



Agricultural Transformation and the Role of Urban Agriculture in Food Security

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Abstract:

The COVID-19 pandemic has led to direct/indirect, controllable/uncontrollable, foreseen/unforeseen impacts and consequences on agricultural systems and global supply-chains. This global emergency provides an opportunity for redesign and transformation in the agricultural sector to build resilience and sustainability in the face of many challenges. These include climate change and extreme weather events, biodiversity, livestock/crop pest and disease, water availability and quality, livelihoods, population, health, and urbanization. Urbanization is increasing, with 55 percent of the world's population (projected to reach 8.5 billion by 2030) residing in urban areas that consume 70 percent of global food supply. This is having detrimental impacts and consequences on water quality, land deforestation, air pollution, and biodiversity loss. For example, it is estimated that there will be a 50 percent increase in urban water demands over the next 30 years.

In our presentation, we focus on the role of statistics and data science in supporting urban agriculture (UA) growth and expansion (e.g., indoor vertical farms, rooftop/backyard gardens, community gardens). Virtual ecosystem big data and digital technologies are already driving redesign and transformation, but need to be interwoven with practical, real-world ecosystem-based frameworks and approaches. Nature-based solutions and biovigilance offer integrated approaches for monitoring, assessing, and co-learning from across multiple actions and interventions. New performance metrics, methods, and tools are needed to provide guidance, encourage adoption, and mitigate risks. With appropriate design, UA can also address rising water demands and alleviate food shortages and enhance self-sufficiency in urban areas (e.g., non-potable water reuse for crop irrigation, groundwater replenishment, industrial processes, and wetland and other environmental restoration). Compounded with escalating food prices, the interest and adoption of UA activities, for enhanced food self-sufficiency, is spreading. This is an unforeseen consequence of COVID-19, and could rapidly and radically transform urban areas into multi-functional, livable, and sustainable foodscapes.

Keywords:

Big data; Climate change; Foodscapes; Transformation; Urban agriculture