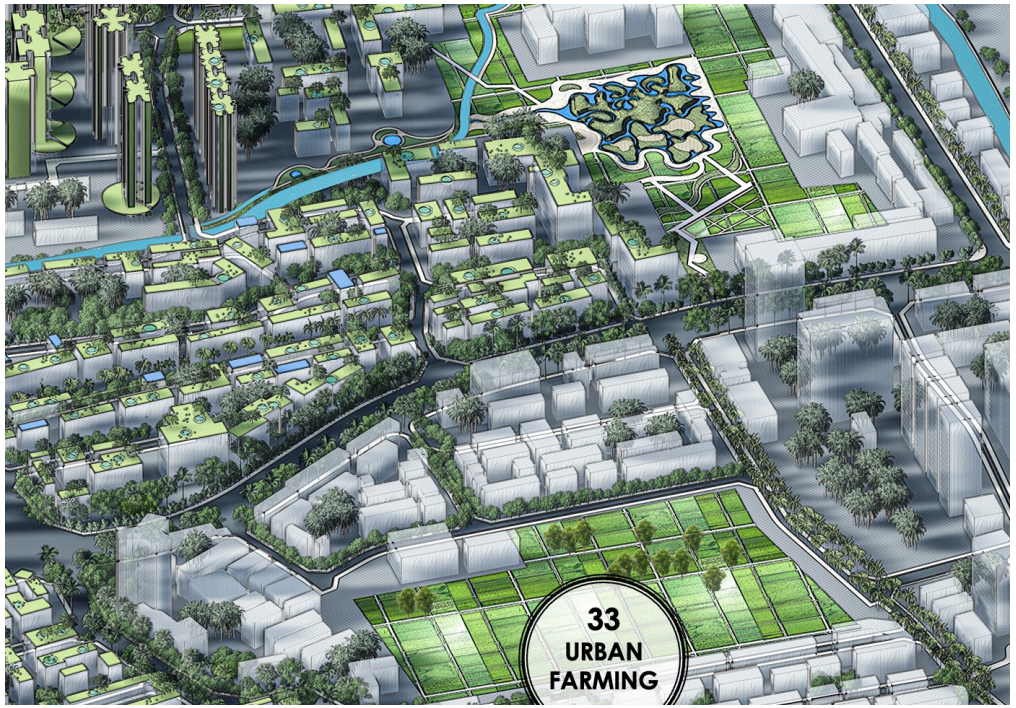
NbS-33 URBAN AGRICULTURE



Urban agriculture can serve as a multifunctional nature-based solution (NbS) for Southeast Asian cities, addressing food security, climate adaptation, and sustainable green infrastructure.

By integrating farming practices into urban spaces like rooftops, vacant lots, and peri-urban areas, it helps mitigate the urban heat island effect, improves air quality, and enhances water retention.

Urban agriculture can contribute to soil bioremediation through the use of biochar and organic farming practices, while green roofs and vertical gardens provide additional space for crop cultivation, reducing pressure on rural lands.

In tropical and equatorial climates, urban agriculture offers year-round productivity, supporting local food systems and reducing reliance on food imports, while also creating green jobs and fostering community engagement.

Additionally, urban agriculture enhances biodiversity by providing habitats for pollinators and promoting ecosystem services, such as nutrient cycling and carbon sequestration, making it a holistic solution for climate resilience and sustainable urban living.

LANDSCAPES SUPPORTED

EbA (ECOSYSTEM-BASED APPROACHES)

BIODIVERSITY CONSERVATION | INTEGRATED FOOD-WATER-ENERGY SYSTEMS | AGROECOLOGY & SUSTAINABLE LAND MANAGEMENT | CLIMATE-SMART AGRICULTURE | WATER SENSITIVE URBAN DESIGN | SOIL BIOREMEDIATION | GREEN INFRASTRUCTURE

MAIN PROBLEMS ADDRESSED

BIODIVERSITY LOSS

FLOOD CONTROL

URBAN HEAT ISLAND

AIR QUALITY IMPROVEMENT

FOOD SECURITY

ECOSYSTEM SERVICES AND ACTIONS

SUPPORTING

- **Soil formation and nutrient cycling**: Enhances soil health through composting and organic farming practices.
- **Habitat creation**: Provides urban habitats for pollinators, beneficial insects, and birds.

REGULATING

- **Climate regulation**: Reduces urban heat islands and mitigates greenhouse gas emissions through carbon sequestration in plants and soil.
- **Water management**: Improves water retention and reduces urban flooding through rainwater harvesting and permeable farm designs.

PROVISIONING

- **Food production**: Supplies fresh, locally grown produce to urban populations, enhancing food security.
- **Renewable resources**: Generates organic matter for biochar, compost, and renewable energy inputs like biogas.

SOCIAL BENEFITS

- **Community engagement**: Builds social cohesion and participation through urban farming initiatives and community gardens.
- **Educational opportunities**: Promotes awareness of sustainable agriculture and environmental stewardship through training and workshops.

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South Taihu Lake project, Huzhou, China. Source: Sasaki

Shongzhuang Arts and Agriculture City, China. Source: Sasaki

PROJECT'S CHALLENGES & RISKS

- **Land availability and tenure insecurity**: Limited access to urban land and unclear land ownership can hinder long-term urban agriculture initiatives.
- **Soil contamination**: Urban soils in Southeast Asia often face pollution from industrial and municipal waste, posing risks to food safety and public health.
- **Water resource competition**: Urban agriculture can strain already limited freshwater supplies in densely populated cities, especially during dry seasons.

NbS co-BENEFITS AND THEIR INDICATORS

- **Enhanced Food Security**
  Increased availability of fresh produce, measured by the number of urban households participating in urban farming.
- **Improved Climate Resilience**
  Reduction in urban heat island effects, tracked through localized temperature measurements.
- **Biodiversity Restoration**
  Increased presence of pollinators and beneficial insects, indicated by species diversity assessments in agricultural sites.
- **Waste Management**
  Reduction in organic waste sent to landfills, quantified by the volume of composted material used in urban farming.
- **Economic Opportunities**
  Creation of green jobs, measured by the number of employment opportunities generated in urban agriculture projects.
- **Community Engagement**
  Strengthened social cohesion, indicated by the number of community-led urban farming initiatives or workshops.

COST ANALYSIS

- **Direct Costs**
  Soil preparation, irrigation, and infrastructure, ranges from $5–$15/m2 (depends on scale/location.
- **Indirect Costs**
  Maintenance, training, and operational expenses, such as labour and fertilizers, amount to approximately $2–$5/m2/year.
- **Time Horizon**
  Projects typically have a 10–15 year timeframe with a discount rate of 5–7% applied to assess long-term benefits.
- **Direct Benefits**
  Increased food production valued depending on crop types and yield.
- **Indirect Benefits**
  Pollination and reduced stormwater runoff, avoided costs of infrastructure upgrades.
- **Risk Assessment**
  Potential risks such as land-use conflicts or pest outbreaks .

REFERENCES:

Thailand, Bangkok Urban Agriculture Initiative : Chulalongkorn University Centenary Park.
Philippines, Quezon City Urban Farming Program.
Singapore's Sky Greens Vertical Farm: Large-scale vertical farming project that demonstrates high-tech, space-efficient urban agriculture.

IMPLEMENTATION OPPORTUNITIES:

Indonesia, Jakarta's green roofs and rehabilitated flood-prone areas.
Vietnam, Ho Chi Minh City's vacant urban lots and rooftop spaces.
Cambodia, Kampong rural-urban transition zones.