was derived in part from new data and maps generated by researchers at the University of Frankfurt and at the US National Aeronautics and Space Administration (NASA) that use satellite imagery and other sources to provider greater insights into the distribution of croplands globally. The authors say their study may have actually underestimated urban croplands, as they focused on farmed areas in and around cities with at least 50,000 residents, even though many countries define areas with smaller populations as "urban."

"This is an important first step toward better understanding urban crop production at the global and regional scales," said Anne Thebo, an environmental engineer at the University of California-Berkeley, who was the lead author of the study. "In particular, by including farmlands in areas just outside of cities we can begin to see what these croplands really mean for urban water management and food production."

Researchers said further study is warranted exploring how crop production in and around cities affects ecosystem services in the rural-urban corridor and, in particular, what it means for managing water resources and improving food safety.

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The **International Water Management Institute (IWMI)** is a non-profit, scientific research organization focusing on the sustainable use of water and land resources in developing countries. It is one of 16 such CGIAR centers across the globe, and is headquartered in Colombo, Sri Lanka, with regional offices across Asia and Africa. IWMI works in partnership with governments, civil society and the private sector to develop scalable agricultural water management solutions that have a tangible impact on poverty reduction, food security and ecosystem health. www.iwmi.org

IWMI leads the CGIAR Research Program on Water, Land and Ecosystems (WLE), which combines the resources of 11 CGIAR centers, the Food and Agriculture Organization of the United Nations (FAO) and numerous national, regional and international partners to provide an integrated approach to natural resource management research. WLE promotes a new approach to sustainable intensification in which a healthy functioning ecosystem is seen as a prerequisite to agricultural development, resilience of food systems and human well-being.