

How cities can learn from nature

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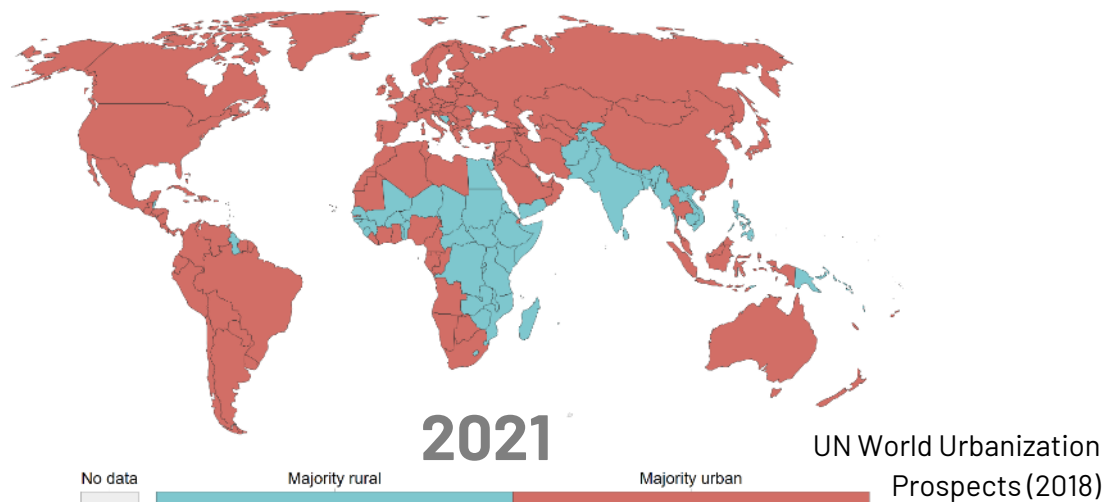
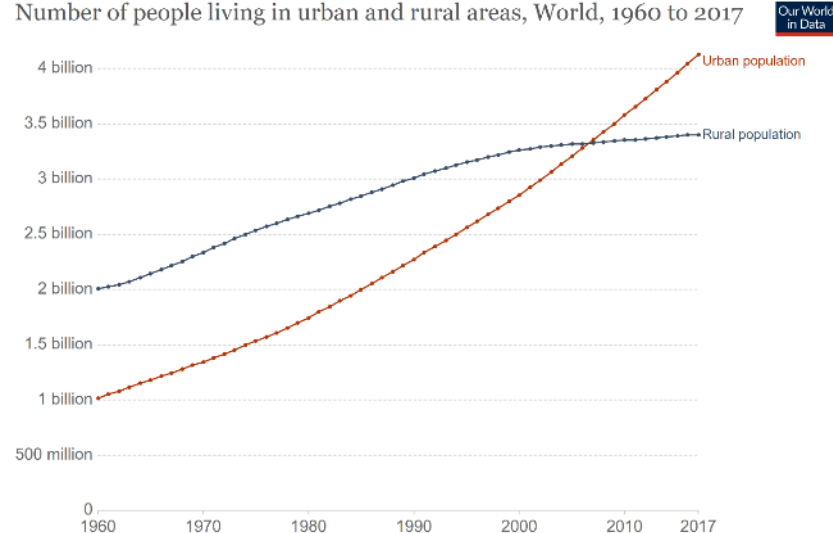




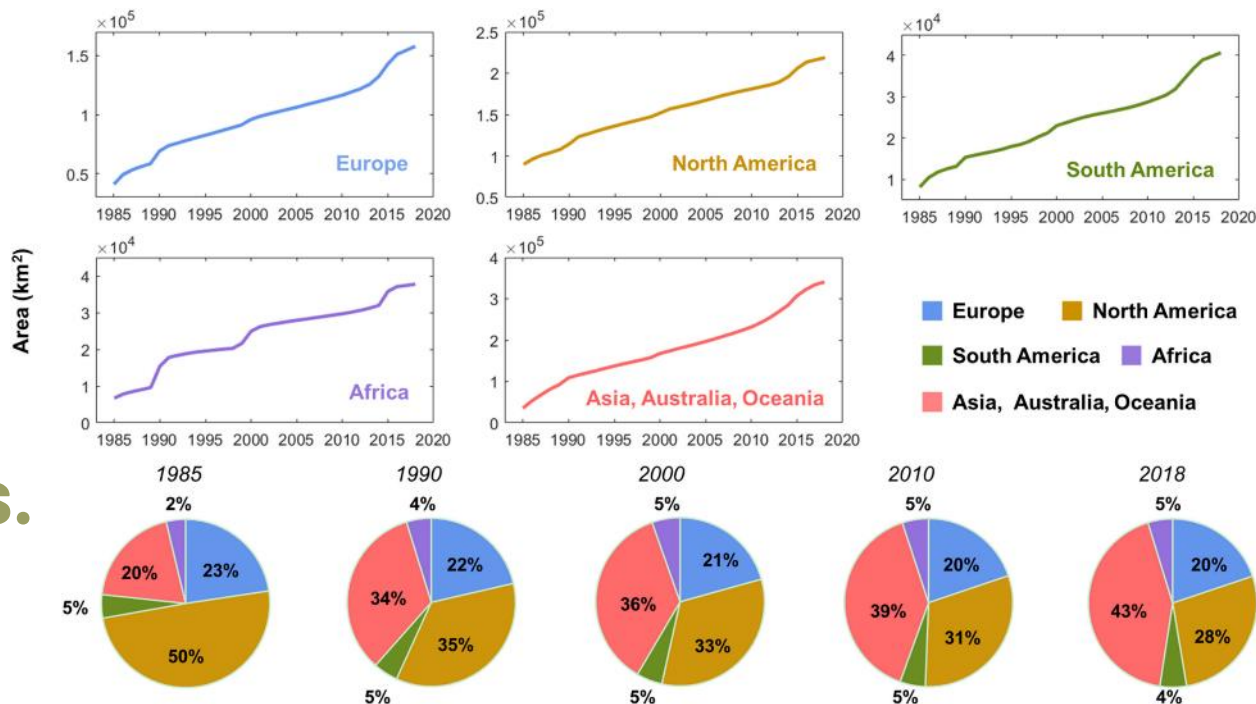
01

EVER-GROWING URBANIZATION

More than half
of the world's
population now
live in urban areas.



Continuous increase of the global artificial impervious areas.



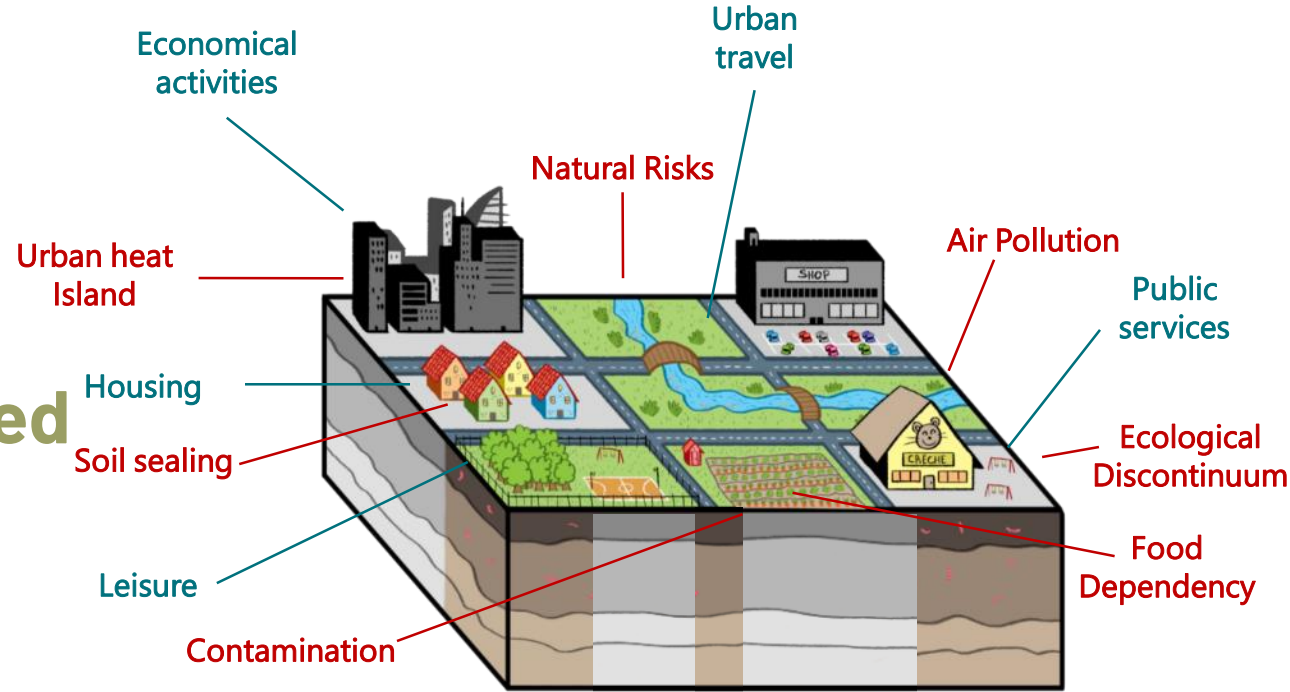


Metamorphosis, Franco (2016)



Metamorphosis, Franco (2016)

Facing many
environmental
issues concentrated
in cities.



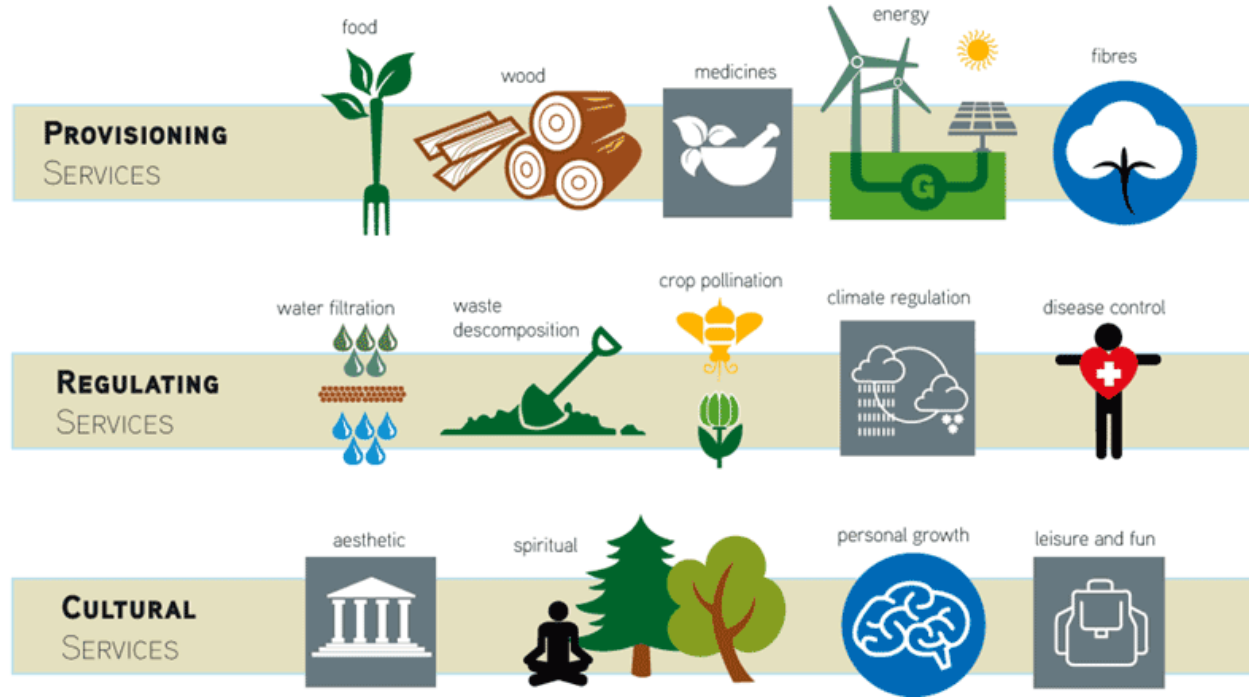


02

ECOSYSTEM SERVICES, BASIS OF MANKIND

Benefits people derive from ecosystems.

Besides **provisioning services** or goods like food, wood and other raw materials, plants, animals, fungi and micro-organisms provide essential **regulating services** such as pollination of crops, prevention of soil erosion and water purification, and a vast array of **cultural services**, like recreation and a sense of place



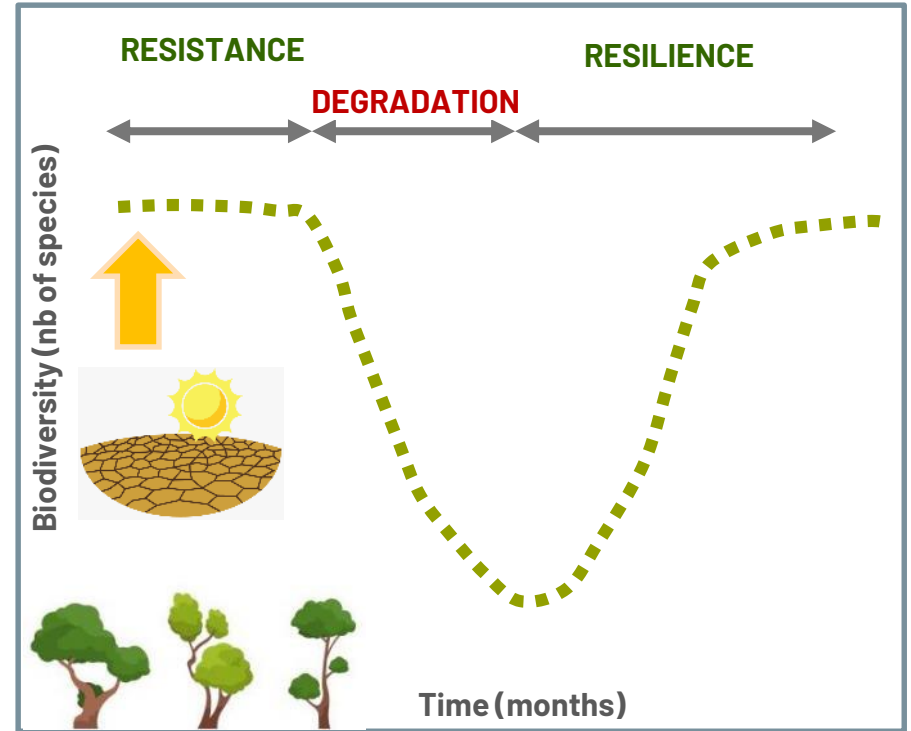




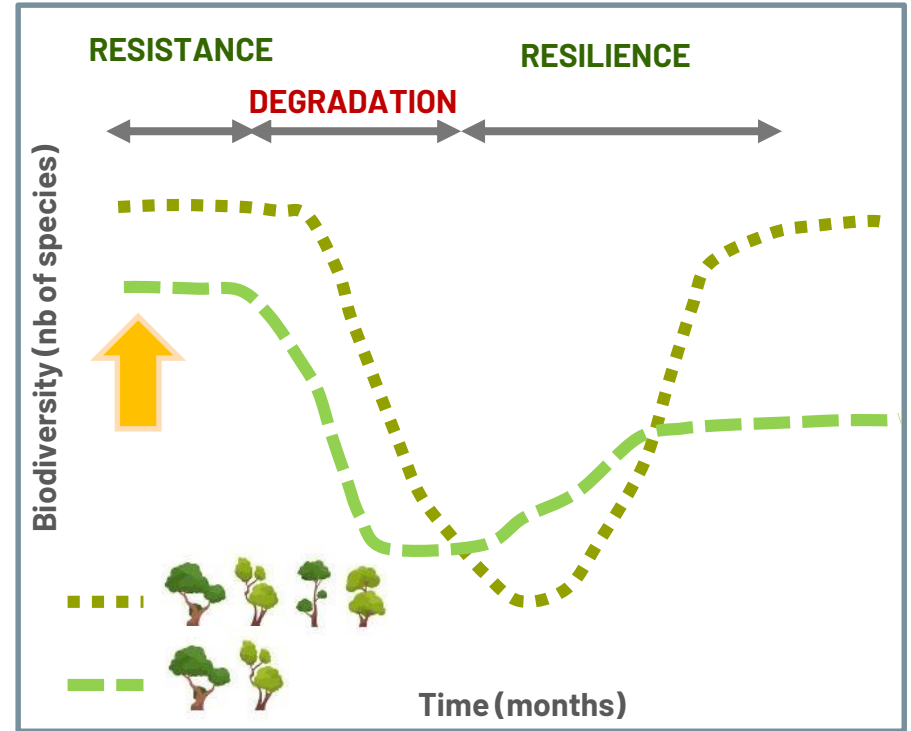
03

(BIO)DIVERSITY TO ENHANCE RESISTANCE & RESILIENCE

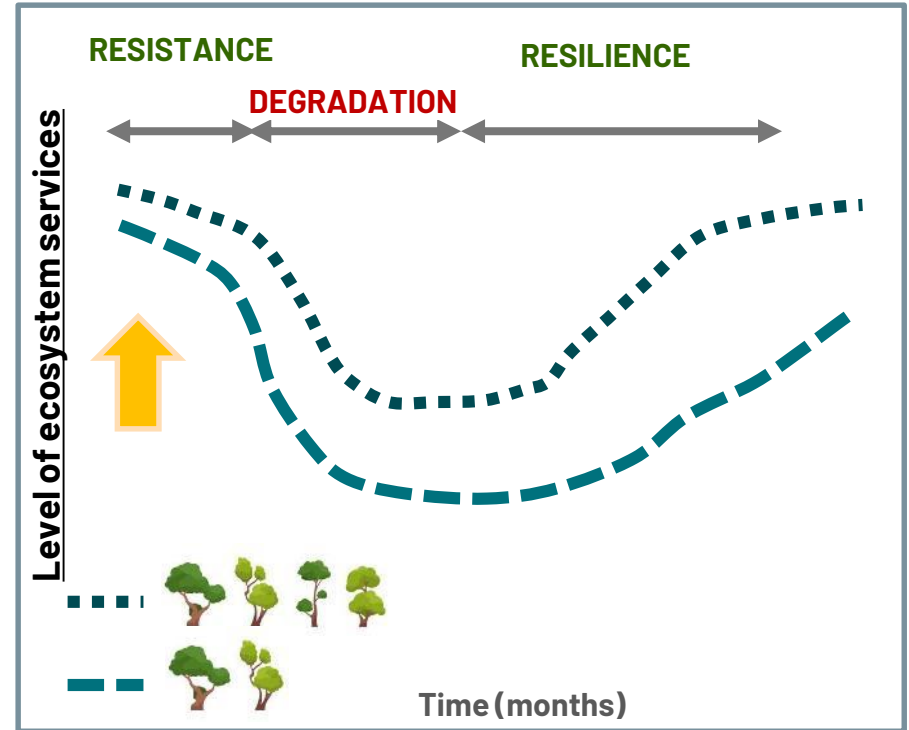
Impact of biodiversity on ecological stability.



Impact of biodiversity on ecological stability.



Impact of biodiversity on ecological stability.





04

FROM LOW TO HIGH-TECH: NATURE BASED SOLUTIONS



Benefits of urban trees

Research has linked the presence of urban trees to...



PROTECTING BIODIVERSITY

including habitat for migrating birds and pollinators



REDUCING OBESITY LEVELS

by increasing physical activity including walking and cycling



MANAGING STORMWATER,

keeping pollutants out of waterways, and reducing urban flooding



INCREASING

neighborhood property values



REDUCING STRESS

by helping interrupt thought patterns that lead to anxiety and depression



REDUCING RATES

of cardiac disease, strokes, and asthma due to improved air quality



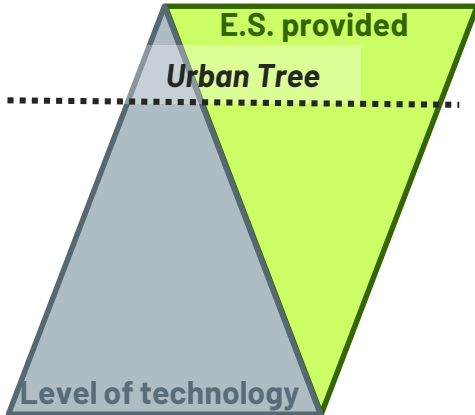
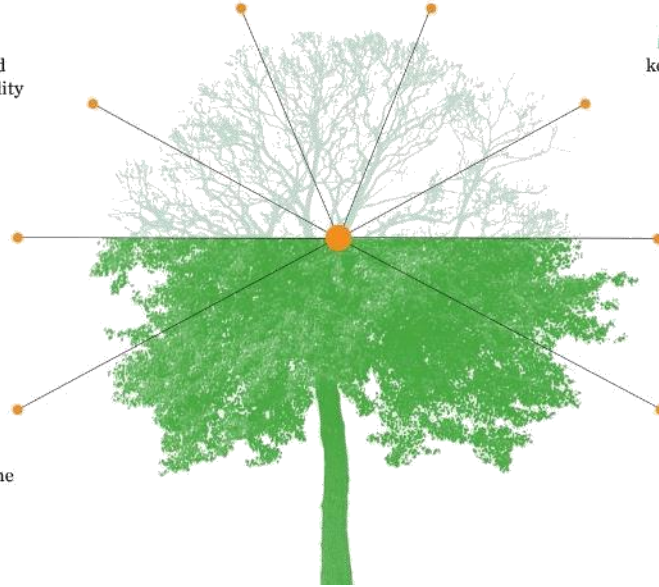
COOLING

city streets by 2-4° F, reducing deaths from heat and cutting energy use



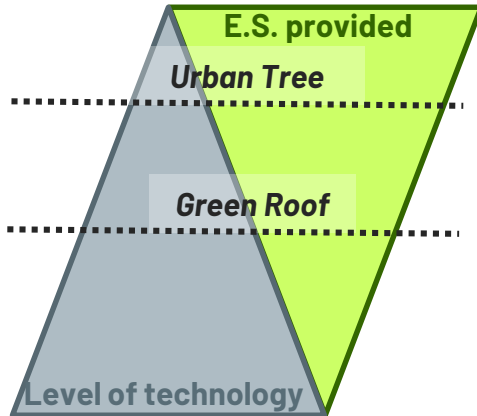
FILTERING

up to a third of fine particle pollutants within 300 yards of a tree

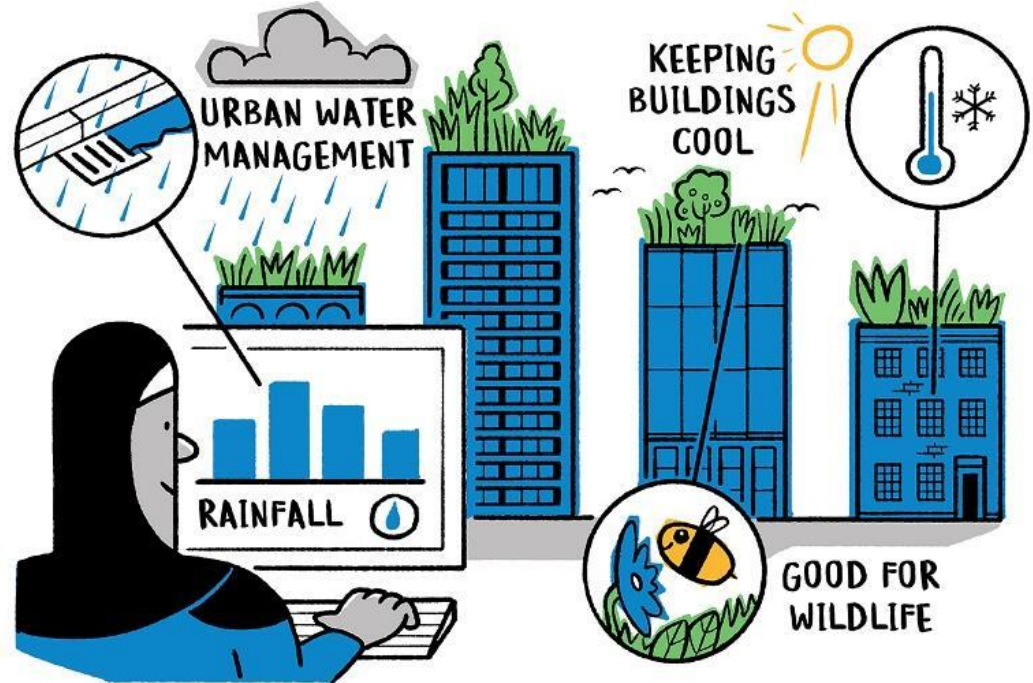




Benefits of green roofs

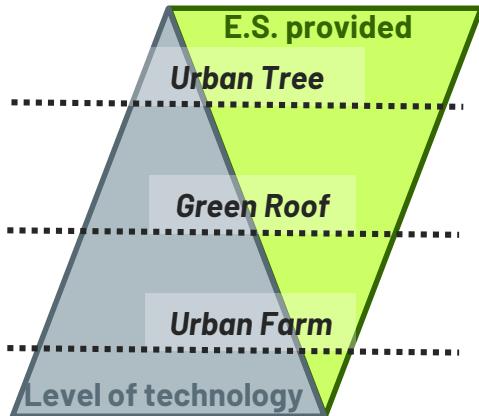


Green roofs are living multi-layered engineered systems made of biotic and abiotic components





Benefits of urban farm



Urban farms are very diverse with an increasing tendency to create high tech non-soil systems

BENEFITS OF URBAN FARMING





TAKE HOME MESSAGE

Mankind is facing multiple environmental issues that are concentrated in cities

Ecosystems, through their functioning, are capable to provide multiple ecosystem services

The more diverse are ecosystems, the more adaptable they are to global changes

Urban areas need a wide and diverse range of Nature Based Solutions – from low to high tech – to develop Smart & Sustainable Cities

