GLOBAL CLIMATE Pledge

Urban Agriculture

A guide for groups to learn about urban agriculture and start their own program

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    a. Definition
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2. Why Do We Need Urban Agriculture?
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5. Starting a Group Urban Agriculture Project
6. Other Ways to be Involved
7. Additional Resources
8. Sign the Pledge!
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What is Urban Agriculture?

What is Urban Agriculture?

Urban agriculture is the growing and distribution of agricultural related products in urban settings

History of Urban Agriculture

3500 BC:

Mesopotamian farmers set plots aside in cities they were building to grow food within them

Image from: The Dirt

1880's:

The Salvation Army in London used farm colonies to help poorer communities become more self sufficient

History of Urban Agriculture

1940's:

Victory gardens became popular in the U.S. post-war with over 20 million victory gardens by 1943

1920's:

More than 4,600 urban farms were used in Israel, which were largely tended to by women

1970's:

Urban gardening in the U.S. was driven by the environmental movement with the public's desire for more pesticide free food

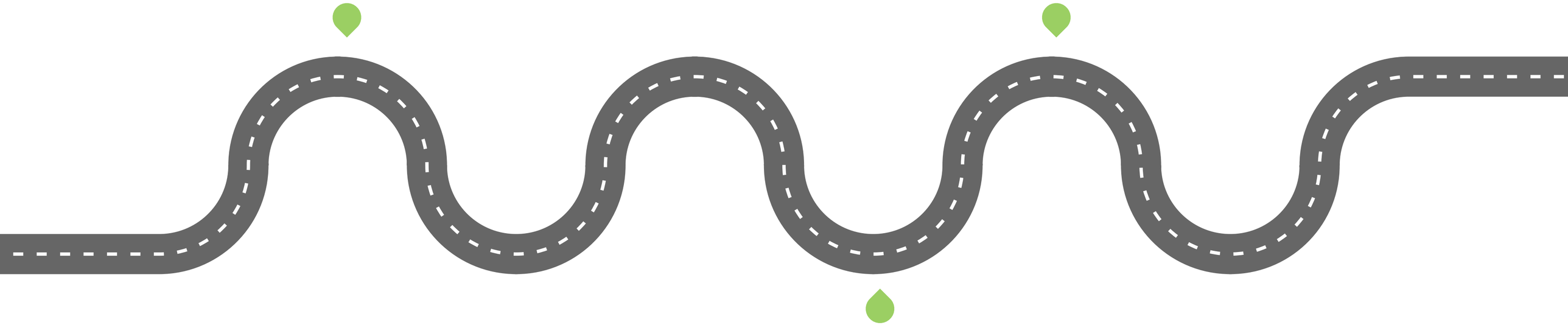
History of Urban Agriculture

1990's:

After the fall of the Soviet Union, Cuba began to use urban gardens to make up for lack of food imports

2018:

The Farm Bill passed in the United States, establishing the Office of Urban Agriculture and Innovative Production



2015:

Japan passed the Urban Farming Promotion Basic Act, validating the benefits of urban agriculture and helping to promote its growth

Why Do We Need Urban Agriculture?

Why Do We Need Urban Agriculture?

In 2017, it was found that 3 gigatons of CO_2 are released into the atmosphere due to food transportation...

...this equates to the weight of 300 million African elephants!

Food Miles

Food miles are the distance that food is transported before it is consumed.

It takes into acount the origin of growth, where it is being transported to, how it is transported, and how fast it is transported.

Food Miles

- A Canadian study found that imported food items traveled an average of **2,811 miles**
- A study in the U.S. found that the average produce item travels **1,500 miles**

Why Do We Need Urban Agriculture?

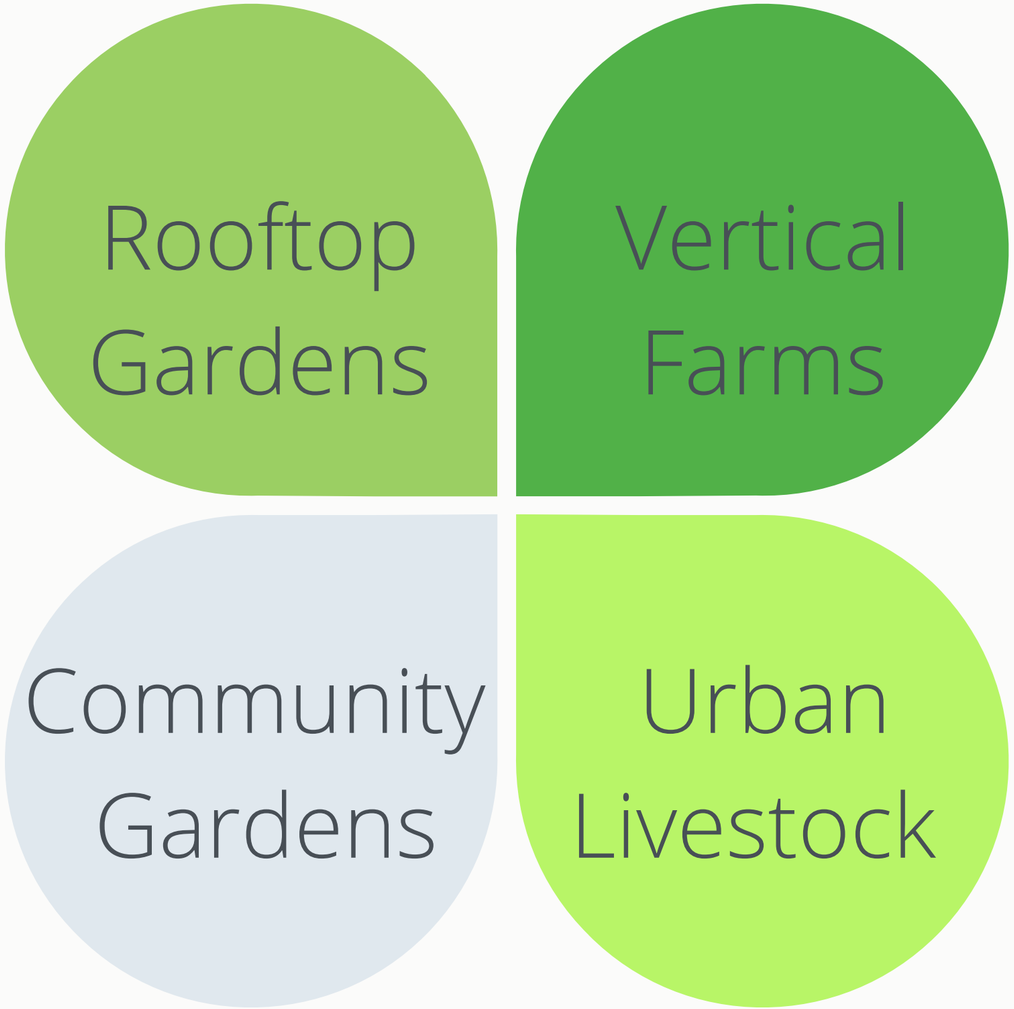
Urban agriculture can decrease the distance produce has to travel to end up on our plates

We get fresher products that support the local economy and add more biodiversity to communities!*

*more info to come on these topics!

Types of Urban Agriculture

There are four main types of urban agriculture:



Rooftop Gardens

What is Rooftop Gardening?

Rooftop gardens are human made green spaces on top of buildings

Rooftop Gardening Benefits

1. Decreasing heat island effect*
2. Adding visual appeal to roofs
3. Decrease Greenhouse Gas usage
4. Slowing down and filtering stormwater runoff

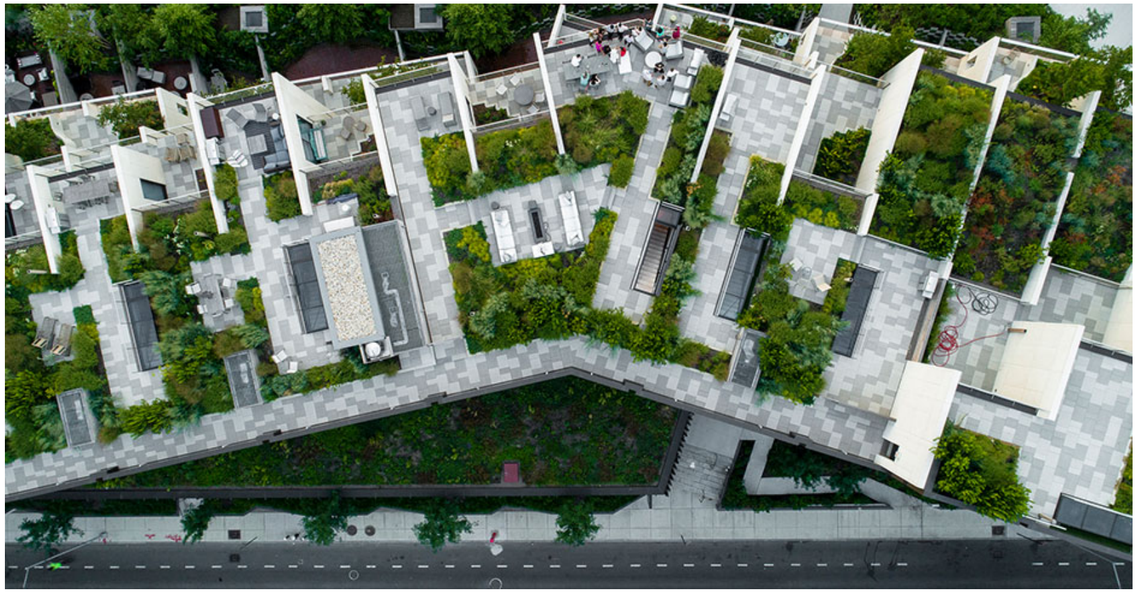
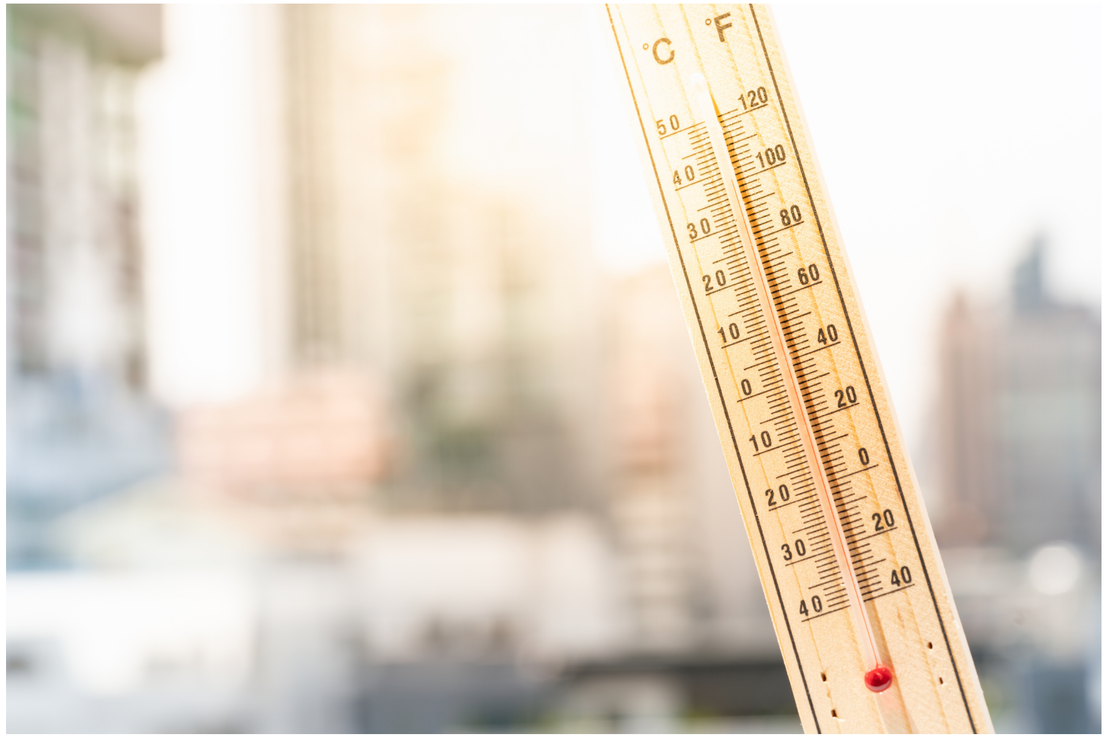


Image from: Lawrence Park Garden Care

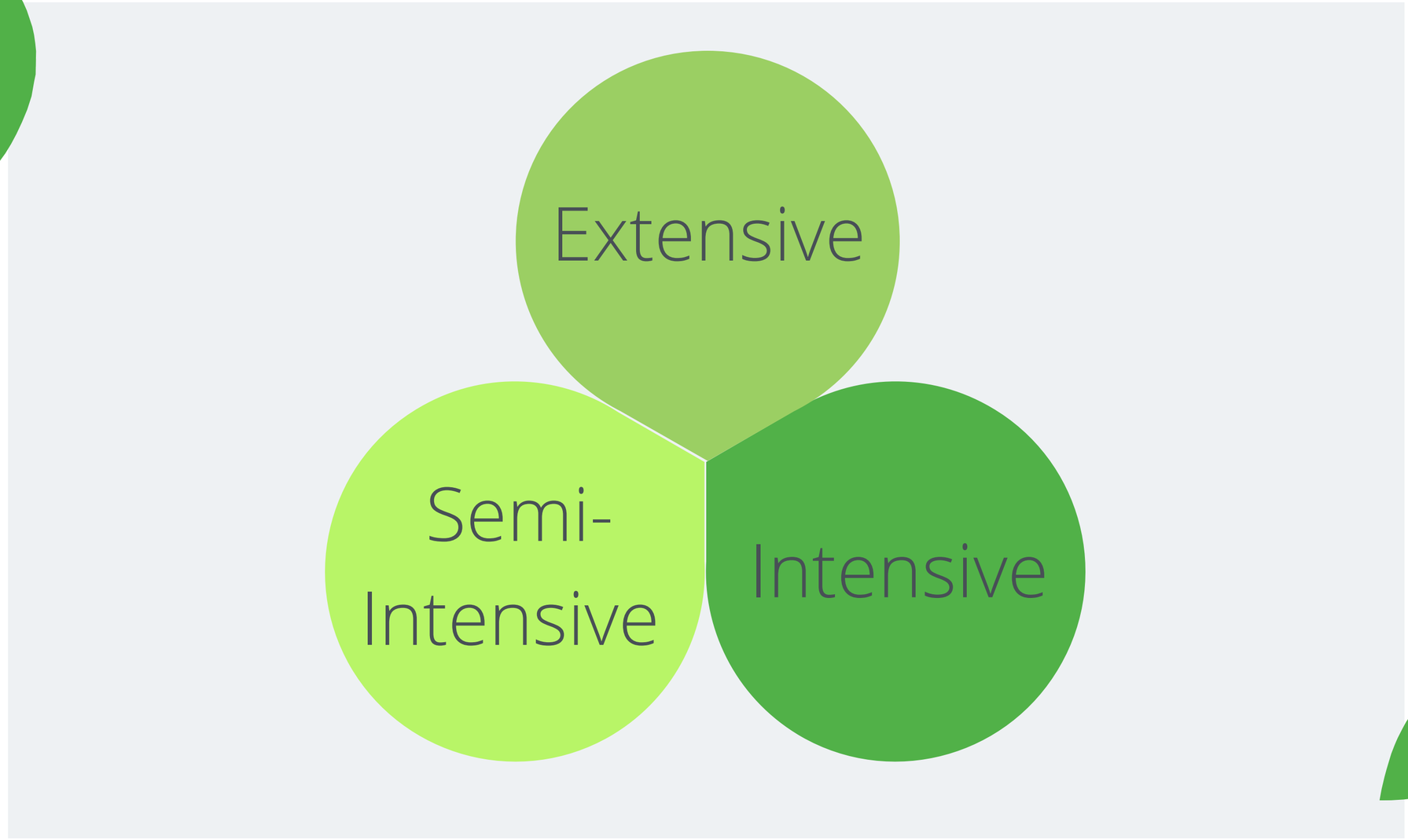
*next slide has definition

Urban Heat Island Effect

- Urban heat island effect is the increase of temperature in urban settings, which is attributed to human activities, city density, and urban construction using low albedo materials
- Trees are one of the best ways to decrease urban heat island effect, as they have been found to lower peak temperatures of concrete by up to 12ºC (53.6ºF)!



Types of Rooftop Gardens



Rooftop Gardens

Extensive

Image from: Bent Architecture

- Low maintenance
- Thin growing mediums
- Commonly have native plants, shrubs, succulents, and mosses
- Usually do not need irrigation

Rooftop Gardens

Intensive

- Deep growing mediums
- Can include vegetable gardens, shrubs, and small trees
- Requires maintenance and usually advanced irrigation

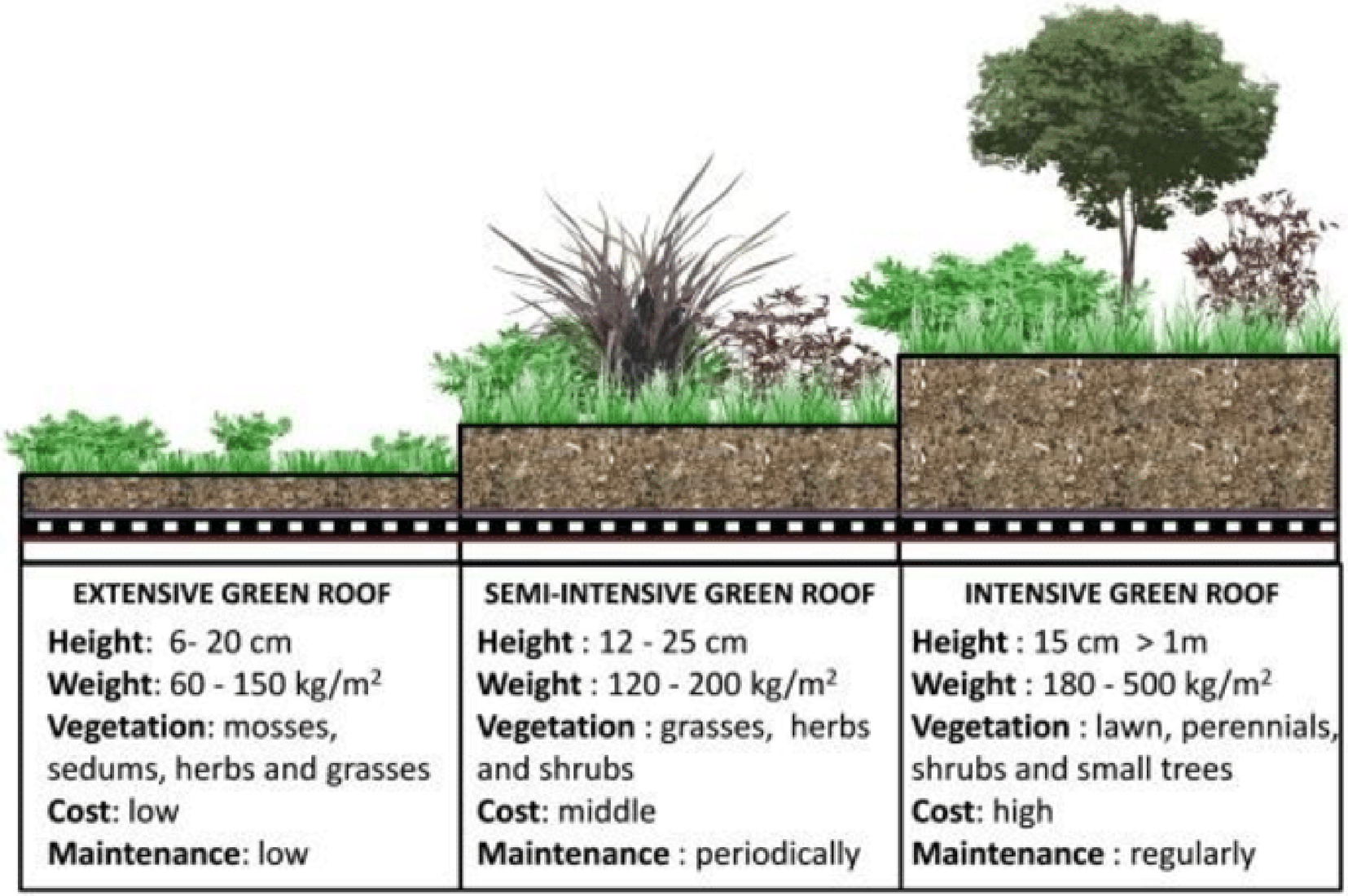
Rooftop Gardens

Semi Intensive

Image from: Green Roof Technology

- Mix between extensive and intensive gardens
- Medium depth growing medium
- Larger plants than extensive rooftop gardens
- May need irrigation

Rooftop Gardens



EXTENSIVE GREEN ROOF	SEMI-INTENSIVE GREEN ROOF	INTENSIVE GREEN ROOF
Height: 6- 20 cm **Weight**: 60 - 150 kg/m^2 **Vegetation**: mosses, sedums, herbs and grasses **Cost**: low **Maintenance**: low	**Height** : 12 - 25 cm **Weight** : 120 - 200 kg/m^2 **Vegetation** : grasses, herbs and shrubs **Cost**: middle **Maintenance** : periodically	**Height** : 15 cm > 1m **Weight** : 180 - 500 kg/m^2 **Vegetation** : lawn, perennials, shrubs and small trees **Cost**: high **Maintenance** : regularly

Image from: Merve Tuna, Researchgate

Case Study: Canada

Image from: National Research Council of Canada

- The National Research Council of Canada built an experimental roof in Ottawa
- Half the roof was conventional and half had an extensive rooftop garden
- The side with the extensive rooftop garden had:
  - More than 75% reduction of daily energy demand during warm months because there was less need for air conditioning
  - Retained 45% of rainwater, preventing severe runoff flooding

Vertical Farming

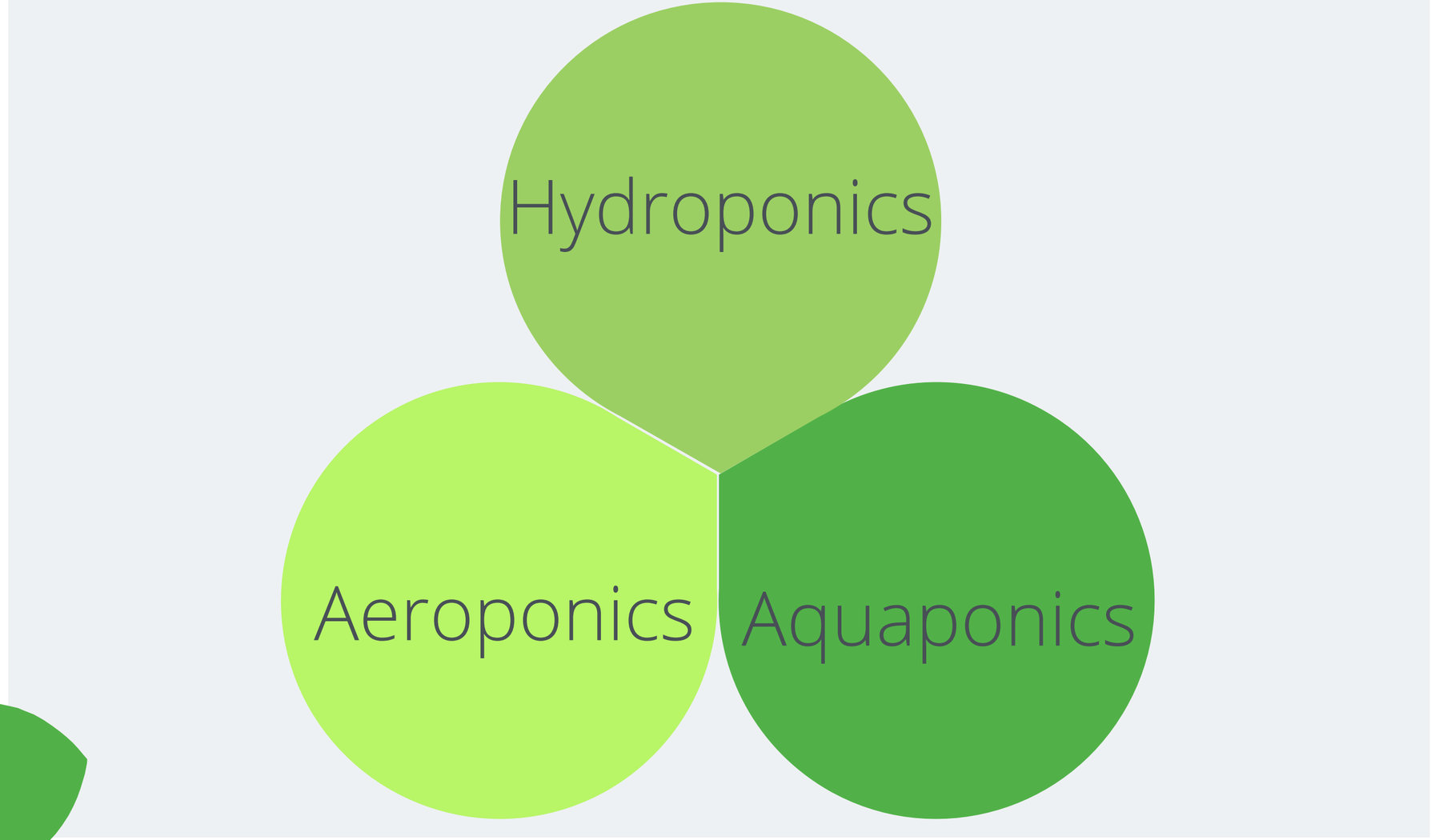
What is Vertical Farming?

Vertical farming is the growing of food crops horizontally and vertically, commonly in indoor spaces

Vertical Farming Benefits

1. Less contamination
2. Less water usage
3. Allows year round growth of plants
4. Less risk of natural disasters impacting crops
5. No weeds

Types of Vertical Farming



Vertical Farming

Hydroponics

- Growing plants in water with added nutrients
- Artificial light is usually used
- Large range of sizes

Vertical Farming

Aeroponics

- The roots of a plant are either misted or water passes over them periodically
- This idea was developed by NASA as a potential way to grow food in space
- Large range of sizes

Vertical Farming

Aquaponics

Image from: Greenlab

- Similar to hydroponics but fish are kept in the water
- This eliminates the need for added nutrients, as the fish waste fertilizes the plants
- Fish in aquaponic systems can be farmed as well

Aquaponic System

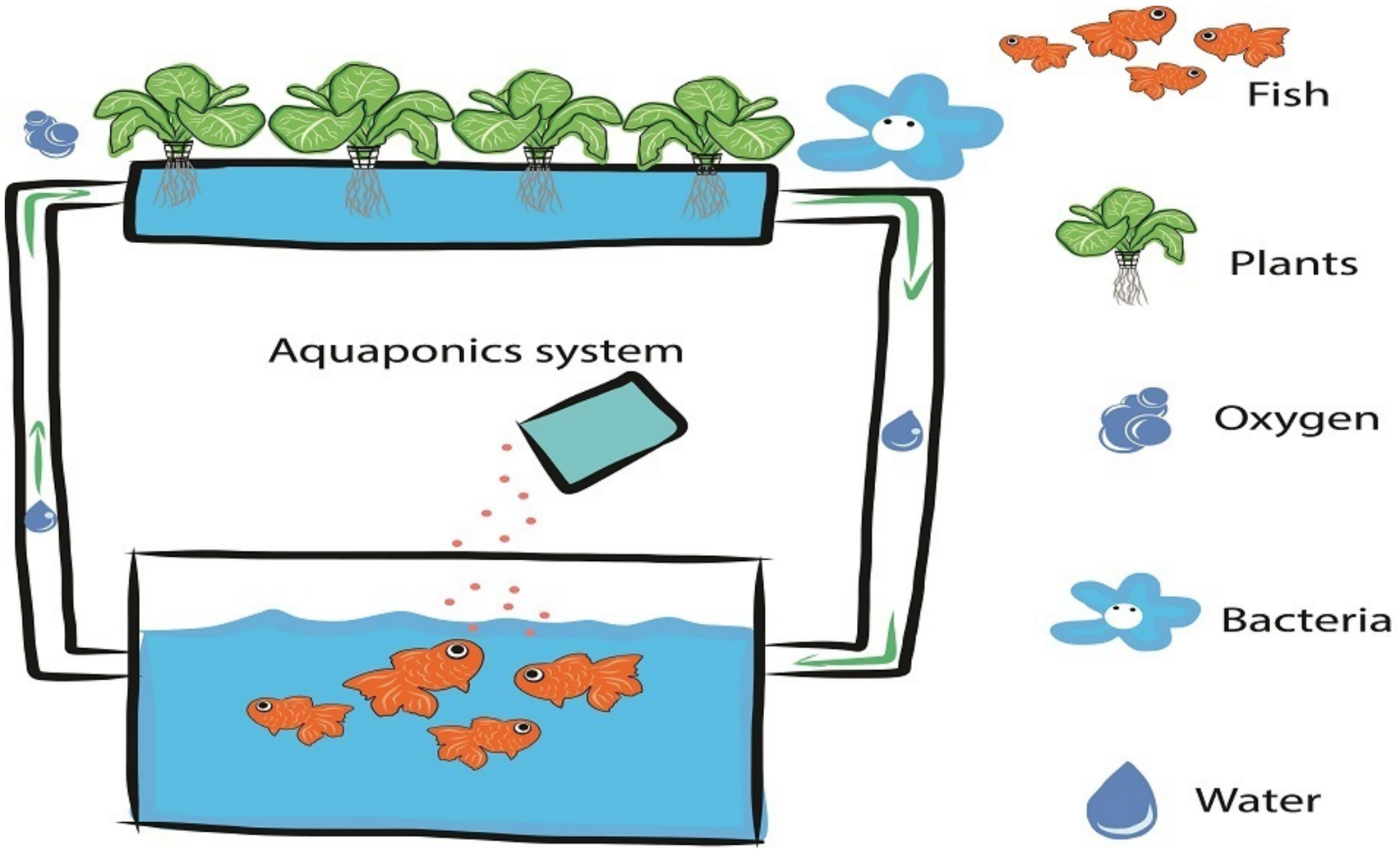


Image from: Orginhydroponics

Case Study: Philippines

Image from: Urban Greens

- According to the Food and Agriculture Organization (FAO), the Philippines has a very vulnerable agricultural system
  - Due to climate change impacts
- The Philippines enacted the Urban Agriculture and Vertical Farming Act of 2019 to encourage vertical farming
- Urban Greens is a company that has shown success in vertical farming in the Philippines
  - They use 90% less water than conventional farming

Community Gardens

What Are Community Gardens?

Community gardens are shared spaces among multiple people to grow produce

Community Garden Benefits

1. Increases biodiversity in neighborhoods
2. Contributes to better air and soil quality
3. Educates public on dietary habits and fresh food intake
4. Allows easier access to fresh produce, epsecially in food deserts*

*next slide has definition

Food Deserts

Food deserts are urban regions where it is difficult to obtain healthy, fresh, and affordable food

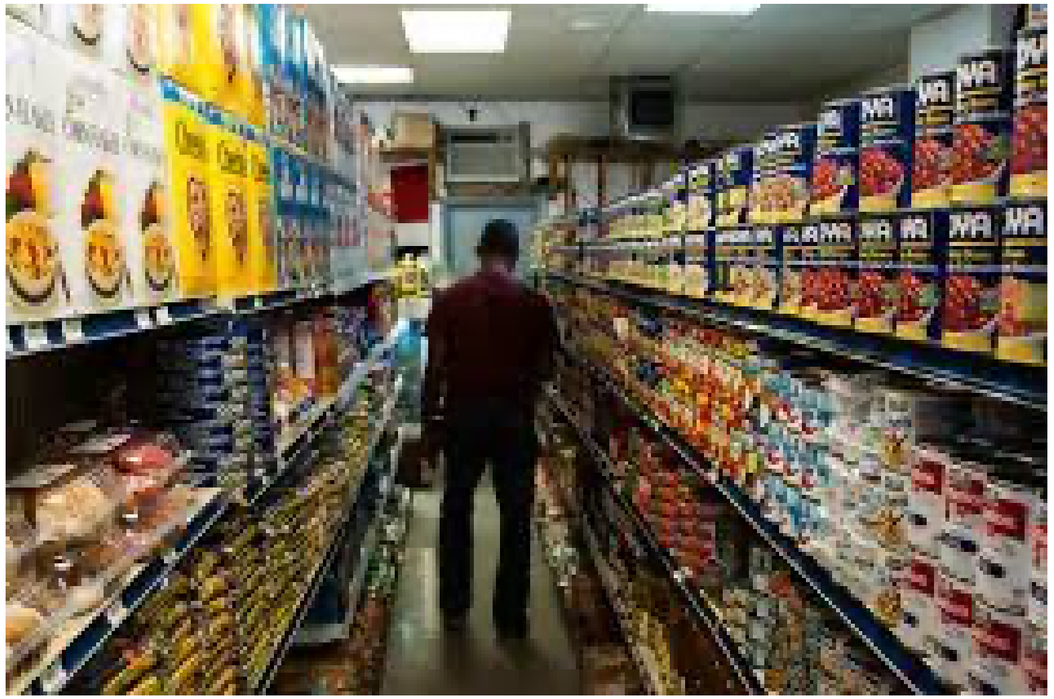
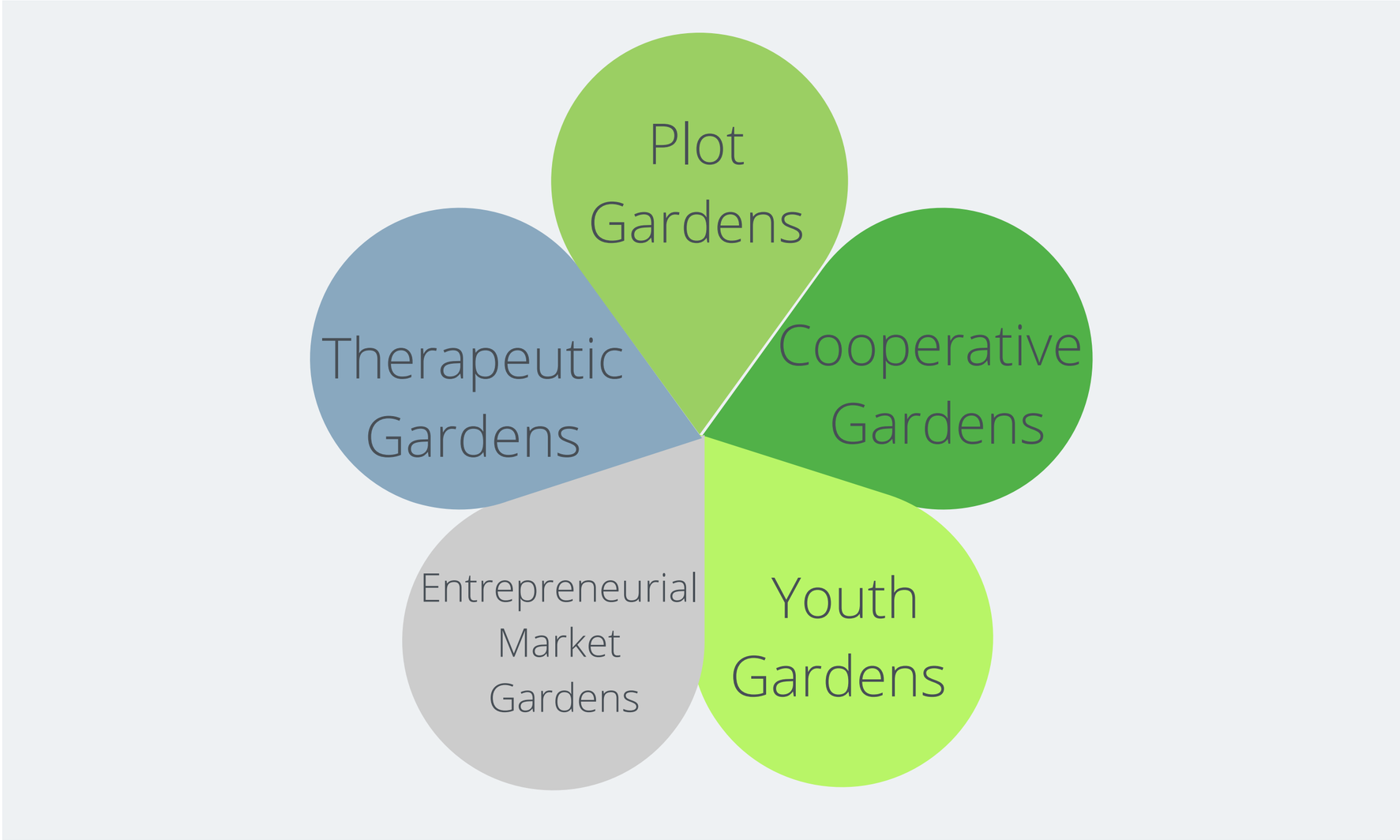


Image from: Wikipedia

Types of Community Gardens



Community Gardens

Plot Gardens

Image from: Golden West Archive

- Subdivide larger gardens into plots for different groups of people
- Plot gardens are flexible in terms of sizing, materials used, and crops grown
- Gives community members access to a garden area that they otherwise may not have

Community Gardens

Cooperative Gardens

- A single large garden is maintained by several members of a community
- Whatever is grown is shared equally and commonly donated in part or in full
- Very common among service organizations

Image from: News.unl.edu

Community Gardens

Youth Gardens

- Commonly used in schools to educate children
- Provides hands-on learning experience in outdoor spaces
- Usually on school properties

Community Gardens

Entrepreneurial Market Gardens

- Production of plants or crops for commercial gain that still uses gardening priciples
- Many entrepreneurial market gardens teach youth how to grow and sell their own food

Image from: Arlingtonva.us

Community Gardens

Therapeutic Gardens

Image from: Accesiblegardens.com

- Great way to improve physical and mental health and wellbeing of gardeners and visitors
- Usually made with wider and flatter pathways to accommodate as many people as possible
- Commonly found in hospitals, retirement communities, and assisted living facilities

Case Study: USA

Image from: Fleet Farming/

- Fleet Farming in Florida, USA
- They are a nonprofit established in 2014
- Their goal is to turn the traditional American lawn into productive land that could provide food for communities, especially in food deserts
- So far, they have:
  - converted 114,500 square feet of lawns into microfarms
  - created 17 school gardens
  - prevented 10,000 lbs of CO_2 from being emitted into the atmosphere from food transportation

Urban Livestock

What is Urban Livestock?

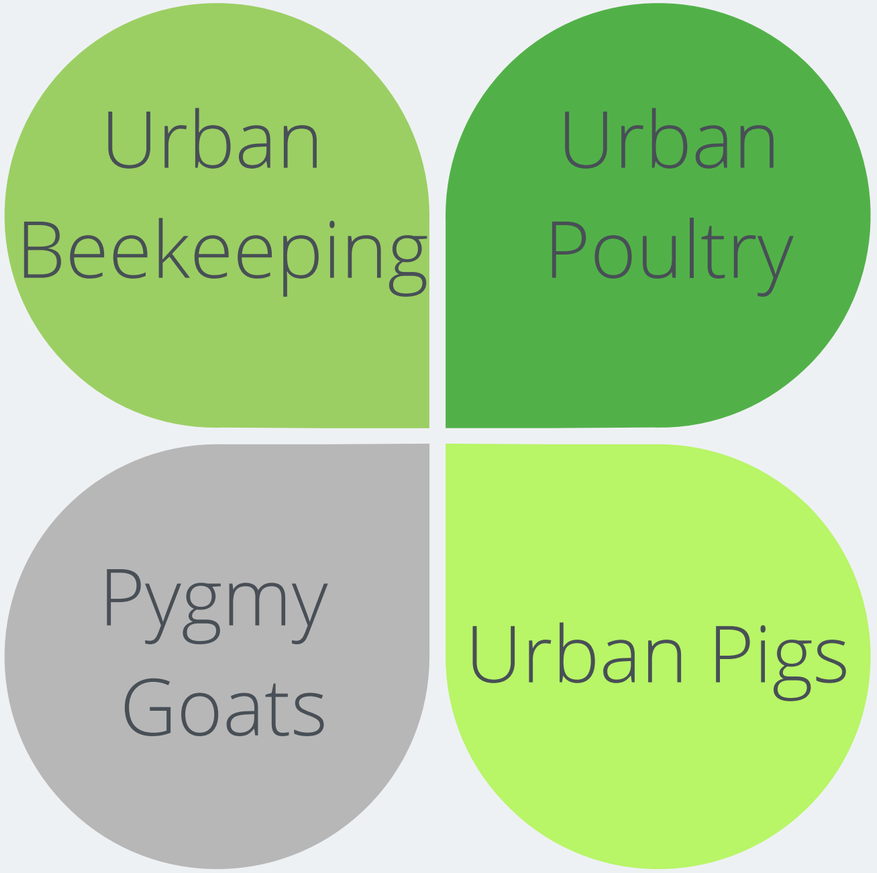
Image from: News and Sentenial

Urban Livestock is the keeping of nontraditional animals in residential districts

Urban Livestock Benefits

1. Locally sourced non-crop foods (e.g. eggs, honey, milk, etc)
2. Potential source of income
3. Close to the source composting
4. Many urban livestock animals eat food scraps, and their manure can be used as fertilizer

Types of Urban Livestock



Urban Livestock

Urban Beekeeping

- Keeping of beehives in cities, commonly on rooftops
- Urban-made honey is safe for consumption

Image from: Bloomberg

Urban Livestock

Urban Poultry

- Keeping flocks of chickens in residential and/or urban areas
- Chickens will eat many garden insects and pests
- They can provide fresh eggs for household units as well as goods to sell
- Chickens can also be great companions or family pets

Image from: Chickens And You

Urban Livestock

Pygmy Goats

Image from: Backyard Chicken Coops

- Some pygmy goats can produce up to 2 quarts of milk a day
- Goats also do a great job eating food scraps and acting as natrual composers
- Some goat's milk can be used to make goat milk soap!

Urban Livestock

Urban Pig Keeping

- Keeping urban pigs works great in conjuction with growing crops because they eat food scraps
- Pigs can also work as natural land tillers when rooting

Image from: Family Fun Canada

Case Study: France

Image from: Aveole

- Aveole is a Parisian company founded in 2013
- They install beehives in cities around the world
    - They operate over 3,100 beehives for over 200 companies
- Aveole has been putting beehives on the roofs of businesses and schools

Benefits of Urban Agriculture

There are three main reasons why urban agriculture is so beneficial :

Social Impacts

Economical Impacts

Environmental Impacts

Social Impacts

- Increases access to nutrition and food education for community members
- Increases fresh food availability
- Decreases food insecurity
- Connects community members with nature
- Surplus food is commonly donated
- Provides health benefits such as increasing fine motor skills

Economical Impacts

- Can increase property values
- Adding jobs to communites
- Provide income to individuals and families
- Converting vacant land may save cities money in municipality fees
- Inspire growth of other local food businesses such as farmer's markets and food pantries

Environmental Impacts

- Provides habitats for pollinators
- Reduce heat of cities
  - Urban agriculture can decrease city temperatures up to 4ºC
- Bringing production of food closer to people decreases food transportation emissions
  - A study found that if 8% of metropolitan Seoul is converted to urban agriculture, annual CO_2 emissions would decrease over 11 million Kg

Starting a Group Urban Agriculture Project

6 Steps:

1. Research
2. Plan
3. Prepare land
4. Plant crops/get livestock
5. Tend to plants/livestock
6. Harvest/collect

Step 1: Research

- Learn about what type of urban agriculture would best suit the needs you are trying to accommodate
  - i.e a group, a community, for profit
- Some starting points for research include:
  - Soil
  - Climate
  - Watering needs
  - Waste management
  - Local zoning/regulations
  - Fertilizer/feed
  - Budget/funding

Step 2: Plan

- Communicate with all group members to determine who will be involved with the project
- Set up a sign up sheet with all daily and weekly tasks to ensure all responsibilities will be taken are of

Step 3: Prepare Land

Image from: Matching Grants

- Plan where crops and/or livestock will be located
- Make sure to account for factors such as:
  - Local pests
  - Sun and shade exposure
  - Drainage
  - Proper soil and/or environment
  - Water access

Step 4: Plant Crops/Get Livestock

Image from: Matching Grants

- Aquire plants and/or livestock in the appropriate manner
- Note: Make sure to buy from trustworthy sources
- Tip: germinating seeds inside can sometimes be an easier environment for them to grow in and eliminates the risk of seeds being eaten by birds

Step 5: Tend to Plants/Livestock

- Take some time to make sure the area is clean, pest free, and safe for you and anything living there
- Give the plants/livestock appropriate care, from feeding to cleaning
- Tip: It helps to get friends and community members involved to have more helping hands!

Image from: South Side CLT

Step 6: Harvest/Collect

Image from: Jakpost

- Reap the rewards of all your hard work!
- If you are looking to sell your products, look into local farmer's markets and regulations about small scale production

Other Ways to Be Involved

No Green Thumb? No Problem!

- Allow other people to farm the land you have
  - Companies like Shared Earth allow gardeners and land owners to connect to provide land to those that want to farm
- Look to see if your community has urban farming and how you can participate or support them
- If possible, use your political voice to support urban agriculture legislation

Additional Resources

How To's

Keeping Urban Pigs

Backyard beekeeping

Starting a market garden

Small scale hydroponics

Rooftop Garden

Local Chickens as Climate Activists

Urban Agriculture Companies

Agricool (Paris, France)

BIGH Farms (Brussels, Belgium)

Aerofarms (New York, U.S.)

Farmizen (Bangalore, Hyderabad, and Surat, India)

Fresh Direct (Abuja, Nigeria)

Liv Up (Sao Paulo, Brazil)

Pasona Urban Ranch (Tokyo, Japan)

Take the Pledge

Organizational Pledge QR:

Individual Pledge QR:

1.Sign the Pledge

Use the QR code or go to
www.globalclimatepledge.com to sign the pledge

2.Share the Pledge

Share the pledge with members who can share the pledge with family members, friends, or other individuals

A pledge may be an individual commitment, but encouraging others to join you establishes a larger community of people who support each other and can make a bigger difference

GLOBAL CLIMATE Pledge

GLOBAL CLIMATE *Pledge*

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