Urbanization & Industrialization

From 1500s, Urbanization and Industrialization totally changed Agriculture Civilization.

Aggregation of social environment & Pollution of natural environment

Restoration of agriculture in urban areas could be a possible solution for those problems and a memorial of Agriculture Civilization.

Proposal of Urban agriculture & Sustainable agriculture

Social problems and Environment problems aggregate due to Urbanization and Industrialization.

Change of life style & Urban farms
Key Problems

- Declining of Agriculture Landscape
  The development of industrialization and the expansion of urbanization changes farmers’ life styles, which aggravate the decline of farms

- Urban Health & Lifestyle Diseases
  According to National Center for Health Statistics, degenerative diseases -- a disease due to normal bodily wear or lifestyle choices such as exercise or eating habits -- accounted for more than 60 percent of all deaths.
Preliminary Potential Solutions

Transformation of Urban Green Space
Constructing Urban Farms rather than common public green space

Eco Village/Community
Community gardens as urban farms, serving residential.

Energy and Techniques Improvement
Using new energies as solar panel, geothermal

Permaculture
Combining farm with gardens and landscapes. Creating recycles in farms.

Improving Economic, Social and Productivity value

Promoting Urban Health
Key and Sub-Questions

**KEY:** How can “perma-farm” improve urban living environment?

**SUB:** What aspects of permaculture are the most effective part to deal with urban health problems?

**SUB:** How to develop urban agriculture landscape and promote urban development simultaneously?
Urbanization & Industrialization

- **Urbanization**
  
  Urbanization is a population shift from rural to urban areas, and the ways in which society adapts to the change.

- **Land-use Pattern**
  
  Under most circumstances, urbanization is an irresistible process, converting farmland to urban areas.

- **Industrialization of Agriculture**
  
  Industrialization in agriculture refers to the increasing consolidation of farms and to vertical coordination (contracting and integration) among the stages of the food and fiber system.

  **Major Drivers for Industrialization of Agriculture**

  - Technology
  - Economic Force
  - Human Capital
  - Value Chain Force

  (Gray, 2007)
Quality of life, is no longer a symbol depending on economic growth, but being concerned with satisfaction and happiness, environmental conditions, and health conditions.

Living Conditions-- *Determinants* of Urban Health

Following urbanization, urban health becomes an unavoidable problem.
Agriculture & Pollution

- **Agriculture Landscape—**Benefits for People
  - Direct Effect on People
    - Improving access to better food and nutrition
    - Improving physical health and activities
    - Improving mental health
  - Indirect Effect on People
    - Improved security and safety in local communities
    - Education/job skills training to create opportunities for community development
    - Increasing social capital
    - Improving local ecology and sustainability

- **Major problems of American Agriculture**
  - Energy, water and soil are three main problems of American agriculture.

Energy, Water, and Soil are three main problems of American agriculture.

- **Water**
  - Pesticides in water
  - Groundwater contamination

- **Soil**
  - Amable land per capita is decreasing

- **Energy**

Sources:
- [oceanworld.tamu.edu/resources/environment-book/groundwatercontamination.html](http://oceanworld.tamu.edu/resources/environment-book/groundwatercontamination.html)
- [www.everythingconnects.org/soil-pollution.html](http://www.everythingconnects.org/soil-pollution.html)
Sustainable Agriculture & Urban Design

- Sustainable Agriculture
  Sustainable agriculture, coined by Gordon McClymont, is the act of farming with ecological principles, imitating natural relationships among human, animals and plants to create harmonious ecosystem.

- Sustainable Urban Design
  Minimizing the harm to the environment or the health of farmers while enhancing quality of environment and human lives.

Urban agriculture & Ecological Urban Landscape

Transformation of Agriculture Landscape

Urbanization

Urban land

Preserve / Rebuild Agriculture Landscape

Urban health needs

Urban ecosystem needs

Urban Agriculture

Urban Farms and Eco village / Community Gardens are main form of urban agriculture.

Urban Farms
- Flat Farm--- Common Form
- Roof Farm-- Higher Space Utilization
- Vertical Farm-- New Form

Urbanization

Cropland

Memorial

Soil and water conservation

http://www.intechopen.com/books/advances-in-landscape-architecture/ecological-landscape-design
Permaculture & Farm Design

- **Permaculture Principles-- Design**
  Returning all *waste* to the cultivated ecosystem—Imitating a nature ability most species have.

- **Core Spirit of Permaculture**
  A complicated *cultivated* ecosystem integrating every related aspects as a *recycling complex*.

Components of Permaculture Recycle
http://weareallfarmers.org/waaf_pdc/

Permaculture Principles
http://www.sector39.co.uk/blog/?p=3006
Conclusion of Literature Review

Recycling and Cultivated Ecosystem

Food Supplies

Food Safety and Health

Permaculture

Human Participation

Agriculture Therapy and Education
# Overview

- **A.** Wheat Street Garden, Atlanta, GA, USA
- **B.** Patch City Farm, Atlanta, GA, USA
- **C.** Art on the Farm, Chicago, IL, USA
- **D.** Iron Street Urban Farm, Kansas City, KS, USA
- **E.** Juniper Gardening Training Farm, Kansas City, KS, USA
- **F.** Growing Power, Milwaukee, WI, USA
- **G.** City Repair, Portland, OR, USA
- **H.** Los Angeles Eco Village, Los Angeles, CA, USA

# Criteria

<table>
<thead>
<tr>
<th>Locality</th>
<th>Experience</th>
<th>Economy</th>
<th>Health</th>
<th>Community Engagement</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant</td>
<td>Physical</td>
<td>Food</td>
<td>Human</td>
<td>Multi-ages</td>
<td>Recycle</td>
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<tr>
<td>Culture</td>
<td>Psychological</td>
<td>Market</td>
<td>Flora</td>
<td>Resident Participation</td>
<td>Energy</td>
</tr>
<tr>
<td>History</td>
<td>Educational</td>
<td>Stimulating Local Economy</td>
<td>Fauna</td>
<td>Access</td>
<td></td>
</tr>
</tbody>
</table>

---

dailycoloringpages.com
Wheat Street Garden

- Location: Atlanta, Georgia, USA
- Type: Urban Farm
- Size: 4 acre
- Year: 2011
- Emphasis: Economy

Patch City Farm

- Year: 2011
- Size: 1.5 acre
- Type: Urban Farm
- Location: Atlanta, Georgia, USA
Iron Street Urban Farm

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Size</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago, Illinois, USA</td>
<td>Urban Farm</td>
<td>7 acres</td>
<td>2010</td>
</tr>
</tbody>
</table>

Emphasis: Economy

Art on the Farm

<table>
<thead>
<tr>
<th>Year</th>
<th>Size</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>2 acres</td>
<td>Art Farm</td>
<td>Chicago, Illinois, USA</td>
</tr>
</tbody>
</table>
Growing Power

Location: Milwaukee, Wisconsin, USA
Type: Urban Farm
Size: 2 acres
Year: 1993

Emphasis: Resources

Juniper Gardening
Training Farm

Location: Knasas City, Kansas, USA
Type: Urban, Training Farm
Year: 2010
Size: 8 acres
<table>
<thead>
<tr>
<th>City Repair</th>
<th>Location</th>
<th>Type</th>
<th>Size</th>
<th>Year</th>
<th>Emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Portland, Oregon</td>
<td>Placemaking/</td>
<td>Multiple</td>
<td>1996-Present</td>
<td>Experience</td>
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<td></td>
<td></td>
<td>Permaculture</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Los Angeles Eco Village</th>
<th>Year</th>
<th>Size</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1993</td>
<td>11 acres</td>
<td>Eco Village</td>
<td>Los Angeles, California, USA</td>
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</table>
## PERMA-Urban Farm

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Wheat Street Garden</td>
<td>4 acres</td>
<td>1.5 acre</td>
<td>2 acres</td>
<td>7 acres</td>
<td>2 acres</td>
<td>8 acres</td>
<td>11 acres</td>
<td>Multiple</td>
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<tr>
<td>Patch City Farm</td>
<td></td>
<td></td>
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<tr>
<td>Grant Park Art in the Farm</td>
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<tr>
<td>Iron Street Urban Farm</td>
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<td>Growing Power</td>
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<tr>
<td>Juniper Gardening Training Farm</td>
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<td>Los Angeles Eco Village</td>
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<td>City Repair</td>
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<tr>
<td>Training Farm</td>
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<td></td>
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<tr>
<td>Eco Village</td>
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<tr>
<td>Piemaking/Permaculture</td>
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</tr>
</tbody>
</table>

**Legend**
- **Locality**: Yellow
- **Experience**: Orange
- **Economy**: Brown
- **Health**: Turquoise
- **Community Engagement**: Purple
- **Resources**: Green
<table>
<thead>
<tr>
<th>A.</th>
<th>8 cases, with representative photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.</td>
<td>Description of a particular criteria of each case</td>
</tr>
<tr>
<td>C.</td>
<td>6 criteria to evaluate each case</td>
</tr>
<tr>
<td>D.</td>
<td>All the criteria in one case</td>
</tr>
<tr>
<td>E.</td>
<td>Conclusion for each criteria</td>
</tr>
</tbody>
</table>
Site Narrative

The site is along Allene Avenue SW. The south part is Sprite. The northeast edge of the site is along Atlanta Beltline undeveloped parts. Across the road, there are some abandoned factories. Also, there are some industrial areas still in use. Around the site, there are large amounts of communities including multi-family, single family and duplex.
Atlanta—A City Starts as Railway

Timeline

- 1847: Peach Tree—2500 citizens
- 1848: First Homeicide
- 1880s: Inman Park—First Streetcar Suburb
- 1890: West End—First Planned Suburbs
- 1886: Coca-cola
- 1941: Delta Airline
- 1965: MARTA—Transpotation
- 2000: Gentrification
- 2005: Beltline

Google Earth
http://en.wikipedia.org/wiki/Atlanta
CSA--Community Support Agriculture

Farmer managed: A farmer sets up and maintains a CSA, recruits subscribers, and controls management of the CSA.

Shareholder/subscriber: Local residents set up a CSA and hire a farmer to grow crops, shareholders/subscribers control most management.

Farmer-cooperative: Multiple farmers develop a CSA program

Farmer-shareholder cooperative: Farmers and local residents set up and cooperatively manage a CSA.

CARTLANTA--City Recycling Program

Purpose of CARTLANTA

Promotes waste reduction

Recommends new recycling initiatives

Implements existing waste reduction and recycling programs

Educates City employees and the general public about recycling programs and opportunities.

Google Earth
http://www.atlantaga.gov/
ATLANTA BELTLINE

Description
The Atlanta BeltLine is a dynamic and transformative project for Atlanta. Through the development of a new transit system, multi-use trails, greenspace, and affordable housing along a 22-mile loop of historic rail lines that encircle the urban core, the Atlanta BeltLine will better connect our neighborhoods, improve our travel and mobility, spur economic development, and elevate the overall quality of life in the city.
Brownfield Redevelopment
More than 73 acres of brownfields have been remediated or are currently in remediation, including 17 acres at Historic Fourth Ward Park and in portions of the Atlanta BeltLine Corridor along the Eastside Trail.

Protecting Water Resources
Most of the sites that the Atlanta BeltLine is transforming into parks are former industrial and commercial properties. Acres of impervious surfaces are being replaced with grass, playgrounds and other permeable materials allowing for more rainwater percolation and less stormwater runoff.

Organic Landscape
These landscapes require fewer – or no – chemicals, reduce long-term maintenance costs for the City, and enhance opportunities for wildlife.

Native/Naturalized plants
Landscaping in Atlanta BeltLine parks and along trails utilize native or naturalized plants, which require less maintenance and are not invasive because they are conditioned for this climate.

Green Demolition
As existing infrastructure is demolished to clear the way for parks and trails, the Atlanta BeltLine typically diverts more than 90 percent of the resulting debris from landfills.

Alternative Energy
Solar photovoltaic panels at DH Stanton and Historic Fourth Ward Skatepark create power during daylight hours which is sold into the grid and offsets the cost for power needed for equipment and lighting. Low voltage LED lights also used at these parks are dimmed to 50% of output during late night hours, minimizing power consumption.
The site is used to be industrial area, surrounded by single family and other residential areas. With some commercial districts, the site has a appropriate background for future agriculture development.
Circulation

Farmer’s Market
(Atlanta Beltline 2030 Plan)

Possible Connection

Barrier

Atlanta Beltline

Comparatively Limited Access
Incomplete Pedestrian System

Intersection

Vacant Lot

Intersection

Undeveloped Trail

Circulation of Atlanta

The site is along an avenue, which means an easy access for vehicles. However, due to the land properties, pedestrian system may not be completed at the site. It is a problem for designing a walkable urban farm. To attract more users in the future, traffic calming may be needed to slow down the traffic and improve safety factor.
History and Visual

Time: 2014.11

Site Area: 3.8 acres

Purposes:

To establish and cultivate the first urban farm along the Atlanta BeltLine, utilizing sustainable, organic based farming practices and implementing sound market strategies, creating the first link in a viable network of farms along the corridor.

To improve access to locally grown fresh produce for surrounding communities and improve formerly vacant and underutilized properties throughout the Atlanta BeltLine corridor for the purpose of Urban Agriculture.

The site used to be a pallet assembly facility and a bus repair facility, but with the help of major funding from the Atlanta BeltLine Partnership, the site was cleaned and prepared to eventually host a variety of species of fruits, vegetables, trees, grasses, bushes and edible berries. The street views indicates that area is almost abandoned and needs some vitality to revitalize the region. The drainage basin is a graphic limit when designing. The slope from the site to the Beltline is an opportunity but also a problem that needs consideration.
Climate

The city of Atlanta enjoys a mild climate throughout the year. Visitors to Atlanta in the springtime will enjoy warm weather and a fairly dry season. In summer, visitors to Atlanta experience warm and humid weather. Winter in Atlanta runs from November through to March. December through April can see wet weather and a chilly climate.

Hot season / summer is in May, June, July, August and September. Rainy season: February, June, July, August and September. On average, the warmest month is July. On average, the coolest month is January. August is the wettest month. November is the driest month.

Temperature

Rainy Days

Precipitation

Humidity

Wind Speed

Soil & Vegetation

The Urban Farm was once a contaminated site plagued by erosion and depleted soil. The land has since been remediated, and a cover crop established. Now, our farmers can bring the site up to its full potential as a living, breathing part of southwest Atlanta.

The site used to be a bus repair facility. So all lot of prep-work had to be done. Along with demolishing the existing buildings, concrete, asphalt and underground storage tanks, the soil had to be tested and remediated, and grading work and a cover crop were established.
<table>
<thead>
<tr>
<th>LOCALITY</th>
<th>STRENGTH</th>
<th>WEAKNESS</th>
<th>OPPORTUNITY</th>
<th>THREAT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Soil is appropriate for local plants.</td>
<td>Restructuring site has little connection with history.</td>
<td>A farm shows local culture of the city.</td>
<td>A landuse property that different from surrounding environment.</td>
</tr>
<tr>
<td></td>
<td>Culture and history of the city and industrial area.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXPERIENCE</td>
<td>Topography of the site is a nature resource for human experience.</td>
<td>Deforestation reduce various kinds of experiences.</td>
<td>Various activities provide various experience in one site.</td>
<td>May not satisfy the needs of users.</td>
</tr>
<tr>
<td>ECONOMY</td>
<td>Large amount of residents are potential customers. The site is in food desert of Atlanta.</td>
<td>The site is not adjunct to downtown or core areas. Low-income community</td>
<td>Stimulate local economy in the nearby area.</td>
<td>May have little contricutions to local economy.</td>
</tr>
<tr>
<td>HEALTH</td>
<td>Along Atlanta Beltline, is a part of Green Future Plan.</td>
<td>Vacant site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMUNITY ENGAGEMENT</td>
<td>The site is surrounded by diverse communities. Along an avenue.</td>
<td>Limited access due to private landuse property.</td>
<td>The farm can be a center of communication and development of the surrounding communities.</td>
<td>May result in uneven development.</td>
</tr>
<tr>
<td>RESOURCE</td>
<td>The site has a good sunshine conditions.</td>
<td>No existing recycle system.</td>
<td>An opportunity to create a recycle system on site.</td>
<td>The recycle may have some negative effects.</td>
</tr>
<tr>
<td>Program</td>
<td>CHILDREN</td>
<td>YOUTH</td>
<td>ADULT</td>
<td>SENIOR</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------</td>
<td>---------------------------------</td>
<td>------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td><strong>GATHERING</strong></td>
<td>Gathering with classmates</td>
<td>Gathering with friends, classmates</td>
<td>A center for gathering.</td>
<td>A center for gathering.</td>
</tr>
<tr>
<td><strong>RECREATION</strong></td>
<td>Play Games</td>
<td>Bicycle</td>
<td>Exercise--Jogging, etc</td>
<td>Exercise-- Walking, etc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Play</td>
<td>Relax Meditation</td>
<td>Relax Meditation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Games--Flying disk,etc</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CONSUMPTION</strong></td>
<td>Indirect consumer</td>
<td>Small consumer</td>
<td>Major consumer</td>
<td>Minor consumer</td>
</tr>
<tr>
<td><strong>FARMING</strong></td>
<td>Easy farming activities</td>
<td>Partial farming activities</td>
<td>Major participants</td>
<td>Major participants</td>
</tr>
<tr>
<td><strong>COMMUNICATION</strong></td>
<td>Communicate with playmates</td>
<td>Group communication</td>
<td>Communicate with friends, neighbours Business</td>
<td>Communicate with friends, neighbours</td>
</tr>
<tr>
<td><strong>EDUCATION</strong></td>
<td>Learn about farming</td>
<td>Learn about farming</td>
<td>Learning about farming and marketing</td>
<td>Learning about farming and health</td>
</tr>
</tbody>
</table>
Concept

SUSTAINABILITY
Create a sustainable urban farms that growing with time to improve urban health and urban environment.

SOCIABILITY & COMMUNITY
Create multiple space for social and communicative uses. Involve community as part of the long-term project.

EDUCATION
Provide various educational functions to people of different ages.

LOCALITY
GATHERING

EXPERIENCE
RECREATION

ECONOMY
CONSUMPTION

HEALTH
FARMING

COMMUNITY ENGAGEMENT
COMMUNICATION

RESOURCE
EDUCATION
Concept—Guiding Patterns

Four Circles
- Highway 285
- Atlanta
- Beltline
- Permaculture

Urban Farm

Circle Relationships
- Secant
- Tangent
- No intersect
- Concentric Circles

Design Principles
- Principle 2
  - Social Hub
  - Socialibility
  - Community
  - Green Center
  - Green Future
  - S.S.E

- Principle 1
  - Organic Food Base

- Principle 3
  - Demonstration Center

From culture to nature From education to future
Zoning, Circulation and Nodes

Considering the needs of users, the farm will be divided into four zones, as community, commercial, experience and farming. Zoning is according to the nature and culture conditions of each part of the site. The four zones interact each other to create a multi-function urban farm.

The farm has four main entrances, three are on Allene Avenue, one is on Atlanta Beltline. While there are several secondary entrances on the Beltline to make the site a part of the entire Green Future of Atlanta. A permanent paved road is designed to provide essential supports and emergency situations.

Nodes of different classes are arranged on the site based on topography, users, access and other site conditions. The sphere of influence can cover the whole site and sprawl to areas nearby.
Socialbility & Community Engagement

- Meditation
- Streetscape
- Garden Beds
- Green Gate
- Farmers Market
- Pebble Garden
- Solar Panel Pergola
- Community Garden
- Green Gate
- Multi-function Plaza
- Slope Garden
- Playground
- Rest Space
- Farming Activities
- Topography
- Children Experience
- Connection to Beltline
- Anti-urbanism
Education
Developing Process

Stage 1

Relying on the current transportation system, the site can attract users by walking, bicycling and driving to accumulate users and improve influences in surrounding areas.

Stage 3

Users then can participate in various activities occurring on site, as farming, playing, relaxing, exercising, educating, etc. More and more functions are explored on site to attract more and more people.

Stage 2

Since farming products cannot be produced immediately after planted, the site can attract farmers from other place to selling their productions. And in the future, the farm can be a center for CSA program to provide organic food to residents nearby.

Stage 4

With large amount of multiple users, and development of Atlanta Beltline, the site would become the centre of the area for farming and marketing, social needs and communities and education; and promoting local economy.
Drainage

A nature recycle without pipes. When raining, the water will be directed to drainage basin and gravel paved path to penetrate into ground. When shine, the water itself can inversely support the needs of plants.
Sections of Slope Garden and Art on the Farm
Topography and Experience

S.S.E Analysis

- Slope: 10%
- Slope: 35%
- Slope: <5%

Section 1
- Avenue
- Understory
- Beltline

Section 2
- Avenue
- Slope Garden
- Beltline

Section 3
- Avenue
- Cropland
- Beltline

Closed Space

Semi-Closed Space

Open Space
Entrance Plaza

A multi-functional plaza, the center of the farm, and the green center in the future.
Cropland and Species
Veggie Beds and Recycling

Spring
- Farming Activities
- Education
- Cooperation

Summer
- Communication
- Education
- Recreation

Composting
Nature Recycle

Harvesting

Winter
- Education
- Recreation

Autumn
- Education
- Farming Activities
- Communication
- Cooperation