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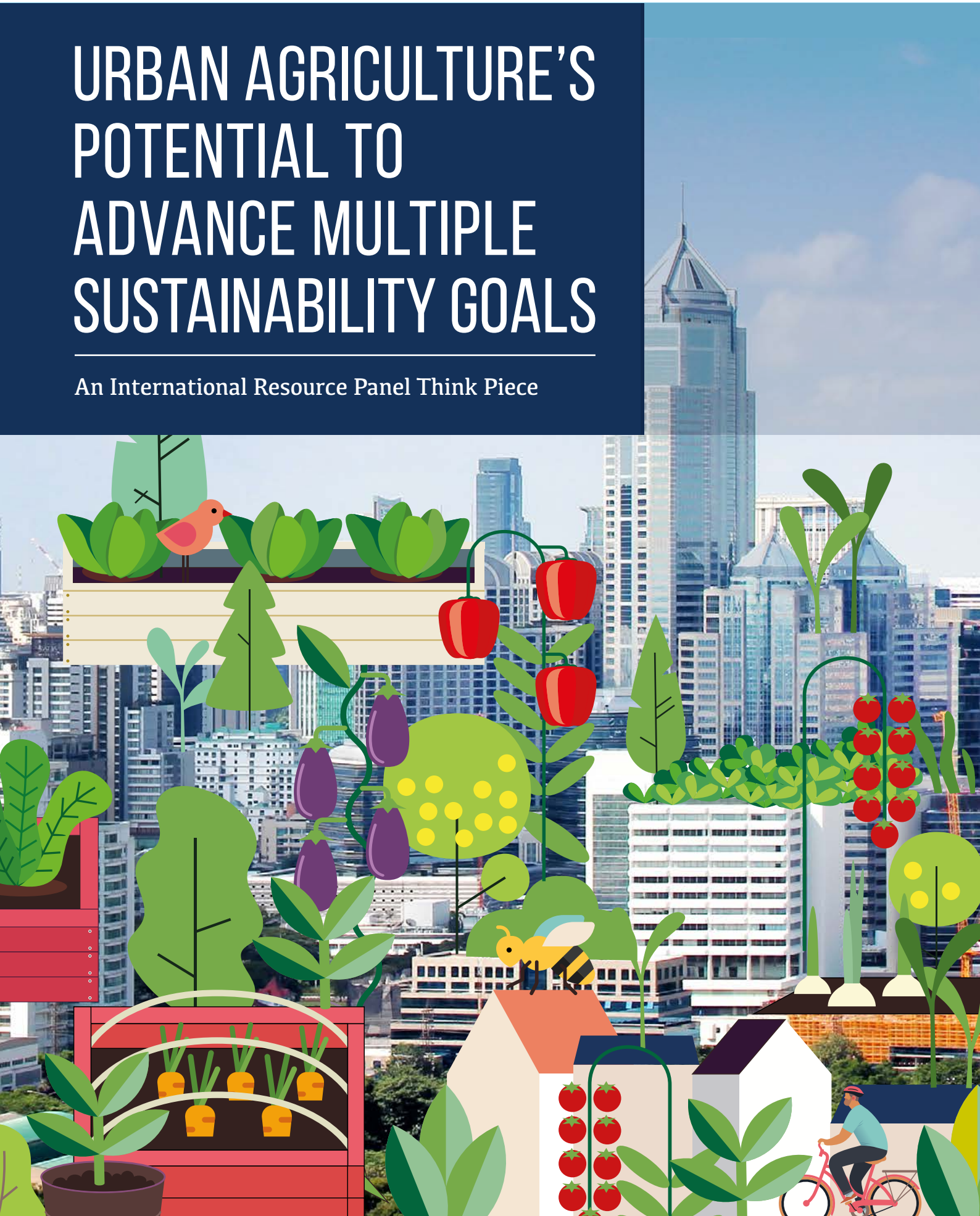
URBAN AGRICULTURE'S POTENTIAL TO ADVANCE MULTIPLE SUSTAINABILITY GOALS

An International Resource Panel Think Piece



Urban Agriculture's Potential to Advance Multiple Sustainability Goals - An International Resource Panel Think Piece

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About This Think Piece

This document is an International Resource Panel (IRP) think piece, which is a technical or policy paper based on IRP scientific studies and assessments and other relevant literature. It is not a full study and assessment but a collection of science-based reflections that may catalyse the generation of new scientific knowledge and highlight critical topics to be considered in policy discourse.

Acknowledgements

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International Resource Panel

Preface

By 2050, 70 per cent of the world's population will live in urban areas, and 80 per cent of food globally is expected to be consumed in cities. Thus, one of the biggest challenges we face as a society is: How do we feed the world's growing cities, while at the same time attending to the various social, economic, and environmental needs and aspirations of cities.

In recent years, urban agriculture has been identified as a solution to advance multiple sustainability goals, such as food security, climate and ecosystem resilience, health and well-being, job creation and social equity. However, the effectiveness of urban agriculture, as well as the policy action needed to tap into its potential, are not well understood.

Since 2007, the International Resource Panel has provided more than 40 impactful scientific assessments on the status, dynamics and implications of natural resource use in cities and in food systems. In this Think Piece, we evaluate to what extent, and in which conditions, urban agriculture can enhance the sustainability of urban-rural food systems and promote a circular economy in cities.

The Think Piece provides an overview of different urban agriculture typologies, ranging from household backyard gardens to community allotment gardens, from rooftop greenhouses to high-tech vertical farming. With a systems lens, it analyses the natural resource use implications of urban agriculture in its various forms and assesses its benefits and trade-offs across multiple sustainability goals, acknowledging distinct regional specificities.

We note that urban agriculture is not a panacea. In realizing its multiple benefits, the objective of urban agriculture needs to be clearly defined in the policy process, with due consideration of local context.

The Think Piece is accompanied by a policy guidance document that presents a road map for designing "fit-for-purpose" urban agriculture policies, taking into account the interaction between urban and rural systems. We call for action from both the agriculture sector and the urban planning sector to realize the untapped potential of urban agriculture in advancing the Sustainable Development Goals of Agenda 2030.

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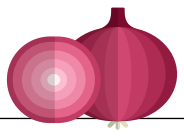

URBAN AGRICULTURE'S POTENTIAL TO ADVANCE MULTIPLE SUSTAINABILITY GOALS

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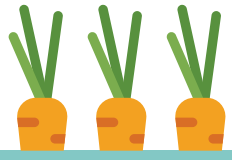
Key messages

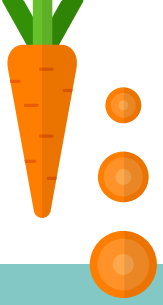
Key Message 1: As environmental challenges grow and the COVID-19 pandemic highlights the fragility of food systems, one of the biggest challenges facing the world is feeding growing urban populations while attending to the social, economic, and environmental needs and aspirations of cities.

Key Message 2: Done well, urban agriculture can help feed people in cities and alleviate the triple planetary crises of climate change, nature and biodiversity loss, and pollution and waste. For example, hydroponic closed-loop systems can save 40 per cent of irrigation water and 35-54 per cent of nutrients.

Key Message 3: Despite the opportunities, we do not fully understand the effectiveness of urban agriculture and the policy actions needed to tap its potential. Local contexts and uncertainties need to be clarified, while diverse forms of urban agriculture must be integrated into a portfolio of approaches that cover land-based and vertical farming, poultry and fish farming, and high-tech indoor techniques.

Key Message 4: While there are trade-offs, a portfolio of urban agriculture policies integrated within a larger regional agricultural system can support the transition to a more resilient and sustainable food system while improving the circular economy of cities.





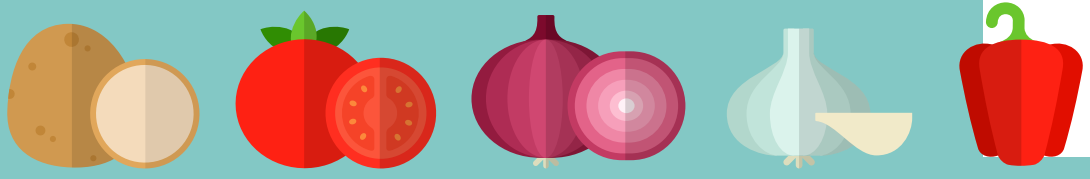
Key Message 5: When designed to support poor communities – in particular, households led by women – urban agriculture can reduce poverty, improve nutrition, reduce inequities, increase well-being and generate livelihoods. For example, a study in São Paulo, Brazil showed that enhanced urban agriculture could supply all 21 million residents of the city with vegetables while creating more than 180,000 jobs.

Key Message 6: When designed to develop a local food economy, high-tech indoor agriculture and local food hubs may play an important role. For example, vertical farming is expected to reach a value of $7.3 billion globally by 2025. However, when looking at the scalability of business models, decision makers should consider impacts on energy, land, labour, and water, and the effects of pollution on food quality and safety.

Key Message 7: Due to the proximity to consumers, diversified and coordinated urban-regional agriculture can promote resilience to food system disruptions, such as those caused by COVID-19.

Key Message 8: Urban agriculture's contribution to reducing environmental impacts from food systems depends on business models and local contexts. Cities must gather data that are more locally and context-specific to measure the environmental impacts of different modes of urban agriculture and policies designed to address them.

Key Message 9: Institutional, governance, behavioural and technical barriers need to be addressed to make urban agriculture part of a sustainable food systems portfolio. Proper attention must be given to land-use planning, urban-regional policy directives, and the cost of land and energy.



1. Introduction: Feeding the World's Bulging Cities

The world population is projected to reach 9.7 billion by 2050, with an estimated 70 per cent of the population living in urban areas (United Nations [UN] 2015; UN 2019). Most of this growth (90 per cent) is expected to occur in Africa and Asia (UN 2020a; Trottet *et al.* 2021). Currently, around 55 per cent of the population lives in cities. As this trend continues, an estimated 80 per cent of food will be consumed in urban areas by 2050 (Veolia Institute 2019; Food and Agriculture Organization of the United Nations [FAO] 2021). Feeding the world's cities means that food production systems will have to change in significant ways, including by bringing food production closer to urban areas.

Urban agriculture has been advocated worldwide as a strategy to provide food and many other benefits to city dwellers, especially as the planet faces the triple crises of climate change, biodiversity loss and pollution. This Think Piece explores the potential of urban agriculture to address these challenges. Specifically, how can urban agriculture be a nature-based solution[1] to support the transition to a more resilient and sustainable food system?[2] What is its potential to improve the circular economy[3] in cities?

This Think Piece applies a systems approach to assess the contribution of urban agriculture to achieving the Sustainable Development Goals (SDGs). In line with the mandate of the International Resource Panel (IRP), it assesses the implications that using different urban agriculture typologies has for natural resources and related environmental impacts. It explores urban agriculture's contributions to job creation, food security and nutrition. Specifically, it highlights the contributions of urban agriculture to circularity, climate change, biodiversity loss and the SDGs; synthesizes the approaches to and benefits of urban agriculture worldwide; and identifies challenges for transitioning to a circular urban agriculture.[4]

Definitions of urban agriculture vary widely (see Annex), with some mentioning intra-city and peri-urban agriculture and others referring generally to agriculture around cities, without specifying boundaries or distances. Meanwhile, separate terms for regional and local agriculture refer to farms at much greater distances from cities. In this Think Piece, the term "urban agriculture" includes peri-urban agriculture. It is based on the definition in FAO (2019), which highlights the growing of plants and the raising of animals within and around cities. The emphasis is on urban agriculture for