Urban Farming

Why in News?

Urban farming, powered by Agriculture 4.0, is ushering in a new era of food production by integrating advanced technologies.

What are Urban Farming & Agriculture 4.0?

- **Urban Farming** – It is the practice of cultivating crops, livestock, or types of food in an urban environment.
- It takes advantage of available spaces in cities, such as rooftops, balconies, community gardens, and vacant lots.
- **Need for Urban Farming** - As urban populations grow, cities are embracing innovative solutions to ensure fresh, sustainable food for all.
- Urban farming is expected to play a critical role in addressing global food security challenges, particularly in cities, where 68% of the world's population is expected to reside by 2050.
- **Agriculture 4.0** - It is the use of Internet of Things (IoT), Big Data, Artificial Intelligence and Robotics to improve farming more precise, productive and efficient.
- **Smart Urban Farming** - Smart technology is at the heart of urban farming's rapid advancement.
- **Internet of Things (IoT)** - It allows for real-time monitoring of environmental conditions such as soil moisture, light levels, and temperature to optimize plant growth.
- **Potential** - By 2028, the global smart agriculture market is projected to reach $25.4 billion, driven by the increasing adoption of IoT and precision farming techniques.

What are the urban farming methods?



- **Rooftop Farming –** It utilizes the underutilized space on rooftops, this urban Farming method involves growing crops in containers or raised beds.
- **Vertical farming** - Vertical farming allows crops to be grown in stacked layers, optimising limited space and enabling year-round production.
- **Community gardens** - They are collaborative spaces where individuals or groups come together to cultivate plants collectively.
- These gardens are typically located on shared land, such as parks or vacant lots.
- **Hydroponics** - Hydroponic systems use nutrient-rich water instead of soil, conserve water while providing higher crop yields in smaller areas.
- **Aquaponics** - The practice of producing fish in tanks and soilless plant culture are combined in aquaponics.
- The aquaponic plants are naturally fertilized by nutrient-rich fish-raising water, and the plants also aid in the fish's water purification.
- **Indoor farming** – It is the cultivation of crops within enclosed structures, such as warehouses or shipping containers by controlling environmental factors like temperature, light, and humidity.
- Vertical farming, smart irrigation systems, and automated greenhouses are becoming integral to the future of food production in urban environments.
- **Microgreen farming** - It is the practice of growing microgreens for commercial purposes in a small space, such as a backyard.

What are the benefits of urban farming?

- **Increased Food Production** - Urban farming allows for the cultivation of fresh produce in areas where traditional agriculture is limited.
- **Improved Food Quality** - Access to fresh, pesticide-free produce, ensuring higher nutritional value and reducing health risks associated with chemical residues.
- **Enhanced Food Security** - Urban farming strengthens food security in urban areas, by reducing dependence on external food sources, particularly during times of crisis or disruptions in the supply chain.
- **Environmental Development** - Rooftop gardens utilise otherwise unused space,

regulating building temperatures ,improving air quality, stormwater management, and reduction of the urban heat island effect.

- **Environmental Sustainability** – It promotes sustainable practices such as composting, rainwater harvesting, and waste reduction, contributing to a greener and more resilient urban ecosystem.
- **Community Engagement** - Engaging in urban farming fosters a sense of community and social cohesion.
- **Eco sensitization** - Urban agriculture provides an opportunity for individuals to connect with nature, learn about agriculture, and develop a deeper appreciation for the food they consume.
- **Skill Development** - Community gardens and shared spaces can serve as platforms for knowledge exchange and skill-building.
- **Economic Opportunities** - By cultivating and selling their produce locally, individuals can create small-scale businesses, contributing to their financial stability and reducing unemployment rates.

What are the challenges ?

- **Limited Space** - Rapid urbanization has led to a reduction in open spaces, making it difficult to establish large-scale farms.
- **Soil Contamination** - Urban areas often suffer from soil contamination due to industrial activities, pollution, and improper waste disposal.
- This contaminated soil can negatively impact crop quality and pose health risks to consumers.
- **Water Management** - Urban farming requires efficient water management, as water scarcity is a prevalent issue in many Indian cities.
- **Regulatory Challenges** - Obtaining necessary permits, adhering to zoning regulations, and addressing potential conflicts with existing urban infrastructure pose challenges for aspiring urban farmers.

What lies ahead?

- Create adequate policy supports to promote urban farming.
- Create awareness among people about the methods and benefits of urban farming.
- Enable funding and technological support to make urban farming a successful commercial initiative.

Reference

The Hindu Businessline | Urban Farming

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