



# Urban Agriculture

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

GLOBAL  
CLIMATE  
*Pledge*

Rotary  Climate Action  
Team Network

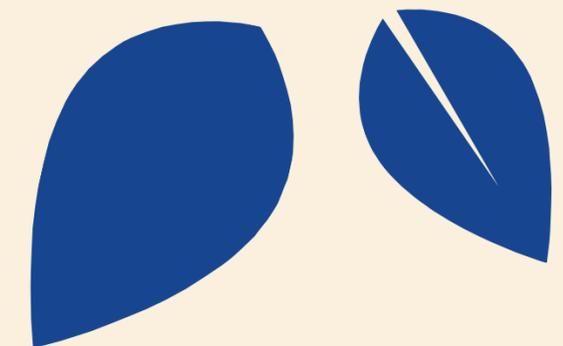
Rotary   
Rotary Club of  
Newport Beach



# Outline



1. What is Urban Agriculture?
  - a. Definition
  - b. History
2. Why Do We Need Urban Agriculture?
3. Types of Urban Agriculture
  - a. Rooftop Gardens
  - b. Vertical Farming
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4. Benefits of Urban Agriculture
  - a. Economic Impacts
  - b. Social Impacts
  - c. Environmental Impacts
5. Starting a Group Urban Agriculture Project
6. Additional Projects
7. Other Ways to be Involved
8. Additional Resources
9. Contact Us!





# 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:

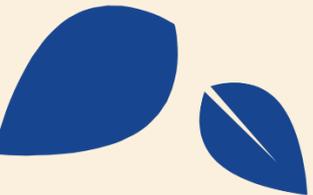
Mesopotamian farmers set plots aside in cities they were building to grow food within them



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:

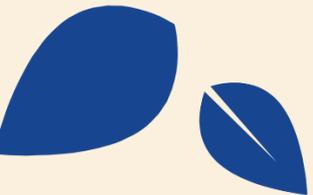
Victory gardens became popular in the U.S.  
post-war with over 20 million victory gardens  
by 1943

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<sub>2</sub> are released into the atmosphere due to food transportation...

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

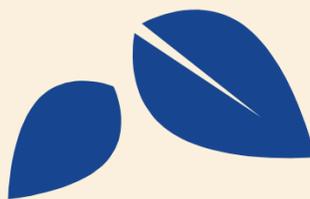




# Food Miles

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

It takes into account 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**





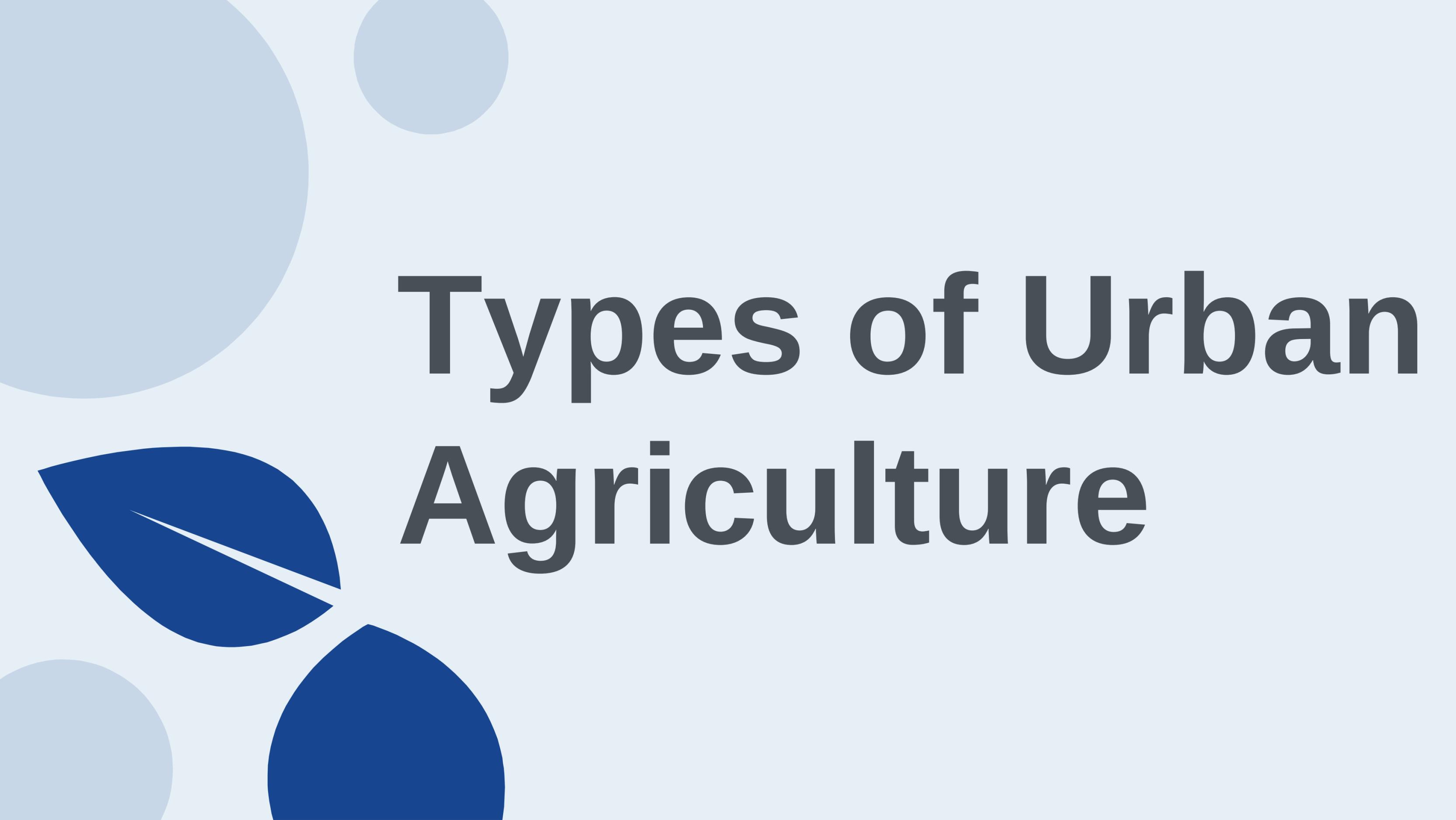
# Why Do We Need Urban Agriculture?

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**



**Vertical  
Farms**

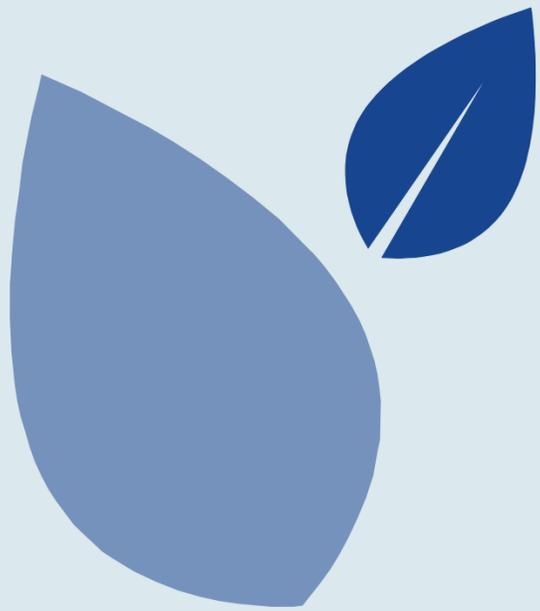


**Community  
Gardens**

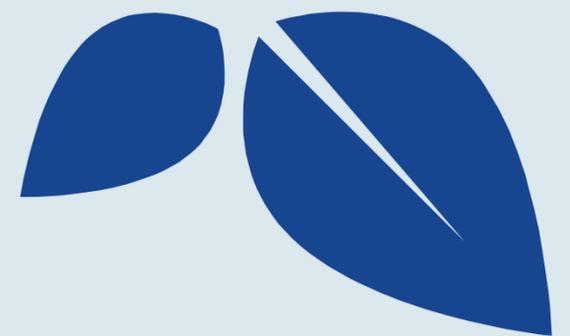


**Urban  
Livestock**



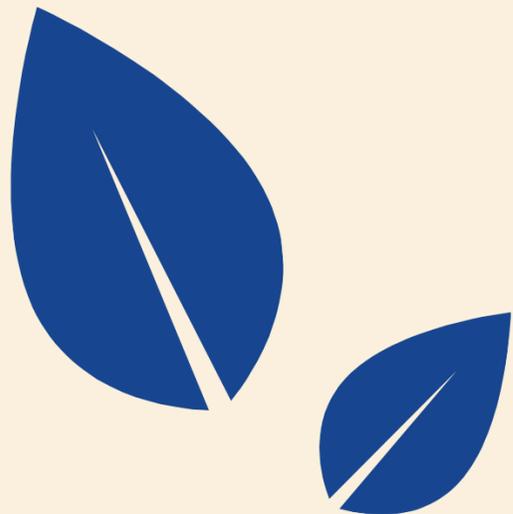


# Rooftop Gardens



# 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

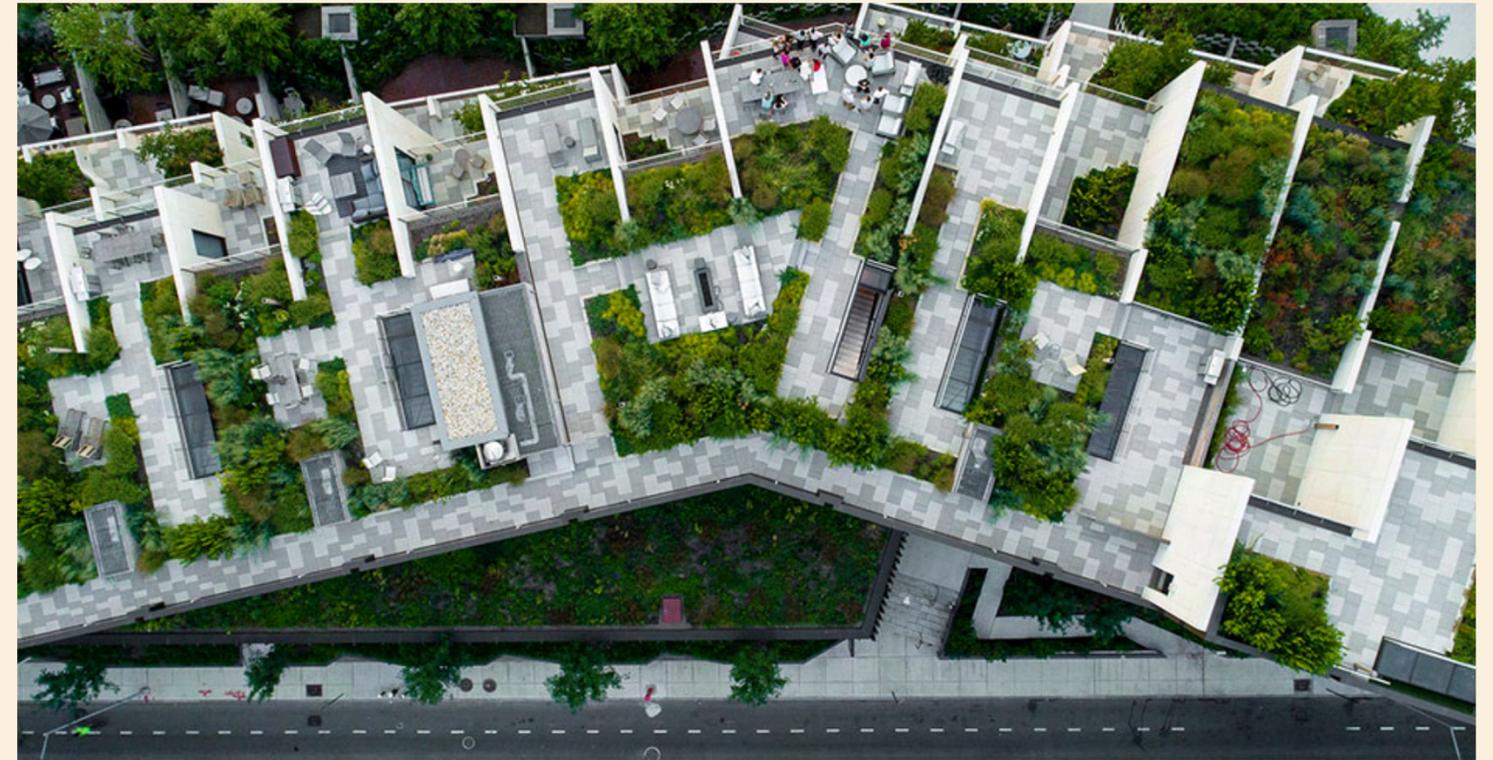


Image from: [Lawrence Park Garden Care](#)

\*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 12°C (53.6°F)!



# Types of Rooftop Gardens

**Extensive**

The diagram features a large orange rectangular background. Three light blue circles are arranged in a triangular pattern. The top circle is labeled 'Extensive'. The bottom-left circle is labeled 'Semi-Intensive' and the bottom-right circle is labeled 'Intensive'. A thin orange line connects the center of the 'Extensive' circle to the center of the 'Semi-Intensive' circle. There are decorative blue leaf shapes: one on the top-left corner and two on the bottom-right corner.

**Semi-  
Intensive**

**Intensive**

# 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



# Project Idea: Extensive Garden

- Rotaract Club of Amman West, Jordan
- This project worked with youth to preserve the country's natural ecology
- Planting cultivated vegetables beautifies the space as well as provides vegetables
- Learn more about the Rotaract Club of Amman West's project [HERE](#)



Image from: [Rotaract Club of Amman West](#)



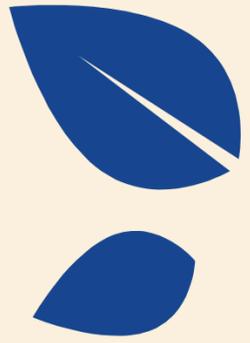
Image from: [Rotaract Club of Amman West](#)

# 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

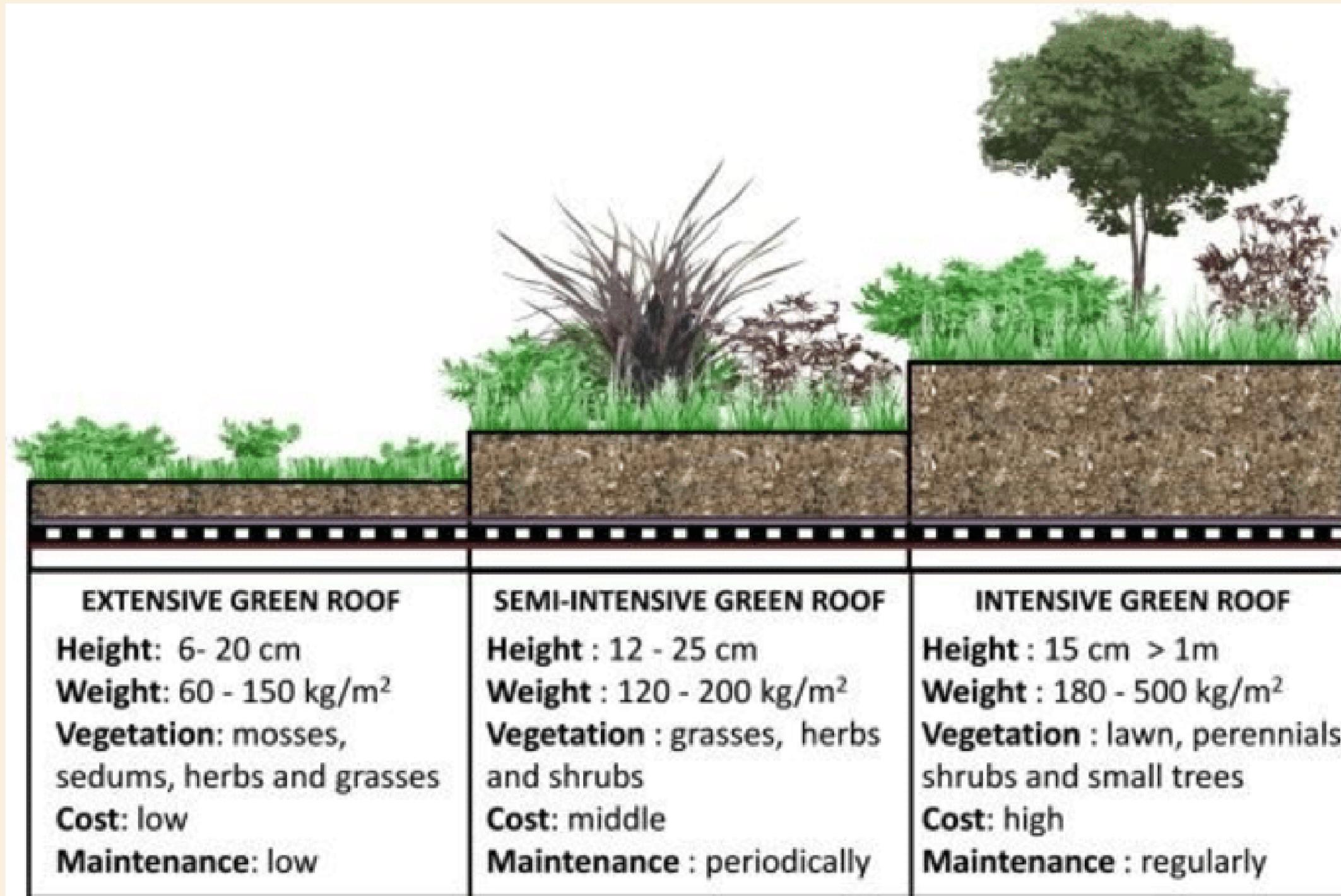


Image from: [Merve Tuna, Researchgate](#)

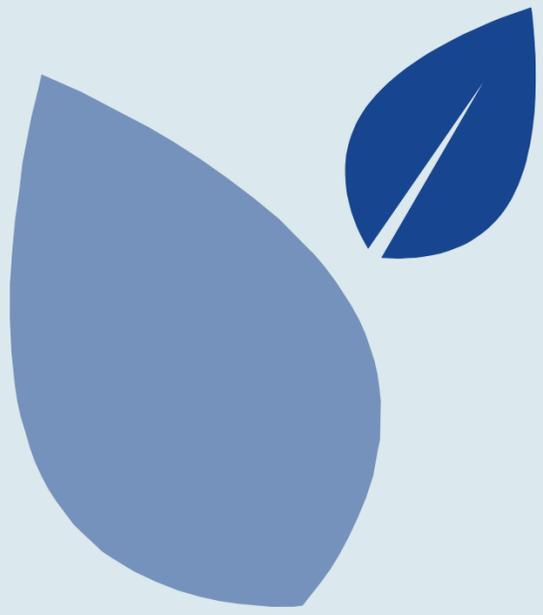


# Case Study: Canada

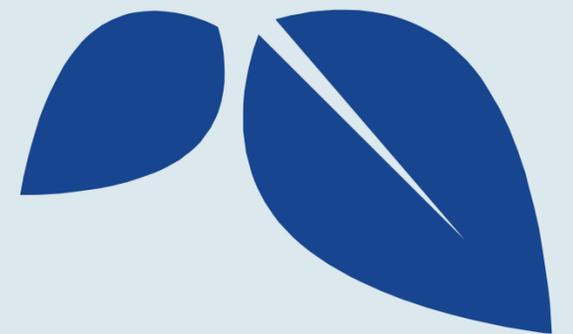


Image from: [National Research Council of Canada](#)

- 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. Little to no weeds



# Types of Vertical Farming

**Hydroponics**

**Aeroponics**

**Aquaponics**

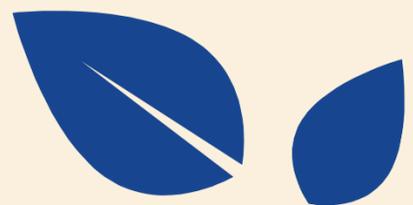


# Vertical Farming

## 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



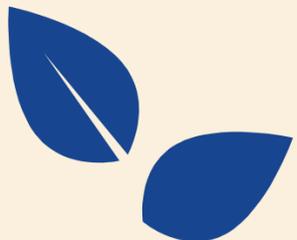
# Vertical Farming

## 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







# Project Idea: Aquaponics

- **Rotary Club of Solana Beach**
- ECOLIFE Aquaponics Education Program uses hands on learning techniques to teach K-12 students the benefits of aquaponic systems and how they can help farmers and the planet
- They are designing a Modular Aquaponics Response Kit (M.A.R.K.) that can be funded to give to communities in need
- Check out more of ECOLIFE's work [HERE](#)



Image from: [ECOLIFE](#)

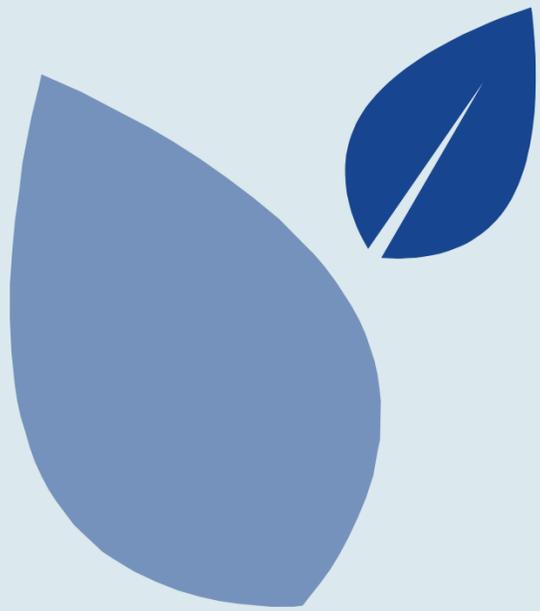


# Case Study: Philippines

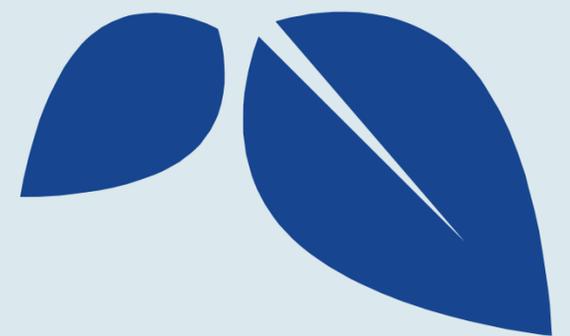
- According to the Food and Agriculture Organization (FAO), the Philippines has a very vulnerable agricultural system
  - Due to climate change impacts
- The Philippines enacted the Urban Agriculture and Vertical Farming Act of 2019 to encourage vertical farming
- Urban Greens is a company that has shown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



Image from: [Urban Greens](#)



# Community Gardens



# What Are Community Gardens?



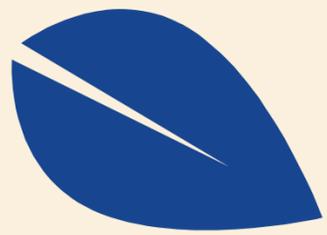
Community gardens are shared spaces among multiple people to grow produce

# Community Garden Benefits

1. Increases biodiversity in neighborhoods
2. Contributes to better air and soil quality
3. Can increase property value
4. Educates public on dietary habits and fresh food intake
5. Allows easier access to fresh produce, especially in food deserts\*

\*next slide has definition





# Food Deserts

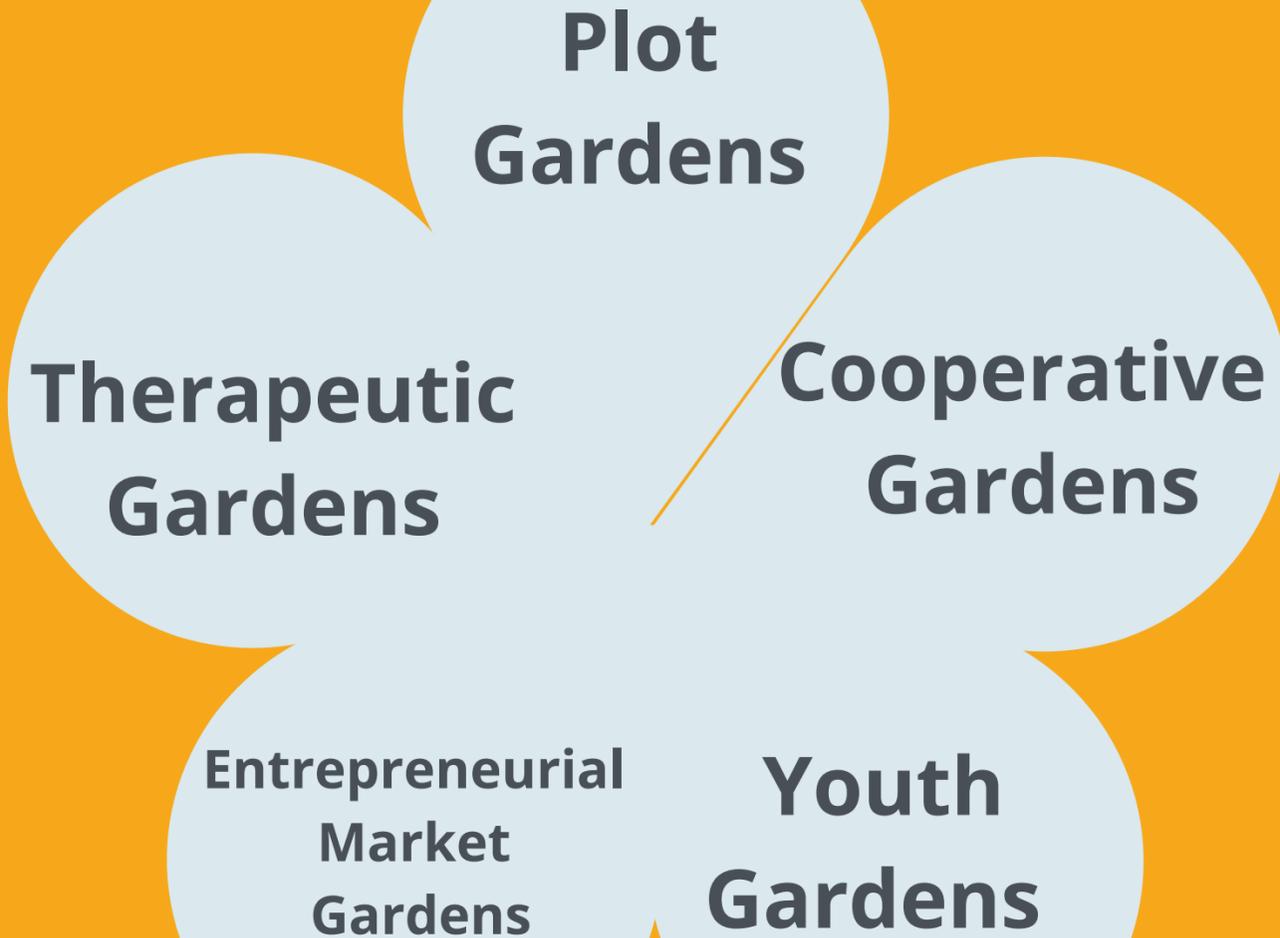
Food deserts are urban regions where it is difficult to obtain healthy, fresh, and affordable food



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





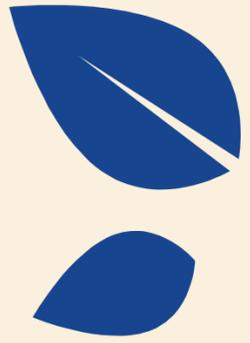
# Project Idea: Plot Garden

- **Rotary Club of Iowa Park, Texas, USA**
- This project took a vacant plot and turned it into sets of both raised garden beds and in ground beds that can be used by either individuals, groups of people, or other organizations
- The garden provides fresh produce, horticultural education, community involvement, and beautification of the community
- The Delbert Todd Memorial garden now has 11 garden beds as well as ground beds



Image from: [Iowa Park Rotary Club](#)





# 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](https://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





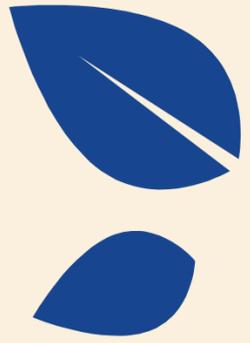
# Project Idea: Youth Garden

- **Rotary Club of Montgomery, Illinois, USA**
- The rotary club partnered with Krug Elementary School to build a garden (a Title 1 School)
- This garden would help teach children the skills of gardening
- The school is also partnering with a nearby church to provide fresh produce to its food pantry



Image from: [Montgomery Rotary Club](#)





# Community Gardens

## Entrepreneurial Market Gardens

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



Image from: [Arlingtonva.us](http://Arlingtonva.us)

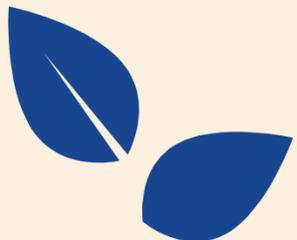
# Community Gardens

## Therapeutic Gardens



Image from: [Accessiblegardens.com](https://www.accessiblegardens.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

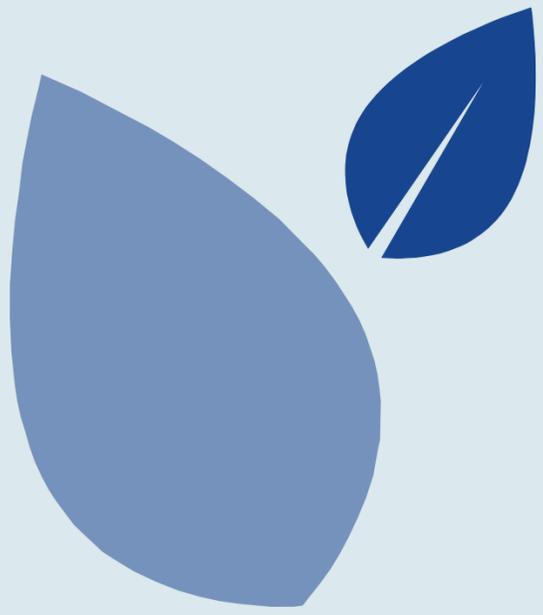


# Case Study: USA

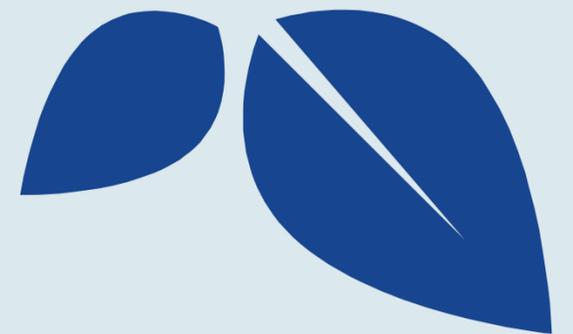


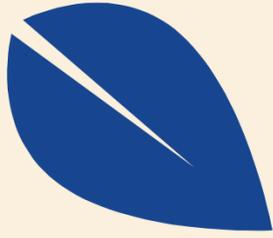
Image from: [Fleet Farming/](#)

- 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<sub>2</sub> 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



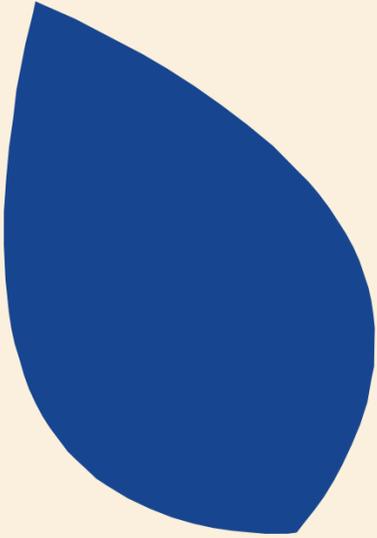


# Urban Livestock Benefits

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

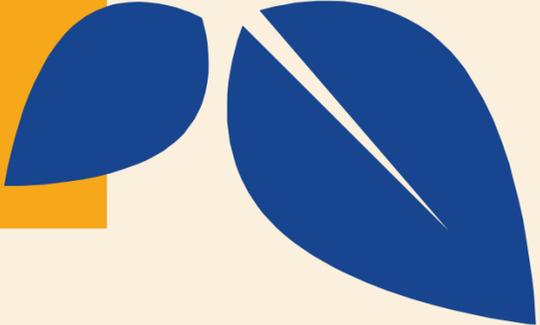


**Urban  
Beekeeping**

**Urban  
Poultry**

**Pygmy  
Goats**

**Urban Pigs**





# 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



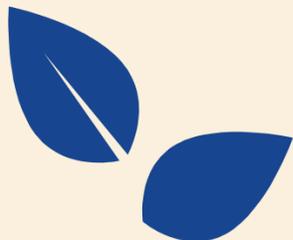
Image from: [Chickens And You](#)

# Project Idea: Backyard Chicken Project



Image from: [The Backyard Chicken Project](#)

- Based in New York, USA
- The Backyard Chicken Project provides great resources for how to take care of chickens in an urban setting
- They have a Free the Chickens Project to help put an end to harmful battery cages, which typically cause hens to live their whole lives in a space smaller than a sheet of paper
- Check out their website [HERE](#) to see how you can support them



# Urban Livestock

## Pygmy Goats



Image from: [Backyard Chicken Coops](https://www.backyardchickencoops.com.au)

- 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 natural composers
- Some goat's milk can be used to make goat milk soap!





# Urban Livestock

## Urban Pig Keeping

- Keeping urban pigs works great in conjunction 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

- 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



Image from: Aveole



# **Benefits of Urban Agriculture**

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

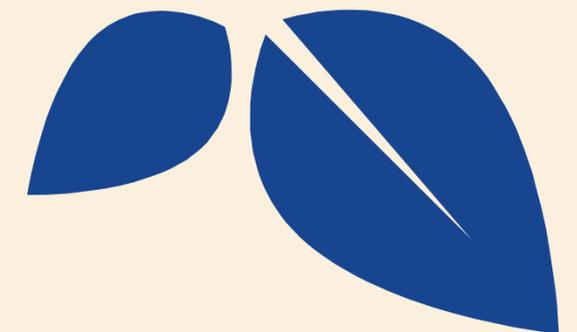
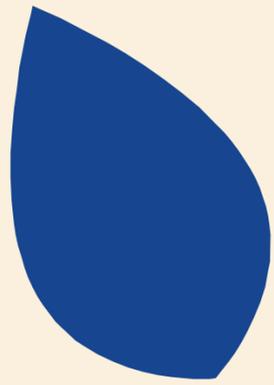
**Social  
Impacts**

**Economical  
Impacts**

**Environmental  
Impacts**

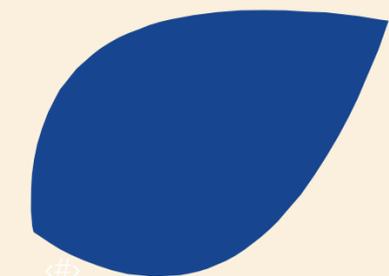
# Social Impacts

- 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 communities
- 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 4°C
- 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 CO2 emissions would decrease over 11 million Kg





# **Starting a Group Urban Agriculture Project**

# 6 Steps:

1. Research

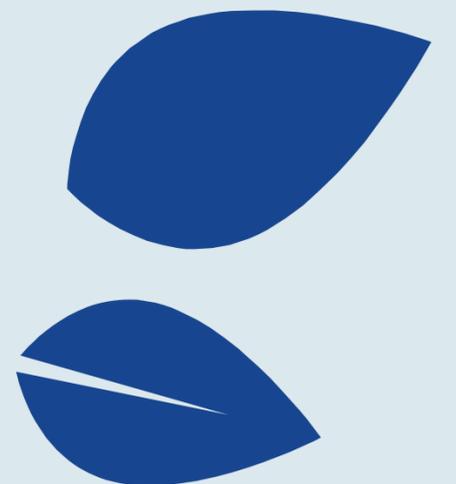
2. Plan

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 care of

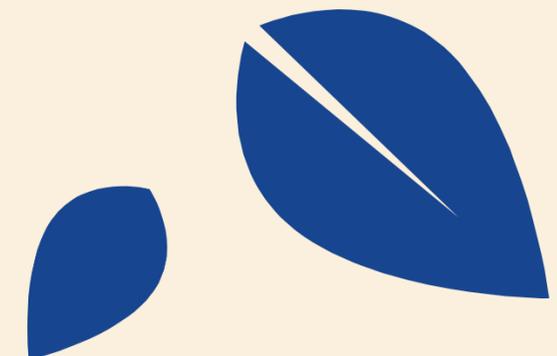


# Step 3: Prepare Land

- 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



Image from: [Matching Grants](#)



# Step 4: Plant Crops/Get Livestock



Image from: [Matching Grants](#)

- Acquire 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



# **Additional Project Ideas**

# Rotary Food Plant Solutions



Image from: [Food Plant Solutions](#)

- Food Plant Solutions (FPS) works with partners across the globe to work towards ending malnutrition
- Some of their main goals are to:
  - Establish local gardens
  - Empower women
  - Provide healthy and nutritious foods
- To get involved go to their [website](#) or email them at [info@footplantsolutions.org](mailto:info@footplantsolutions.org)

# Rotary Fellowship of Urban Gardening

- The Rotary Fellowship of Urban Gardening aims to improve cities' food and environment
- This is largely achieved through using and creating green spaces to grow food
- Visit their Facebook page [HERE](#)



Images from: [Rotary Fellowship of Urban Gardening](#)





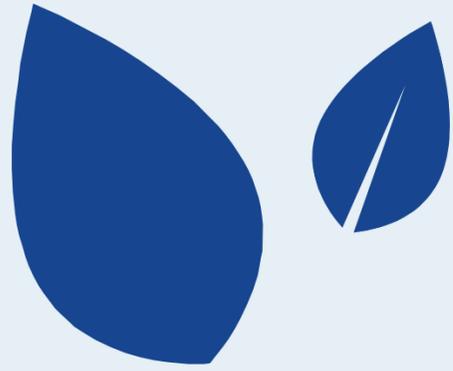
# Other Ways to Be Involved

# 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)



# GLOBAL CLIMATE *Pledge*

## Rotary Action Climate Network

Click below for links!

### Step 1

Sign the Pledge

Join the 370+ Rotary clubs from 83 countries around the world and sign the Global Climate Pledge today.

### Step 2

Create a Climate Action Team

We invite you to become part of the Rotary Climate Action Team (RCAT) Network by creating an Action Team.

### Step 3

Take Action

Support worldwide Rotary climate action by uploading a 70 second video your club's project to the RCAT Network website.

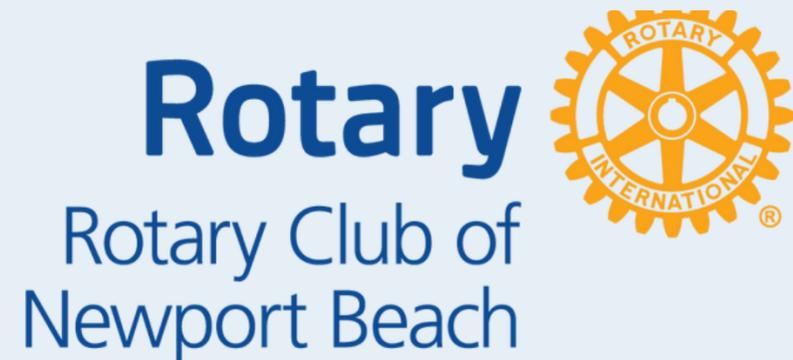
# GLOBAL CLIMATE *Pledge*

Rotary Action Climate Network



Use the QR code or go to  
<https://www.globalclimatepledge.com/peace-and-rotary/>  
to learn more about getting involved with Global Climate  
Pledge resources, partnerships, and more!

# GLOBAL CLIMATE *Pledge*



**ROTARY GLOBAL SERVICE CLUB**  
Embracing the Future  
While Respecting the Past  
[www.rotaryglobalserviceclub.org](http://www.rotaryglobalserviceclub.org)



Climate Action  
Team Network



# GLOBAL CLIMATE *Pledge*

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Beach, CA 92075

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<https://usgreenchamber.com/>

<https://www.globalclimatepledge.com/>



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