

UF/IFAS Extension

The Journey to Sustainability Begins with Education



URBAN AGRICULTURE

A Participatory, Primer Course Part 1a: Introduction



2017-18 Urban Ag Certificate Course

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Outline of Today's Class

- Course Introduction
 - Objectives
 - Syllabus
 - Format
 - Certificate
- Urban Agriculture
 - Definitions
 - Concepts
 - Examples
- Introduction to Science of Agroecology
- Production Systems
 - Traditional
 - Trends
 - Crops

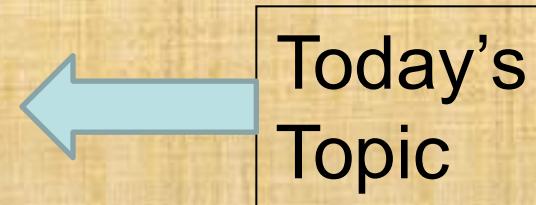
My Teaching Approach Based on Lessons Learned in National Small Farm Training Programs

- Introduce the background of agriculture and sustainability
- Ask first the question “Is starting an agricultural business right for you”
- Provide guidance to help focus planning, learning and resource acquisition
- Offer information about local events and contacts for networking
- Recognize that many students will choose not to farm commercially

Urban Agriculture Certificate Course

Class Topics Sequence

- #1: Introduction and Production Systems
- #2: Business and Marketing Plans
- #3: Regulations and Direct Markets
- #4: Equipment and Tools; Post Harvest Handling
- #5: Financial Resources & Management



Urban Agriculture Certificate Course

Workshop Topics Sequence

- #1: Container and Hydroponic Growing Systems
- #2: Frost Protection and IPM
- #3: Farmscaping w/ Cut Flowers
- #4: Farm Food Safety Plan
- #5 Composting and Renewable Energy Technologies

Course Objectives

- Introduce a whole farm approach, such as agroecology and holistic management, to urban agriculture
- Explore sustainable growing methods for higher yield production per unit area
- Develop business & entrepreneurial skills
- Begin a sustainable business plan
- Find resources and become part of the greater Sarasota County area's emerging local foods and urban Ag movement

Additional Course Objectives

- Conduct a paperless course that utilizes online, free resources as course materials (see syllabus for websites) and my loan library of books.
- Introduce UF/IFAS resources:
 - Extension agents in Sarasota County office
 - the UF/IFAS/FAMU Small Farms & Alternative Enterprise Program – see <http://smallfarms.ifas.ufl.edu/>
 - small farmer networks - see http://smallfarms.ifas.ufl.edu/current_issues/SFWG.shtml
 - training workshops/conferences – see http://smallfarms.ifas.ufl.edu/events_calendar.html



Additional Course Objectives

- Provide access to these subscription online resources:
 - a) “Growing for Market” and its archives - see

<http://www.growingformarket.com/>

- b) “ATTRA” and its archives – see

<https://attra.ncat.org/>

NEWS & IDEAS FOR LOCAL FOOD PRODUCERS

growing
FOR MARKET

Volume 21 / Number 2
February 2012

How to choose tomato varieties

By Andrew Mefford

Tomatoes are the most profitable crop on many market farms — if you choose the right varieties. But with thousands of varieties on the market and hundreds of new ones introduced every year, how do you know which ones to grow?

As the owner of a small market farm in Maine and the trial technician for tomatoes at Johnny's Selected Seeds research farm, I have a lot of experience with growing tomatoes. I want to share my perspective on how to choose the best varieties for your location and markets.

One of the best ways to figure out what varieties to grow on your farm is to look around at the farmers and gardeners in your area and see what they like. Asking what varieties they are not growing and why will help you learn from their mistakes and not waste production space on something that doesn't work in your area. It's always worthwhile to keep a little bit of field space devoted to on-farm trialing of new varieties to see if they work before going into production.

Most years at Johnny's we trial roughly 300 varieties of tomatoes in the field, 50 in the hoophouse, and 10 to 15 different rootstocks for grafted tomatoes. It is a daunting task to evaluate 400 varieties every year and figure out which ones make sense for the catalog.

The most important criteria we look at when evaluating tomatoes is flavor. It may sound redundant to say that we consider flavor with something edible, but if you've ever eaten a grocery store tomato, you know that much vegetable breeding is devoted to qualities besides flavor. We also look closely at yield, appearance, disease resistance, cracking, blemishes, and all the other factors that affect tomato selection. Being a company that sells to market growers, one of the most important things for direct marketing tomatoes is good flavor since your customer will associate the flavor of your produce with you.

Before talking about individual variety selection, let's talk tomato types. You probably already know that tomatoes are categorized by two broad plant habits: Indeterminates, which grow nearly indefinitely, adding leaves, shoots, and flowers until frost or something else kills them; and determinates, which grow more like a bush and have a predetermined size.

One reason to grow indeterminates is flavor. Generally speaking, indeterminate tomatoes have better flavor than determinates. Indeterminate tomatoes have three or more leaves between fruit clusters, whereas determinates have two or fewer leaves per fruit cluster. So indeterminates have a higher ratio of leaf area to fruit. If you think of foliage as solar panels

continued on page 4



URBAN AGRICULTURE
is RESHAPING our CITIES

CLICK for ALL NEW ATTRA RESOURCES



Introductory Activity (10 min.)

❖ World Café Format

- Collaborative
- Respectful

❖ Answer the following:

- What is urban agriculture?
- What is a food system?

- ❖ Form groups of 4 persons. Appoint 1 spokesperson to take notes and report out to the class on your group's responses, using bulleted descriptors.



What is Urban Agriculture?

- ❖ Hybrid Urban Ag and Community Garden Enterprise Examples:



Apartment residence w/ balcony gardens & community garden



HOA Community Garden

- ❖ Meet our Community/School Garden Program Coordinator, Stacy Spriggs

What Is Urban Agriculture?



- ❖ Watch the short video “Urban Farming” at <http://www.pbs.org/food/features/lexicon-of-sustainability-urban-farming/>¹²

A Brief History of Urban Farming

- Urban farms have been in existence since the advent of the city
- Cities perhaps wouldn't have existed without urban farms
- Urban farms throughout the world contributed substantially to cities food access – especially perishable fruits and vegetables
- Improvements in transportation changed the relationship of farms to cities

Urban Farms in the Modern World

- As railroads and refrigeration became more popular, farms moved away from cities to better cheaper farm land
- Coupled with these technologies, 'Suburbanization' drove farms far from cities
- By the mid-20th century, there were virtually no more urban farms.



Fairview Gardens

the 'last' farm in Santa Barbara

Urban Farms address Social Issues

- Urban Farms in America have had multiple growth periods and retractions.
- 1890's urban farming exploded out of Detroit in response to a recession – driven by the Mayor as a Social Project
- Other cities adopted similar projects but all were abandoned after recession

Victory Gardens

- During both WW1 and WWII, government pushed the public towards urban farming with great success – to support the war effort
- After the wars, however, the gardens were largely abandoned.
- In the 1970's, urban farming was again looked to as the 'cure' for urban blight.



Contemporary Urban Farms

- Today Urban Farms are being embraced as the 'cure' for numerous social issues, such as childhood obesity and urban blight
- All major cities have urban farm projects, ranging widely in size and scope
- In Europe and Asia, however, urban farming has been integrated into the social fabric – not used as a response to crisis.
- In developing countries, urban farming is primarily driven by a need for 'food security'

The Future of Urban Farms

- Will the current interest in urban farming sustain itself after the current public health 'issues' are resolved?
- The current interest in Local Food Systems perhaps points at a longer term shift in the way America thinks about urban farming?



What is Urban Agriculture?

- Food production, processing, marketing and distribution within and around cities contributing to the community food system
- Agriculture is typically considered a rural activity but today up to 15% of our food originates from within metropolitan areas.
- Urban Agriculture types are highly variable in technique, form and purpose
- Contributions of urban agriculture include providing healthy, local food that contributes to food security and helps to maintain additional green space.

What is Urban Agriculture?

- Many people have definitions for the terms urban and rural, but seldom are they in agreement.
- The use of different definitions by Federal agencies reflects the multidimensional qualities of population areas.



Their differences are based on the purpose of the application, whether that application is for research, policy analysis, or program implementation

What is Urban Agriculture?

➤ Definition Examples.

➤ Urban = within city limits

- ❖ (U.S. Census Bureau) Urbanized Areas (UAs) are residential, commercial, and other non-residential land use areas with 50,000 or more people; Urban Clusters (UCs) are areas of at least 2,500 and less than 50,000 people.
- ❖ (2014 Farm Bill & USDA) a city or town that has a population of greater than 35,000 inhabitants and 'any urbanized area contiguous & adjacent to a city or town

➤ Peri-urban = urban outskirts (a.k.a., suburbia)

➤ Rural = non-urban area

- ❖ (U.S. Census Bureau) all population, housing, and territory not included within an urban area
- ❖ (2014 Farm Bill & USDA) areas with population up to 35,000 and rural in character

What Is Urban Agriculture?

Urban Farms: Different things to different people

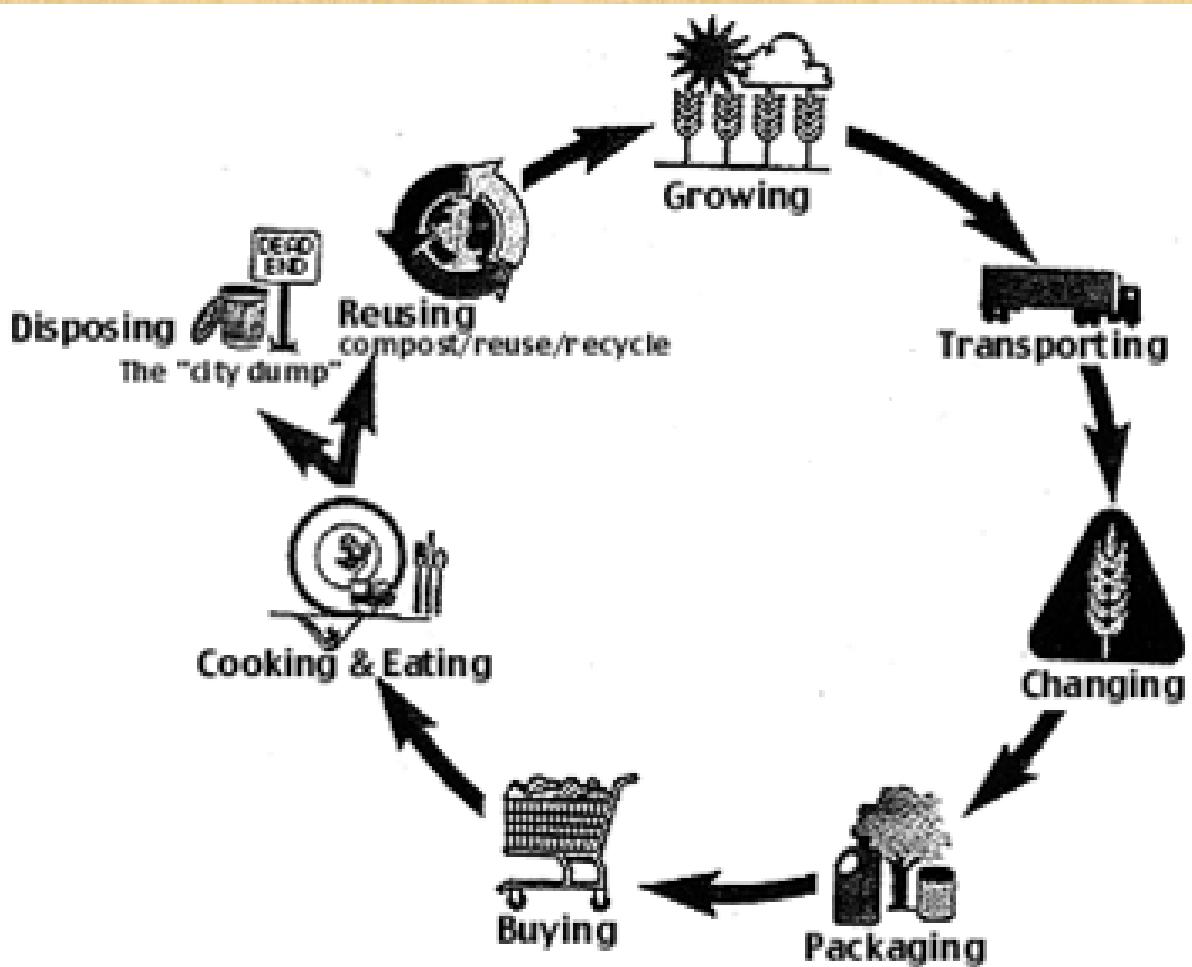
- Home-scale food production: community gardens, backyard plots, and school/educational youth gardens.
- Specialized techniques and infrastructure: rooftop gardens, aquaponics, hydroponics, and vertical farming systems.
- Market Farms: in-ground production and selling those products for profit.

What is Urban Agriculture?

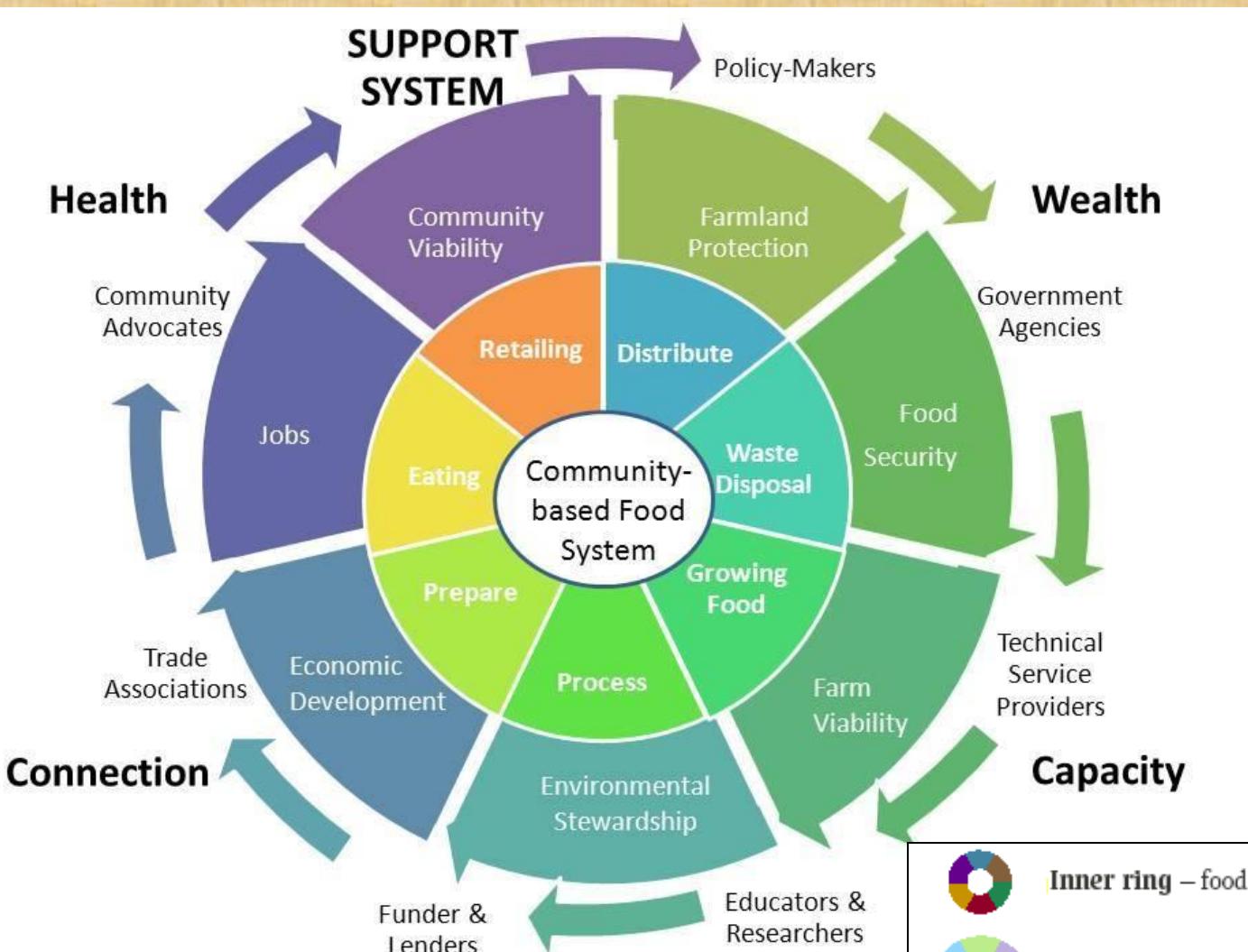
- Urban agriculture is integrated into the urban economic & ecological system, and is embedded in - & interacting with- the urban ecosystem such as:
 - the use of urban residents as labourers
 - use of typical urban resources (like organic waste as compost and urban wastewater for irrigation)
 - direct links with urban consumers
 - direct impacts on urban ecology (positive and negative)
 - being part of the urban food system
 - competing for land with other urban functions
 - being influenced by urban policies and plans, etc.
 - not a relict of the past that will fade away nor brought to the city by rural immigrants that will loose their rural habits

What is a Food Systems (a.k.a., Foodshed)?

- ❖ **The Who, What, Where, When, Why and How of Our Food Getting From Farm to Our Plate**



What Is A Community Foodshed?



Inner ring – food system components



Outer ring – community-based food system outcomes

<http://www.choicesmagazine.org/choices-magazine/theme-articles/developing-local-food-systems-in-the-south/local-food-systems-in-the-south-a-call-for-a-collaborative-approach-to-assessment>

What is Urban Agriculture?

- The United States Department of Agriculture's (USDA) Census of Agriculture is considered a consistent measure of agriculture data in the United States
- However, USDA's broad definition of a farm, in which urban and rural farms are not differentiated by geographical size or location, but instead all fall under the definition of a farm as producing and selling at least \$1,000 worth of agricultural products during the year the census is conducted.
- Results of a special 2013 Census of Urban Agriculture will be reported in upcoming slides

2013 National Survey of Urban Ag Commercial Farms Profile

- ✓ Based on 315 respondents from across the country that self identified their farm as “urban or peri-urban (i.e., suburban area, or outside a suburban area of a city).

Table 2: General Characteristics of Urban Farms, 2013 National Survey of Urban Farms

Aspect	Mean (St Dev)
Number of production sites ¹	3.1 (2.2)
Percent production in urban core	78.1 (39.5)
Acres in production	9.0 (3.5)
Years farm has been in operation	13.0 (13.6)
Number of primary farmers and managers	2.0 (2.8)
Number of farm workers	2.2 (6.6)
Number of apprentices or interns	3.3 (14.75)

¹For those operations reporting multiple sites

2013 National Survey of Urban Ag Commercial Farms Profile

Table 3: Land Tenure Arrangements for Urban Farms, 2013 National Survey of Urban Farms

Tenure Arrangement	N	Percent
Own land that was purchased	141	49.0
Long-term lease, even if you don't pay rent (multiple years)	79	27.5
Short term lease, year-to-year or shorter, even if you don't pay rent	65	22.6
Borrow, informal agreement	61	21.2
Own land that was inherited	14	4.9

Note: Can add to more than 100% because farms may have more than one arrangement

2013 National Survey of Urban Ag Commercial Farms Profile

Table 4: Structure of Urban Farms, 2013 National Survey of Urban Farms

Type of Structure	N	Percent
Non-profit	95	32.1
Sole proprietorship	93	31.4
Limited liability corporation	66	22.3
Corporation	16	5.4
Cooperative/employee owned	11	3.7
Other type of partnerships	9	3.0
Family owned	6	2.0

2013 National Survey of Urban Ag Commercial Farms Profile

*Table 9: Marketing Outlets Used By Urban Farms, 2013
National Survey of Urban Farms*

Marketing Outlet	% Gross Sales Mean (St. Dev)
Farmers market or farm stand	40.7 (38.3)
CSA	22.4 (32.7)
Restaurants	12.0 (22.0)
Other outlets	10.7 (27.1)
Direct-to-retail (e.g., grocery stores, food cooperatives)	4.9 (15.1)
Other institutions (such as schools)	2.6 (13.3)
Wholesale outlets	2.5 (11.8)
Distributed through cooperative of farms/other farmers	2.3 (11.2)
Regional or local food hub	0.9 (6.1)
N=2477	

2013 National Survey of Urban Ag Commercial Farms Profile

Table 8: Gross Sales of Urban Farms, 2013 National Survey of Urban Farms

Total Gross Sales Categories (from all products)	Frequency	Percent
Less than \$10,000	119	49.0
\$10,000-\$24,999	54	22.2
\$50,000-\$99,999	17	7.0
\$25,000-\$49,999	25	10.3
\$100,000-249,999	18	7.4
\$250,000-\$499,999	5	2.1
\$500,000-\$999,999	1	0.4
\$1 million or more	4	1.6

N=243

Meet a ‘Peri-Urban’ Farmer in Sarasota County

- **Nature’s Partner**

- Peter Burkard

- Contact info: 941/351-8297

- Production Location:

- 7614 Linden Lane, Sarasota, FL

- Less than 1 acre farm size

- Retail Location:

- Downtown Sarasota Farmers’Market

- Food Products: Local Honey,

- Seasonal Produce & Fruit (e.g.,

- Greens, Lemons, Avocados, Peppers)

- Flowers



How Does Peter's Urban Farm Grow ?



How Does Peter's Urban Farm Grow ?



How Does Peter's Urban Farm Grow ?



How Does Peter's Urban Farm Grow ?



How Does Peter's Urban Farm Grow ?



Meet a ‘Peri-Urban’ Farmer in Sarasota County

- **Jessica's Organic Farm**

- Bill & Pam Pischer
- Contact info: (941) 358-3895
- Production/Retail Location:
4180 47th St, Sarasota, FL 34235

- 5 acres farm size

- URL: <http://jessicasorganicfarm.com/> (Watch video)

- **Food Products:** Salad greens; root crops; herbs; vegetables; supplemental organic foods



Find More Urban Ag in Florida and Across the Country

- Growing Cities Website Database – see
<http://www.growingcitiesmovie.com/>

GROWING CITIES

The Film

Screenings

News

Learn

Shop

Contact

 Watch the Trailer

Grow Where You Are

WHERE ARE YOU? Pick a city

WHAT DO YOU WANT TO DO? Everything

RESULTS:

1,000 New Gardens Missoula, MT >

1000 New Gardens Bozeman Bozeman, MT >

596 Acres

ADD YOUR PROJECT

Powered by Leaflet — Map data © OpenStreetMap contributors, Imagery © Mapbox



MAP BY 596 ACRES

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Why Urban Agriculture?

- Over half the world's population (7 billion) living in cities United Nations Population Fund 2008 Annual Report.
- In North America & Europe, 80 percent of the population lives in metropolitan areas
Cockrall-King, J. 2012. Food and the City.
- There are now thirty-five “megacities” – urban clusters of over 10 million people – around the world
“Population 7 billion” National Geographic, January 2011; en.wikipedia.org/wiki/Megacity

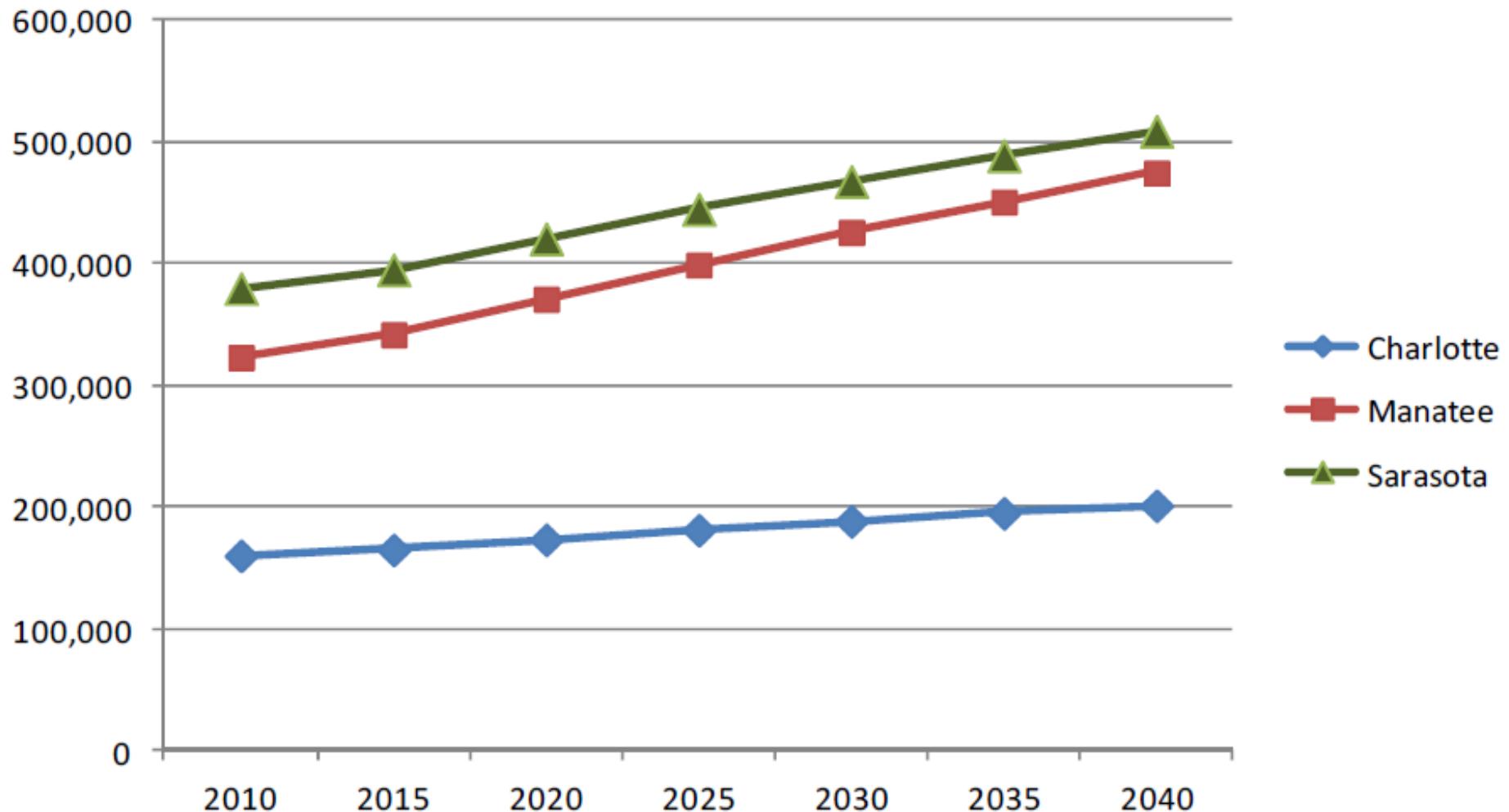
Why Urban Agriculture?

Local Community Growth Statistics to Consider:

- ❖ Historical and projected regional population growth
- ❖ Sarasota County urban population growth
- ❖ Sarasota County urban and per-urban infrastructure growth
- ❖ Sarasota County agriculture land use changes

Local Regional Population Growth

Population Growth Projections by County, 2010 - 2040

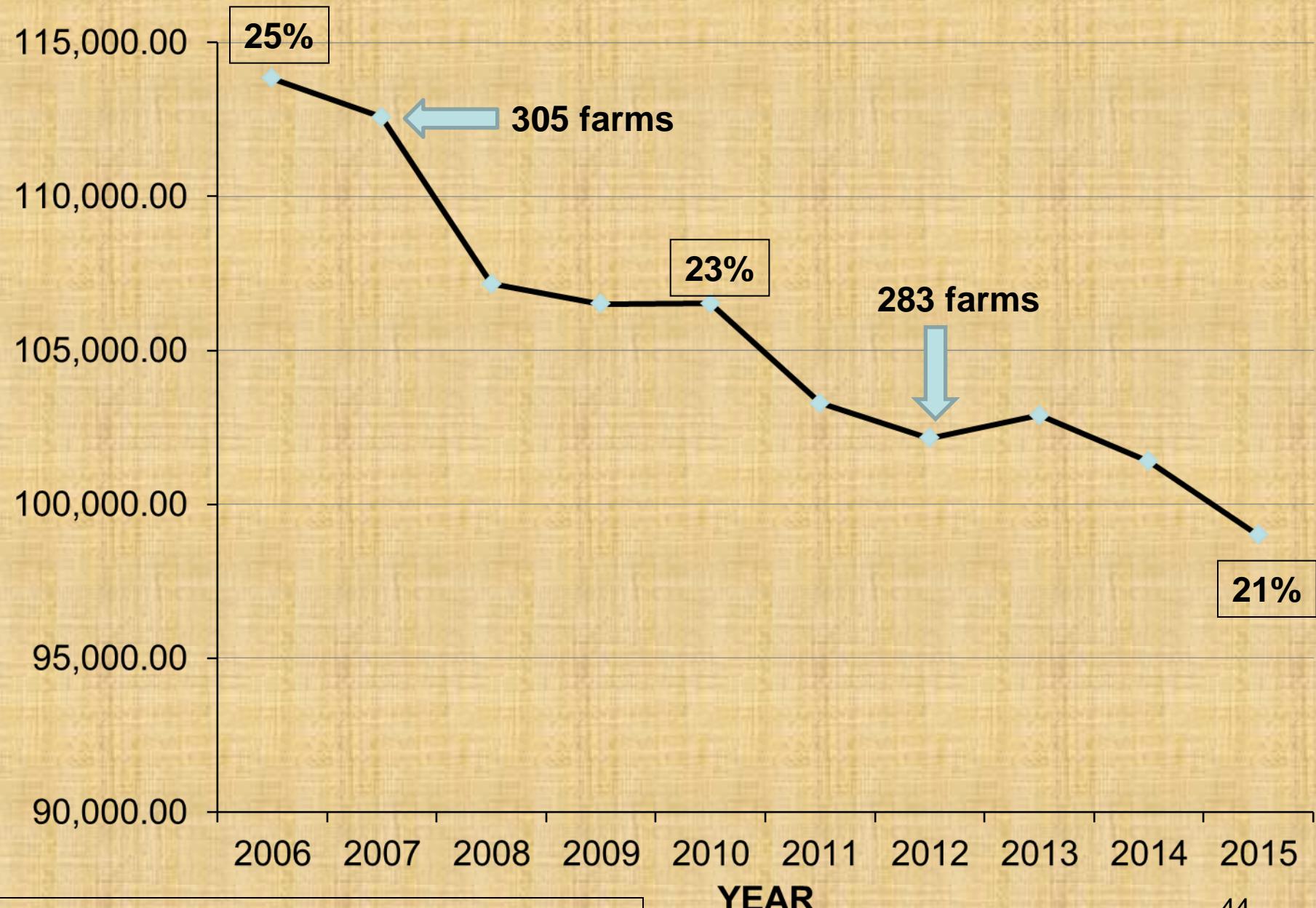


Source: Bureau of Economic and Business Research (BEBR), Florida Population Studies, Volume 45, Bulletin 162, February 2012; U.S. Census Bureau, 2010 Census

Sarasota County Urban Population Growth

Geographic Area	2000	2010	Numerical Change	Percentage Change
North Port	22,797	57,357	34,560	152%
Sarasota	52,715	51,917	-798	-2%
Venice	17,764	20,748	2,984	17%
Longboat Key (Sarasota County portion only)	5,012	4,490	-522	-10%
Total Municipalities	98,288	134,512	36,224	37%
Unincorporated Area	227,669	244,936	17,267	8%
Total County	325,957	379,448	53,491	16% ⁴³

Sarasota Co: Total Ag Land Use Changes (% Total Area)



Why Urban Agriculture?

There are NINE food deserts in Sarasota County.

- At least 20% of residents live in poverty
- At least 33% of residents live more than a mile from a grocery store

Source: Herald Tribune, Oct. 25, 2014

“Healthy communities flourish with access to healthy food through a variety of places, including grocery stores, urban farms, community gardens, and farmers markets.”

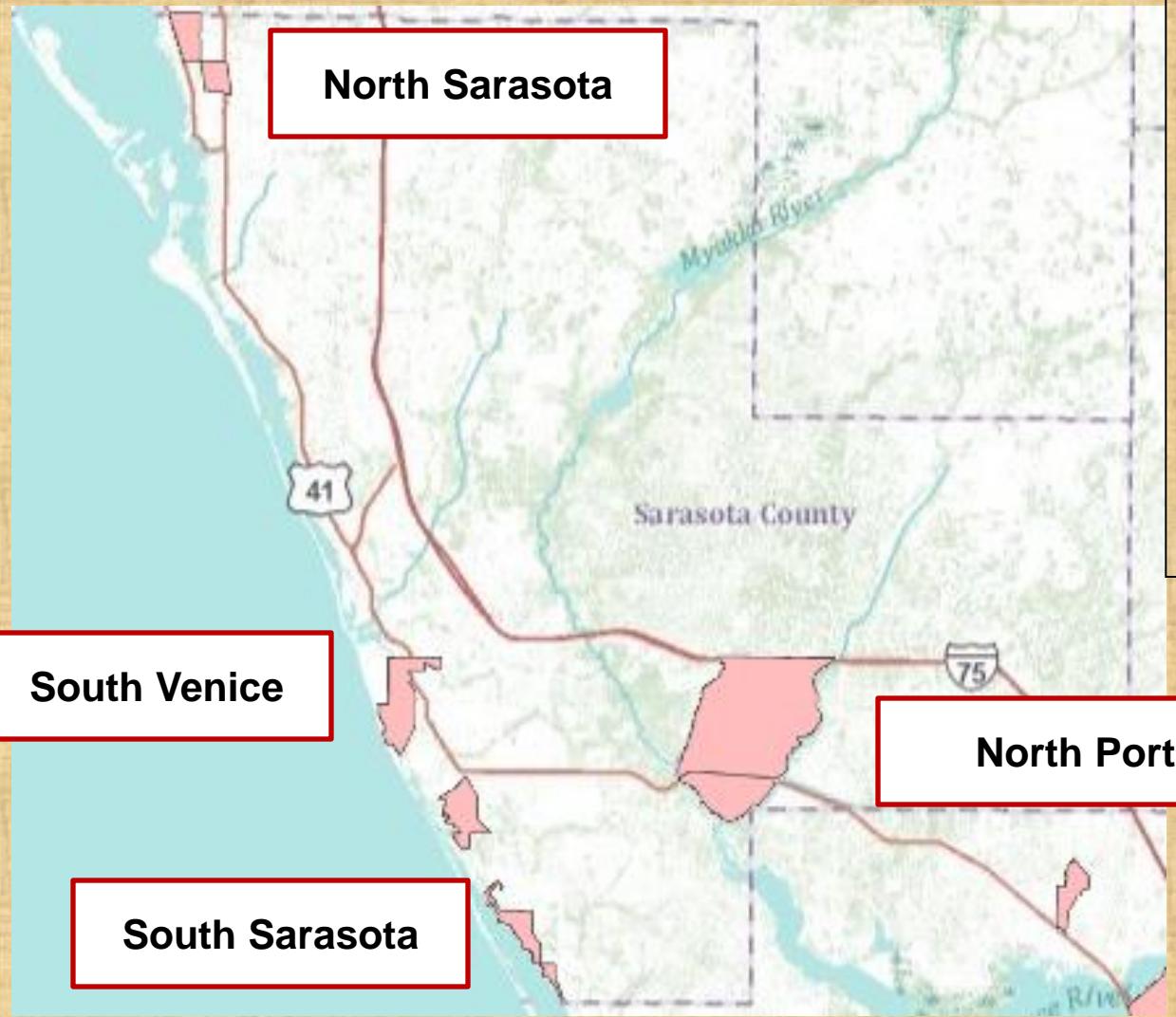


Source: ULI, Intersections: Health and the Built Environment

Why Urban Agriculture?

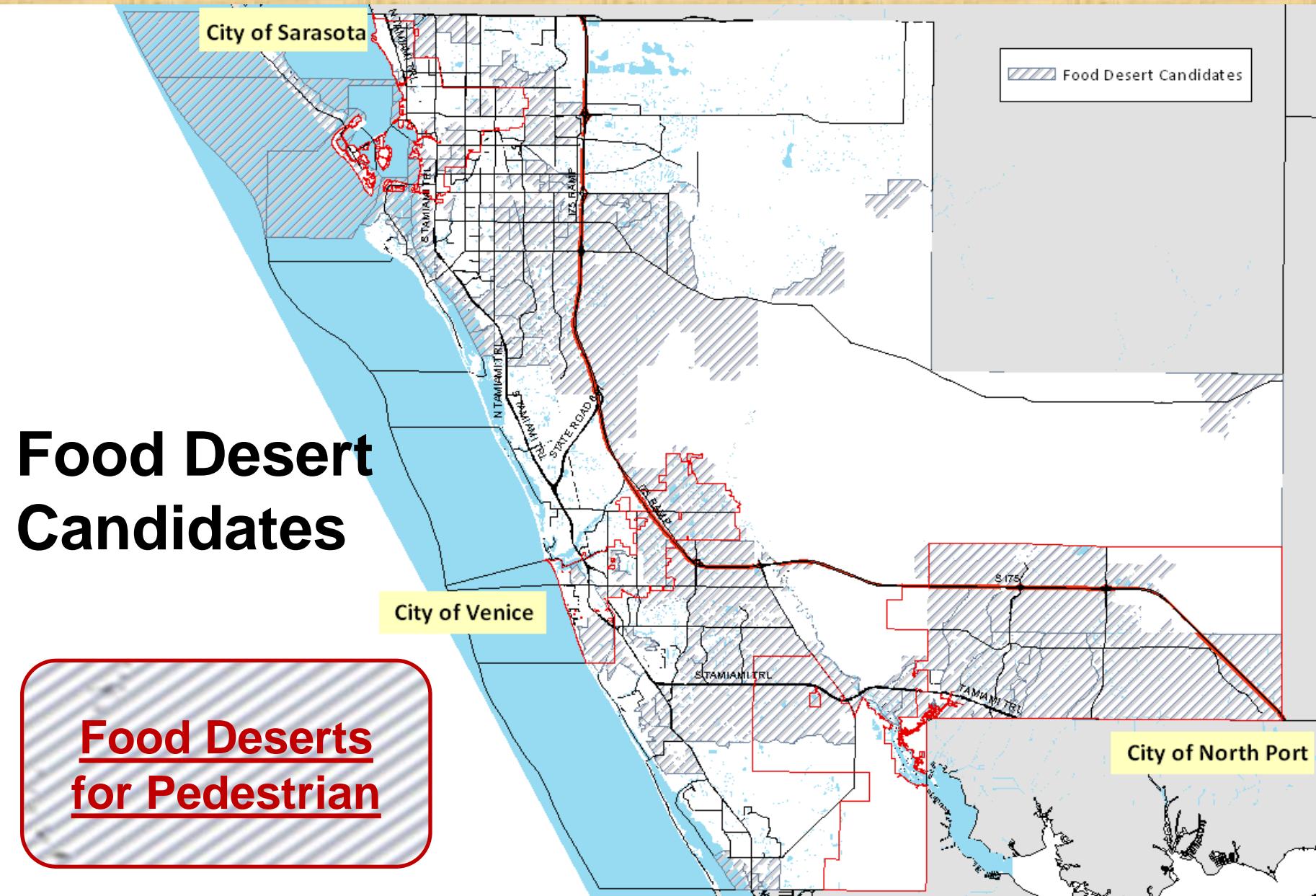
- Food deserts within cities

USDA Food
Desert
Locator:
Sarasota
County
Example



Why Urban Agriculture?

Sarasota County



Why Urban Agriculture?

Sarasota County

City of Sarasota

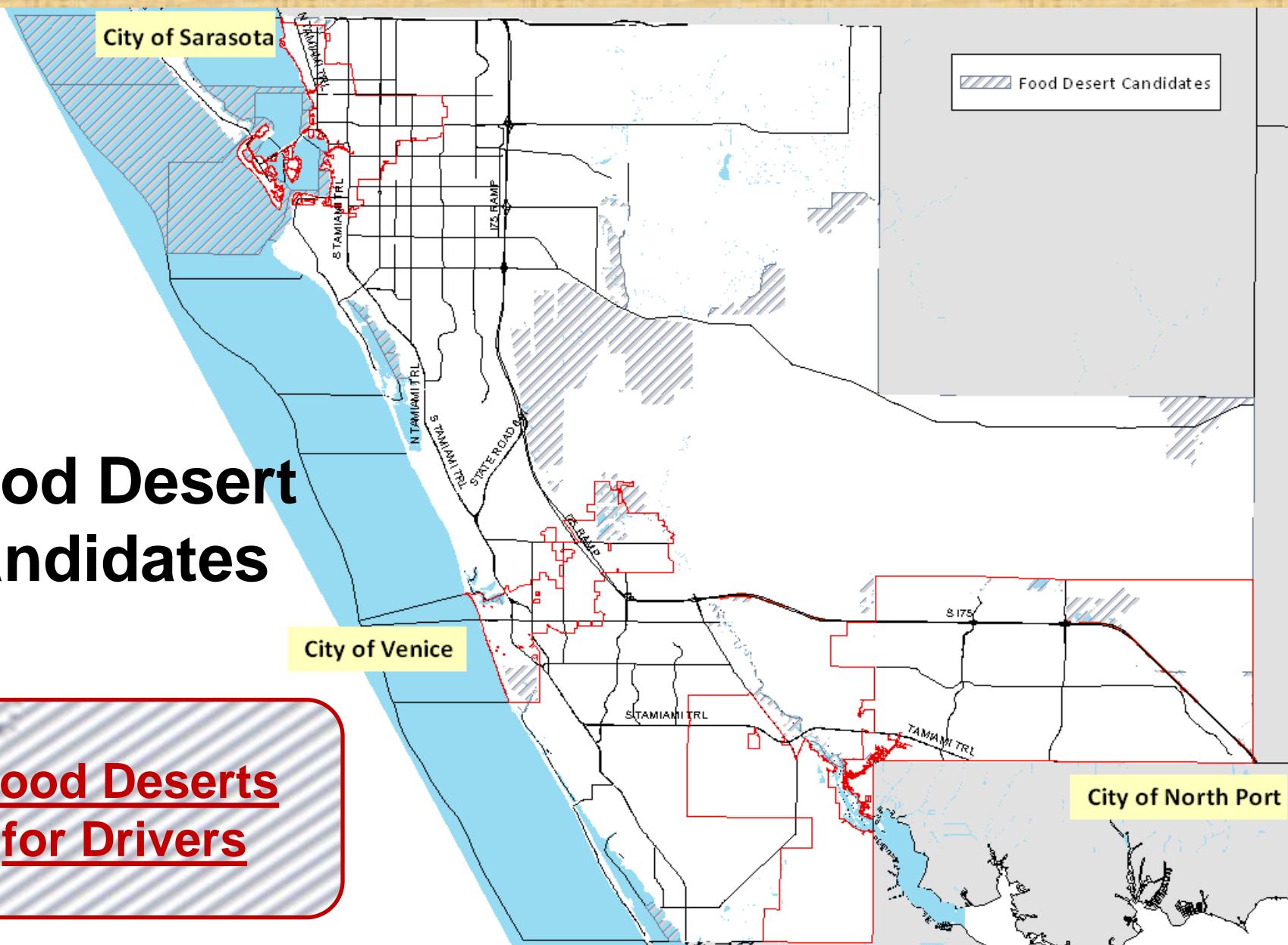
Food Desert Candidates

Food Desert Candidates

Food Deserts
for Drivers

City of Venice

City of North Port



Why Urban Agriculture?

Local Municipality & County Policies

- ❖ Example of Sarasota County Comprehensive Plan Components (see <https://www.scgov.net/government/planning-and-development-services/comprehensive-plan>)
 - Mission Statement

“The Mission of Sarasota County Government is to be the most livable and best managed community in the country, providing quality services, programs and facilities that reflect the goals of the community.”
 - Food Policies adopted that support local and urban Ag development – see
<http://sfyl.ifas.ufl.edu/sarasota/agriculture/agriculture/food-policy/>

Why Urban Agriculture?

Sarasota County Food Policy Example

- ❖ FLU OBJ 2.2
 - Maintain governing regulations for Semi-Rural, Rural, and Agricultural land uses.
- ❖ FLU Policy 2.2.1
 - Protect and maintain agricultural lands.
- ❖ FLU Policy 2.2.1 (a)
 - The county will support the implementation of a voluntary sustainable agriculture program to promote voluntary sustainable agriculture practices on private and publicly owned lands.
 - The program may include but shall not be limited to the following:

Continued on next slide

Why Urban Agriculture?

Sarasota County Food Policy Example

- ❖ FLU Policy 2.2.1 (a) - continued
 - Provisions for community gardens and farms, as well as farmers markets;
 - Coordination with neighborhood planning efforts and subdivision review to provide adequate land for community gardens, farms, and farmers markets;
 - Where appropriate, encourage the use of county parks for community gardens and farms, as well as farmers markets;
 - Incentive-based programs for agricultural lands in all areas that use sustainable farming practices;
 - Encouraging the School Board to use locally grown foods in the daily school breakfast and lunch programs;
 - Support for institutional purchasing from local agriculture;

Continued on next slide

Why Urban Agriculture?

Sarasota County Food Policy Example

❖ FLU Policy 2.2.1 (a) - continued

- Support for a local food marketing strategy;
- Encouraging the expansion of existing agricultural uses and development of new business involved in agriculture such as new agricultural technologies and infrastructure to allow operational activities of urban and small scale agricultural opportunities;
- Support an assessment of the community food system in order to promote profitable small and large farms and alternative enterprises to sustain economically viable agricultural communities and to preserve the agricultural heritage of Sarasota County; and
- Support for protection initiatives (e.g., farmland trusts, farmland mitigation, conservation easements and small farms)

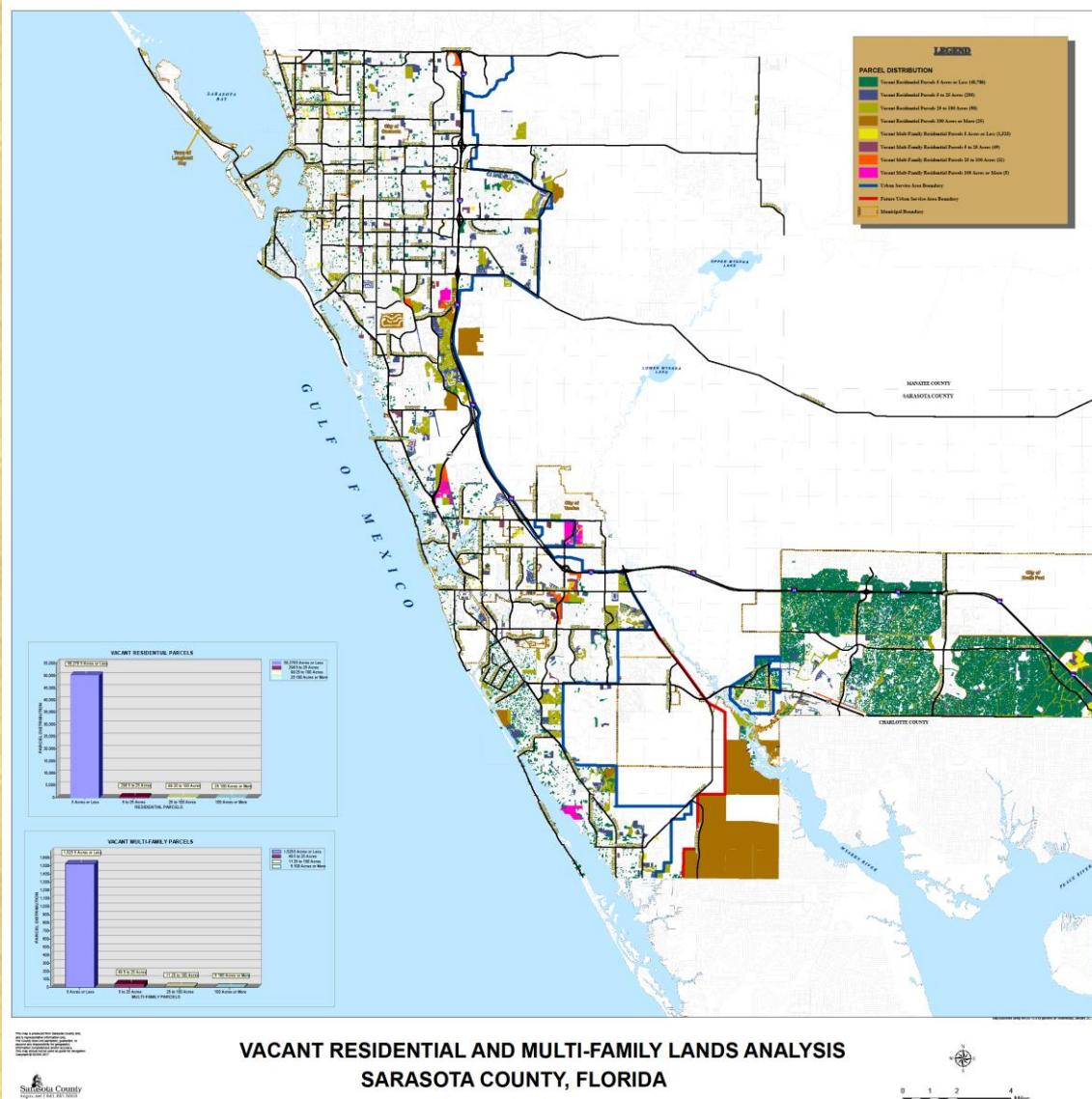
Why Urban Agriculture?

Food Policy Council (FPC)

- ❖ Urban Ag food policies are being formulated nationally by local and state FPCs which are a unique forum for diverse stakeholders to come together and address common concerns regarding food policy including food systems, food security, farm policy, food regulations, health, and nutrition.
- ❖ The Sarasota Food Policy Council developed the food policies of Sarasota County Comprehensive Plan (see <http://sfyl.ifas.ufl.edu/sarasota/agriculture/agriculture/food-policy/>)
- ❖ The Manasota Food Action Council promotes urban Ag initiatives in local food deserts (see <https://www.facebook.com/ManasotaFAC/>)
- ❖ The FL Food Policy Council supports local and regional FPCs (see <https://flfpc.org/>)

Why Urban Agriculture?

Sarasota County Vacant Urban Lots Map (2016)



- > 50K lots (< 5 ac size) exist today!
- See interactive map at http://sfyl.ifas.ufl.edu/sarasota-a-docs/ag/2017_Ag_Analysis_Sept2016_ResidLands.pdf

Why Urban Agriculture?



- ❖ Watch the short video “Why We Should Be Urban Farming” at <https://www.youtube.com/watch?v=XaEKJ5Vv3Zg>

Why Urban Agriculture?

Benefits

- Reconnect people to food sources
- Make use of limited open spaces, including roofs
- Provide a fresh and safe food supply
- Reduce the ‘Carbon Foodprint’ of cities
- Provide employment and income
- Contribute to food access and security
- Increase positive social interactions, mental health, and physical environments
- Reduce food wastes
- Improve community health
- Create a new generation & demography of farmers

Why Urban Agriculture?

Urban Agriculture as a climate adaption mechanism.

- The need for UA will increase with the anticipated population growth and increased urban density.

Multifaceted benefits of UA

- Promote Nutrient cycling
- Enhance Food Security
- Minimize greenhouse gases Emission
- Enhance Urban environment
- Promote Energy Efficiency
- Promote Waste Management

Why Urban Agriculture?

❖ Urban Farming Could Revolutionize City Planning

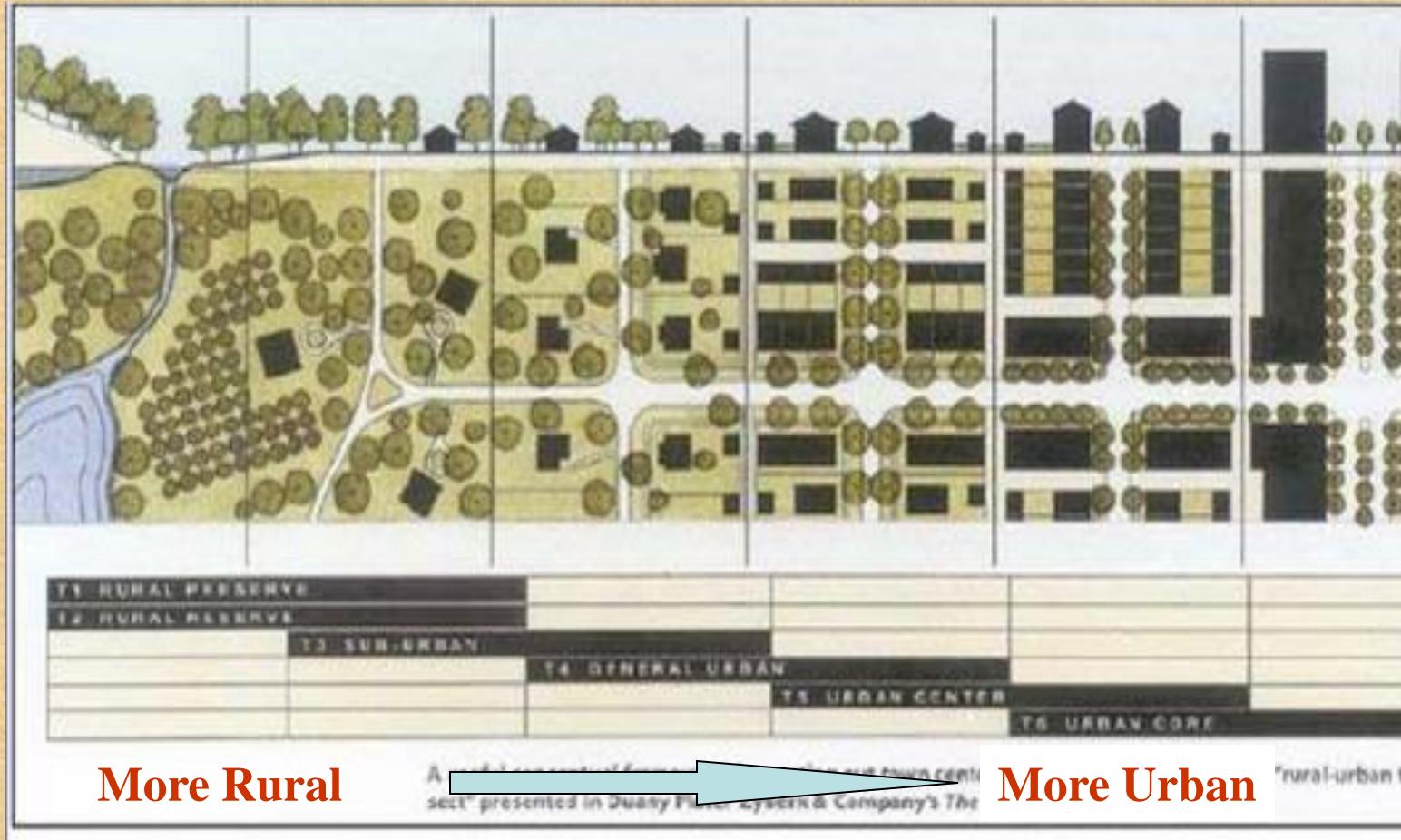
- ❖ Agricultural urbanism or “agrarianism” city planning approach offered a counterpoint to the increasingly dense metropolises that grew with the great migrations from farm villages to industrial cities in the 19th and early 20th centuries.
- ❖ Can today's urban Ag movement become proactive and adopt the idea of agricultural production as a formative element of city structure, rather than as an adjunct, something to be inserted into already existing structures, or remediate abandoned brownfield sites or conserve greenfield sites?
- ❖ Resources include a history of international agrarianism projects designed to engage issues of economic inequality, social justice, & environmental health w/ city planning.

https://placesjournal.org/article/history-of-agrarian-urbanism/?gclid=CIwKCAjAxuTQBRBmEiwAAkFF1uzoSxLdG3WmiVBJKcW9JaMLgycn5FMGD2DCSBVD3Opmcml2Ux2DBoCxqMQuAvD_BwE

Why Urban Agriculture?

“Smart Growth” Land Planning Tools:

Form-Based Code and Transect Zones

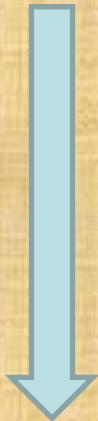


Mixed Land Use Along The Transect Allows for
Urban Ag Opportunities and Local Foodshed Development

Why Urban Agriculture?

'Smart Code' of Integrated Ag Production Systems

More
Rural



More
Urban

SMARTCODE		TABLE 19 FOOD PRODUCTION							
Municipality		T1	T2	T3	T4	T5	T6	SD	Species
<small>TABLE 19: Food Production. This table shows ways of incorporating food production within the transect.</small>									
<small>Farm</small>									
Farm			●						●
Agricultural Plots				●	●				●
Vegetable Gardens				●	●	●			
Urban Farm					●	●	●		
Community Gardens					●	●	●	●	
Green Roof - Extensive			●	●	●	●	●	●	●
- Semi-Intensive					●	●	●	●	
Intensive					●	●	●	●	
Vertical Farms					●	●	●		

FOOD PRODUCTION

Farm

Agricultural Plots

Vegetable Gardens

Urban Farm

Community Gardens

Green Roofs

Extensive
Semi-Intensive
Intensive

Vertical Farm

Why Urban Agriculture?

Challenges

- Limited space
- Expensive land and resources
- Zoning restrictions and requirements
- Startup costs
- Agribusiness and development competition
- Production factors
 - ✓ inadequate resources (soil, water, etc)
 - ✓ weather
 - ✓ nuisances (pests, animals, people, etc)
 - ✓ contamination

Why Urban Agriculture For You?

Motivations

- Economic Independence
- Sustainable Food System Activist
- Life Style Choice
- Spiritual Connection
- Health Consciousness
- Intellectual Growth
- Food Safety Concerns
- Self-Reliance

Example Motivations for Urban Agriculture

“Urban Farming, SPIN Farming - Small Plot INtensive Urban Farming Production System to Create Income”

- ❖ A short video of an urban micro-farm that integrates vegetables, herbs, and fruit production that values economic-based goals as personal motivation

- ❖ See this video at

<https://www.youtube.com/watch?v=BsJeDZr9MI4>

Example Motivations for Urban Agriculture

“Organoponico !
An Agricultural Revolution in Cuba”

- ❖ A short video of an urban micro-farm program that integrates vegetables, herbs, fruit and animal production that values community & national goals.
- ❖ See this video at
<https://www.youtube.com/watch?v=JIWsxo5nNgg>

Urban Ag and Agroecology

What Is Agroecology ?

- Agro = agriculture = the science, art, or occupation concerned with cultivating land, raising crops, and feeding, breeding, and raising livestock; farming.
 - from Late Latin *agricultura* "cultivation of the land," compound of *agri* *cultura* "cultivation of land," from *agri*, genitive of *ager* "a field" and *cultura* "cultivation".
- Ecology = the branch of biology dealing with the relations and interactions between organisms and their environment, including other organisms.
 - coined by German zoologist Ernst Haeckel (1834-1919) as *Okologie*, from Greek *oikos* "house, dwelling place, habitation" and *-logia* "study of".

What Is Agroecology?

- The application of ecology to the design and management of sustainable agroecosystems.
- A **whole-systems approach to agriculture and food systems development** based on traditional knowledge, alternative agriculture, and local food system experiences.
- Linking ecology, culture, economics, and society to sustain agricultural production, healthy environments, and viable food and farming communities.
 - Stephen Gliessman, Professor Emeritus, Center for Agroecology and Sustainable Food Systems, Univ. of CA-Santa Cruz

What Is Agroecology?

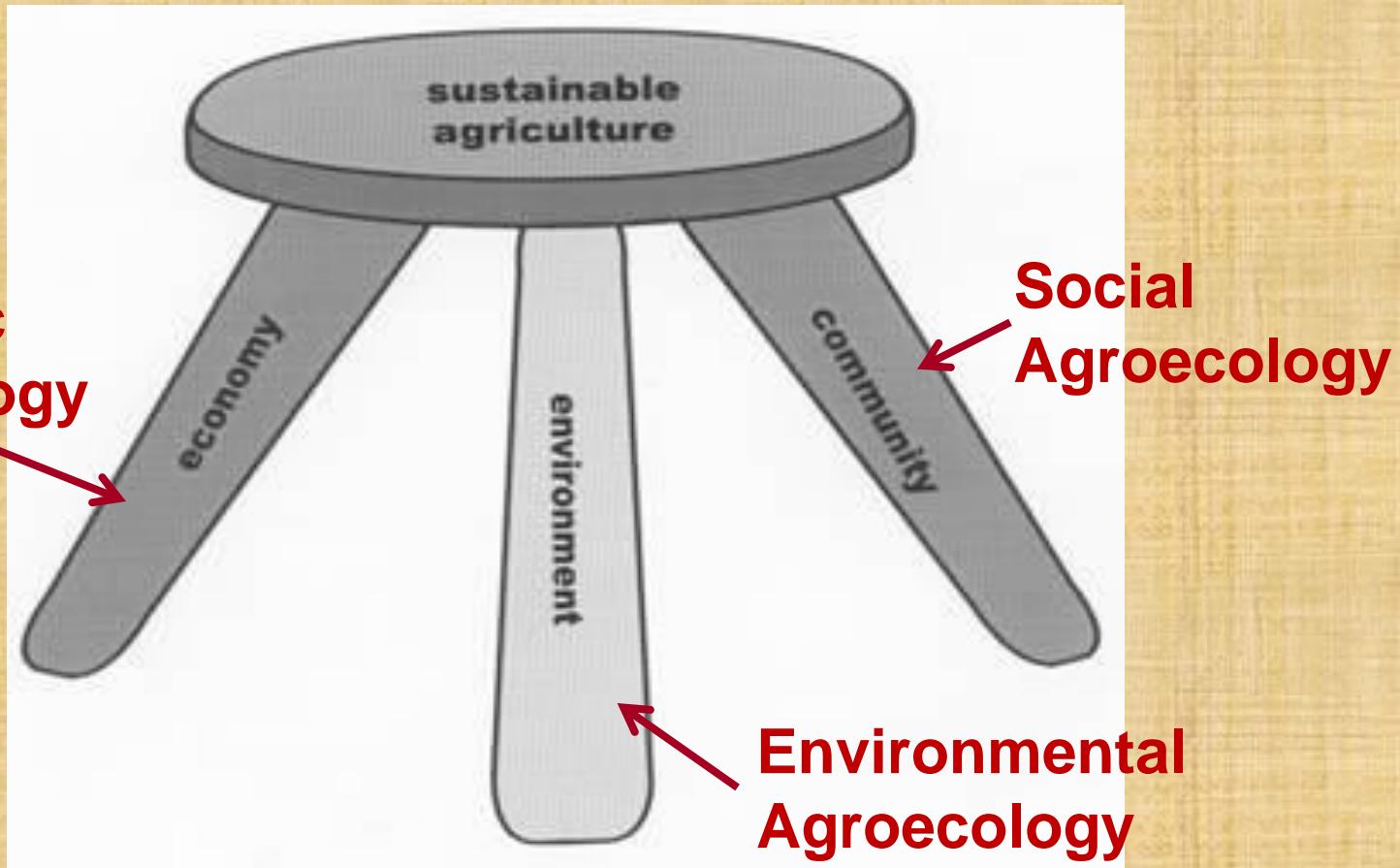
- The scales & dimensions of the science of agroecology have changed over the past 80+ years of its historical development across the world from the plot & field scales to the farm & agroecosystem scales.
- One definition refers to the "-ecology" part of "agroecology" narrowly as the natural environment and its ecological processes.
- A more common definition of the word refers to the study of the interactions between plants, animals, humans and the environment within agricultural systems
- Three approaches presently persist:
 - investigations at plot and field scales
 - investigations at the agroecosystem and farm scales
 - investigations covering the whole food system.

What Is Agroecology?

- ❖ Agroecology provides the knowledge and methodology for developing a sustainable agriculture that is:
 - Environmental sound
 - Socially equitable
 - Economically viable
- ❖ Agroecological design achieves:
 - Improved overall biological efficiency & production
 - Biodiversity preservation
 - Maintenance of productivity and self-regulating capacity/resiliency

What Is Agroecology?

Economic
Agroecology

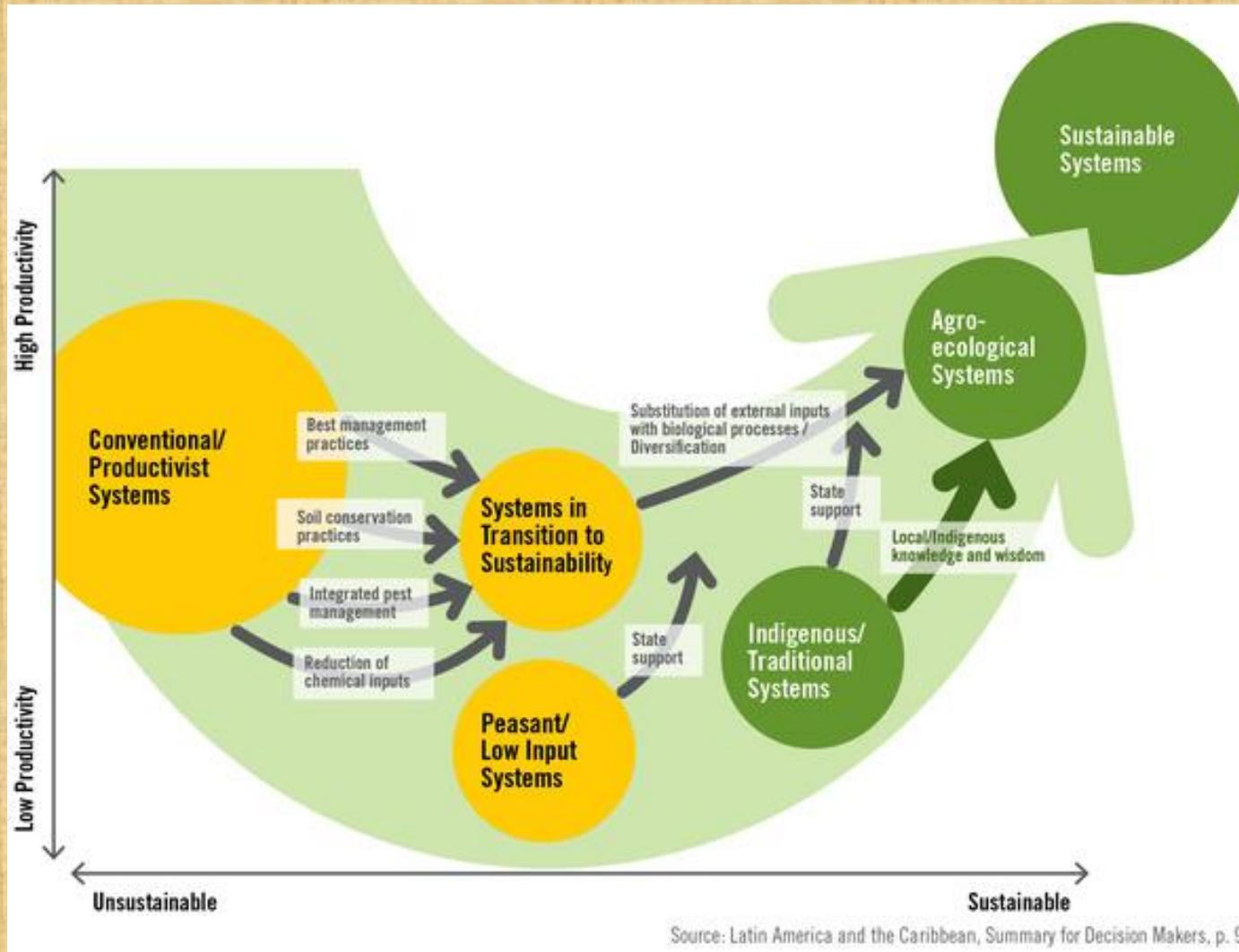


Social
Agroecology

Environmental
Agroecology

Agroecology provides the science for the practices to achieve the goals of sustainable agriculture. ⁶⁹

What Is Sustainable Agriculture?



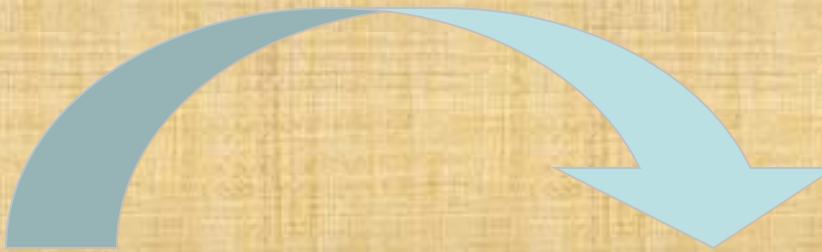
Source: Latin America and the Caribbean, Summary for Decision Makers, p. 9

Sustainable agriculture is the agro-ecological evolution
in agriculture, food production & consumption.

The Current Food System

Sustainability Issues

“Agricultural
Supplies”

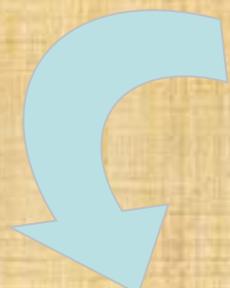


Food production
(largely technological and
removed from society)

Global Food Distribution
(nonrenewable energy)

An average food item in the U.S.
travels 1,500 miles –
up to 25% farther than in 1980

“waste
products”

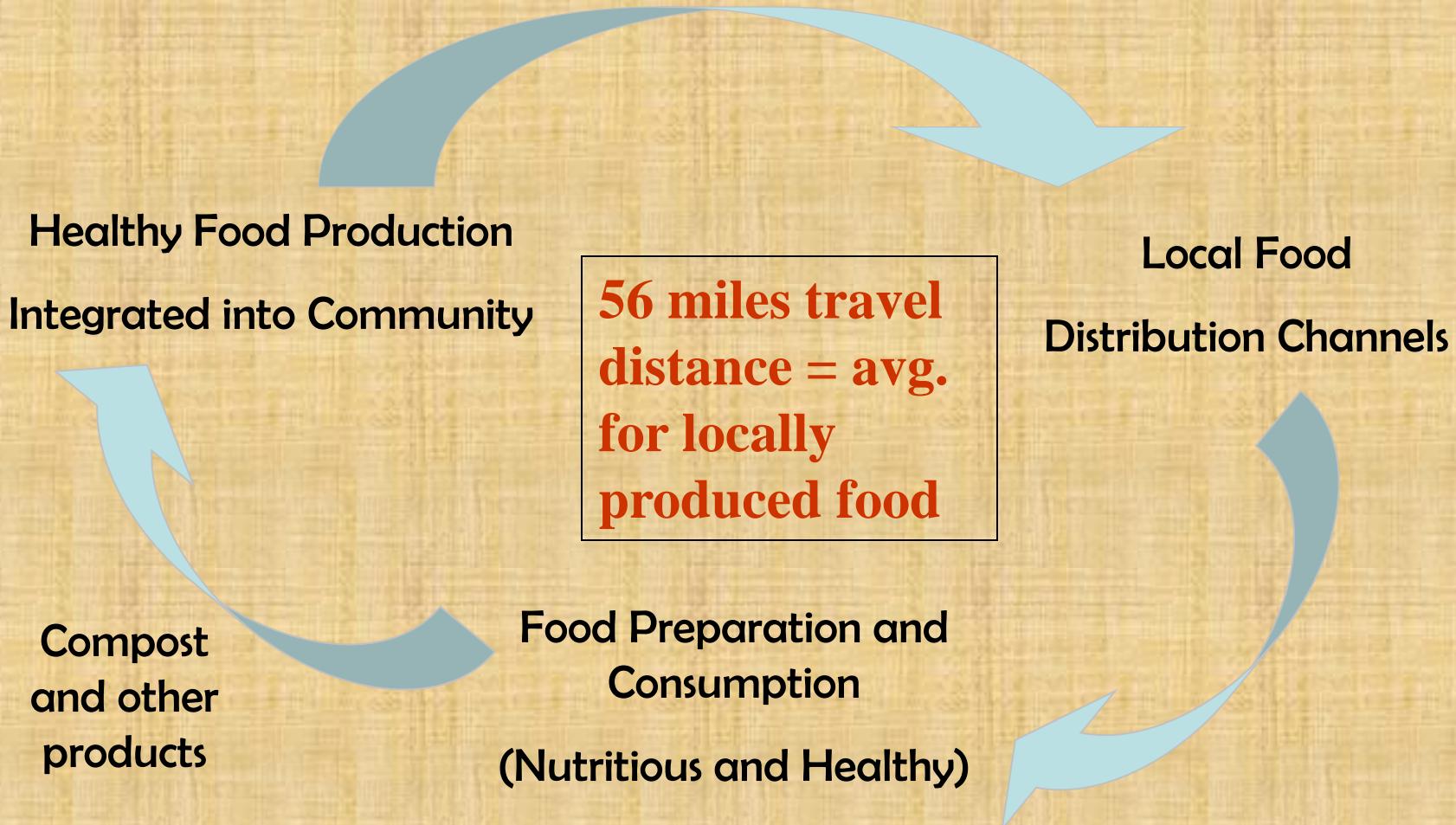


Food Preparation and
Consumption

(fast and cheap)



A Sustainable Local Food System



Why Agroecology?

- ❖ Agroecology addresses these unsustainable impacts of conventional agriculture:
 - Soil degradation
 - Overuse of water & damage to hydrological systems
 - Pollution of the environment
 - Destruction of natural habitat
 - Dependence of external inputs & nonrenewable resources
 - Production of greenhouse gases and loss of carbon sinks
 - Loss of genetic diversity
 - Loss of local control over agriculture production
 - Increasing vulnerability and risk
 - Global inequality
 - Externality negative impacts

Agroecology: Concepts and Principles

❖ Ecosystem Concept from Ecology Science

- A functional system of complementary relations between living organisms and their environment, delimited by arbitrarily chosen boundaries, which in space and time appears to maintain a steady yet dynamic equilibrium.
- It is the unifying concept of agroecology = the idea that farms are “agroecosystems” and should mimic the functioning of local ecosystems with tight nutrient cycling, complex structure, and enhanced biodiversity conservation.

Ecosystem Science

Ecosystem Properties Include:

- Biological diversity and organization
- Trophic structure (e.g., food webs)
- Processes or function
- Succession
- Carrying Capacity
- Homeostasis
- Emergent property
- Resiliency

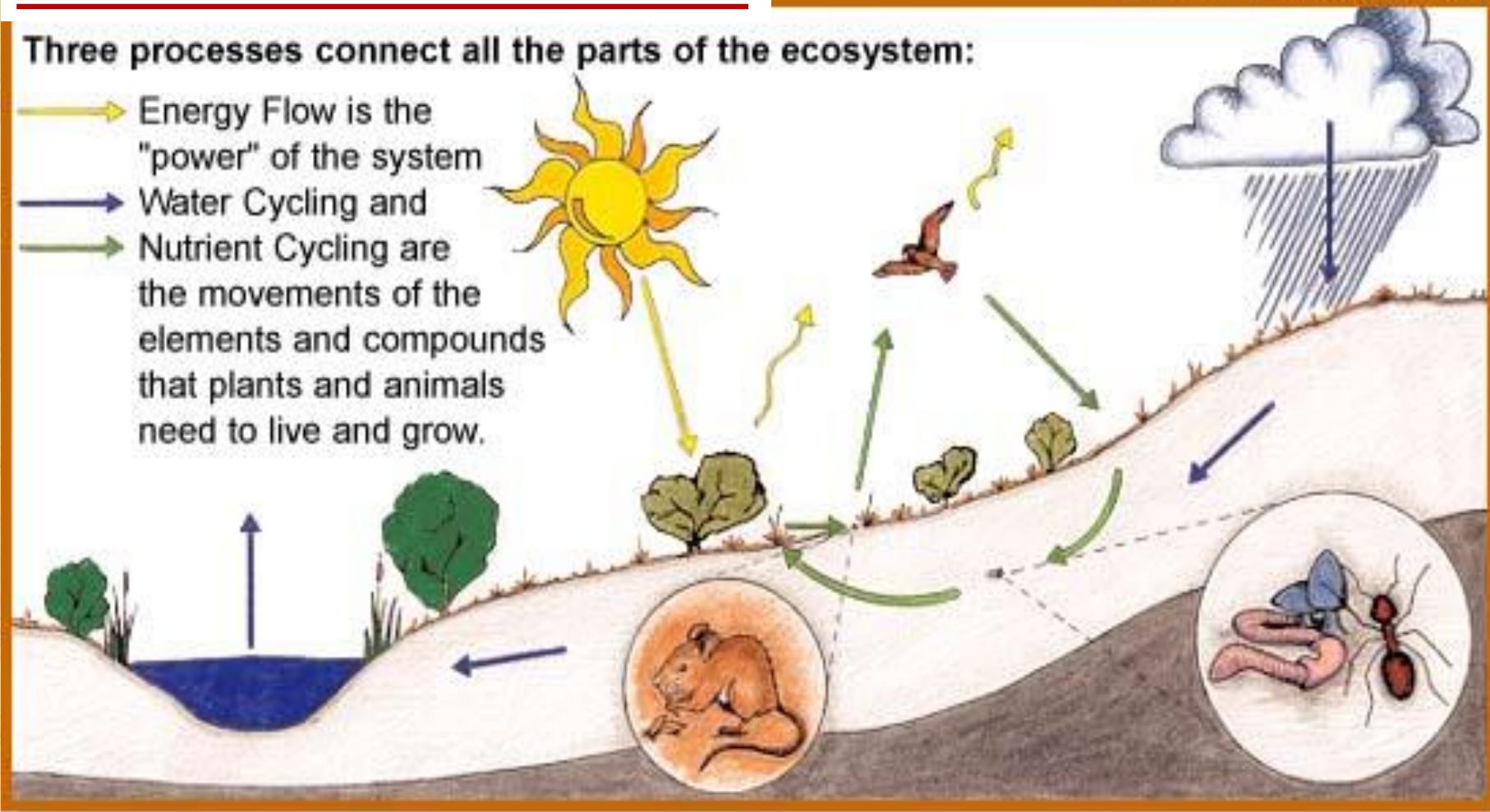
Ecosystem Science Example

Processes or Functions

ILLUSTRATION: NICOLE BRAND

Three processes connect all the parts of the ecosystem:

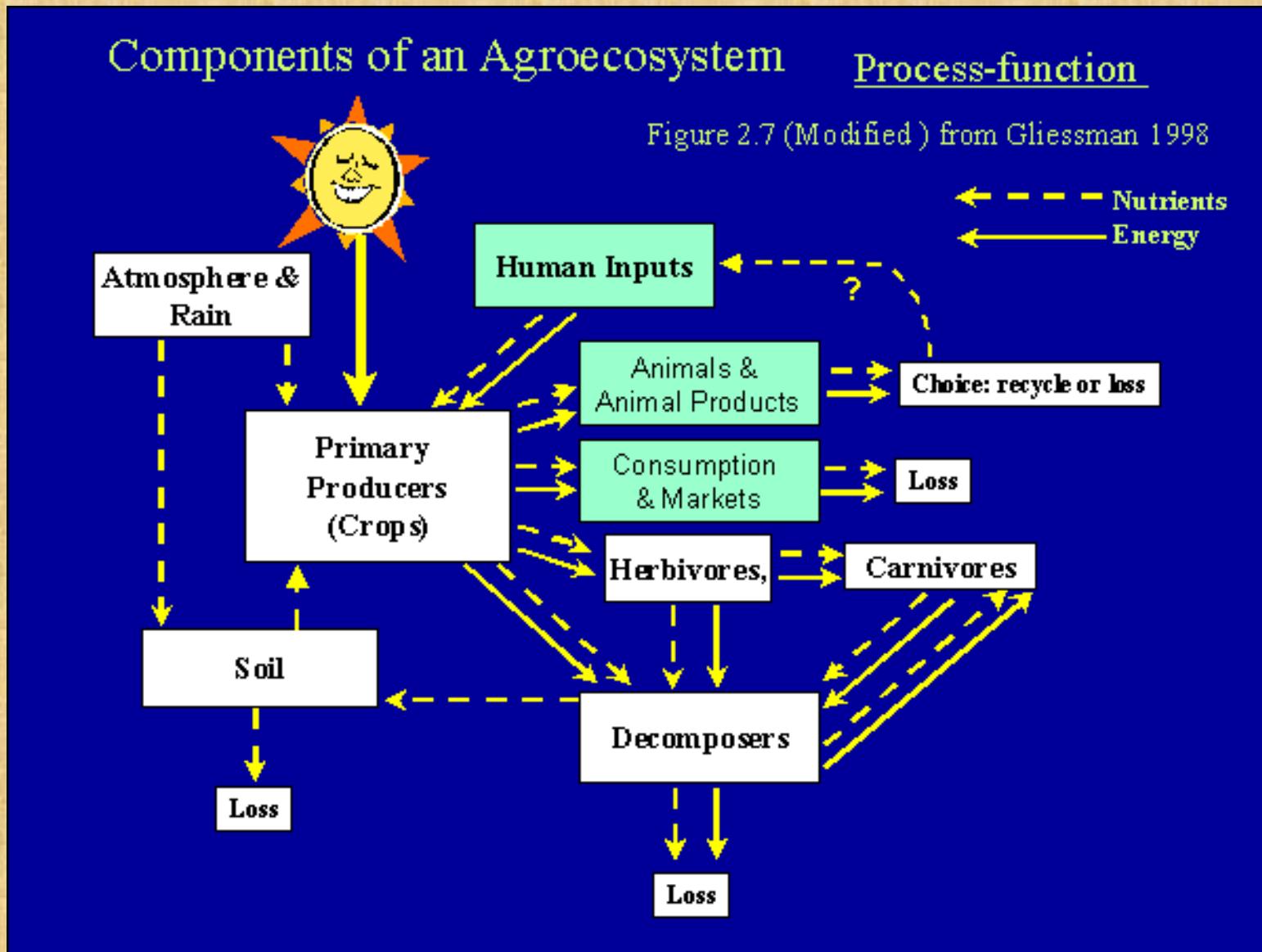
- Energy Flow is the "power" of the system
- Water Cycling and
- Nutrient Cycling are the movements of the elements and compounds that plants and animals need to live and grow.



Watch the short video “How the ecosystem works” at
https://www.youtube.com/watch?v=o_RBHfjZsUQ

Agroecosystem Science Example

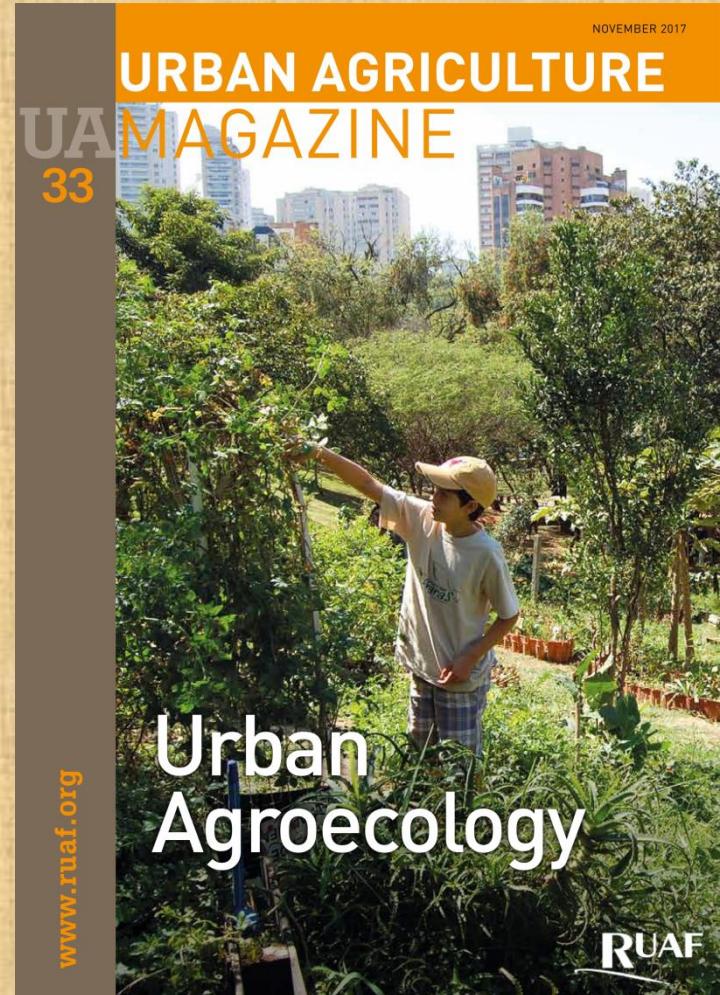
Structure and Processes



<https://people.ucsc.edu/~cshennan/migrate/d/envs130/ENVS130A003/sld007.htm>

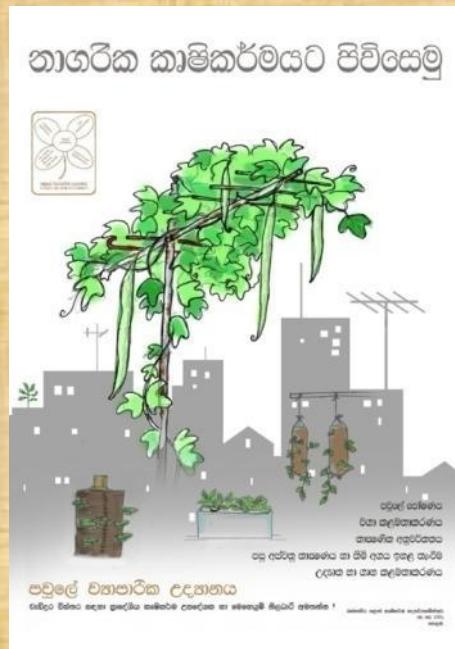
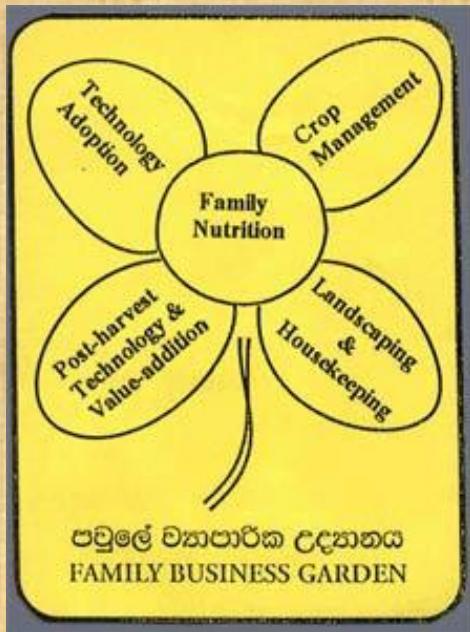
Urban Agroecology

- ❖ Urban agroecology', is a practice which, while it could be similar to many 'urban agricultural' initiatives born out of the desire to re-build community ties and sustainable food systems, has gone a step further: it has clearly positioned itself in ecological, social and political terms.
- ❖ At the same time, definitions differ and tend to reflect the various ways the term agroecology is understood in different countries, by different organisations, or according to different political economic preferences.



Urban Agroecology Example

The Concept of the Family Business Garden (FBG)



An Urban–Rural Application of Indigenous Home Forest Gardens in Sri Lanka

What Are Home Forest Gardens?

- Whether they are known as home, mixed, backyard, kitchen, farmyard, compound or homestead gardens, family food production systems are found in most regions of most countries worldwide.
- They may be the oldest production system known and their very persistence is proof of their intrinsic economic and nutritional merit.
- Traditional gardens typically exhibit a wide diversity of perennial and semi-perennial crops, trees and shrubs, well adapted to local microclimates and maintained with a minimum of purchased inputs
- Studies on traditional mixed gardens have emphasized their ecologically sound and regenerative characteristics, by which they “recreate natural forest conditions” and minimize the need for crop management

What Are Home Forest Gardens?

- Term 'forest garden' coined by Robert Hart in the 1980s after adapting the principles and applying them to temperate climates.
- Forest gardens are known by various names
 - Home gardens (South India, Nepal, Zambia, Zimbabwe and Tanzania)
 - Kandyan forest gardens (Sri Lanka)
 - Huertos familiares or "family orchards" (Mexico)
 - Pekarangan, or the gardens of "complete design" (Java)
 - Agroforests
 - Shrub gardens
- Bill Mollison, who coined the term permaculture, visited Robert Hart at his forest garden in Wenlock Edge, UK, in October 1990. Hart's seven-layer system has since been adopted as a common permaculture design element.

Urban Agroecology Example

Urban Techniques of the FBG Concept



Urban Ag Startup Factors

Core Enterprise Areas :

- On-farm infrastructure
 - Production systems
- Business Planning
- Land/Water Access/Costs
- Capital and Financing
- Market Development



Whew!

Let's take a break!

15 minutes