

**EVOLUTION OF URBAN AGRICULTURE CONCEPT AND
DETERMINATION OF DESIGN CRITERIA**

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**KENTSEL TARIMIN TARİHİ GELİŞİMİ VE KENTSEL TARIM TASARIM
KRİTERLERİNİN BELİRLENMESİ**

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Aileme,

FOREWORD

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ABBREVIATIONS

AFF	: Ankara Ataturk Forest Farm
Agenda21	: UN Conference on Environment and Development, 1992
CCG	: Clinton Community Garden
EIA	: Environmental Impact Assessment
EPA	: Environmental Protection Agency
FAO	: The Food and Agriculture Organization of the United Nations
GDP	: Gross Domestic Product (GSYIH)
IUCN	: International Union for Conservation of Nature
TEMA	:The Turkish Foundation for Combating Soil Erosion, for Reforestation and the protection of Natural Habitats
TOKİ	: Housing Development Administration of Turkey
TUIK	: Turkish Statics Association
UA	: Urban Agriculture
UN	: United Nations
USA	: United States of America
WCED	: World Commission on Environment and Development
WHO	: World Health Organization
WWF	: World Wild Found
WW I	: World War I
WW II	: World War II

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EVOLUTION OF URBAN AGRICULTURE CONCEPT AND DETERMINATION OF DESIGN CRITERIAS

SUMMARY

Urban agriculture has been an indisputable part of cities' historic development and is an important subject to improve sustainability of cities, urban landscapes, and agrarian society. Establishing the urban-rural linkages is a critical endeavor for the quality of life in urban areas.

The purpose of this thesis is to present the historical evolution of different urban agriculture concepts; and to elaborate their design criteria. In addition, it develops a chronological diagram, which shows urban agriculture thresholds through history.

The review of different urban agriculture cases through literature and internet searches highlighted the effects of different eras (eg. World Wars, Industrial Revolution etc.) on urban agriculture. The cases are exclusively analyzed for their size, location, ownership, benefits, and functions in order to define general principles of allotment gardens, community gardens, and city farms. Institutional environment with regards to urban agriculture in Turkey is also analyzed in three sections: public institutions, laws and legislations, NGOs. A

The final outcome is presented in the form of a chronological diagram and a design criteria table of urban agriculture. The findings show that through the history agriculture has played a big role in development of cities. It was the war, crises, and famine through all over the world that contributed agriculture to rise in urban areas as a vital solution. However, the notion has changed its characteristics from being an implicit concept in utopian cities of preindustrial and post war eras to being more exclusive planning and design strategy of the age of sustainability. Despite having many concepts and institutions within the frame of agriculture and environment in Turkey, it is clear that there is elusiveness of authorities in the field of urban agriculture.

Recommendations include; 1- Increasing collaboration between governmental, non-governmental bodies, and individuals, 2- Composing an Urban Agriculture Commission of residents and a city representative, 3- Generating financial support to producers, 4- Raising awareness of how UA contributes to the city's sustainability, 5- Adapting Urban Agriculture Concepts in City Plan and Policy, 6- Conducting a comprehensive review of policy and zoning regulations, 7-Providing access to UA areas, 8-Exploring the possibilities of utilizing degraded and derelict land for urban agriculture, 9-Adapting Permaculture techniques in urban life, and 10-Explore possibilities of urban agriculture on structures.

KENTSEL TARIM İLİŞKİSİNİN TARİHİ GELİŞİMİ VE KENTSEL TARIM TASARIM KRİTERLERİNİN BELİRLENMESİ

ÖZET

Kentsel tarım tarih boyu kentlerin gelişiminde olduğu kadar sürdürülebilir kalkınmasında, peyzajının ve tarım toplumunun gelişmesinde de önemli rol oynamıştır. Kentsel alanların yaşam kalitesinin artırılmasında kent-kırsal ilişkisi kurulması kritik bir önem taşır.

Bu tezin amacı, tarihten bugüne kentsel tarımın geçirdiği evreleri, bulunduğu dönem ile birlikte inceleyerek kronolojik bir gelişim diyagram ortaya çıkarmak ve incelenen örnekler ile literatür çalışmalarından edinilen verilerden yararlanarak kent tarımı konseptlerinin tasarım kriterlerini oluşturmaktır.

Kentsel tarım alanlarının tarih boyunca geçirdikleri etkileşim ve değişimleri ortaya çıkarmak için Dünya Savaşları ve Endüstri Devrimi gibi eşik dönemlerinin kent ölçeğinde etkileri literatür ve örnekler üzerinden incelenmiştir. Parsel bahçelerinin, Topluluk bahçelerinin ve Kent çiftliklerinin tasarım kriterleri örneklerin ‘büyüklük’, ‘konum’, ‘mülkiyet’, ‘yönetim’, ‘fayda’, ve ‘fonksiyon’ özellikleri analiz edilerek oluşturulmuştur. Ayrıca kentsel tarım kapsamında Türkiye’de ki kurumsal çevre üç bölümde incelenmiştir, kamusal yapılar, mevzuat ve yönetmelikler, sivil toplum örgütleri.

Çalışma sonucunda üç temel kentsel tarım konsepti olan parsel bahçeleri, topluluk bahçeleri ve kent çiftlikleri, karakteristikleri ile incelenmiş, tasarım kriterleri ortaya konmuştur. Kent planlaması tarihinde tarım alanlarının önemli bir role sahip olduğu görülmüştür. Tarih boyunca birçok çalışma tarım ve kent ilişkisinin önemini vurgulamış olsa da asıl teşvik edici etken dünya genelinde yaşanan savaş, kriz ve kıtlığın getirdiği yokluk dönemleri olmuştur. Ancak, bu tarım kavramının sanayi öncesi ve savaş sonrası dönemlerdeki ütopyik şehirlerde arka planda kalan karakteri, yeni sürdürülebilirlik çağı ile birlikte daha özel bir planlama ve tasarım stratejisi halini almıştır. Türkiye’de çevre ve tarım ile ilgili pek çok kavram ve kurumun olmasına rağmen, kentsel tarım alanında yönetimsel yetersizlikler olduğu açıktır.

Öneriler; 1- Devlet kurumları, sivil toplum örgütleri ve bireysel katılımcılar arasındaki işbirliğinin artırılması, 2- Yerel halk ve temsilcilerinden oluşan bir KT Komisyonu kurulması, 3- Üreticilere finanssal destek sağlanması, 4- Kentsel tarımın kentin sürdürülebilir kalkınmasındaki etkisi ile ilgili bilinçlendirmenin artırılması, 5- Şehir plan ve politikalarına kentsel tarım konseptlerinin adapte edilmesi, 6- Kapsamlı bir zonlama politikası oluşturulması, 9- Permakültür tekniklerinin kent hayatına entegre edilmesi ve 10- Yapılar üzerinde kentsel tarım olanaklarının keşfedilmesi.

1. INTRODUCTION

Rapid urbanization all around the world became a phenomenon. Estimates indicate a level of urbanization in the world of only %1.6 around 1600s' A. D. UN Habitat (2010) reported, between 1950 and 2010, that humankind has endured its most rapid expansion. The number of urban population grew to %47 in the year 2000, and is expected to grow to 60 percent by the year 2025 (Deelstra and Girardet, 2005). According to United Nations forecasts, by 2050 nearly %80 of the global population will live in cities, up from around %50 today (Matuschke, Ira., 2009). This shift will bring a new set of challenges for city authorities in terms of social, economic, governance, and environmental issues: how to provide the urban population with sufficient food, water, energy, transport, and waste services in a sustainable way.

Considering that by 2030, almost two billion people will inhabit the great urban slums of Africa,, Asia, Latin America, and the Middle-East, the world will face serious environmental and social problems. The increase in the city population also increases the need for public open space. The lack of enough space for public use causes damages human health, and decline in quality of life.

As a critical challenge, the intensive housing system that has been growing in metropolitan areas, are causing an indisputable dilemma for sufficiency of the cities. Dense housing is commonly misperceived as a solution for meeting the growth of urban populations and economies, as well as limiting urban sprawl. Tough, there are close relationships between urban housing density and urban sustainability. Especially, the increase in the city population also increases the requirements while decreasing the percentage of land per capita. As a result of this rapid growth, agricultural lands, open spaces, green areas, recreational areas, and public spaces are leading those, which are degraded. The lack of space causes decline in the quality of life in urban areas, and damages human health. Despite the indisputable damages, the city has to serve to the high population and its demands. If a city' s urban housing density could be adjusted or influenced through some regulations, urban developments could be guided along the right path to meet such needs.

Despite these indisputable damages, the city has to feed the demands of high populations. Thus, urbanization is synonymous with stress on food supplies, waste disposal systems, air pollution, and traffic. As an urgent response for rapid urbanization, urban agriculture is progressing.

According to Mougeot (2000), urban agriculture is the agriculture that is practiced in areas close to urban centers, using primarily urban-based resources to provide the urban population with certain services. In other words, urban agriculture helps reducing urban poverty, and improves the food security of households with a health combination of nature and city life together.

Subsequently, adapting agriculture inside the boundaries of cities reduces the energy that is used for transportation. Growing food close to our living places provides citizens to reach fresh and healthy food directly from the producers. As a result, food miles could be reduced by keeping food production within our neighbourhood instead of driving outside our living places to big buildings of markets that sell packaged or frozen food.

The majority of urban habitants are net food buyers and spent a large part of their income on food. Subsequently, the food crisis causes the vulnerability of the urban poor, and led the food-related conflicts. In addition, urbanization may lead to the development of slums and create a considerable threat to all dimensions of food security. Many cities may be affected by these social, political and environment challenges.

Making food available for urban poor is an important component of urban sustainability. It does not only improve the income of the families in need, but also increases their quality of life, by enabling them to earn additional income, and providing employment. Urban agriculture also provides extra green space for city, and improves the health standards.

With the rising attention for nature, urban agriculture appeared as a system that shows how cities can be transformed from being only consumers of food and other agricultural products into important resource-conserving, health-improving, sustainable generators of these products.

Obviously, cities have been merging nature in their own image for centuries, the only difference now is that industrialization has made food production invisible, increasing the scale of our delusion, and the scale of our destruction. With cities already consuming an estimated 75% of the world's resources, and the number of

people living in them doubled by 2050 (Steel, 2009), we need to stop seeing nature down a one-way telescope. Food is the main vein that connects the city to the countryside, and we must start using it for a vital connection, where you can't have one without the other.

There are actions and movements around the world for increasing the awareness on the linkage between human and nature. The importance of urban agriculture was also mentioned in Our Common Future (World Commission on Environment and Development (WCED, 1987). The need for 'adopting city planning strategies for environmental and social issues', including 'strengthening community based sustainable policies were highlighted in Agenda 21 (United Nations Conference on Environment and Development, 1992).

Although, urban agriculture becomes a hot topic in the public realm, the main problem seems to be the disorders of planning and policy about agriculture, considering the usage of these areas, and lack of serious studies that focus on agricultural land.

Settlement and Urbanization, Specialization Report in the 9th Development Plan for 2007-2013 (Anonymus, 2007), pointed out the absence of urban agriculture concepts in planning system. As a response to the lack of policy and planing about urban agriculture, the report recognised the role of urban agriculture concepts for sustainability in Turkish cities.

"The clarification of the terminology regarding urban agriculture (e.g. allotment gardens, community gardens, and city farms, etc.) and inclusion of the terminology in the planning legend is urgently needed." (Anonymus, 2007, pg. 56).

In order to meet this need, this thesis aims to highlight the historical evolution of urban agriculture and to explain the basic characteristics of three major urban agriculture concepts: allotment gardens, community gardens, city farms.

1.1 Method

The methodology of this thesis relies on an extensive academic and popular literature review, including a systematic review of the most basic sources of urban agriculture along with the publications of Gardening Associations (1700s to 2000s).

The study of Luc J.A Mougeot in 2000, “*Urban agriculture: definition, presence, potentials and risks*” defines the major terminology about urban agriculture, and gives basic information about urban agriculture concepts clearly.

In addition, the book of Andre Viljoen and others, which was published in 2005, “*Continuous Productive Landscapes: Designing Urban Agriculture for Sustainable Cities*” analyses variety urban agriculture activities in city scale with worldwide examples, and historical development of concepts depending on the country, and region.

Besides, Bakker, N., Dubbeling, M., Gündel, S., Sabel-Koschella, U., Zeeuw, H. De, Ruaf, have published the “Growing cities, growing food: urban agriculture on the policy agenda.” in 2005, which consist of variety urban agriculture concepts in detail. This book was beneficial for the concept clarification with the analyses on characteristics of UA from all around the world.

Also, the thesis of Behice Bilgi Solduk, in 2010, was an exclusive study of urban agriculture potential of Istanbul. This thesis is beneficial with its detailed analyses about agriculture implementation in urban areas.

Through literature and internet searches, the review of different urban agriculture cases highlighted the effects of different eras (e.g. World Wars, and Industrial Revolution etc.) on urban agriculture: the outcome is a chronological diagram.

Even though, there exist variations of urban agriculture concepts, this thesis features on three major concepts: allotment gardens, community gardens, city farms. These concepts are compatible with the urban planning scale, and are umbrella concepts comprising different agricultural opportunities such as rooftop gardens, children city farms etc.

The characteristics of aforementioned concepts are elaborated based on their size, ownership, management, feature, and purpose by analyzing different cases from all over the world. The outcome of this part is presented in a comparison table.

Institutional environment concerning urban agriculture in Turkey is also analyzed in three sections; public institutions, laws, and regulations, NGOs.

To demonstrate the relationship between the institutional structure, and urban agriculture in Turkey, the ministries and their associated sub-organizations has been analyzed. In this context, an interview with Istanbul Provincial Directorate of Agriculture was conducted to reveal the relevant legislation and information about agricultural studies in the city. The Ministry of Food, Agriculture, and Livestock, and The Ministry of Environment and Urbanism were examined with their corporate structuring such as sub-organizations, and civil society organizations. One of these non-governmental organizations working on protection of ecological balance, and sustainability in cities was the Green House Organization; their staff was also interviewed. Details of their in city projects were obtained. Besides, a Permaculture seminar's notes were studied and two members from The Permaculture Turkey Association were interviewed to gain information about the association. The examples from different cities in Turkey, have been analyzed to reveal the current situation in terms of urban agriculture.

This thesis consists of six sections. Section 1 consists of a general introduction with a brief summary of current problems, and solutions, with the methodology of the study. Section 2 gives information about sustainability, urban agriculture, and permaculture. Section 3 scrutinizes the evolution of urban agriculture, and composes a chronological diagram of thresholds through UA history. Section 4 presents urban agriculture concepts with definitions, criteria, and collection of international cases, and displays makes a concept comparison as a section summary. Section 5 displays the institutional environment with regards to urban agriculture in Turkey, and presents UA examples from different parts of the country. At the last section, conclusions and recommendations are presented.

2. SUSTAINABILITY AND URBAN AGRICULTURE

2.1 Sustainability and Urban Environments

The intend of carrying existing nature resources to future generations, formed the vision of ‘sustainability’ of today. The word sustainability is originated from the Latin word “sustinere” (to maintain, to support, to endure) (Onions, C., T.,1964).

The concept of sustainability was first mentioned in the World Conservation Strategies Report prepared by International Union of Conserrvation of Nature in 1982 (IUCN, 1980). In March 20 1987, the Brundtland Commission of the United Nations stated that sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations General Assembly, 1987). Following the Brundtland Commision, as one of the most important outcomes of Rio World Summit in 1992, Ajenda 21 formed an action plan based on the sustainable development, which is the most comprehensive plan to date outlining necessary actions for sustainable development at local, national and international levels. In 2005, at the world summit, the three pillars of sustainability is structured as environmental, social, and economic.

Subsequently, urban planning and design related professions have influenced by the notion of sustainability. As the concept broadened, the derivatives like livable communities, and sustainable cities occurred. It is obvious that sustainability is not only a term but also a movement, and a life style for creating changes even in complex systems like cities.

Portney (2003), defines a sustainable city as a city that is working hard to promote some operational version of sustainability. According to these definitions, the city also can be self-sufficient as well. Since the cities, especially in the industrialized nations, have a high share of the world’s resource use, energy consumption and environmental pollution. Therefore, serious attention should be given to urban sustainability.

Manning and Beatley stated very clearly in their work (1997, p. 28);

“A sustainable community is a place that seeks to contain the extended urban ‘footprint’ and strives to keep a minimum conversion of natural and urban lands to urban and developed uses”.

‘Ecologic footprint’ is largely expresses the size of environmental impact that effects the earth and its resources.

Especially in metropolitan areas where people consume and waste more compared to rural areas, it is a challenge to keep the ecological footprint smaller. Subsequently, planning to minimize energy, materials and land use consumption, increasing green areas, per capita by integrated open space planning, protecting the integrity of local ecosystems, and striving for economic development that has zero net impact on ecosystems can be designated as sustainable solutions (Rees, 1997).

2.2 Urban Sustainability: The role of urban agriculture

Urban agriculture (UA) seems to be one of the vital solutions for decreasing urban footprint and promoting urban sustainability. “Urban agriculture” is a relatively new term that was popularized in the 1996 United Nations Habitat conference in Istanbul to describe the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities (Butler and Maronek 2002).

Belows (2011), points out that urban agriculture includes production for self-sufficiency, barter, and sale. According to Belows (2011), the location, purpose, and forms of urban agriculture and urban gardening overlap with each other. Distinguishing them is confusing and reflects regional preferences, historical references, and personal choice. With varieties of urban agriculture concepts such as community gardens, allotment gardens, and children farms urban agriculture addresses different types of societies and conditions, as a result, it is much easier to adapt this system to larger areas like cities.

The expression “urban agriculture”, originally refers to agriculture, which occurs within the city in different shapes and sizes, even different dimensions like on the ground, facades, fences, boundaries, and roof gardens (Viljoen, 2005). Furthermore, Muogeot (2000) defines urban agriculture very clearly in his work;

“Urban agriculture is an industry located within (intra-urban) or on the fringe (peri urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-)using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area.”(Mougeot, 2000, p10).

Urban agriculture could occupy any space and any scale in the city, big, small, horizontal, on green field sites, brown field sites, reclaimed roads, spacious planes, meadows, vacant lots or squeezed corners as well as rooftops and balconies (Viljoen, 2005).

The researchers, and practitioners have been focusing on the issue of urban-rural linkages to improve the sustainability of food in urban areas without compromising quality of life. The main reason of focusing on food is that it is the main requirement of our lives. Even our transportation systems and our city designs are shaped according to the access to food. Since this is not a new habit, the obvious signs of food paths could be easily recognized in the old plans and pervititches of the cities. But in todays cities, this path to food is not so clear. Instead of buying fresh vegetables and fruit from the farmers directly, we buy our food from a grocery chain, which sells packet and frozen food.

One of the main aims of urban agriculture, food security has also an important role for cities' future. The Food and Agriculture Organization of the United Nations defines food security as a situation that “exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary need and food preferences for an active and healthy life” (FAO, 1998). This definition comprises four dimensions of food security: availability, stability, safety, and access. The first dimension relates to the general availability of sufficient amounts of food. Food stability requires that food can be accessed at all times. Food safety is linked to the quality of food. If the food can not be consumed without risking major health problems, it is not enough to produce sufficient amounts of food. As the final dimension, access to food, is associated with the resources that an individual or household possesses to obtain food required for a healthy diet (Schmidhuber and Tubiello, 2007). The urban poor struggles with difficulties for accessing food through the formal food supply of the city. Therefore, the distance between food resource and people has a key role in the system of sustainable cities (Mougeot, 2000).

2.2.1 Permaculture as a tool for sustainable environments

With the demand for ecology and food security in cities, permaculture becomes an indisputable part of urban agriculture and sustainability.

Permaculture is a combination of the words “permanent” and “agriculture” (Cruz and Osentowski).

The term "Permanent Agriculture", was first used in 1911 by Franklin Hiram King who was an American agriculture scientist at the University of Wisconsin–Madison. In his work, Hiram King described permanent agriculture as an agriculture that can be sustained indefinitely. The definition was also supported by Australian P. A. Yeomans, who introduced an observation-based approach to land use in Australia in the 1940s.

Howard T. Odum also contributed to the advancement of the permanent agriculture. He focused on system ecology, especially the maximum power principle, which examines the energy of a system and how natural systems tend to maximize the energy embodied in a system. The other early influences in soil, water and energy studies can be seen in 1950s in the works of Alan Chadwick, who has started organic gardening concept, and Paolo Soleri as the creator of Arcosanti in Arizona.

The word 'permaculture', was first used during 1970s by Bill Mollison and David Holmgren, who were influenced by these precedents to emphasize both environmental and cultural aspects of permanent agriculture. Culture here defines not only an agricultural movement but also a change in life style.

Permaculture is not only about organic gardening, sustainable farming, energy efficient building or eco-village development but also is designing, establishing, managing and improving these and all other efforts made by individuals, households and communities towards a sustainable future. The principles are illustrated in Figure 2.1;

Permaculture affirms that nature should be preserved from human affects. According to permaculture, human influence on environments causes vital degradations. Metropolitan cities are the most obvious examples. As solutions this system supports reducing our energy consumption, growing our own food, composting the household waste, using water smartly, and using natural energy sources like sun and wind can create a sustainable future by conserving nature with less environmental footprint.

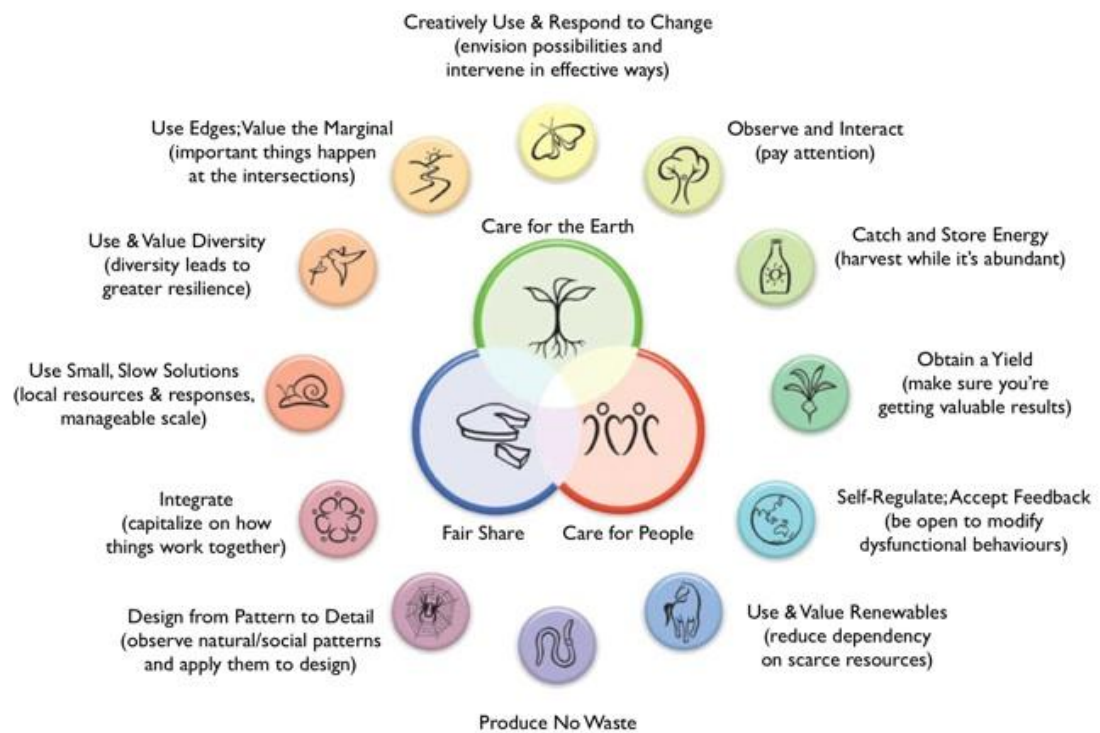


Figure 2.1. : Permaculture flower (Holmgren, 2002)

According to Holmgren 2011, permaculture is a design process streaming from three primary ethics: 1-) Care of People, 2-) Care of Earth, and 3-) Fair Share. Designers use principles derived from ecological thinking to guide the development of everything from gardens, to city government, to global energy systems.

Below, there are twelve principles for applying permaculture (Holmgren, 2002).

- 1) Observe and Interact
- 2) Catch and Store Energy
- 3) Obtain a Yield
- 4) Apply Self Regulation and Accept Feedback
- 5) Use and Value Renewable Resources and Services
- 6) Produce No Waste
- 7) Design from Patterns to Details
- 8) Integrate Rather than Segregate
- 9) Use Small and Slow Solutions
- 10) Use and Value Diversity
- 11) Use Edges and Value the Marginal
- 12) Creatively Use and Respond to Change

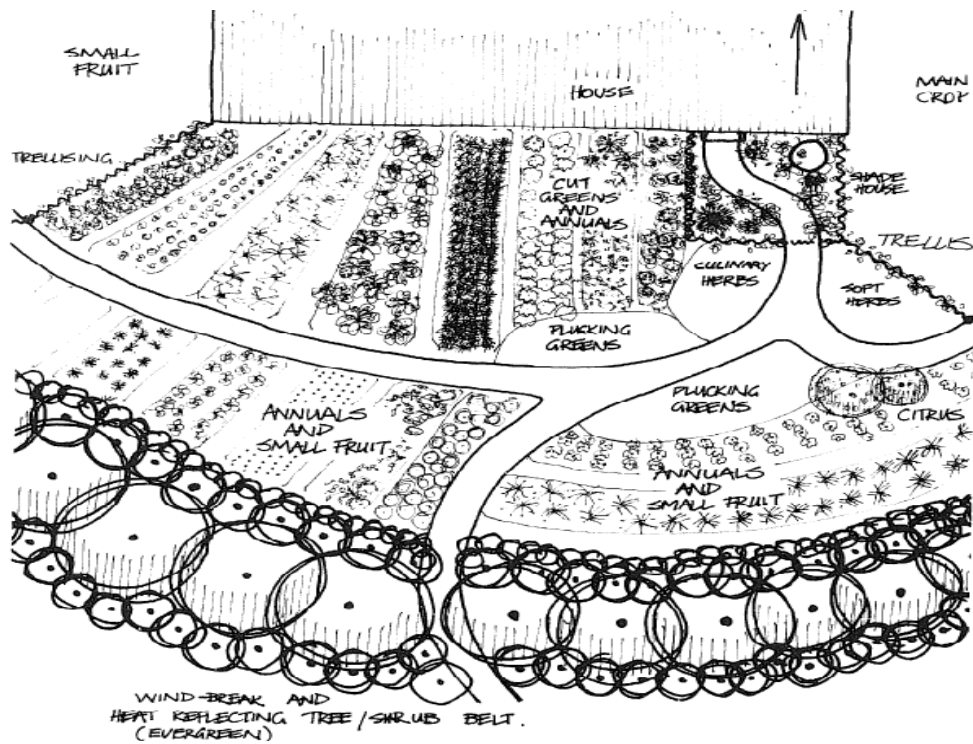


Figure 2.2 : Zone placement out from kitchen door. A permaculture example for a house garden (Mollison, 1979).

The whole key to permaculture is zoning as one of the most important and basic levels in design. Zoning, (distance from centre) is decided on two factors:

- a- The number of times you need to visit the plant, animal or structure;
- b- The number of times the plant, animal or structure needs you to visit it (Mollison, 1979).

For example, on a yearly basis, the poultry shed might be visited: For a fresh lemon 60-100 times a year, but the tree needs visiting only 6-12 times a year (Mollison, 1979). Therefore, the circulation and zoning should be considered carefully for a smarter design in the garden.

When people design for permanence, they go generally toward forests, permanent pastures, lakes and ponds, and non-tillage agriculture. Permaculture is a wide topic itself, but this thesis will examine the basics of permaculture in brief.

Industrial water can be supplied from roofs. Settlements can use that water. There are three ways of water storage. They can be in the soils; we can store it in surface earth tanks, and they can be in sealed catchments. For an agricultural situation, it is better to use the soils, and for domestic situations, earth tanks are more useful.

Mollison also states that 2011, there is no mystery nor any great problems in such common sense design systems. It is a matter of quietly bringing to consciousness the essential factors of passive planning. To restate the basic energy-conserving rules: 0
“No placement without the element (plant, animal or structure) serving at least two or more functions”.

“Every function (water collection, fire protection) served in two or more ways.”

With the foregoing rules, strategies, and criteria that permaculture clarifies, it is hard to go wrong in sustainable design.

As Mollison stated in his master work “introduction to permaculture¹” (1979);

“If one cannot maintain or improve a system one should leave it alone, thus minimizing damage and preserving complexity. If we do not regulate our own numbers and appetites, and the area we occupy, nature will do so for us.”

3. EVOLUTION OF URBAN AGRICULTURE

The historical evolution of urban agriculture can display six distinct eras: Pre-Industrial, Industrial Revolution, World War I, World War II, Post War and The Age of Sustainability (Figure 3.1). Each era is described based on the developments in the social, political, and urbanization context.

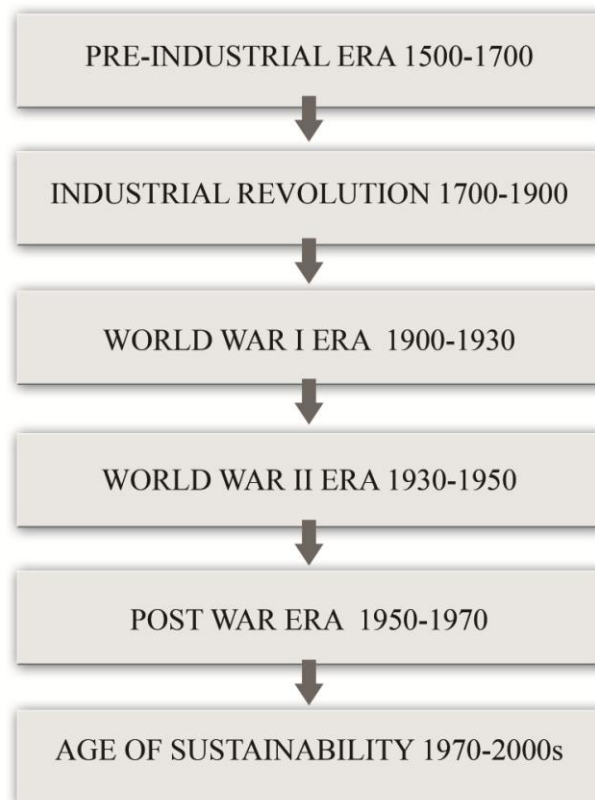


Figure 3.1. : Eras of Urban Agriculture History

3.1 Pre-Indusrty Era, 1500 - 1700

Urban agriculture ideology can be defined with a long history. The transformation of nature to the garden has exerted a long lasting impact on the landscape imagination. It is a journey from rural areas with ornamented farms for feeding sheep and sowing corn to the urban garden.

The lack of high capacity transportation systems and preservation techniques as refrigeration inevitably moved people towards growing food close to their living places. Farming and feeding animals seemed like the only way of access to food.

In 15th century, urban settlements have supplied their food, but the open space for cultivations in the city was precious and small. Therefore, they used a distinct rural area around their boundaries for food production. Tough, cities and towns surrounded with distinct boundaries such as city walls, rivers or other geographic features.

Growing food outside built settlements caused a few supply and transportation problems, though, nearly all European towns and cities did not exceed 30.000 inhabitants living on an average 5 ha urbanized area (Viljoen, A., 2005). As a result, all of the inhabitants lived close to countryside and to their source of food production.

Regarding the importance of food supply, in 16th century the art of eating became a serious matter. “Potager du Roi”, the king’s kitchen garden, at Versailles was one of the good examples of this trend (Figure 3.2). The king was concerned with not only the aesthetics of power but also with the prestige of cuisine. To provide a steady supply for food, Jean Baptiste La Quintinie created a nine-hectare ornamental garden with vegetable parcels and orchards. The protective walls, espalier trees, and green houses satisfy the regal appetite for figs, pees, and strawberries beyond that typical growing season.

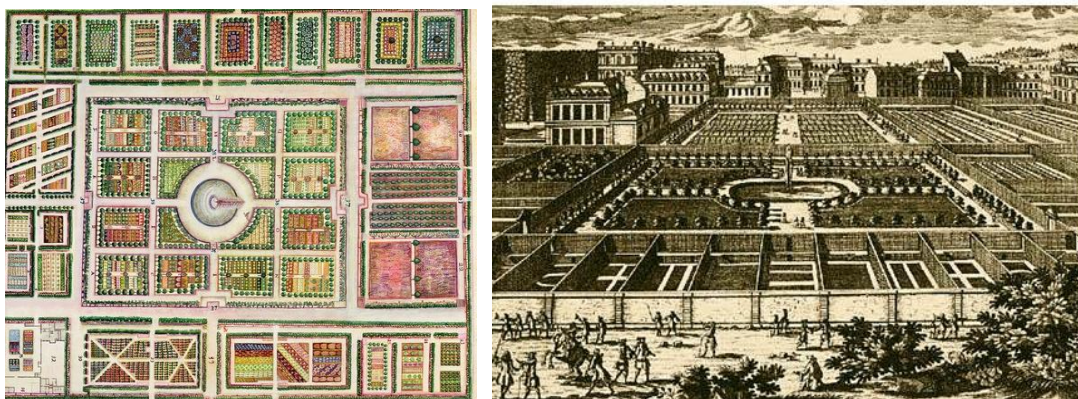


Figure 3.2. : The king’s kitchen garden, at Versailles (Url-23)

With rise of monarchy and feudality, land ownership became more concentrated in the hands of royal families, manorial lords, and churches.

In the late 1500s Elizabeth I, the queen of Britain, let the poor use the common lands for growing food and keeping animals. The main purpose of this attempt was to use the spare land in a more productive way. In compensation, allotments of land became attached to cottages, which are the traditional houses of Britain in those times.

This was the first mention of allotments in England, where the allotment gardens were born (Burchard, 2002).

3.2 Industrial Revolution, 1700 – 1900

Following the 17th century, England was encircled by allotments. The attempts of Elizabeth encouraged the folk to manage allotment gardens around their houses. Tough, the rise in the number of allotments seems to have taken place almost entirely after 1830, since there is no evidence before 1830s.

In 1830s, Whilst St Ann's Allotments in Nottingham, was created, and regarded as one of the oldest allotments sites in England (Savil, 2009). The rise in the number of allotment plots seems to have taken place almost entirely after 1830, since there is no evidence of any sites in the county before 1830s (Burchardt, 2007).

In the pre-industrial world, managing food supply was one of the biggest challenges that cities faced. Food was a difficult material to transport from far away because it was soft and squishy. Therefore, it effectively limited where the cities could be built and how large they could grow.

Other than the transportation problem, urban areas were facing an immigration problem with a population growth in the 17th century. Europe's population reached an estimated 78 million (excluding Russia and the Ottoman Empire), up from 70.2 million in 1550 (Jason, and others, 2006). For accelerating the food transportation to feed the rising populations in urban areas, people started to look for new inventions. In addition, the bourgeois life style and the capitalism indicated the flow of changes in social, economical, and environmental dimensions. Subsequently, people were expecting more from their environments. Following the year 1760, which was accepted as the “eve” of the Industrial Revolution, the vital linkage between urban populations and food production started to fell apart.

The era known as the Industrial Revolution was a period in which fundamental changes occurred in agriculture, textile and metal manufacture, transportation, economic policies and the social structure through all over the world (Montagna, 2011). As the term “revolution” mainly comes from destroying the old manner of doing things, after this new period, everything changed.

With the arrival of the railways (Figure 3.3), along with inventions such as canning and freezing, contrary to old times, it became possible to build cities more or less

anywhere and any size. One important consequence of this was that urban authorities began to loosen their grip on the food supply, relying more and more on commercial companies to feed the urban population. That might have seemed a good idea at the time, but the result today that people are totally reliant on trans-national corporations to feed them, who have no civic responsibility and no interests other than trade (Steel, 2007).

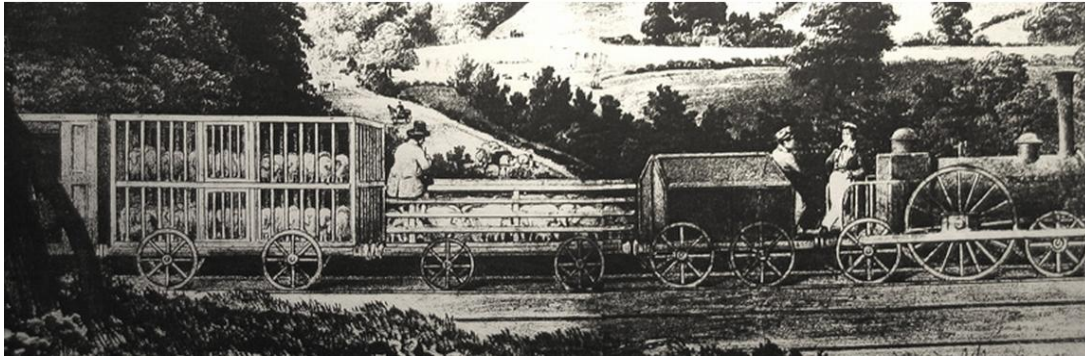


Figure 3.3. : The Great Western Railway (Steel, 2007).

Invention of steam engine and the improvement of railway system brought a different work attitude while the invention of machine caused a big increase in unemployed population. Big companies and factories have taken the place of fieldwork. The production carried outside the cities, so the labor force was carried out too. As a result, people have chosen to move closer areas to factories where they can find work opportunities. Mass housing systems were prepared for workers and their families. Furthermore, companies established different facilities, which look like grey deserts, in their properties including community areas, and markets that will serve only the company workers and their families.

Subsequently, the low qualified living conditions, and health problems occurred. There was limited opportunity for education, and children were expected to work. Employers could pay a child less than an adult even though their productivity was comparable; there was no need for strength to operate an industrial machine, and since the industrial system was completely new there were no experienced adult labourers. This made child labour the labour of choice for manufacturing in the early phases of the Industrial Revolution between the 18th and 19th centuries (Douglas A. Galbi, 1994). The unhealthy living conditions endured by urban factory workers and separation from nature caused a mounting concern through all around Europe.

For responding to the living requirements of larger populations, allotments spread from Britain to other European countries during industrial revolution period. Even though, the allotments originated in Britain, Germany also started applying the concept of cultivating mini allotments attached to living places.

Dr. Daniel Gottlieb Schreber (1806–1861), a Prussian from Leipzig, initiated the garden system as a response to dreadful working conditions. Schreber was the founder of the "Schreber movement", although that term was used only after his death. In 1864, Leipzig school principal Ernst Innozenz Hauschild established the first "Schrebergarten" (allotment garden in German), and he named this association after his late colleague. It was the time of industrialization in Germany. The children of the workers grew up in grey urban deserts with little or no contact to nature. Therefore, Hauschild leased a meadow, and let schoolchildren plant flowers and care for their little plots of land. Soon the whole family cared for the garden.

The first playground called Schreberplatz was opened, following the first Allotment Garden Association in May 1864. At first, the Schreberplatz (Figure 3.4) was a simple meadow. In 1868, the teacher and co-initiator Karl Gesell (1800 – 79) suggested using the site partly to lay out small allotments to teach children gardening. Only one year later, these became allotments for the whole family and subsequently the allotments were built with fences on borders and arbors. That is how the Schrebergarten developed (URL-10).



Figure 3.4. : A “Kleingarten” in Germany, 1850 (Demir, 2007)

At the Schrebergarten, the central meadow was surrounded by trees with play and gymnastic equipments. This part was the imaginative and creative centre of the park. Today the eastern part of the meadow has been restored in the historical style with reconstructed historical play equipment, whereas the western part is now occupied by newer allotments.

It has hosted the German Allotment Museum (the Schreberverein house by architect Carl Fischer), which shows numerous exhibits of the German Kleingarten wesen since 1996. In addition, the owner of the site, which is used by the Dr Schreber Club, is the city of Leipzig (URL-10).

The authorities supported this Schrebergarten movement for several reasons such as promoting public health by making them work in fresh air and making them consume the vegetables and fruits that were grown in the own gardens as in Colony Eden (Figure 3.5). Spending their time with caring for their gardens and enjoying these gardens, the workers would not find any time for political activities. This was a plus for government since Germany was still a monarchical empire and the emperor had forbidden Socialists and Social-Democrats in 1878.



Figure 3.5. : Colony Eden in Germany, 1893, Anarchy and self-help, 1871- 1918, (URL-11).

By 1891 there were 14 associations founded in Leipzig alone, and the initial idea had developed into a movement, that swept over Germany. In the crisis of 19th century, people lost their homes and works. For many of them managing an allotment garden and growing their own food was the only possible form of life. By the time the scale of the settlement with allotments has grown. Following the rising requirement for allotments in 1887 and 1892 required local authorities for the first time to provide allotments for laboring poor. The need for urban allotments became popular during 19th century as the landless poor flooded to great cities.

Among all the concern on healthy living conditions, a model village called “Bournville” was planned in Birmingham, in 1895. This was a good example for ‘back to the land’ tradition. Bournville model village was giving extra attention for the garden. When George Cadbury began building at Bournville in 1895, he was planning to build sustainable communities with good quality houses and gardens for

people of all kinds; with local shops, open spaces and community centers in accessible distance. According to Cadbury, the garden, a feature of such importance in a garden city, should have no less care and attention in the planning than the house itself (Harvey, 1906). In George's case, it was the creation of the world's first planned and balanced community.

Following the Model Villages, the urban agriculture gained more importance. Allotment gardening, and associations spread through Europe such as the allotment gardens in Stockholm in 1895, the Etterstad Kolonihager gardens and Solvang Kolonihager gardens in Norway in 1908, and Naerum allotment gardens in Denmark, in 1948 were established. Especially the Naerum allotment garden by Carl Theodor Sorensen was a unique example with its oval shapes and fingerprint designs (Taylor, 2006).

After the Model Villages, and the rising concern on allotment gardening, Ebenezer Howard's "Garden Cities of Future" was featured in England, in 1898, which focused on urban food growing in general. Garden cities were intended to be planned, self-contained, communities surrounded by "greenbelts" (parks), containing proportionate areas of residences, industry, and agriculture (Lucey, 1973).

Ebenezer Howard who was a 19th century British reformer and city planner, saw new planned towns can balance urban and rural occupations; and include a whole range of amenities as libraries, schools, wide avenues, and mix of commercial and residential zones. Food production within the Howard's garden cities was a key element. In each city, 5/6 of the area was devoted to food production. The residential plots were generous enough to feed a family of five people.

While focusing on the human, Howard aimed to keep a balance between the people's needs and nature. Within the book, he put forward, designs for 'social city', which links the individualist system (capitalism) to the ideas of socialism.

As a response to the socially and naturally critical conditions, the book purposed a realistic and achievable design scheme for development of cities that are in the danger of industrialization. Subsequently a formation of the Garden City Association in 1899 has lead to the "Garden City Movement".

Obviously, the motto of 'Garden Cities of Tomorrow' created a strong influence on urban planning in 20th century, particularly on post World War II. In the history of planning, Ebenezer Howard stands as one of a success, even though, he is not well known compared to other architects and urban planners.

3.3 World War I Era, 1900 - 1930

Even though, the Garden City of Howard could not succeed, other governmental acts raised from Europe such as Allotment Act, in 1887 and Small Holdings and Allotments Act in 1908 in Britain.

Allotments and Cottage Gardens Compensation for Crops Act in 1887 obliged local authorities to provide allotments if there was a demand for them. Allotments were commonly private until this time, but with the growing power and responsibilities of local government, the first allotment legislation established in 1887. The previous allotment act and requirement for municipal provision strengthened in the Small Holdings and Allotments Act in 1908, which was known as the principle piece of legislation governing allotments (Crouch and Ward, 1988). This act has built up the Law, which made allotments available to communities. After this legislation, local authorities were expected to provide allotments. In addition, there were some obligations for local authorities prepared by Verwood Small Holders Association (1908) such as;

- Providing a sufficient number of allotments and letting them to persons residing in its area, if there is a demand for allotments.
- Unless there is land available, the authority could acquire a suitable land through obligatory purchase.
- The authority has to encourage to acquire land for allotments (Anonymous, 1908).

Although, Howard's theories could not reach the whole Europe towns, later then America gave birth to new ideas such as Le Corbusier's work of 'The City of Tomorrow and its Planning' in 1924.

Le Corbusier pointed out that people prefer living in suburbs rather than in cities, and therefore he based his theory of urban planning on the idea that the center should be for public services, and two belts of residential areas should surround it. He defined one of these belts as blocks of dwellings on a cellular system, and the other belt as the outer garden city.

In Corbusier's urban plans, agriculture had an important role. He proposed 150 m² to a communal market which refers to farmers' market of today, for a typical suburban housing plot of 400m² (Viljoen, 2005). Following his studies, he mentioned this sentence in 1971;

“There would be a farmer in charge of every 100 such plots and intensive cultivation would be employed... Orchards lie between the houses and cultivated land” (Corbusier, 1971).

Even though, Corbusier gave extra attention for creating a self-supplied city, he suggested applying the garden city outside as a surrounding belt. However, he speared the city center just for commercial use. As for his Garden City, it is sure that his vision is different from Howard’s. His garden city was to be purely a geometrical kind, and as a difference, he designed the garden cities with curvilinear streets. The building that he purposed to build in the central area would only house for business and commercial use. Residential building would have hanging gardens and look onto parkland. The generalization of his concepts is geometrical in layout, oppose to the trend of industrial standardization, and irregular creativity.

Following all these revolutionary acts, and movements, the world has faced a crucial time period, which influenced almost every culture and civilization. The new inventions and new sectors, brought the need of crude for the industrial production such as coal or petroleum. Owning such underground resources was occurred as a critical requirement for the imperialist powers of the world. Together with the industrial development and colonization, England strengthened its power economically against its biggest rivals in Europe as Germany and Italy, and allied with American forces. With the vision of imperialism and rising concern of acquiring lands, these countries collided with each other, which resulted as one of the deadliest war of the earth (Sander, 1998).

World War I (WW I), also called the First World War or Great War, was centred in Europe that began on 28 July 1914 and lasted until 11 November 1918. More than 9 million combatants were killed, largely because of great technological advances in firepower without corresponding advances in mobility (Willmott, 2003).

During the World War I, blockades caused vital food shortages, which increased the demand for food, so to allotments. The allotments helped ensuring supply in the war (Figure 3.6.). The importance of allotment gardens for food security was so obvious that in 1919, one year after the end of World War I, the first legislation for allotment gardening in Germany was established. It was called "Small Garden and Small-Rent Land Law" and, provided security in land tenure and fixed leasing fees. In 1983, this law was amended by the "Federal Allotment Gardens Act" (Gröning, and Wolschke-Bulmahn, 1995).

The land legislations encouraged the holdings and companies for acquiring lands for allotments. Especially the lands near railway lines were the most suitable lands for allotments, which were not large enough for general agricultural use.

In the years following the WW I countries contended with grave economic difficulties and social problems. There was a decrease in demand for allotments and this combined with increased demand for building land for housing reduced the number of allotments, which would rise again during the World War II.



Figure 3.6. : Refuge among the ruins, 1945-1949 and Allotment gardens in Germany in 1950 (Holmer, 2003).

3.4 World War II, 1930 - 1950

Once again mankind faced the results of ambitions of imperialist powers of the world. The improvements in technology couraged the countries for another military conflict, which resulted as World War II, and lasted from 1939 to 1945 (Sommerville, 2008). This time the pressure of blockades and food shortages were greater than the WWI. Even the cargo ships were used as a war material instead of food transportation, which resulted as vital food shortages.

The Dig for Victory Campaign was created in 1939 by British government due to the prolonged food shortage. As a result, lawns, the formal gardens, even the sports pitches were transformed into allotments. People were encouraged to become gardeners of their own gardens, which were attached to their houses.

The whole Britain's front gardens transformed to private gardens with mini allotments. Furthermore, the moat at the Tower of London was used to grow vegetables. The government also encouraged the people to keep a few chicken or ducks for eggs. Even Hyde Park had its own piggery.

In addition, this was the first time when the importance of educating people about nature was realized. Posters, leaflets, short movies, and radio broadcasts helped to educate communities to show how to grow vegetables, animals, and compost yields. The posters of this campaign are still well known today (Figure 3.7).



Figure 3.7 : Dig for Victory Campaign posters (Url-24).

The War Food Administration published many leaflets showing how to grow fruit and vegetables.

Furthermore, the War Food Administration created a National Victory Garden Program, which set five main goals;

1. Lessen demand on commercial vegetable supplies and thus make more available to the Armed Forces and lend-lease programs
2. Reduce demand on strategic materials used in food processing and canning
3. Ease the burden on railroads transporting war munitions by releasing produce carriers
4. Maintain the vitality and morale of Americans on the home front through the production of nutritious vegetables outdoors
5. Preserve fruit and vegetables for future use when shortages might become worse (Bassett, 1981).

After WWII Victory gardens in squares and public parks continued in all around the world (Figure 3.8).

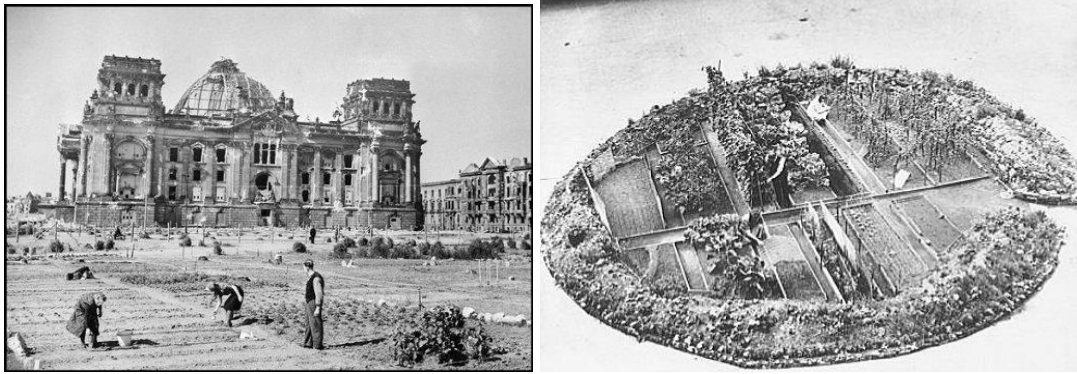


Figure 3.8 : Gardeners fend off starvation in Berlin, 1946, and a crater garden in London, 1943 (Url-25)

Following the recovery methods of Europe, Americans also recognized the benefits and advantages of urban agriculture. Anyhow, the allotments were not just for the poor, who could not find food to feed themselves. The notion of the allotment garden and agriculture in urban areas became popular with its aesthetic, physical and mental benefits. Furthermore, the cult tradition of individual garden plots of Europe, transformed to wider community gardens in America, which formed with the attachment of many allotments together. This time the garden was serving for a larger community instead of serving just an individual or a family. The notion of community gardening not only contributed producing food supply, but also strengthened the social link between people.

Subsequently, following the war shortages, and fear, populations gave extra attention for growing food in cities, and towns. In 1942, about 5.5 million gardeners participated in the war garden effort. The USDA estimated over 20 million garden plots were planted with an estimated 9-10 million pounds of fruit and vegetables grown a year, %44 of the fresh vegetables in the America (Bassett, 1981). In the picture below The Jefferson County community cannery is shown (Figure 3.9). It was a project started by the WPA (Work Projects Administration) in June 1943.



Figure 3.9 : The Jefferson County community cannery, 1943 (Url-22)

3.5 Post War Era, 1950 - 1970

The socio-economic situation was very miserable whole around the world, especially the nutritional status of urban residents was crucial. Many cities were isolated from their rural hinterlands and agricultural products did not reach the city markets anymore or were sold at very high prices at the black markets. Consequently, food production within the city, especially fruit and vegetable production in allotment gardens, became essential for survival. After the war, in the second era of 20th century, small gardens with accomodation became the most desirable dwellings where people could live under a shelter and harvest their own food. The countries, whose economy was based on agriculture and trade, effected mostly from the war.

Once the war ended, Japan was using urban agriculture as an emerging recovery strategy for food shortages, and starvation that the World War brought. War-time conditions went down with the breakdown of the Japanese health service, lack of food, casualties caused by bombings, disruption of family life, heavy labor demands. Decline in the food supply was the major reason for illness and death during the WWII (Lin, 2004). Preceding period of starvation had a great impact on the Japanese people's sense of scarcity so that, every square meter of soil was valuable for cultivation.

Cuba was struggling with the blockade of Soviet Union and suffered 40 years long embargo of United States in 1950s. Besides, the collapse of The Eastern Europe Block, in the early 1990s resulted as social and economic damages on the country (Viljoen, 2005). Obviously, the revolutionary recovery of Cuba is one of the best examples of urban agriculture developments in history.

In 1820s, Cuban agriculture was dominated by sugar and Cuba became the biggest sugar exporter. With the Cuban Revolution in 1959, other agriculture movements supported agrarian culture (Viljoen, 2005). After 1989, the food imports were drastically reduced and agriculture faced a serious crisis. Imports as wheat, and other grains for human consumption dropped by more than 50 percent (Deere, 1992), while other foodstuff declined even more (Rosset, and Benjamin, 1994). The declaration on electricity, fuel, oil, fertilizers, and pesticides caused a vital reduction on food resources in the country. Between 1993-1994 agricultural imports decreased %67 and especially Havana challenged with a serious food shortage. As a result during the years 1991 and 1995 the food supply decreased %60 (Bakker and others,

2005). Even though, there were a few available basic foods such as rice and beans, home gardens offered a free or low priced food supply (Wezel, and Bender, 2003).

For recovering the effects of crisis, Cuba developed a community based strategy that relies on agriculture of the country. This strategy served well to the food requirements of dominantly urban population. With the privation of food crises, urban agriculture improved rapidly.

Consequently, Fidel Castro manifested the vital importance of agriculture and encouraged citizens to grow their food.

“Even one hand span land will be sown” (Fidel Castro).

With this phrase of Castro, even the front garden of Ministry of Agriculture in Havana was cultivated (Bakker and others, 2005).

Havana as the capital city of Cuba, covers % 0,67 (721 km²) of total land of the country. With the rapid growing of the city, population arrived to 2.2 million, which is %20 of the country's population so the density was 3.014 person/km². Besides Havana has a tropic climate which is a coastal climate and its mean degree is 25 °C in the city (Bakker and others, 2005).

At the end of 1980s, the food production in Havana was evolved through the whole city. The production was managed by local commissions and the community gardens were appeared everywhere of the city. In those years, a self response plan ‘autoconsumo’ was carried. Consequently, the local food supply amount was increased, and transportation, cooling, storing requirements were decreased.

Four different agriculture types in Havana were defined with their characteristics. The most obvious differences between these types are their location and sizes. As the area gets bigger, the garden or the farm goes to the peri-urban sites. In core urban areas, the size of agricultural lands are usually 1000-3000 m². According to their purpose, the garden can be located in an educational or commercial areas or private places.

Urban community gardens ‘organoponicos populares’ form the most visible type of urban agriculture, although not the largest by area or total output. They are managed by their operators, and selling vegetables from the farm gate is common (Viljoen, 2005).

The size of urban agriculture sites in Cuba relates both to their location in the city and type of urban agriculture practiced (Table 3.1).

Table 3.1. : Urban agriculture types in Havana (Cruz and Medina, 2003).

	Size	Location	Ownership	Management	Function
City farms for producers consumption 'Autocunsomo'	10.000 m ² or more	Peri-urban		Voluntary cultivation by workers	Feed state workers, support daycare centers, homes for elderly, and facilities for newborn babies
Community gardens (plots) 'Huertos populares' parcela.	Less than 1000 m ²	Urban or peri-urban, vacant lots, unexploited area within educational or health facilities.	State owned or private	One person or family	To supply cultivator or family
Community gardens (intensive cultivation) 'Huertos populares'	Typically between 1000 m ² -3000 m ²	Urban or peri-urban	State owned or private land	One person, family, several families or cooperative	Feed producers and for trade
Urban community garden 'Organoponicos Populares'	Typically between 3000 m ² -5000 m ²	Vacant urban sites, not suitable for direct agriculture use, require imported soil and containers.		Groups of individuals formed into a collective. Institutional technical support.	Produce for trade and small-scale consumption by producers

The size of organoponicos varies depending on site availability and number of people farming them (Viljoen, 2005). Besides, cultivation is manual, and the size of cultivated are in the smallest organoponicos is 500 m² for comparison, a standard allotment site in Britain has an area of 250 m² (Viljoen, 2005).

City farms 'autocunsumos estatales' were similar to urban community gardens 'organoponicos', but were located near factories and other institutions. They used to supply local food needs.

His objection for the demoralizing city that pressures the individual with the concept of rent for land, and traffic invention resulted as one of his master works. He formed this book with the series of essays from the 20th century. He mostly influenced from the Great Depression that occurred right after the Great War (1914-1918). He argued against the dehumanizing conditions of large American cities, and purposed a life for inhabitants in generous spaces, which generated comfort, safety, and productivity.

He proposed to integrate agriculture into the suburban settlements for increasing the productivity of cities. His work and his ideas about agriculture and architecture were as a response to the architecture trend that was coming from Europe, and to the machine age. In addition, the common vision of Corbusier and Wright was the personal transportation that they have purposed in their urban plans. Furthermore, Wright proposed the generative power of landscape concept in 1970;

‘Architecture and acreage (agricultural land) will be seen together as landscape, as was the best in antique architecture, and will become more essential to each other.’

Obviously, Wright was the product of an agrarian society, his interest in architecture possibly fuelled by an early interest in geometry. Contrary to the Garden City of Howard, which was surely traditional, the Broadacre City, was much more radical, and geometric even though, they both focused on the vision of decentralization. In the Garden City Howard mentions about combining the urban and rural though, they are still separate. The urban and rural is next to each other where they are joined in the Broadacre City. Besides, the boundaries and the certain locations of urban and rural were not defined in Wright's study. He mixed the environment in rural and disappeared the center of the city and became a part of it. He proposed hundreds of *homestead* (farms) instead of the compact districts of the Garden City.

Rachel Carson's *Silent Spring* in 1962 has stirred thoughts and believes on human's relationship with nature. In her pioneering book she elaborated environmental problems eloquently and measures needed to be taken. Her words define the relation between human and nature briefly:

“Man is a part of nature, and his war against nature is inevitably a war against himself.”

Surprisingly, the phrase still strongly defines the present environment, nature and human issues. Carson's work has inspired many planning efforts such as Ian McHarg's.

Ian Mc Harg published *Design with Nature* in 1969. Mc Harg, a landscape architect from Scotland, was interested in garden design and believed that homes should be planned and designed with good private garden space. His study supports that soil, climate, hydrology, etc. should be analyzed for defining problems clearly. *Design With Nature* was the first work of its kind to define the problems of modern development and present a methodology or process prescribing compatible solutions (Schnadelbach, 2000).

With its environmental impact assessment, new community development, coastal zone management, brownfields restoration, zoo design, river corridor planning, and ideas about sustainability and regenerative design the book created a respectable impact on different design fields (Steiner, 2004). He mainly argued with the destructive heritage of urban-industrial modernity which he described as 'Dominate and Destroy'(Schnadelbach, 2000). Following the publication of the book, environment based master plans for few cities in America emerged.

The literature and the projects developed in the post war era constructed the base for the actions regarding balancing human and nature relationships. The works in the post war era, also raised the awareness about the next era's key word: sustainability.

3.6 The Age of Sustainability, 1970 – 2000s

In the era after 1970s to the present time, the city has gained more importance in the production of food due to the changes in the consumption patterns of the present day society. Rapid population growth began to drain the limited resources, this occurred as irreversible damages on the environment. Emerging technology, and changing requirements of the living conditions led to the depletion of fossil fuels such as coal, natural gas, and fuel oil (WWFN, 2008). This rapid change has become a global problem with the destruction on environment. The global warming with greenhouse effect, CO₂ emissions, and the rise of water emerged as a global problem. Also, due to increasing housing demands, natural and semi natural lands (e.g. agricultural lands) were converted into high impact developed lands. With the

rapid change in urban life, cities are challenged with different economic, and social problems. Many attempts are made to promote more ecologically sound living such as Allan Chadwig's organic farming and Paolo Soleri's Arcosanti.

Paolo Soleri is an architect who realized the human and technology effects on nature. He designed "Arcosanti" in 1970 (Figure 3.10). This utopian project was built as a prototype city for 5000 people where human and nature linked peacefully. The city was planned to be self sufficient and productive enough, where the artificial resources cooling or warming energy are not required. In this utopian city, unlike the metropolitans that we live in, human needs outlined the base plan instead of cars. Contrary to our consuming cities and metropolises, Arcosanti grows its own food inside the city within a walking distance. Arcosanti is more like a small example of an utopian city that Ebenezer Howard, and F.L. Wright tried to create, and it is still developing.



Figure 3.10 : Arcosanti by Paolo Soleri (Url- 36).

With the small vegetable gardens and orchards, Arcosanti has presented a real case for the application of permanent agriculture which was promoted by Bill Mollison and David Holmgren in 1970s. Starting in a local context, the permaculture soon gained a global acceptance.

According to permaculture, human influence on environments causes vital degradations. Metropolitan cities are the most obvious examples of ecological footprint of mankind. The concept pointed out reducing energy consumption, growing our own food, composting the household waste, water smart design, and using natural energy sources like sun and wind to create a sustainable future and decrease environmental footprint.

In spite of the aforementioned projects and concepts to pursue more ecologically sound development. Environmental problems continued to escalate. This brought

human kind to global scale solutions to balancing social, economic, and environmental needs. Subsequently, the concept of “sustainability” was first mentioned in the World Conservation Strategies Report prepared by International Union of Conservation of Nature in 1982 (IUCN, 1980).

In March 20 1987, the Brundtland Commission of the United Nations stated that sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (United Nations General Assembly, 1987). Following the Brundtland Commission, as one of the most important outcomes of Rio World Summit in 1992, Agenda 21 formed an action plan based on the sustainable development, which is the most comprehensive plan to date outlining necessary actions for sustainable development at local, national and international levels. Moreover, at the world summit in 2005, sustainability was structured with environmental, social, and economic dimensions as the three pillars of sustainability.

As a result of sustainability notion, the urban agriculture, which used to be an auxiliary element of the city as a buffer zone, or a recreational area in the dream cities of Ebenezer Howard, F. L. Wright and Le Corbusier, became the focal point of the plans and projects in this period.

Obviously, the concern about food production with urban agriculture uses in cities had improved the city ecologically, socially, and economically. The first well known global study about this is The Food-Energy Nexus (FEN) by Ignacy Sachs at the United Nations University in 1990. It surprised urban planners, agriculturists and sociologists with the prevalence and similarity of community-based agriculture in many disparate cultures, climates and economies. According to the study by Smith (2002), urban agriculture has developed more rapidly than rural agriculture (Smit, 2002). The individual works of the urban planning and design professionals contributed the development of urban agriculture. Especially, landscape architects had an important role for providing urban agriculture (UA) as a design strategy. Landscape architects uniquely situate a special vision for urban agriculture, and bring back the nature aesthetics into our urban environment. Consequently the notion of Landscape Urbanism was promoted in 90s. Landscape urbanism argues that landscape is the dominant character to design more sustainable cities, yet it has to express the true nature of urban experience. Even tough, the origins of this radical

vision dates back to the postmodern critiques of modernist architecture and planning (Waldheim, 2006), the first event was the Landscape Urbanism conference in 1997, which was held with the speakers Charles Waldheim, Mohsen Mostafavi, James Corner, Alex Wall, and Adriaan Geuze, among others. Then these academicians, and practitioners improved the concept by combining planning, architecture, landscape architecture, and urban design to find better ways to deal with complex urban problems such as population growth, energy consumption, and lack of open space.

Towards the new decade, due to the insufficiency of open urban spaces and increasing urban population, the urban agriculture that we used to see on horizontal plane, has grown in to vertical dimension. We started to witness more of architectural solutions to urban agriculture on structures during 2000s (e.g. facades, roofs, inter-stages of buildings. According to Kain (2009) vertical farms, if designed properly, may eliminate the need to create additional farmland and help create a cleaner environment. Even though the benefits of vertical farming is well elaborated and design projects are generated in different parts of the world. The actual application of these utopian building designs are not yet developed. However, there are few projects worth mentioning such as Lacavore, Dragonfly, and Pyramid farms.

The Lacavore Utopia Project (Figure 3.11) was designed by Work AC with the notion of making cities more sustainable by cutting the miles that food travels (New York Magazine, 2008).



Figure 3.11 : Locavore Fantasia, a proposal for NYC (Url-27).

As another example in New York city, The Dragonfly Vertical Farm Project (Figure 3.12), was designed by Vincent Callebaut Architects from Paris. The project that is modeled after the wings of a dragonfly has an incredible urban farm concept for New York City's Roosevelt Island. It intends to ease the problems of food shortage and to reconnect consumers with producers (Kain, 2009).

The Dragonfly is designed to accomodate 28 different agricultural fields for the production of fruit, vegetables, grains, and meat. With the location in the city center, shipping and its associated environmental impact is anticipated to decrease.



Figure 3.12 : The Dragonfly Vertical Farm by Vincent Callebaut Architects (Kain, 2009).

In addition, gray and black water, along with rainwater will be treated for irrigation use, which will be combined with water recovery systems to collect unused water for use in growing. Environmental conditions will be tightly controlled for each crop, maximizing growth, while minimizing the use of water and nutrients. Waste from plants will be either composted for fertilizer or will be combined with animal waste and used as a fuel within the building. Also, the solar and wind power systems makes the projects concept %100 self sufficient (Kain, 2009).

Another urban farming concepts on structure (Figure 3.13) was envisioned by professors Dickson Despommier of New York's Columbia University and Eric Ellingsen of the Illinois Institute of Technology. The Pyramid Farm aims to grow fruits, and vegetables. In addition it includes a heating and a conversion system that converts sewage into water and carbon to fuel machinery and lighting (Url-28).

The Pyramid Farm is a self-sufficient ecosystem as the other vertical farms, but the difference here is that apart from raising vegetables and fruits indoors, the ecosystem utilizes waste to produce fish and poultry as well.

The design is so efficient that it would just use 10% of the water and five percent of the land needed by farm fields (Url-28).



Figure 3.13 : Pyramid Farm (Url-28).

According to the United Nations population estimates (2010), by 2050, 3 billion people could face starvation. The vertical farms combined with the rooftop agriculture mitigate the problems regarding food production, and waste management in cities all around the world. Observing the most recent urban agriculture examples from the first decade of 21st century it is easy to foresee the implication of these utopian projects in cities in close future.

Through all the historical evolution of urban environments, urban agriculture has developed a respectable improvement. Facing varieties of challenges such as the rapid separation of food and cities, the shortages and famine that came after the wars, created the ‘back to the land’ vision. Subsequently, the awareness influenced the lifestyle in every dimension, from political issues to architecture, and landscape as well. Food, as one of the primary material of humans’ lifecycle, was recognized by communities and governments for the sustainability of urban environments. The notion of urban agriculture became the first strategy for creating self sufficient cities all over the history. However, the notion has changed its characteristics from being an implicit concept in utopian cities of preindustrial and post war eras to being more exclusive planning and design strategy of the age of sustainability.

3.7 Section Summary

Urban agriculture developed through history. The need for food made agriculture valuable for urban sustainability. Although, there are quite a few studies emphasizes the importance of agriculture in cities, it was the war, crises, and famine that escalated the necessity and importance of urban agriculture for quality of living.

As one of the aims of this study, a chronological diagram is created which includes six different eras of thresholds in urban agriculture history (Figure 3.14).

In the early middle ages, the population increase caused changes in urban expansion. Especially England, which is the birthplace of allotments, was an agrarian society with a feudal system. Villagers shared pieces of land around their villages to form their living spaces and cultivated these areas for producing their food. With the population growth, the lack of land occurred as a change in agriculture systems in 16th century and gradually changed this “sharing” approach. Pastoral and mixed farming became attractive. People from aristocracy and successful farmers aggressively defended the vision of privatizing land by moving to a closed field system.

In the pre-industrial world, managing the food supply was the biggest challenge cities faced, and it effectively limited where cities could be built and how large they could grow. The lack of high capacity transportation systems and preservation techniques as refrigeration inevitably moved people towards growing food close to their living places. With the rising requirements for quality of life, people searched for new inventions for a faster progress in machine age. The year 1760 is generally accepted as the “eve” of the Industrial Revolution (machine age). The vital linkage between urban populations and food production largely fell apart after this period. The allotment approach in the UK has begun in this period with the rising industrialization and population growth in urban environments. The desire to enable the urban working classes to feed themselves contributed the rise of allotments.

With the rise in the number of factories and companies, the working class population also increased. The child labor, and unhealthy living and working conditions were other rising situations of this period. Meanwhile, the famine that came with the World Wars caused food shortages. As a response for these conditions allotment gardens in Europe, and community gardens in America have emerged in the 20th century for meeting increasing need for food.

Following the end of the World War I, the concern on allotments were decreased while the demand for building land for housing increased. This situation changed with the World War II, in which the pressure of blockade and food shortages were greater than World War I.

Eras	Thresholds	Affecting Events of The Eras
1970 - 2000s AGE of SUSTAINABILITY	Environmental Awareness	"Vertical Farming" "Landscape Urbanism" "Agenda 21" United Nations Conference on Environment and Development, 1992 "Bruntland Commission" United Nations General Assembly, 1987 "Our Common Future" International Union of Conservation of Nature in 1982 "Arcosanti" by Paolo Soleri 1970 "Organic Gardening" Alan Chadwig
1950 - 1970 POST WAR ERA	Post War Recovery Era	"Design with Nature" Ian Mc Harg 1969 "Silent Spring" Rachel Carson 1969 Green Revolution of Cuba 1950 -1990 'Living City' Frank Loyd Wright 1958
1930 - 1950 WORLD WAR II ERA	World War II. 1939-1945	Seperation of Berlin 1949 The Food and Agriculture Organization of the United Nations, 1945 (FAO) "Dig for Victory Campaigning" 1939
1900 - 1930 WORLD WAR I ERA	World War I. 1924-1918	'The City of Tomorrow and Its Planning' Le Corbusier 1924 Small Garden and Small Land Law-1920 Small Holdings and Allotments Act 1908
1700 - 1900 INDUSTRIAL REVOLUTION	Industrial Revolution 1760 - 1850	'Garden Cities of Future' Ebenezer Howard- 1898 Model Villages Act 1895 Allotment Act 1887 First Allotment Garden Association is established -1864 (allotments were private until here) III. Allotment Movement 1850- 1900s II. Allotment Movement 1830-1850 I. Allotment Movement after the outbreak of War with France 1793-1800
1500 - 1700 PRE-INDUSTRIAL ERA	Dependence between Food and Cities	Translation of the common lands to growing food and animal care areas by Queen Elizabeth 15th century The Norman Conquest, rise of the Land Ownership

Figure 3.14. : Diagram of Thresholds of UA through history

Even public parks were utilized for food production. The famous ‘Dig for Victory’ campaign exhorted and educated the public to produce their own food and save shipping needed for war materials (Url-20).

The post war era was the recovery period from the exhausting consequences of the wars. And yet, it was a fruitful period for constructing a base for environmental awareness. The works of McHarg, Rachel Carson and Frank Lloyd Wright, with the influence of their precedents such as Ebenezer Howard and Corbusier, have changed the perception towards human-nature relationships. .

This shift constructed a conceptual and theoretical background for the next era of urban agriculture after 1970s: the age of sustainability. The rapid improvement of technology, uncontrolled population growth, environmental, social, and economical problems such as green house effect, air pollution, food shortages, and nature degradation pushed design and planning professions to pursue a greener vision to find solutions for a more sustainable future of cities. The notion of urban agriculture was recognized as a prominent strategy for creating self sufficient cities all over the world. Combined with the principles of landscape urbanism, urban agriculture concepts have promoted in horizontal and vertical dimensions.

4. URBAN AGRICULTURE CONCEPTS: DEFINITION, CRITERIA, AND EXAMPLES

4.1 Allotment gardens

“Allotment gardens” refer to a collection of garden plots that lie attached to each other, effectively subdividing a larger piece of land that is dedicated to gardens. Ideally, an allotment garden is located in the neighborhood of those who manage it. This, however, differs greatly by location. An allotment might serve a family, a schoolroom, other individual or group. Generally, allotments’ first purpose is to provide for household consumption, as well as sharing and bartering. As a matter of policy, gardeners might or might not be encouraged or allowed to sell their produce (Bellows, 2011).

Allotments are small tracts of land generally rented from a local authority usually managed by an individual, a family or a small group of friends. Their size and the dedication of their use vary drastically according to the context and country in which they are found (Bellows, 2011). In allotment gardens, the parcels are cultivated individually (Mac Nair, 2002).

Generally, an allotment garden association organizes individuals for managing the allotment garden, so the individuals suppose to pay a small membership fee to the association (Drescher, 2006).

Nonetheless, residents of the city or people, who are employed in the city, are qualified to apply for allotment garden use if they can pay an amount of money as a rent, grow plants effectively, and will not use the allotment for commercial purposes.

As observed in the third section of this thesis, Allotment gardens have older history, which originated in Britain in 17th century as a response to the privatization of land (Brunel, 2003). After, they spread through all around Europe as the first allotment garden of Sweden was established in Malmö in 1895, followed by Stockholm in 1904. The local authorities were inspired by Anna Lindhagen, a social-democratic leader, who visited allotment gardens in Copenhagen and was delighted by them

(Lindhagen, 1916). In her first book on the topic devoted to the usefulness of allotment gardens she wrote:

“For the family, the plot of land is a uniting bond, where all family members can meet in shared work and leisure. The family father, tired with the cramped space at home, may rejoice in taking care of his family in the open air, and feel responsible if the little plot of earth bestows a very special interest upon life.” (Lindhagen, 1916.)

As one of the unique examples of allotment gardens, Nærum Allotment Garden in Denmark is considered as one of master works of Carl Theodor Sorensen's, which were established in 1948. 40 oval allotment gardens, each measuring $25 \times 15 \text{ m}^2$, were designed on a rolling lawn. The individual garden plots are enclosed compartments surrounded by hedges (Figure 4.1); their cottages may be situated in different ways, but fit the overall plan. The oval shape lies across the curves of the slope. This use of the rolling terrain, combined with the sweeps and curves of the hedges that highlights the dynamic impression (Taylor, 2006).



Figure 4.1 : Hedges of Naerum allotment gardens (Url-12).

As the most significant characteristics of the gardens, the hedges were originally intended to be both clipped and unclipped, using species as hornbeam, hawthorn, privet, and roses, but today there are mostly privet and hawthorn, clipped in different heights and forms.

Furthermore, each owner designed the individual plots, with the guidance of an assistant from Sorensen who showed various models. The allotment gardens situated close to a large public housing scheme, with flats and terraced houses, characterized by its homogeneous look and red hipped roofs (Figure 4.2). Therefore, Sorensen landscaped the green area here too.



Figure 4.2 : Denmark's oval allotment gardens (Url-12).

The allotment gardens in Naerum (Figure 4.3), were designed as a fingerprint to define the combination between topography and landscape.

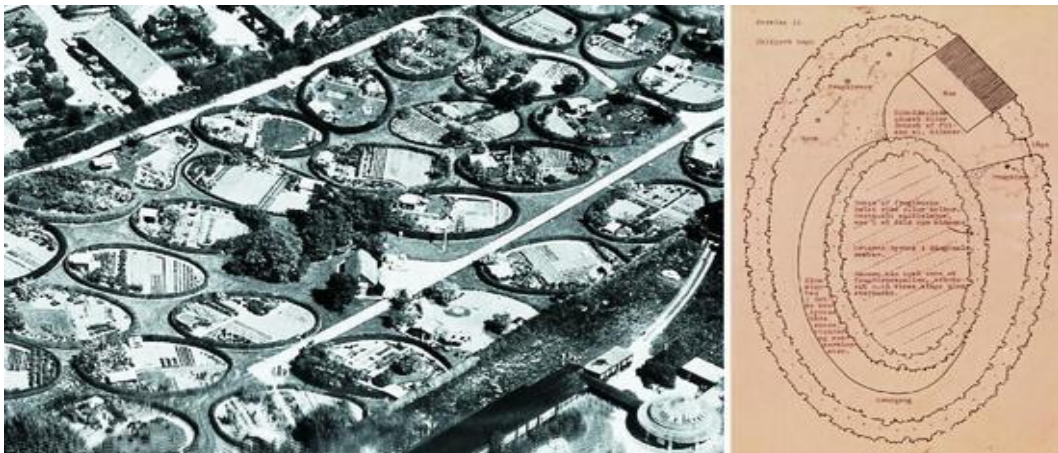


Figure 4.3 : Naerum allotment gardens , 1948 (Url-12).

Another example of allotment gardens was the Etterstad Kolonihager in Norway (Figure 4.4), which dates back to 1908, where the largest one is Solvang Kolonihager in Oslo, which has around 600 allotments and close to the woods and Sognsvann lake.



Figure 4.4 : Etterstad Kolonihager:The oldest allotment garden in Norway (Url-15).

The Solvang Allotment gardens are divided into five parts, which include minimum forty-five maximum a hundred and fifty-three parcels inside. Song Garden Colony leads these gardens with two hundred and four parcel (Figure 4.5).



Figure 4.5 : The largest allotment gardens in Norway: Solvang Kolonihager in Oslo (URL-16).

Contrary to Solvang, in the allotment garden on Käferberg hill in Zürich, Switzerland (Figure 4.6), the parcels typically range in size from 200 and 400 square meters each and often include a structure (tiny house) for tool storage and shelter. To provide governance, member associations are formed to manage plot assignment and the collection of fees for leasing the land and common maintenance.



Figure 4.6 : Typical allotment garden on Käferberg hill in Zürich, Switzerland (Url-13).

With a deep background history urban agriculture survived until today with a growing generation through the world. It is possible to see the applied and ongoing examples around. The Kauswagen allotment Garden in Philippines is one of them.

With the foundation from Europe Aid's AsiaUrbs Programme the project is being implemented in Cagayan de Oro, Southern Philippines, to establish four pilot allotment gardens in different parts of the city.

In Kauswagan Allotment Garden (Figure 4.7) in Cagayan de Oro, the size of each family unit is 20 m x 20 m (400 m²) consisting of eight beds planted to vegetables of different botanical families. The design of a pilot Barangay allotment garden consists of eight individual family units having a net total area of 3,200 m² and a gross total area of 4,000 m². The area is fenced, and has an entrance, a tool shed, a nursery, and water supply (for which the additional 800 m² is used. One important aspect of the allotment garden is the compost heap for the biodegradable household wastes. The compost heap thus links the allotment garden with the integrated solid waste management component of the pilot area. More than 50 % of the household waste in Cagayan de Oro is biodegradable, and its conversion into compost and safe application in the allotment garden significantly reduces the residual waste to be dumped at the controlled city landfill (Holmer, and others, 2003).



Figure 4.7 : Kauswagan Allotment Garden, Cagayan de Oro, Philippines (Url-16).

Japanese cities were also short of available land for agriculture, the suburban converted from farming to urban uses. As a result, fragmented urban landscapes with residual pockets of agriculture formed (Wiltshire, and Azuma, 2000). Urban people started to combine agriculture with urban facilities, and characterized agriculture as a solution for environmental issues in urban life. Hanaten Sewage Treatment Plant Ground is one of the good examples for this urban vision with its smart allotment garden solution over the roof of a treatment plant (Figure 4.8).

The project is located in Joto Ward, Nagata, Japan, and the total area of the project is approximately 14.000m². The construction of overhead facilities in Hanaten Sewage Treatment Plant Ground was commenced in year 2001 (Oono, 2005). The overhead space that consist of multipurpose ground, sports area were not attracting people around, so with the participation of citizens the aspect of an allotment garden in this region was figured out (Figure 4.10). The main purpose of the project was constructing a new shed over the sewage treatment facilities at Hanaten Sewage Treatment Plant (Oono, 2005).

Nonetheless, the project consists of a 1.500 m² lawn square, 1.400m² promenade, 4.700m² garden area, 1.400m² parking area, and 5.000m² allotment garden area. Also the allotment garden includes 153 allotments, 20 m² per each (Figure 4.11).

The allotment garden includes 153 allotments, which has 20 m² for each, and the total area of the allotment garden is 5000 m². Besides, running water, shared warehouse for gardening tools, dump yard, flush toilets, and benches are provided for user convenience (Oono, 2005).

Since the conditions were not suitable for every kind of activity over the roof construction, the availability of the area was considered carefully. The loan capacity was low, because the project area was planned over the sewage facility. The construction was influenced by the 'Chishima Sewage Treatment Plant' that used the overhead space as a tennis court, but this project figured allotment gardens as a original idea instead. In addition, this idea was a response to citizens' need for a place to experience vegetable growing.



Figure 4.8 : Hanaten Sewage Treatment Plant. (Url-18).

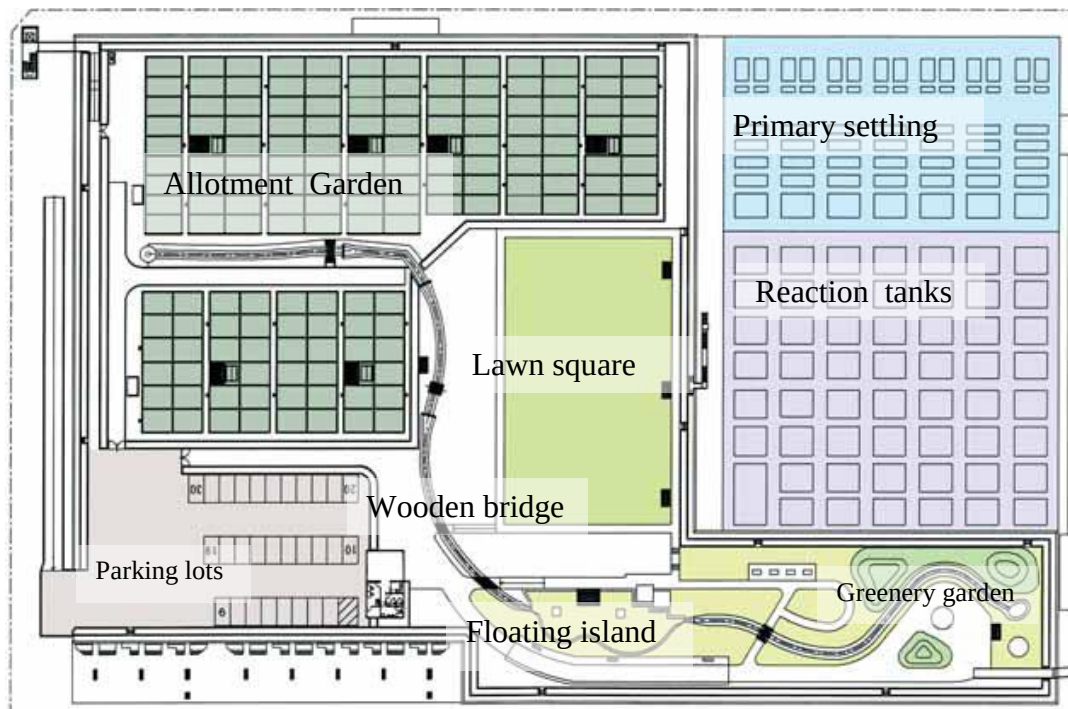


Figure 4.9 : General plan of Hanaten Sewage Treatment Plant over facilities (Oono, 2006).



Figure 4.10 : Hanaten Sewage Treatment, full view, after completion (Oono, 2006).

It is possible to explain the difference of roof gardens and allotment gardens at this point. Creating green areas is possible on roof gardens as well, but allotment gardens are for harvesting flowers, and growing vegetables at the same time. On the other hand, since this allotment garden was build on a roof, the soil weight and drainage was considered carefully (Figure 4.11).



Figure 4.11 : The view of the allotments, before and after harvest (Oono, 2006)

Artificial and decomposed soil is used in the allotments (Figure 4.12). And the deepness of the allotment varies from 50 – 60 cm (Oono, 2005).

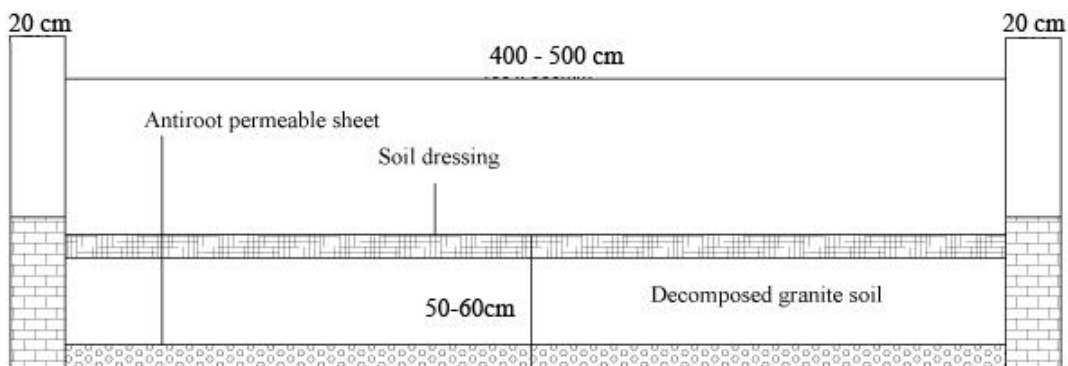


Figure 4.12 : Cross section of a roof allotment

Individual users of the allotment garden are responsible of maintaining and managing, except for paying the water bills, trash disposals, hedge trimming, and pest controlling. On the other hand, every individual has to pay a fee for the time period that they used the parcel. The working hours also varies depending on the individual holder. Every allotment garden owner has a key so he can decide working hours by himself. The other facilities like garden and lawn area are open for public.

Together with the observations from worldwide examples, and literature reviews, the benefits of allotment gardening, and the characteristics of allotment gardens were formed.

4.1.1.1 The benefits of allotments

- Give direct access to fresh fruit and vegetables, local food production,
- Contribute to green areas in cities,
- Waste recycling,
- Contribution to wildlife,

- Relaxed social activities within a community,
- Physical exercise at low cost and accessible to many people who are not involved with active sports (Wiltshire, and Azuma, 2000).

It is possible to make a longer list of benefits, but mainly the aim of allotments is the food security and sustainability in urban areas. Nevertheless, governments must recognize that allotments can generate benefits not just for plot holders but also for the wider community.

4.1.1.2 Allotment Garden Criteria

With its small cottages, and vegetable beds, allotment gardens provide city people to experience rural life. In other words, allotment gardens combine rural life and city life. They are mostly placed around living quarters in urban areas, where the people can reach easily. Some of them were also placed on polluted lands because they were cheap and available, which was the point when allotments started.

If an allotment is municipality-owned it will be rented, which is cheaper. It could also be a co-operative association where each gardener owns a share of the land, which is expensive (Damin, and Palmer, 2002). The basic price for an allotment garden changes depending on the region. In addition, the quality, age, and size of the house, as well as the garden plants and any remaining furniture help to determine the price. Along with relaxing, gardening is the most common activity. The approaches of allotment gardening seem to be very diverse. Some residents focus on mixed flowers, vegetables, shrubs and trees as well as bedded plants (Damin, and Palmer, 2002). Besides, there is not a specific shape or form of allotments though, geometric, uniform plots are similar to most allotment gardens. The one exception is the Round Gardens in Naerum, which were designed specially.

Common standards of allotment gardens are formed according to the international cases that were examined in this thesis. However, the characteristics may change depending on the region, and local authorities. Most basically the dominant characteristics were chosen for defining allotment gardens.

- Allotments cover apprx. 250m² and the total area of allotments can reach up to 1000m² at total.
- Water and electricity resources should be accessible for a healthy irrigation system and lightning system.

- Allotments should be designed for an individual or family use.
- A reasonable circulation for pedestrians between allotments is vitally important.
- Storage for equipments such as a wooden house or cottage, and a composting area is necessary to use the waste as nutrition for plants and vegetables.
- Using hedges or wooden fences would be better to define the boundaries of the garden. Although, the boundaries should match with the other allotments, the individual can design the inside of the allotment by himself.
- Instead of growing woody plants or high rise trees, planting succulents, annual, perennial flowers, and vegetables are more suitable for allotment gardens.

4.1.2 Community gardens

“Community gardens” refer to land that might be subdivided into allotments, where the garden plots, trees, or fruit bushes often produce something available to all, who participate in the garden. A community garden might also grow for domestic use, sharing, bartering, or sale (Bellows, 2011).

Also many of these gardens provide a wide variety of social, recreational, educational and environmental services, facilities and opportunities that are generated by local needs. The main driving force behind their creation, and the key to their success, is that through community gardens local people make a positive contribution to regenerating their communities.

These gardens can be held in a public or private land. They are open to public and dependent upon the lease agreements with the park management or the community garden membership. Opened or closed gate policies of them changes according to the region. There is not a specific model, which can be used in every country for community gardens, however; providing green space in urban areas, creating opportunities for social gatherings, beautification, education and recreation are their common characteristics.

Community gardens are managed with the participation of gardeners (gardeners are citizens here), and general public rather than a professional staff (Figure 4.13).. They encourage an urban community’s food security, and decrease the reliance on fossil

fuels for transport of food from large agricultural areas and reduce the society's use of fossil fuels to drive in agricultural machinery. This is countable as big step for energy consumption in cities.



Figure 4.13 : Zenda Community Garden and, La Finquita community garden(Url-8)

Although, it sounds like a new approach in some developing countries, it has been a tradition for a long time but with varieties of names instead of ‘community garden’. In Germany, it was called, the arbeitgarten, schrebergarten, and now it is Kleingarten. In England, it was called hobby garden, guinea garden and allotment garden. In United States, it was street garden and finally community garden. In Turkey, it was known as ‘kent bahçesi’, ‘halk bahçesi’, ‘hobi bahçesi’.

Even tough, the history of allotment gardens dates back to England of 17th century, the first community gardens were established in America during the post-war recovery era.

Liz Christy Community Garden, is one of the oldest community garden in New York City founded in 1973 (Figure 4.14). Liz Christy Community Garden refers to the inventor of this garden, who was an activist citizen.

The creation of the garden was started with Liz Christy but other local volunteers supported the development. As all community gardens, Liz Christy Garden also belongs to everyone, and lives with participation of people who visits and supports the garden. Besides, it is the first winner of the American Forestry Association's Urban Forestry Award.

As seen in the master plan of the garden (Figure 4.16) the raised beds were planted with vegetables, and the garden is shaped with trees and herbaceous borders. At the end of the garden there is another gate next to the compost area.



Figure 4.14 : Liz Christy Garden in New York, 1973 (Url-19).



Figure 4.15 : Liz Christy Community Garden Bowery entrance, 2011. (Url-19).

As the garden hosts the native plants, it also preserves wildlife, and creates a place for city animals. The turtle pond also creates a habitat for water animals. Next to the pond there is the Grape Arbor and Bee Hive.

The entrance to the garden links Bowery to Houston Street with a small path. On the bottom left of the plan there is a hidden bench where people stop by and have a rest. Also the boundaries are made of transparent fence that people can see through.

The Clinton Community Garden is another influential example from United States. It is located on West 48th Street in Manhattan between 9th and 10th avenues. With the area of 1.400 m² of land, the garden includes flowering pods, plots, and also serves the community for special gatherings. It is managed with the support of the gardeners and volunteers. One of the most significant characteristics of the garden is composting. Again a group of volunteers collects fruit and veggie food scraps as well as egg shells, loose tea (remove from tea bag), and coffee grounds from their neighborhood. At first the land was under the Housing Department of New York and then it was transferred to New York City's Parks and Recreation in 1984.

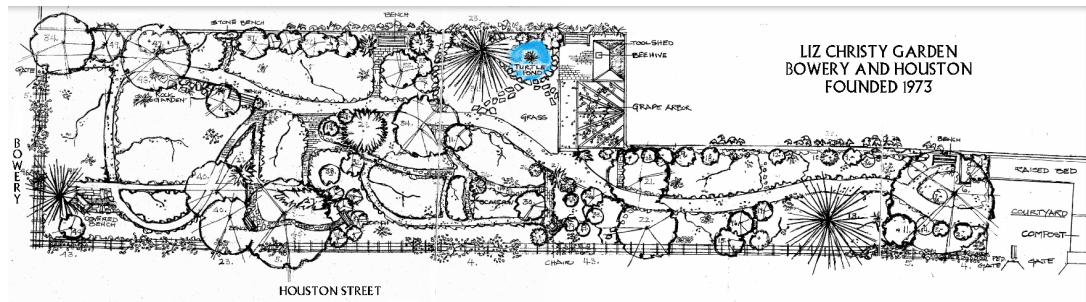


Figure 4.16. : Liz Christy Community Garden Site Map (Url-19)

The garden is planted with flowers, vegetables and fruits. The garden consists of two section; The Front Garden, and the Back Garden. According to this, the front garden is open to public, but as usual in community gardens people are expected to be respectful for the garden rules.

In addition, the garden includes a wide lawn inside (Figure 4.17) as well as the flower beds which creates the identity of the garden.



Figure 4.17 : The view of the lawn in Clinton Community Garden (CCG archive, 2010).

Against the front fence are beds influenced by Japanese gardening methods. East of the front gate is a sun and shade garden and a rock garden. Distinctive beds float on the lawn, surround the grape arbor and the magnolia tree, and line the brick walkways. Under the spruce tree is a special children's area.

According to the plant list that is given in the official site of Clinton Community Garden, the native plants were preferred. It is also possible to see familiar plants though. Since the garden is a street garden, the plants were chosen carefully by considering their resistance to the heavy urban atmosphere.

In addition, the rotation of the plants through the seasons are considered. As a results, the garden shows a perfect image in every time of the year.

The planting design principles shaped the main lines of the garden. The front beds include an herb garden along the east fence, and a honeybee colony. Against the front fence are beds influenced by Japanese gardening methods (Figure 4.18). East of the front gate is a sun and shade garden and a rock garden. Distinctive beds surround the grape arbor and the magnolia tree, and line the brick walkways. In addition, there is a special children's area under the spruce tree.

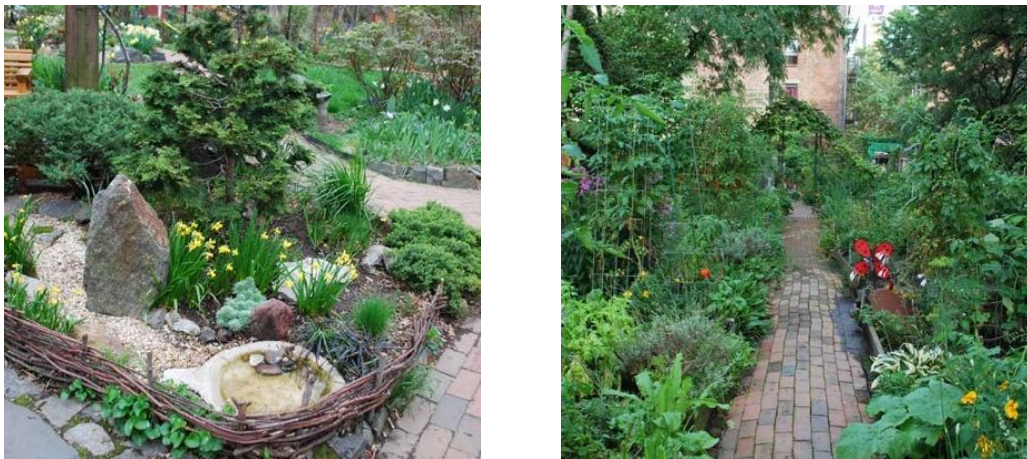


Figure 4.18. : Dwarf *Hinoki* cypresses, and a pathway through the garden (CCG archive).

Besides America, community gardening spread through other countries such as Spain. Can Masde Community garden was established as a community garden, social center, and residence in Barcelona in 2002. The area for the garden covers 10000m² area. It holds social activities related to ecology, activism, and self sufficiency. Every week 100 or 300 visitors participates these activities (Cordingley, 2008).

The garden is self sufficient in energy, food, and water. The garden hosts a bike shop, and also a local shop for customers. Baked bread, and fresh vegetables from the garden are sold here.

There is also a space for schoolchildren for meeting and performances. As education, community contribution has an important role in the creation of the garden (Figure 4.19). The work in the garden and in the common house is shared between volunteer locals (Cordingley, 2008).



Figure 4. 19. : Lunch and dinner is communal in Can Masde Community Garden (Cordingley, 2008)

Not likely as in developed countries, the community gardens in Taipei sprouted too fast, and operated outside the official urban control. These gardens present a platform for anarchy through gardening, which means that they haven't waited for instructions or official permission. For a healthy future of Taipei, the network of these gardens provide a positive social and ecological development (Figure 4.20). The community gardens usually took place on abandoned construction sites or ruined housing areas, where the ownership issues are unsettled. They are turning the industrial city towards the organic, and ancient. In other words they are serving for an organic revolution in the industrial city (Casagrande, 2010).



Figure 4.20 : 101 community garden in-between Taipei 101 and World Trade Center (Url-8).

4.1.2.1 The benefits of community gardens

- Increase the amount of Local food, decreases food miles,
- Contribute green areas in city,

- Nature conservation, wildlife preservation,
- Give education about nature, and growing vegetables,
- Social inclusion, creating a sense of stewardship among neighbors,
- Improve environmental and public health,
- Host sport activities.

4.1.2.2 Community garden criteria

- The garden area should include separate parcels of allotment gardens up to 10 ha area,
- The water and electricity resources should be accessible,
- The gardens should be designed for a community use not only a family or individual use,
- Cautions should be taken for car entrance to the garden if permitted,
- The pedestrian circulation should be suitable and the hard landscape materials should match with the garden design. Natural material should be preferred,
- A tampon zone should be applied around the garden,
- A clear lightning plan should be applied through the garden ,
- A storage for equipments, and a composting area is necessary.

4.1.3 City farms

City farms (urban farms) have a variety of forms, some may be located in vacant city lots with a few raised beds, and the others may have several acres in vegetable production. They are usually owned by corporations, land trusts, and local authorities. They commonly locate in urban fringe where land and soil is suitable for vegetable growing.

It is also possible to define city farms functions as commercial food production in broad acre in urban fringe (Gelsi, 1999). They are also known as urban farms, children's farms, or community farms. However, it is not always easy to find a land in urban areas for agriculture, especially the land in core urban area is really expensive. As a result, many municipalities prefer to use these lands for residence and commercial purpose.

With these urban challenges city government, local authorities, and civil organizations should support farms. European Federation of City Farms (EFCF) is a good example for these organizations, which has the center in Britain.

City farm projects are managed by a local group, and they all have volunteer involvement (Viljoen, 2005). People are involved in these projects by managing plants and animals. Although, they mostly rely on volunteer workers, they have paid employees. Besides, some are managed by volunteers alone, and some are run by partnership with local authorities.

City farms provide citizens an opportunity for growing food, training courses, school visits, and sport facilities. They enhance food production of the cities, and contribute environmental and public health. Most commonly, the crops, which produced here, are for selling in farmers' market or for donation to local charities. This is also countable as a contribution to local income value.

The aim of city farms is to improve community relationships and create an awareness of agriculture and farming to people who live in urban areas. Besides cultivation, they also provide a chance to see how animals are raised, and give a good opportunity to make a link between agriculture and food. Also, they improve the environmental awareness and conservation activities in the city.

These community based agriculture activities in cities are usually funded by variety of resources depending on their stage (Viljoen, 2005).

For exploring the characteristics of city farms Kentish Town City Farm in London is analysed for its characteristic. Kentish Town City Farm is an educational and recreational project that developed out of the needs of local people.

Initiated in 1972, through the medium of an existing community group, it has provided animals, gardening space, horse riding and a focus for youth education and community work for thousands of users per year.

Originally called the Fun Art Farm and the City Farm 1, Kentish Town City Farm was the first of its kind to be established. As such it played an important historical role and acted as a model in the development of the City Farm movement as a whole.

Entrance to the garden is free though, a small donation is estimated from the visitors. In this farm Children, young people and adults are actively encouraged to participate in all aspects of animal care, from mucking out to helping with feeds and site maintenance. Besides, the farm has a stock of chickens, cows, ducks, geese, goats, horses, pigs and sheep. Some of the animals are rare breeds and they are used to being touched by everyone.

The Farm covers 5 ha area, which is a reasonable for a small farm or smallholding. As such, it has had a breeding programme over a number of years.

The Farm has a classroom, an activity room for children under 5, a training room, fitted kitchen, stables, gardens and seating areas. It also has disabled access including hard paths and decks throughout.

The basis and thinking behind the program is wholly educational. The Farm is neither a zoo for farm animals, nor a museum piece. The primary aim of the farm is to address the educational and recreational needs of local people with special emphasis being placed on children and young people coming from economic or socially disadvantaged backgrounds and young people with special needs.

The farms run a wide range of activities and events such as horse riding, animal care, planting, and education for schoolchildren. In addition, volunteers are really important for the sustainability of the activity program.

Furthermore, the farms enjoy a varied wildlife including house sparrows seen in the orchard and family garden areas. Also the farm includes a pond, which is preferred for relaxing and enjoying the afternoon.

Heeley City Farm, which started in 1981 is also a good example of city farms. This farm is one of the oldest community led sustainable projects in Sheffield. It is one of the most sustainable developments in the inner city. Many national and international prizes were given to this project for contributing city sustainability with community based activities, youth organizations, and educations. 34 staff and approximately 100 volunteers are running this project (Viljoen, 2005). Each year they provide environmental, food and health related education to 5000 school children (Viljoen, 2005).



Figure 4.21 : Kentish Town City Farm (Url-28).

The project consists of farm animals, organic gardens, café, garden centre and farm shop, and all the buildings are powered with wind and solar energy. It is also a pioneer in many community development and environmental projects with environmental education, recycling, community composting, energy generation and conservation, organic and local food production, health and healthy eating.

The farm locates in a corridor of land through Heeley, which was cleared and set aside from reconstruction in anticipation of a never built road scheme (Figure 4.23). The land was regenerated in the late 20th century by local community groups as a City Farm and public park.



Figure 4.22: Sattelite image of Heeley City Farm (Cities Revealed Aerial Photography, the GeoInformation Group, 1999)

Heeley City Farm is located on 60.000 m² land in urban area in Sheffield, South Yorkshire, England. The settlements around the project also benefit from the green space. The red topped settlements is also available to see in figure 3.16. One of the project's important characteristics is being self sufficient in water and electricity resources. On the other hand a compost plan is in progress. The wind tribune in the farm supports the energy with the solar energy panels.

The access to the farm is limited because the land is owned by Heeley City Farm Association. So the management of the farm is provided by a single source, compatibly to community gardens where a few groups of people run the organization.

The Heeley City Farm consist of undercover planting areas, raised beds, flower and vegetable planting areas, lawn square, recreational areas, sport facilities, resting facilities. Also the farms gives an opportunity for educating school children with the monthly activities within a cooperation with neighborhood schools. On the other hand, this farm is hosting farm animals so that the relation between urban people and animals grow stronger. Another contribution of the farm to the urban area is the food security effect.



Figure 4.23. The Polytunnels in Heeley City Farm (Url-1)



Figure 4.24. The Heeley City Farm entrance and children's playground (Url-1)

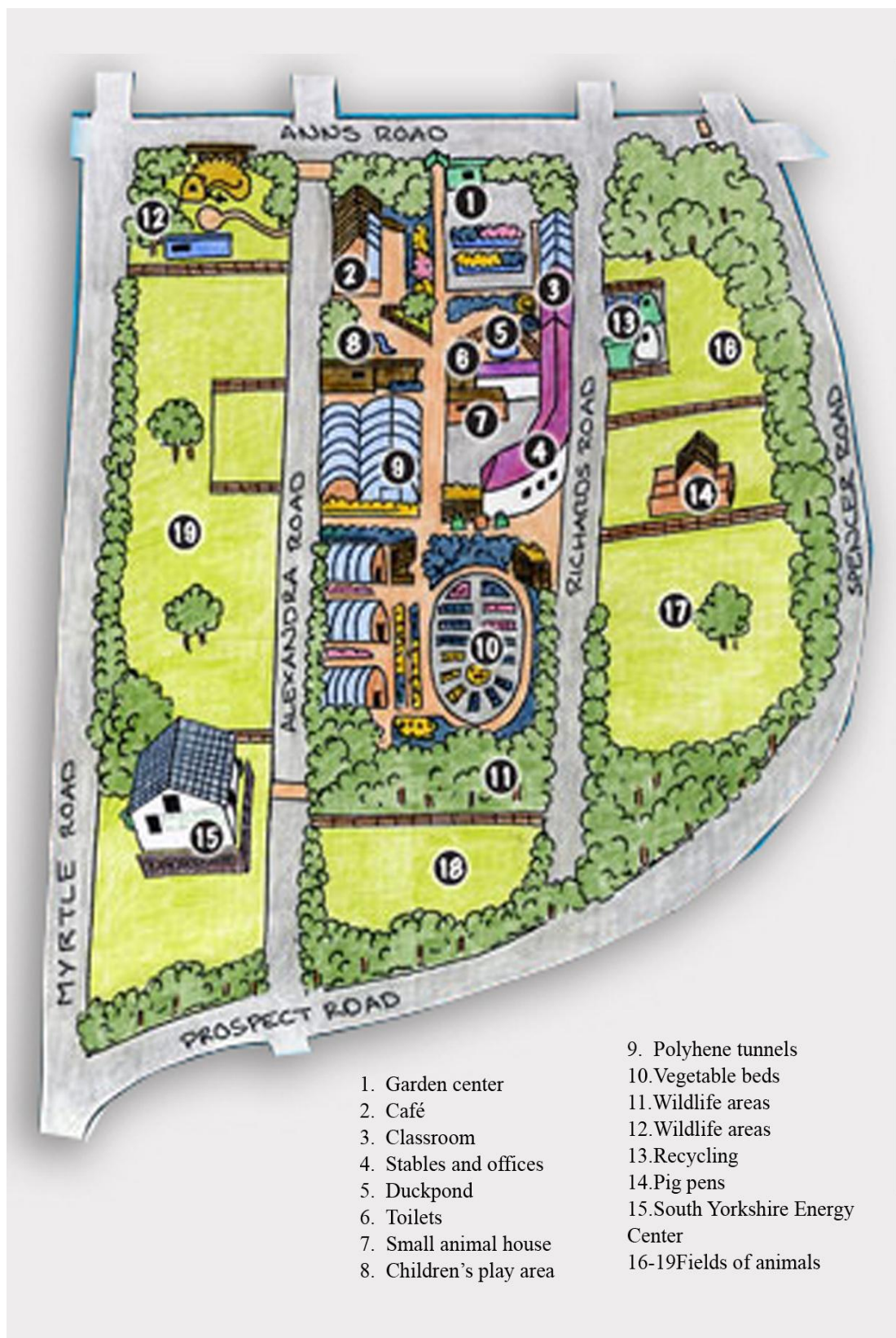


Figure 4.25 : Heeley City Farm Plan (Url-21)

The green roof is a demonstration of the farm's commitment to sustainable development and environmental issues (Figure 4.22). Also, the farm has formed a system for collection of recyclables, including organic wastes, throughout Sheffield. The project demonstrates a positive development in terms of environmental design and brown field urban regeneration forming a local employment construction scheme.



Figure 4.26 : Heeley City Farm (Url-7).

Heeley City Farm is an environmental, social and economic project where children, young people, and adults can daily learn about urban and rural environments, natural cycles, plants and animals, the impacts of the seasons and the relationships between all of these. This is a good example for helping urbanized people of all ages to develop an understanding of sustainable communities using farming and gardening as a platform.

As in western cities, the city farms in China contributed agricultural development in cities. Landgrab city farm project in urban square in Shenzhen, China was established by Joseph Grima, Jeffrey Johnson, and José Esparza in 2009 (Figure 4.27). This was an installation commissioned by the Hong Kong Biennale of Architecture, Urbanism and located on a busy shopping district in the city of Shenzhen. The project is planned as an experimental investigation into the full extent of Shenzhen's spatial footprint but inspired a lot of community gardens in the country.

The Landgrab City project is also important for its social message for urban environments. This ecological attempt represents the 21st century metropolis; it proposes a new urbanism, which looks beyond the city limits to spatial, social, economic, and political implications of the planet's rapid urbanization.



Figure 4. 27 : Landgrab City farm, China by Dezeen (Url-8).

4.1.3.1 The benefits of city farms

City farms are adaptable to the local community requirements. Also, they may vary in size and location. However, the common purpose in city farms is to encourage citizens to create a sustainable city. City Farms are a good way of bringing many people into contact with modern agriculture and horticulture. Furthermore, city farms give the opportunity to gather people for a mutual purpose as producing their own food, organizing health, and environmental activities.

It is possible to summarize the benefits of city farms as follows:

- Increase the amount of Local food, decreases food miles,
- Contribute to green areas in cities,
- Link rural life to urban life,
- Give education about food growing and animal welfare (school visits, educational activities, adult education about gardening, horticulture, animal care)
- Social inclusion, strengthening urban communities,
- Improve environmental and public health,
- Give opportunity to see domestic animals in their own environment,
- Improve local income (paid employees, volunteer workers),
- Increase quality of life,
- Host, sports and recreation activities (horse riding lessons, cafes, and community activities). (Viljoen, 2005).

4.1.3.2 City Farm Criteria

City farms come in all shapes and sizes, from 10.000 square meters to over 50 hectares. In some countries, there is a close cooperation between city farms and commercial working farms with a school program or visitor's farms. Many city farms work together with care farms, environmental organizations, zoos, museums or are involved in conservation grazing and forestry work (EFCF, 2008).

- The garden area can vary from 10 ha area to 50 ha area or more,
- The water and electricity resources should be accessible,
- The gardens should be designed for a larger population and varieties of people,
- Car access to the city farm and car ways inside the city farm should be designed carefully. Especially a service road for large vehicles should be applied to the plan,
- An open space for community activities and community gatherings should be considered,
- A tampon zone should be applied around the garden to prevent from outside affects,
- A clear lightning plan should be applied through the garden for night use,
- A storage for equipments, and a composting area is necessary to use the waste as nutrition for plants and vegetables,
- Undercover cultivation areas can be established to city farms,
- A sale department for selling the products to city people should be included,
- An area for education schoolchildren is necessary,
- A suitable space for animals should also be considered for wildlife conservation.

4.2 Concept Comparison

The urban agriculture concepts share common characteristics within but these can change according to their location, and region.

Even though, allotment gardens' size and shape may change (Bellows, 2011), they are usually smaller than city farms and community gardens in general. In addition, they differ from other gardens with their purpose of growing and harvesting flowers and vegetables (Brunel, 2003). Allotments are generally rented from a local authority, and managed by an individual, a family or a small group of friends. Whereas, community gardens are managed by an organizing group of individuals, and city farms are managed by paid employees, and volunteers.

In allotment gardens, the parcels are cultivated individually, contrary to other community garden types where the entire area is tended collectively by a group of people (MacNair, 2002). Generally, a garden association organizes individuals for managing the allotment garden, and the individuals pay a small membership fee to the association (Drescher, 2006). Community gardens differ from allotments with their social based activities and stewardship among volunteer workers in the garden. The food production is managed together with the social support of these neighbors.

Community gardens, and city farms are community managed lands and have wider size compared to allotments (Table 4.1). The size defines the location of these concepts. For instance, the largest ones, city farms, commonly locate in the urban fringe. Whilst, the smallest ones, the allotment gardens, find place in inner urban areas.

Especially in city farms, there are special education programs for gathering children and nature together. In this context, city farms are more suitable for this kind of teaching programs with their large area and varieties of facilities inside. The introduction of animals to city children is the most valuable experience. For creating a clear scheme, the three concepts were compared, and criteria for allotment gardens, community gardens, and city farms are shown (Table 4.1).

The purpose of allotment gardens are to supply food for the individuals or the family who manage the parcels, while the community gardens supply food for the whole community and volunteers. In addition, community gardens aim to improve the social linkage between community. On the other side, city farms contribute food supply with selling these products to citizens. Besides social gathering, they provide nature education, sport activities, and recreation.

Table 4.1. : Criteria for urban agriculture concepts

	Allotment gardens	Community gardens	City farms
Purpose	To supply food for family or individual, Hobby.	To supply food for community, Hobby, Social gathering.	To supply food for city, Trade, Education, Social gathering, Sports and Recreation.
Location	Inner urban area	Urban-urban fringe (vacant lots, unexploited area within educational or health facilities).	Urban fringe
Size	Up to 1000 m ² each allotment apprx: 250m ²	1000-5000 m ²	More than 10.000 m ²
Ownership	State owned or private (rented to management)	State owned, Association owned, Charity owned	Individual, Association owned, Land trusts, and Local authorities
Management	Lease holders (individuals, families).	An organizing group of individuals who volunteer for working.	Voluntary workers, Paid employees
Consumer	Individuals, families who manage the land.	Volunteer workers and individuals in neighborhood.	Citizens who come to buy the products. (They produce for trade and small-scale consumption by producers)
Access to the garden/farm	Limited (The land belongs to the holder during the rent period)	Open for access. (The entrance hours depends on the organization community rules).	Semi limited. (Open for educational, sports, and community activities).
Features	Raising beds, Warehouse, Compost area, Hedges as boundaries (optional).	Open and undercover cultivation areas, Warehouses, Lawn, Community gathering squares, Compost area, Little recreation (small pond or lawn with seasonal flowers)	Open and undercover cultivation areas, Accommodation, Recreational and resting areas, Compost area, Education activity places (for school children, and students), Sport facilities (horse riding club). Sales area (for selling products)
Products	Vegetable, fruit, ornamental plants	Vegetable, fruit, ornamental plants	Any kind of plant and animal production.

These three concepts aim to produce edible plants for food security in common. Although, in allotment gardens, and community gardens vegetable, fruits, and ornamental flowers are possible to grow, in city farms it is possible to find animal products such as milk, meat, and egg.

Even though, the urban agriculture concepts share common characteristics, they also have different requirements, which can change according to their location, and region. These criteria will be useful for creating a design scheme for these concepts.

5. URBAN AGRICULTURE IN TURKEY

5.1 Institutional Environment

The Institutional Environment has a major role in terms of development of the urban agriculture within the city. The institutional environment encompasses institutional establishments such as possession, laws, international conventions and unofficial sanctions such as the codes of conduct, traditions, society rules as well as the methods of implementation of such rules and sanctions. Economic components (companies, cooperatives, firms etc.) such as political parties, city councils, government units within this frame, social components (non governmental organizations, clubs, chambers etc.) and training components (schools, universities, research centers, etc.) are major players.

The countries having a solid institutional environment are more developed compared to the countries with deficiencies in this field (Ostrom, 1990). On the basis of the troubles at the core of the agricultural sector lie the institutional environment and the relevant deficiencies. Despite Turkey being an agriculture based country, the agricultural lands can not be stopped from destruction. The codes and regulations relating to the utilization of the agricultural lands within the city fails to be compiled as of now. There is lack of authority and coordination among the problems relating to this problem.

Many studies are available in the literature covering this subject (Aksoy and ark., 2004, Alphan and Yılmaz, 2005, Esbah, 2007, Deniz, 2005, Irtem, 2005).

5.1.1 The institutions

The first step in terms of organization in Turkey was taken with the Ministry of Agriculture which was founded in 1846. The name of the ministry was amended many times after this date. In 1911, the Ministry was, for the first time, organized in Turkey scale and was put into a more permanent order (Anonymous, 2004). In this era, the name of the Ministry was changed into the Ministry of Commerce and Agriculture, moreover agricultural training and specialization on agriculture gained

so much importance. The system brought by the semi-feudal structure with the arrival of the Republic Era increased the number of smaller families of farmers and caused developments in the field of agriculture. In this era, agricultural organizations were formed in the fields of forestry, stockbreeding and agriculture (Gürbüz, 1989).

With the Law no. 3203 dated June 1937, the Ministry of Agriculture was reorganized and it was divided into three general directorates as Agricultural Affairs, Veterinary Affairs and Forestry Affairs (Zincirci, 1994).

Until recently, the ministries and institutions such as Ministry of Forestry were constantly united with the Agricultural Departments to be separated afterwards, which caused the ministry of agriculture change names many times and changes of authority and new regulations were introduced with all such changes. The changes and transfers in authority caused the ministry to fail to focus on subjects such as agriculture sufficiently and develop efficient strategies and go through employment problems. The name of this ministry, jurisdiction and authority of which was amended constantly was changed into “Ministry of Foodstuff, Agriculture and Stockbreeding” with the decree dated June 03, 2011 under no. 639 through the “Statutory Decree relating to the organization and the authorities of Ministry of Foodstuff, Agriculture and Stockbreeding and the responsibilities and authorities of the Ministry were rearranged. In accordance with the ordinance, it is the responsibility of the Ministry of food, agriculture and livestock to carry out researches aimed at establishing agricultural policy and to carry out works aimed at development of the production of herbal and animal production and aquaculture resources, food production and protection, rural development, protection and of soil, water resources and bio-diversity and productive use of them, to organize and raise awareness of the farmer, effective management of agricultural supports, control of agricultural markets and actualization of main area of activity; furthermore to specify general policy for food, agriculture and livestock and the inspection of practice of them.

The Ministry of Foodstuff, Agriculture and Stockbreeding consists of the main departments as follows; the Ministry, Head Office, Rural and Foreign Institutions. The Rural Institution may be established by the ministry as required. As it can also be understood from the structuring of the ministry, there is placement within agricultural organization and structuring within the province. However the current

studies focus on the extensive agricultural landscaping within the province and sufficient emphasize was not put on urban agricultural activities which were performed within the city in smaller areas.

Finally, in 2003, the Ministry of Forestry and Environment were United and the “Ministry of Environment and Forestry was founded (Anonymous, 2004).

The Ministry of Environment and Forestry is in charge of monitoring and controlling all activities having adverse effects on Turkey as a whole. To this end, studies are performed so as to evaluate the environmental effects and so as to maintain the sustainable use of the natural resources, based on the development plans and regional plans so as to prepare environmental (settlement and layout) plans as well as approval and implementation of the same which are the major responsibilities and duties of this Ministry. This Ministry has been preparing the environmental plan at 1/100.000 and 1/25.000 scales until the Ministry of Environment and Urbanization was incorporated in 2011. This plan prepared at the macro level and the decisions adopted contribute to the protection and improvement of agricultural lands within the city at a general frame (Url-35).

In 2009, Prof. Dr. Mehmet Çubuk proposed changing the name of the Ministry of Environment and Forestry into the “Ministry of Environment and Urbanization” as a city planner and academician against the disorder formed and generated in the structural disorder within the Ministry of Environment and Forestry. According to Çubuk, this ministry was predicted to come up with a systematic approach to urban planning and will be able to focus on the decisions of use of estates such as agricultural lands, forest lands and wet lands more diligently (Çubuk, 2011, via Url-28).

Thus, upon the establishing of the “Ministry of Forestry and Water Affairs” and the “Ministry of Environment and Urbanization”, the tasks and authorities of the Ministry of Environment and Forestry were assigned and transferred and the Ministry in question was closed. Based on the statutory decree of the Ministry of Environment and Urban Planning under no. 644 published in Official Gazette as "the Statutory Decree relating to the organization and tasks of the Ministry of Environment and Urbanization, its tasks and functions were determined and stipulated. Based on this statutory decree, the duties of the Ministry are as follows; preparing the development, building, settlement legislation regarding housing and

environment. To this end, the Urbanization Commission under the supervision of the Ministry of Environment and Urban Planning performs activities for urban transformation, location planning, planning the estate policies and raising urban awareness by means of the reports and publications they execute. In this scope, the role of Ministry of Environment and Urban Planning is of significant importance within the scope of development of urban agriculture.

However, it is still not clarified which ministry is to manage the Works relating to urban agriculture directly. This vagueness is a typical example of the conflict of authorities between the Ministry of Environment and Urban Planning and the Ministry of Foodstuff, Agriculture and Stockbreeding. As there is no such clarification in terms of management, it causes the urban agriculture not to be adopted by any relevant institutions and ensure the expected development.

The Municipalities within the provinces and the institutions such as TOKİ have significant roles in terms of taking decisions regarding urban agriculture.

The urban substructure studies prepared by the municipalities have a significant role in urban planning services, with the relevant master plans having positive effects on protecting the diversity of plants and animals thus improving the agricultural lands within the city. However, within the master plans prepared by the municipalities and the provincial directorates, not sufficient emphasize is put to the urban agriculture. The agricultural lands remain at the scale of rural areas or countryside and actually, during the decisions regarding the uses of areas, the potential of the areas within the city which are vacant and not used are denied.

In accordance with the law regarding TOKİ (Housing Development Administration of Turkey) within the frame of urban structuring and transformation of shanty towns dated 1984 under no. 2985, the income, expenditure and inspection structure was determined with the purpose of meeting the need of housing. Taking into consideration that the shantytown settlements were organized on mostly vacant agricultural lands, in accordance with the Law No 775 on shantytowns, there are close relations with agricultural lands. At this stage, it is of essential importance to transform the shantytown settlements into housing regions or retransformation into agricultural estates. However, due to the decisions taken by TOKİ for creating speculative income, it can be seen that settlement areas were spread even more widely within urban areas while the ecologic balance is neglected.

5.1.2 Legislation and regulations

As we study on the legislation of the agricultural lands in Turkey, we can see that the emphasize was put on agricultural lands by means of the new constitution of 1982. The subjects such as ownership, rights, agriculture and protection of the living things were clarified (Parlak, 2010).

“Environmental law” numbered 2872 dated 09.08.1983 is one of the effective laws that involve agricultural lands in Turkey. This law is aimed at the protection of environment, common possession of all living creatures, in line of sustainable environment and sustainable development principles. According to the law, in line of sustainable development principles, in order to prevent environmental pollution that may result from the supply the needs of rural and urban population such as sheltering, working, relaxation and transportation, it is prepared and approved by ministry that environmental plans scaled 1/50.000-1/100.000 which will provide basis for structural practice construction plan on the basis of area and catchment area. In the works, it is determined that damaging cultivated areas will be punished.

Together with this legislation, lots of laws and regulations are made; 3083 numbered “Land Reform” that came into practice in 22.11.1984, is one of these laws. (Parlak, 2010). This legislation is aimed at productive cultivation, constant increase in agricultural production, and increasing employment opportunity in irrigation fields and the fields determined by the ministerial cabinet. Besides, it is intended on determining, under the condition that it would be widen whenever required, consolidation of the lands, which is fragmentized too much to carry out economic production, and valuation method of the agricultural land that is not fragmentized. (URL-33). In this law technological and financial methods are followed to handle the problems in cultivated areas by which financial problems of the farmers are solved. (Parlak.2010).

In 04.11.2000 the regulation about “Using Agricultural lands out of Purpose” went into operation. This regulation is aimed at deciding the compulsory situations in which these lands will be used out of purpose, determining and protecting large fertile plains, consolidation and distribution of land with a protective approach for soil. (TMMOB, 2011)

Another regulation based on the 2872 numbered Environmental Law is 30.06.2011 dated “Unplanned Area Bylaws”. This regulation is made to ensure unplanned areas within/out municipal adjacent areas to be built in accordance with science, health and environmental conditions.(Url-34). It has great importance to include urban agriculture as an alternative, when zoning decisions are made for potential cultivating areas within this scope.

Moreover, the “Regulation on Evaluation of Environmental Affect” (ÇED) published in the official gazette dated 16.12.2003 aims at arranging the administrative procedures and principles to be abided by in the course of Evaluation of Environmental Effect. With this regulation, a report will be compiled so as to evaluate the negative and the positive sides to these effects to be created in this frame and by means of this, the projects which may cause the natural resources to be damaged may be asked to be changed or cancelled. While assessing the areas potentially to be affected by the project, the capacity of use of lands currently such as agricultural lands, forest lands, planned lands, water lands and their qualities shall be taken into consideration. Moreover the agricultural lands within capacity of soil use under I, II, III, and IV., agricultural development lands and special production lands, irrigated agricultural lands were designated as the estates to be protected (TMMOB, 2011).

In accordance with the relevant laws and regulations, “Organic Agriculture Law” under no. 5262 was enacted on 1.12.2004. Upon this law taking effect, the urban agriculture was entered into agricultural legislations. The organic Agriculture Law was the basis which motivated the farmer and the townsmen into urban agriculture. The purpose of this law is determining the procedures and principles for developing organic production and inputs so as to provide the consumers with reliable products at a certain quality. Furthermore, this law encompasses the matters relating to control and certification services for performing the organic agriculture activities and the inspection procedures and principles of the ministry as well as its duties and tasks (Url-30).

Another law which formed basis for development of urban agriculture was the Law regarding Protection of Soil and Land which was enacted on 07.2006 under article no. 5403. Within the frame of this law; prevention of loss of soil and its qualities based on natural and artificial methods and in line with the principle of development based on sustainability with the emphasize on environment, the objective was determining the principles of the planned use of the lands. Within the process of preparation of land usage plans, excluding the exceptions stipulated in the law, the agricultural lands cannot be used for the purposes other than those stipulated in this law. The agricultural lands, special product lands, irrigated farming lands can only be used for purposes other than agriculture if no alternative estates can be obtained to this end and provided that the Commission of Soil Protection deems it suitable. In the land utilization plans prepared by the Ministry of Foodstuff, Agriculture and Stockbreeding; there will be placement for agriculture lands in the regional, local and overall/country scales, lea lands, forest lands, lands determined by special laws and settlement areas, substructure facilities with the social and economic purposes and other methods of land utilization will be available. Under this law, the agricultural lands are preserved under more comprehensive protection. The agricultural lands were classified within themselves based on their properties as parts of land (Url-34). “Organic Agriculture Law” and “Law regarding Protection of Soil and Land” although not including provisions relating to urban agriculture, it has brought important sanctions in terms of sustaining the agriculture and urban relation. Not emphasizing the urban agriculture in none of the documents relating to the agriculture caused the economic aspect of the agriculture to be emphasize at all times. The ecological and social dimensions were neglected in all aspects. The first document having mentioned urban agriculture was the report compiles under ninth development plan which was prepared in 2007 by the special commission on settlements and urbanization.

As it was emphasized in the report, integrating the urban agriculture concepts to the planning system has significant importance. The following arrangements are required according to the report in terms of regulation amendments and improvements

“The community gardens, allotment gardens or allotments, rooftop gardens, city farms, city farms etc. related with the urban agriculture have to be distinguished in terms of their methods of use and the terminology must be clarified and they have to be available and placed at urban construction plans.”

so as to contribute to the sustainable urban development (Anonymous, 2007, pg. 56). This latest development emphasizes the requirement for the special regulations and laws, which shall be enacted in Turkey in the field of urban agriculture.

5.1.3 Non governmental organizations

There are many NGOs in Turkey which perform studies on urban green areas and urban agriculture. These organizations do not only contribute to the agricultural lands with the organizations and events they perform, also they contribute to the development of the green areas within the city. As an example to such organizations in Turkey, the departments of TMMOB consist of partially public institutions but also many NGOs such as TEMA, Yeşil Ev, and Permaculture Türkiye provide support.

The departments of TMMOB (UCTEA) such as Chamber of Landscaping Architects, Chamber of City Planners and Chamber of Agriculture Engineers support the development of agricultural lands in Turkey with their studies and projects such as developing the agricultural policies in Turkey, increasing the quality of soil and protecting the plant genetics, causing the natural agricultural products expand more in use. Furthermore, with the training and social activities they organized, they aim at increasing the awareness in the field of agriculture. Their major objectives are protecting the natural resources and public assets in line with the public benefits and ensure that they enhance moreover, organize the activities and events required for the artistic and technical development of the country. The objective is compiling efficient policies of utilization of land by following up legal developments such as regulations and legislations. Especially in case of abuse of the ecologically valuable lands which need to be kept under protection such as urban green areas, forests, lea and agricultural lands, they intervene to this and stop these areas from being damaged and lost. NGOs support the improvement of the agricultural lands within the urban areas and they also aim at protecting the areas available.

TEMA Vakfı (Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats) is an NGO, which is not under the supervision of the government. This foundation aims at preservation of the diversity of soil, plants and living things with its studies home and abroad. Many volunteers work in this foundation from different occupation and age groups. TEMA emphasizes his activities on the protection of soil, which is among the most precious assets of Turkey. Thus, it strives to execute organizations so as to protect natural assets such as lea, agricultural fields, meadows, forests, water and plant genes. The foundation asserts that by regaining the agricultural and lea areas terminated by erosion, the immigration from rural areas to urban areas can be prevented. TEMA has no projects directly related with urban agriculture, however it has significant experiences in preservation of the biodiversity by protecting the soil which is amongst most important components of agriculture.

Another NGO which supports utilization and foodstuff safety within cities in the way to cause the green and open areas to contribute to ecology is “Yeşil Ev”. This NGO emphasizes on the effects of urbanization based on the manifests it publishes and brings forward a constructive and solution focused criticism. Protection of the natural resources, increasing the green areas within the city and expanding the urban agriculture having the purpose of production of foodstuff within the city are among the main objectives of this organization. Also, panels, discussions workshops are organized so as to increase the number of volunteers which is the core of this organization and to raise awareness of people. Furthermore, the city has gained many urban agricultural lands due to cooperation with municipalities (such as Maçka park and Çengel köy natural gardens).

“Permaculture Research Institute Turkey” supports local vegetable and fruit farming and it has adopted missions such as protecting the food sources and green areas within the cities and live apart from the artificial sources as much as it can be done. For this cause, it aims at increasing awareness all over Turkey with courses and workshops. Other than the courses, conducting eco-system design applications, trying sustainable energy methods and techniques in the fields of agriculture, forestry, architecture and production of energy and to maintain the flow of information by means of trainings, seminars, conferences and broadcasting in this area are amongst the missions of the institute.

Despite having many concepts and institutions within the frame of agriculture and environment in Turkey, it is clear that there is elusiveness of authorities in the field of urban agriculture. In the same way, despite having many laws and regulations in effects, the legislations fail to emphasize on urban agriculture directly. This increases the authority overlaps and jurisdiction problems. Despite having this clumsiness in terms of governmental institutions and procedures, the NGOs promote more productive urban agriculture activities.

5.2 Urban Agriculture Examples in Turkey

Ozkan (1996) states that, allotment gardens have gradually entered into the new phase of urban development in Turkey, although it has established within the last decade. Contribution of the local administrations in Turkey to adopt the urban community garden idea would undoubtedly serve as the solution for improving the quality of urban life.

According to Ozkan (1996), allotment gardens mostly locate in Bursa and Izmir in Turkey. On the other side, a few attempts are rising in Ankara (capital of Turkey), and Konya.

Allotment gardens in Bursa (Figure 5.1), which were constructed by the Municipality of Bursa in 1985, were located 10 km far from the city center (Ozkan, 1996). The total area of the garden is 26.500m² with 24 allotments that became 86 later (Ozkan, 1996). The average area of the allotments is 200 m², and each one includes a wooden house with one room (Ozkan, 1996). The gardens are rented to retired people for one or two years. In addition, it is not allowed to grow woody plants and raise animals in the gardens, only the succulent plants, annual and perennial flowers, and varieties of vegetables are allowed to grow (Ozkan, 1996).



Figure. 5.1. : Bursa allotment gardens (Balkan,2004)

The allotment gardens in Bursa are usually, rented to retired people as the new allotment gardens in Gaziantep City (Figure 5.2). The Municipality of Gaziantep has inspired from the popular allotment gardens in Bursa and adapted the same system to their city. Even though, the establishment of these gardens are just finished (2010), the increasing demand for renting the gardens are obvious. Even the people that are going to rent the gardens were chosen with drawing of lots (Anonymous, 2010).



Figure 5.2 : Gaziantep allotment gardens (Url-31)

Since the gardens are new established, the electricity and water availability is not solved yet. Though the night time lightning system will be established, and the people will use well water as well.

The total area of this allotment gardens covers 26 ha. In addition, 100m² land is given for each individual or family, including a 10m² storage, and 90m² gardens.

On the other side, as another benefit of the gardens, they were build over an old waste disposal area, where people do not prefer to live because of the bad smell. With the reclamation of this land, and transformation to allotment gardens, it is a popular place between locals.

Furthermore, Konya is another pioneer city for UA development. The Nilüfer municipality of Konya has established a community gardening project with a 90 ha area (Figure 5.3). With this project, one of the green corridors would come back to life. According to the garden regulations, the parcels are rented to the retired citizens, and only one parcel was given for one family. In addition, each parcel is planned to be 150 m² with a wooden house in it, which is not for accommodation but for daily use only (Demir, 2007).



Figure 5.3 : Allotment gardens of Konya, Nilüfer Allotment gardens (Balkan,2004)

The improvement of allotment gardens in İzmir is also a role model for other cities in Turkey. The İzmir Allotment Gardens project was established in 1989 by the Big Municipality of İzmir. The location was 100m apart from the main road, with a 13.950m² land. The project consisted of 44 parcels, with approximately 150 m² each, and a storage. As an obligation, it was not allowed to grow woody plants in the gardens. As other allotment garden examples in Turkey, this allotment garden in İzmir also rented for retired people for a year. Following the establishment of these gardens in İzmir, other examples sprouted from different parts of the city (Url-32).

The İzmir İnciraltı Allotment gardens are one of them, which was established on an 15000m² area in 2003 (Figure 5.4). The garden included 150 allotments inside, each measuring between 60-120m². Contrary to the previous allotment garden examples, this garden includes only one storage at the entrance of the garden. In addition, the garden is surrounded with wooden hedges to line the borders (Demir, 2007).



Figure 5.4 : İzmir İnciraltı Allotment Gardens (Demir, 2007).

As the most crowded metropolitan city of Turkey, Istanbul is lacking urban agriculture uses in the city. Dealing with rapid urbanization problems, agricultural lands are transforming to settlement areas. Although, some sensible and farsighted people provoke creating agricultural lands in inner urban areas, which is closer to their living places. The first example of this city was established in Çengelköy district on a 2000m² area. The Çengelköy Nature Garden (Figure 5.5) is also special with not using pesticides, but organic solutions for dealing with insects, and diseases. The garden is established by local people of Emek district, and Nature Association volunteers. It has 25 individuals, who share the management of the garden, and products.



Figure 5.5 : Çengelköy Nature Garden, in Istanbul (Url-33).

Furthermore, the citizens, who are tired from the urban life and missing the natural country life, found their own way of creating green spaces in the city. The difficult urban conditions and financial problems pushed people to grow their own food, and sell the extra production to the citizens, which prefer to eat fresh vegetables from the farmers. The allotment garden in Kasımpaşa district in Istanbul (Figure 5.6) is also an example for these nongovernmental gardens. The common characteristic of location, which was preferred to be next to a church or a school, has taken place near a mosque in Istanbul. This is an obvious adaptation of the allotment gardens to the culture and region of the country.

The garden is located on a 1500 m² area, and managed by three families, which sell the weekly products in the farmers market near to their neighborhood.

The main production in the garden is vegetables, and they avoid planting big trees, but they prefer bushes or small trees for surrounding the garden and creating a tampon zone to separate the garden from city environment (Figure 5.7).



Figure 5.6 : Allotment gardens examples in Kasımpaşa District of Istanbul.



Figure 5.7 : The allotments and cultivation in Kasımpaşa.

Even though, Ankara as the capital of Turkey, recently started city greening projects such as urban parks, and botanical gardens, the establishment of Ankara Atatürk Forest Farm (AFF) dates back to 1925 (Figure 5.8). This farm is one of the pioneer examples of urban agricultural developments. In relation to the concept of "urban agriculture", AFF continues its functions such as providing food, labour, education and opportunity for recreation. It was planned to supply food for the urbanities, and create education and employment opportunities. Moreover, the first National Botanical Garden of Turkey is planned to be constructed in the borders of this farm. The National Botanical Garden is planned to be on a 65 ha land including picnic areas, pond, and varieties of social activities as well as education areas, and sport facilities (Acıksöz, 2004).

In the garden except the planting activities, suitable conditions for animals are prepared too. As in the examples from worldwide, there are special sections in these gardens for educating about animals and nature. These gardens contribute the social improvement of the community as they improve the green infrastructure of the city.



Figure 5.8 : Ankara Ataturk Forest Farm (AFF), (Url-34).

Furthermore, The Cankaya Municipality as one of the affiliated municipalities of The Big City Municipality of Ankara, has prepared a “City and Agriculture Project”. With this project the municipality aims to produce a solution for the growing food crisis, and food security in cities. Another purpose of the project is to break the eating habit, which relies on food transportation from far away with consumption of expensive fuel oil. Instead, food production in close neighborhood area is encouraged (Url-34).

These urban agriculture activities are the main signs of the urgent need of food, green space, recreation, and stewardship in cities. Even though, the people in Turkey do not call the concept as allotment gardening, community gardening, or city farming, their purpose or their organization is the same. This unplanned development of agriculture in urban areas by citizens shows that if this movement gets support from government, the citizens can live in more nature integrated cities. Therefore, urban agriculture should be considered more carefully not only in 1/25.000, 1/50.000, or 1/100.000 scaled city plans but also in neighborhood scale development planning.

6. CONCLUSION AND RECOMMENDATIONS

The urban agriculture activities contribute to sustainable development. Obviously, urban agriculture is an important component for making food available for urban poor. It does not only support nutrition and health standard in the city but also improves the family budget of the urbanites, enable them to earn additional income, and provide employment. Furthermore, urban agriculture provides greener space, fresher, and cheaper products, and helps recycling household waste. It also contributes to the urban green system.

Although, farming in urban areas is practiced for income-earning or food-producing activities, in some communities it is also function as recreation and relaxation opportunity. In addition, urban agriculture promotes energy saving by local food production.

Adapting agriculture within the boundaries of cities reduces the energy that is used for transportation. Besides, it provides citizens to reach fresh and healthy food directly from the producers. This is a better way for decreasing our food miles instead of driving outside our living places to big buildings of markets that sell packaged or frozen food.

The link between food and environmental sustainability inevitably has taken the attention of writers, politicians, and academicians. Subsequently, as a popular way of thinking a delicious revolution has started with growing food in cities, reducing footprint, and decreasing waste lines on urban environments. Related to this interesting food actions, an interesting urban agriculture is rediscovered, which is equivalent to technically high and sustainable architecture. This refers to the era of sustainability, in which the landscape arises with every dimension of design, combining architecture and nature.

It is clear that this combination strengthen the agriculture and nature in cities. For keeping this urban agriculture movement on the agenda, not only citizens, but also governmental support is required.

In fact, institutional environment is critical in sustainable urban agriculture system. In Turkey's case, even though, the institutional framework related to agriculture goes 50 years back, the recognition of UA in the planning environment is very recent. Urban agriculture is still a new and rare concept in Turkey, which is an agriculture-based country. Although there are social and political actions for improving urban agriculture in cities, there is still lack of explicit policy. The agricultural activities and actions of the relevant institutions focus exclusively on peri-urban or rural scale agricultural activities. Subsequently, the absence of urban scale limits the development of UA in Turkish cities. Following recommendations are presented for improving agriculture in urban areas;

1-Increase collaboration between governmental, non-governmental bodies, and individuals

Even though, there are many urban agriculture related governmental, nongovernmental organizations, and legislations, the authority gaps and overlaps prevent urban agriculture to present an effective role in the development of sustainable cities. For instance, "Environment Law", and the "Soil Conservation and Land Use Law" includes articles dealing with agriculture in cities. However, the actions and measures to promote urban agriculture practices are overlooked issues. Therefore, a legislation should be generated directly dealing with urban agriculture.

Furthermore, a new office, which will be responsible for UA development should be established within The Ministry of Environment and Urbanization. In addition, the coordination of these governmental institutions together with nongovernmental organisms (NGOs), and individual bodies should be increased. An exclusive policy should be developed to promote urban agriculture in Turkey.

2-Form an Urban Agriculture Commission of residents and a city representative

At the city scale, a new urban agriculture commission should be formed to manage urban agriculture practices. This commission can be formed by officials from municipality, local branches of ministry of agriculture, and ministry of environment and urbanization as well as representatives of NGOs, and citizens. The strongest opportunity of the UA concepts is the participation of people. The citizens are the main actors in UA concepts. The producer and the consumer are both the people, who live in the neighborhood.

Subsequently, their participation in decision-making process will guide planners to more sustainable plans and policies and make recommendations on urban agricultural issues.

The commission can be responsible from generating policies and taking actions with regards to urban agriculture in the city.

3-Adapt Urban Agriculture Concepts in City Plan and Policy

Cooperation between policy makers and planners will strengthen the adaptability of UA in the city plans and policies. Agenda 21 is an important policy instrument to promote community based sustainable policies and to combine environmental and social issues in planning (United Nations Conference on Environment and Development, 1992). For developing a sustainable future for cities, strong development plans and policies play a vital role. Collaboration between policy makers and planners and stakeholders from the community and utilizing Agenda 21 are crucial strategies to adapt urban agriculture in city plans and development policies.

4-Conduct a comprehensive review of policy and zoning regulations

The implementation of UA concepts in zoning plans is necessary for sustainable urbanization. For decreasing obstacles and improving opportunities for urban agriculture (UA), current policies and zoning regulations should be re-evaluated. If urban agriculture concepts and approaches can guide zoning regulations, a new and more sustainable vision for the further expansion of cities will emerge.

5-Raise awareness of how UA contributes to the city's sustainability

Nowadays, eating habit happened to be an emerging problem for our children's future. A new generation is growing without knowing where the milk comes from. For the sake of teaching the nature to the upcoming generations, strong education programs about nature should be conducted. There are examples around the world for improving the awareness on nature and human linkage. There are special education programs for gathering children and nature together. Cooperation of urban agriculture organizations with schools is one of the best examples for creating awareness. The involvement of media (internet, radio broadcasting, newspaper and TV) should be encouraged to reach all segments of the society.

6-Provide access to UA areas

The location of urban agriculture concepts has great importance in terms of accessibility. The accessibility will encourage people for involving in agricultural activities.

Special attention should be given to utilize open spaces for agriculture in central parts of the city. This will enable the citizens to do agriculture without leaving the city and social space thus making agriculture more socially acceptable and attractive.

7- Provide financial support to producers

Although, the whole concept of UA is a community and volunteer based movement, there is a serious need for financial support. Financial support should be provided for those farmers who opened their farm for public use, because there is a cost of conducting urban agriculture. The cost of facilities for such use can be supported by public bodies. Extra incentives can be provided for not selling their farm space to developers. The encouragement with funding and provision of credit facilities by government for the urban farmers will provide an increasing interest in agriculture.

8-Explore the possibilities of utilizing degraded and derelict land for urban agriculture

Urban agriculture concepts should be promoted wherever possible in the urban fabric. The common sense is to use current agricultural patches in the urban matrix, however derelict, degraded and vacant lands also offer a great deal of space for urban agriculture. Although the settlement areas are not suitable, their adjacent vacant lots, brown fields, green fields, empty roadsides, and urban parks should be evaluated for their urban agriculture suitability. Waste disposal is a challenge for the development of sustainable cities. The urban agriculture concepts can help in waste management through the utilization of existing gap sites and permaculture principles in cities.

9-Adapt Permaculture techniques in urban life

Even though Permaculture seems as a small-scale action, it is another version of UA, which is a perfect match with the movement 'Think Global Act Local'. Permaculture shows that even the movement of individuals may have global effects. According to Permaculture, organic waste can be used in the agricultural practices as a valuable nutrition.

Permaculture also prohibits the use of pesticides and other chemicals, this in turn contributes to healthy urban environments. Water smart approaches of permaculture is critical in developing urban agriculture areas as this concept reduces cost for irrigation and environmental impacts. Similarly, the utilization of natural energy resources not only promotes environmentally responsible practice but also it can reduce energy bills generated by urban agriculture uses.

10-Explore possibilities of urban agriculture on structures

Even though, the traditional agriculture appeared on horizontal plane, it gained a new vision of vertical growth in the age of sustainability. Using every space and possibility for UA surely will bring cities in a much ecologic position. The concept starts from utilizing vertical facades and rooftops of structures to seeking opportunities even with urban furniture. This will not only promote a great post-modern design work, but also contribute to landscape urbanism practices which in turn promote sustainability in urban environments.

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