ARCHITECTURE, PLANNING AND DESIGN IN THEORY AND PRACTICE

Editor:
Assoc. Prof. Dr. Can KARAGÜLLE

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Architecture, Planning and Design in Theory and Practice
Editor: Assoc. Prof. Dr. Can KARAGÜLLE

Editor in chief: Berkan Balpetek
Cover and Page Design: Duvar Design
Printing : December -2024
Publisher Certificate No: 49837
ISBN: 978-625-5530-72-1

853 Sokak No:13 P.10 Kemeraltı-Konak/İzmir
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Chapter 1

POST-INDUSTRIAL TRANSFORMATION IN CITY CENTRES: THE EXAMPLES OF PITTSBURGH AND LIVERPOOL

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1. INTRODUCTION

Since the second half of the 20th century, deindustrialisation has emerged as a complex phenomenon that has forced many urban centres to face economic, social and spatial transformation processes. The decline in industrial production has led to deep problems such as unemployment, population loss and social inequality in many cities. This situation required cities to reshape not only their economic structures but also their spatial organisation and social fabric.

Pittsburgh and Liverpool are two striking examples of cities that have developed innovative solutions to these challenges through their post-industrial transformation processes. Pittsburgh has transformed from the "Steel City" to an innovation city known for its high technology and research centres. Liverpool, on the other hand, has redefined itself after the collapse of the port trade by using its cultural heritage and tourism potential, and has become an international centre of attraction with its UNESCO World Heritage site title. By examining the post-industrial transformation processes of Pittsburgh and Liverpool, this study analyses in depth the challenges these cities faced and the strategies they developed. It also aims to provide applicable lessons and recommendations for other cities based on these examples.

2. HISTORICAL CONTEXT

Pittsburgh: The Rise and Fall of the Steel Industry

Pittsburgh is located in Pennsylvania, USA, at a strategic point where the Allegheny and Monongahela rivers merge to form the Ohio River. This geographical advantage has made the city an important trade centre and industrial city since the 19th century. Identified especially with steel production, Pittsburgh has become one of the leading cities of the industrial revolution, earning the title of "Steel City" on a global scale. The city, where more than 300 steel production and trading companies operate, has achieved great success not only in the steel industry but also in the aluminium, glass, white goods and electronics sectors (Steelcactus.com; Blankrome.com).

With the impact of the industrial revolution, Pittsburgh entered a period of intense economic growth from the 19th century to the mid-20th century. The job opportunities created by the steel mills brought waves of immigration and led to a rapid increase in the city's population. In the 1950s, Pittsburgh reached 676,806 people, the highest population in its history, and was considered the heart of America's industrial infrastructure (U.S. Census Bureau, 2021). Economic vitality transformed Pittsburgh's cultural and social landscape, and the city became a prosperous industrial centre.

However, in the second half of the 20th century, changes in the world economy and the globalisation of industry deeply shook Pittsburgh's economic foundations. From the 1970s onwards, the collapse of the steel industry weakened the economic structure of the city, leading to a rapid increase in unemployment. With the closure of the steel mills, economic contraction began and population loss accelerated. In the 1980s, Pittsburgh's population declined to approximately 423,938 people and urban voids emerged with the abandonment of industrial facilities in the city (Bluestone & Harrison, 1982). In this process, social problems deepened and the economic crisis had particularly severe effects on the working class.

During this period, Pittsburgh's economic model based on industry lost its sustainability. Struggling with the economic crisis, the city administration and local actors searched for solutions and tried to develop a new economic model in the process of deindustrialisation. Launched in 1985, the Strategy 21 Project was implemented as a comprehensive transformation plan developed to stop Pittsburgh's economic and social collapse. The project aimed to lay the foundations of a technology and education-oriented economic structure by re-functionalising abandoned industrial zones. Educational institutions such as Carnegie Mellon University and the University of Pittsburgh became key actors in the transformation process with their innovative research activities (Caliguiri et al., 1985). During this period, it was aimed to ensure economic diversification by implementing projects supporting technology and service sectors.

Within the scope of the project, physical infrastructure was also renewed. Former industrial areas were transformed into technology centres such as "Bakery Square", and the amount of green space in the city was increased with projects such as "Three Rivers Park". Thus, environmental sustainability was targeted and social quality of life was improved at the same time. In the post-industrial period, Pittsburgh emerged from the economic crisis and became a prominent city again in sectors such as technology, education, health and finance (Florida, 2005; Vey, 2007).

Today, Pittsburgh is recognised as a successful example of post-industrial transformation with a population of approximately 300,000 (U.S. Census Bureau, 2021). The city continues its economic development, especially with investments in technology, health, education and finance sectors. Preserving its old industrial heritage and adapting to modern needs, Pittsburgh is often cited as one of "America's Most Livable Cities".

Pittsburgh's transformation model demonstrates how the economic and social challenges faced by post-industrial cities can be overcome through innovative and sustainable strategies. Strategic planning, education and technology-led

development projects, and infrastructure renewal have made Pittsburgh a strong city again. This transformation has enabled the city to build a modern identity while maintaining respect for its industrial past.

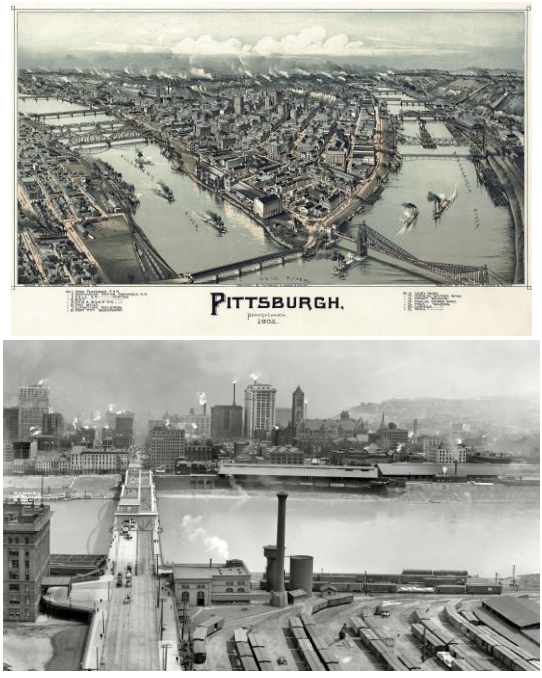

Figure 1: Images from the city of Pittsburgh

Liverpool: From Port Trade to Cultural Attraction

Liverpool stood out as an important crossroads of world trade in the 18th century and played a central role especially in the Atlantic slave trade. Within the scope of the Three Corners Trade System, slaves were transported from Africa, while sugar, tobacco and other agricultural products from the Caribbean and America were brought to England via Liverpool ports. This trade network contributed to the rapid growth of Liverpool and the development of port infrastructure, and the city became one of the most important port cities in England as it entered the 19th century (Lane, 1997).

In the 19th century, with the end of the slave trade, Liverpool shifted its economic activities to cotton and cotton weaving trade. During this period, Liverpool ports became an important centre of the global economy, handling approximately 40% of world trade (UNESCO, 2004). Port activities encouraged the trade in cotton, textiles and industrial products, enabling the city to grow rapidly. By 1851, Liverpool's population had reached 376,000 people (Census of England and Wales, 1851). In this process, the city became the main transit point

for migrants from Europe to America and earned the title of "Gateway to the Atlantic".

In the early 20th century Liverpool reached its economic peak, fuelled by the industrial revolution, with a population of around 846,000 in 1931 (Census of England and Wales, 1931). However, during World War II, Liverpool's harbours were subjected to intense air raids by Germany and were badly damaged. The city's recovery was difficult in the post-war period, and the economic crisis deepened from the 1950s onwards as port activity declined, industrial production declined and shipyards closed.

By the 1970s, industrial production had declined by 50 per cent, leading to a rapid decline in the city's population. In 1971, Liverpool's population fell to 610,000 and by the 1980s it had fallen below 500,000 (Parkinson, 1985). Unemployment in the city increased, urban deprivation areas became widespread and social inequalities became evident.

The economic crisis of the 1970s made Liverpool's transformation inevitable. Established in 1981, the Merseyside Development Corporation (MDC) undertook major projects to revitalise the economic and social structure of the city. One of these projects is the renovation of Albert Dock. This area, which was built in 1846 and whose harbour activities ceased in 1972, remained idle for a long time, but in 1983, MDC started to re-functionalise it (UNESCO, 2004).

Within the scope of the Albert Dock project, the fabric of the historic buildings was preserved and the warehouse buildings were transformed into cultural and touristic centres such as Tate Liverpool, Merseyside Maritime Museum and International Slavery Museum. Thanks to this project, Albert Dock has become an international cultural attraction centre attracting 5 million visitors a year (Ersine, 2012).

Another important step in Liverpool's revitalisation process was the King's Waterfront project. Abandoned in 1972, the 14.6 hectare Kings Dock was modernised with a comprehensive masterplan and transformed into a multifunctional area including pedestrian-oriented transport, housing projects and exhibition-conference centres (Kings Dock Masterplan Report, 2016).

The Liverpool One project was completed in 2008 and aimed to revitalise the city centre. This 42 hectare area has been transformed into a living space representing the contemporary face of the city with mixed-use spaces such as bars, restaurants, residences, cinema and bus station. These projects have increased the economic attractiveness of Liverpool, boosting tourism revenues and employment opportunities (BDP, 2009).

By winning the title of European Capital of Culture in 2008, Liverpool strengthened its strategy of using its cultural heritage as a tool for economic

development. The international art events, concerts and festivals organised in this process have increased social interaction in the city and encouraged the cultural participation of local people (Garcia, 2004). In addition to cultural events, infrastructure projects and touristic investments have made Liverpool one of the leading cultural and tourism centres in Europe.

Liverpool's post-industrial transformation demonstrates that economic development can be achieved through the conservation and repurposing of cultural heritage. Projects such as the Albert Dock, King's Waterfront and Liverpool One have revitalised the city's economic and social dynamism by harmonising historic buildings with modern uses. Liverpool, struggling with depopulation and economic crisis, is an important example for the restructuring processes of post-industrial cities with its culture-based development model. This transformation process proves that although Liverpool's population has fallen from 846,000 in 1931 to approximately 500,000 today, it has created a sustainable economic structure through urban regeneration projects and cultural development strategies.

Figure 2: Images from the city of Liverpool

3. URBAN REVITALISATION STRATEGIES

Revitalisation in Pittsburgh: Strategy 21 and Downtown Plan

Pittsburgh has developed extensive urban and economic revitalisation projects to regain the economic dynamism lost with deindustrialisation. Strategy 21, one of the most important of these projects, aimed to increase economic diversity in the region and create new industrial areas. Launched in 1985, this programme offered an innovative model based on the collaboration of the private and public sectors and local universities (Cowell, 2015). Old industrial areas were transformed into technology centres, and this transformation, led by Carnegie Mellon and Pittsburgh Universities, enabled the city to create an innovative economy.

Strategy 21, launched in 1985, is a multi-dimensional transformation strategy developed to alleviate the economic and social decline of Pittsburgh in the post-industrial period. The project aimed to rebuild the economic and social fabric of the city by focusing on the goals of strengthening social capital, increasing social

solidarity, and repurposing industrial heritage sites (Caliguiri et al., 1985; Cowell, 2015).

Within the scope of Strategy 21, abandoned factories and industrial areas that constitute Pittsburgh's industrial heritage have been re-functionalised and transformed into urban living spaces. These projects include;

SouthSide Works: This area, where former iron and steel factories used to be located, has been transformed into a mixed-use development of modern housing, shopping centres, restaurants and green spaces. This transformation has both provided new living spaces for the local community and supported economic vitality (Pittsburgh Downtown Plan, 1998).

Bakery Square: This area, which was created by converting an abandoned Nabisco factory into technology firms, office spaces, residences and commercial units, has made Pittsburgh a centre of technology and innovation, especially by attracting large technology companies such as Google (Cowell, 2015).

Washington's Landing: Located at the intersection of three rivers, this area was cleared of old industrial facilities and redeveloped as a living centre with a combination of residential, office and recreational areas. This transformation, combined with environmental rehabilitation, has succeeded in creating a sustainable urban area (Caliguiri et al., 1985).

The project was not only limited to physical transformation, but also focused on social programmes to increase social solidarity. Vocational training programmes and employment projects were developed especially for the re-inclusion of unemployed blue-collar workers and low-income groups into the economic system. These projects, carried out in cooperation with universities, public and private sectors, have contributed to the transformation of local people into a qualified labour force (Cowell, 2015).

In addition, the social acceptance of transformation projects has been increased by ensuring the participation of local communities in the project processes. For example, in the SouthSide Works project, green areas and public spaces were created in line with the demands of the neighbourhood residents, aiming to revitalise social life.

Strategy 21 has been an important milestone in Pittsburgh's post-industrial transformation. The re-functionalised industrial zones have contributed to the development of new economic activity areas such as technology, education and service sector. Thanks to these projects, the unemployment rate in the city decreased, social solidarity was strengthened, and a transformation from an emigrant city to a city that became a centre of attraction was achieved (Caliguiri et al., 1985; Cowell, 2015).

Pittsburgh's Strategy 21 project provides a successful model for the economic and social transformation of post-industrial cities. The repurposing of former industrial areas through projects such as SouthSide Works, Bakery Square and Washington's Landing has revitalised the economic dynamism of the city, while increasing social capital and social solidarity (Caliguiri et al., 1985). This process shows that the balance between the requirements of the modern world and historical preservation has been successfully achieved.

The Downtown Plan is a comprehensive urban renewal of the "Golden Triangle", known as the traditional centre of Pittsburgh, to revitalise the city in the post-industrial era. This area is strategically located at the confluence of the Monongahela, Allegheny and Ohio rivers. The renewal process was carried out in two phases to redefine Pittsburgh's urban identity and ensure economic and social vitality (Pittsburgh Strategic Plan, 2016).

The first phase, completed by 2001, aimed to improve the quality of urban life by reorganising the area along the riverside. In this process:

Riverfront Parks: Green areas and recreational parks were built along the Allegheny and Monongahela rivers and made available to the people of the region. Especially Point State Park became one of the landmarks of the region and increased the touristic attraction of the city (Briem, 1998).

Pedestrian Friendly Streets: Streets cleared of traffic and prioritised for pedestrians have facilitated urban mobility and formed the infrastructure of the "walkable city" concept.

Increasing Green Spaces: Green areas integrated into the region to reduce concrete density have increased the aesthetic value of the city and supported environmental sustainability (Pittsburgh Strategic Plan, 2016).

The second phase aimed to expand the "walkable city" concept and to create family-friendly urban landscapes and pedestrian routes. In this process

Pedestrian Connections: Pedestrian paths and bridges connecting the city centre to the riverfront and neighbouring areas have been constructed to improve accessibility.

Family Friendly Spaces: Attractive social spaces for families have been created by adding playgrounds, recreation areas and recreation zones to public spaces.

Urban Landscape Arrangements: With the urban landscaping works supporting the green texture, the region has been transformed into a centre where not only economic activities are concentrated but also social and cultural interactions take place (Briem, 1998).

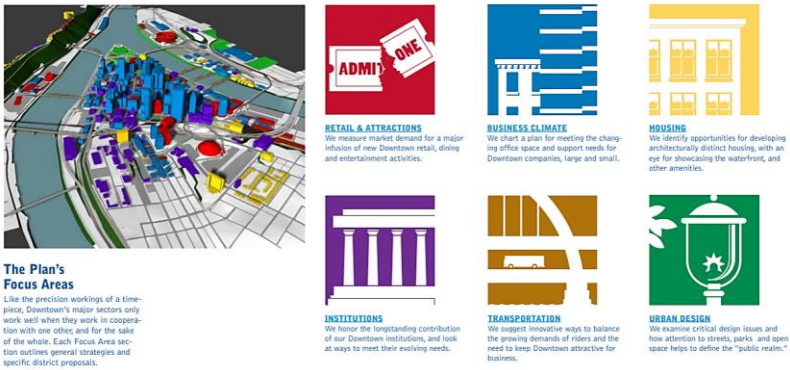

Figure 3: Downtown Plan Focus

These regeneration projects in the Golden Triangle area have contributed significantly to the regional economy by increasing the tourism potential of the city. In addition, this area, equipped with pedestrian-friendly designs and green spaces, has created an urban regeneration model that aims to improve environmental sustainability and quality of life (Pittsburgh Strategic Plan, 2016).

The two-phase redevelopment of Pittsburgh's Golden Triangle neighbourhood has provided economic, social and environmental benefits by blending modern urbanism principles with historic fabric. Riverfront parks, a walkable city concept and family-friendly public spaces have transformed Pittsburgh's downtown into a modern urban attraction (Pittsburgh Strategic Plan, 2016; Briem, 1998). This transformation is a successful example that emphasises the importance of a multidimensional approach in urban regeneration projects.

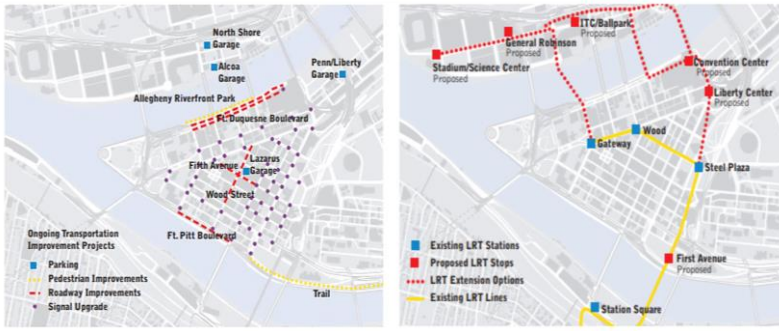

Figure 4: Downtown Plan Transport Solutions

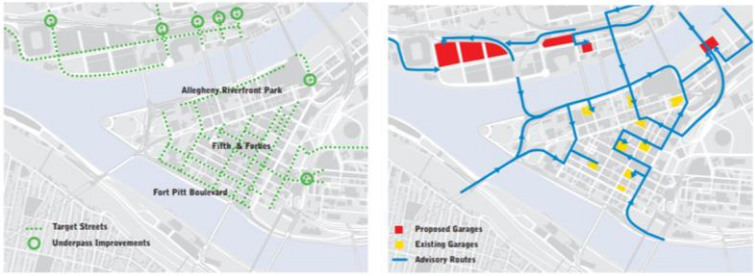

Figure 5: Downtown Plan Street and Car Parking Solutions

Transformation in Liverpool: Albert Dock, King's Waterfront, Liverpool One

To recover from post-industrial decline, Liverpool has created a new urban identity through the re-functionalisation of its historical heritage and tourism-oriented projects.

Albert Dock In 1983, the Albert Dock project was initiated by the Merseyside Development Corporation (MDC) as a major milestone in Liverpool's emergence from post-industrial decline. Focusing on the conservation and re-functioning of the historic fabric, the project aimed to transform the 19th century port infrastructure into a modern cultural and commercial attraction. Albert Dock, built in 1846, is a Victorian engineering marvel. However, with the cessation of harbour activities in 1972, the area remained derelict for many years and became a symbol of urban decay (UNESCO, 2004; Lane, 1997).

Merseyside Development Corporation aimed to preserve the original stone and brick architecture of the historic warehouse buildings and adapt them for modern uses. In the first phase of the project, the principle of minimal restoration was adopted in the interventions to the warehouse buildings; the main load-bearing structures were preserved and the interiors were converted into museums, art galleries, restaurants and commercial spaces. Completed in 1984, this phase saw the opening of cultural institutions such as Tate Liverpool and the Merseyside Maritime Museum. These buildings contributed not only to the physical but also to the social transformation of the area (Garcia, 2004; Evans, 2005).

The project was supported not only by the restoration of the buildings, but also by events to enhance the social and economic vitality of the area. The 1984 Tall Ships regatta and the International Garden Festival played an important role in promoting the refurbished Albert Dock. These events attracted millions of visitors to the area and increased Liverpool's national and international visibility. The Tall Ships event in particular both emphasised the maritime heritage and

created a strong link between the city's past and its future (UNESCO, 2004; Parkinson, 1985).

Albert Dock has been designed as an area where cultural and commercial activities can be carried out together in line with the principle of mixed use. The area after renovation;

Tate Liverpool: It has gained a European reputation as an important art gallery exhibiting modern artworks (Evans, 2005).

Merseyside Maritime Museum: Houses collections that tell the maritime history of Liverpool (Lane, 1997).

International Slavery Museum: It is an important cultural institution that enables the city to confront its history by addressing the Atlantic slave trade process (Garcia, 2004).

Restaurants and Commercial Areas: Food and beverage venues and boutique shops that meet the social needs of visitors have brought economic mobility to the region (UNESCO, 2004).

The success of the project has attracted over 5 million visitors to the area and has been a significant driver of Liverpool's tourism economy (Ersine, 2012). Thanks to the project, Albert Dock serves not only as a cultural attraction, but also as a model of transformation that creates jobs and stimulates the local economy. During the restoration process, training programmes and workforce employment projects were developed for local people (Parkinson, 1985; Evans, 2005).

The Albert Dock has become a symbol of Liverpool's transformation process and has been internationally recognised as a UNESCO World Heritage Site. The project is recognised as an example of good practice in preserving historic heritage and harmonising it with modern needs (UNESCO, 2004).

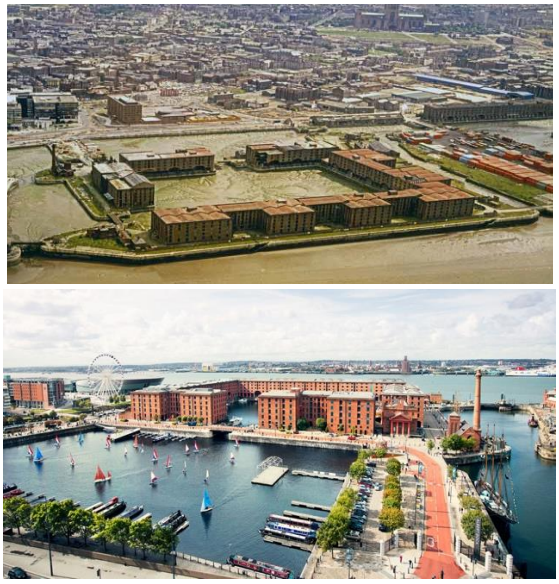

Figure 6: Before and After Albert Dock Renewal Project

King's Waterfront: The derelict King's Dock is one of the key areas revitalised in Liverpool's post-industrial regeneration process. The 14.6 hectare site, which became derelict after the end of shipyard activities in 1972, remained unused for a long time and became an urban slum. However, as part of a comprehensive regeneration strategy aimed at restoring Liverpool's economic and social vitality, King's Dock was re-planned in the 2000s and transformed into a modern living space in line with the King's Dock Masterplan Report (2016).

The main focus of the King's Dock project has been the development of social living spaces and the promotion of economic development. Within the framework of the master plan, buildings for multifunctional use were constructed in the area:

Modern Housing Projects: It is aimed to improve the quality of urban life in Liverpool by building housing that meets modern living standards close to the city centre (King's Dock Masterplan Report, 2016).

Hotels: Hotels in the area have contributed to the economic development of Liverpool by increasing tourism capacity (Evans, 2005).

Convention and Exhibition Venues: ACC Liverpool and Exhibition Centre Liverpool have hosted international congresses, exhibitions and events, enabling the city to gain a share of global event tourism. In particular, these areas have made a major contribution to the local economy and increased employment opportunities (Garcia, 2004).

Another important component of the project was the development of public transport and pedestrian routes. Access to the area has been facilitated and the area has been integrated with the city through pedestrian-oriented designs and environmentally friendly transport options. In this way, King's Dock has become an accessible attraction for both locals and tourists (King's Dock Masterplan Report, 2016).

The King's Dock project played a critical role in Liverpool's post-industrial economic regeneration. The housing, hotel and commercial areas created within the scope of the project supported economic growth by providing employment to local people. In addition, thanks to the congress and exhibition centres, Liverpool became a city where international events were held (Parkinson, 1985; Garcia, 2004). This transformation has revitalised the social life of the region, and modern buildings combined with cultural events have reinforced Liverpool's contemporary city identity.

In conclusion, the redevelopment of the King's Dock area has demonstrated that economic development and social quality of life can go hand in hand in Liverpool's post-industrial regeneration. This project is a good example of transforming underutilised urban spaces into cultural and economic benefits (King's Dock Masterplan Report, 2016; Evans, 2005).

Figure 7: King's Watefront Renovation Project Diagram

Liverpool One A major urban regeneration project developed as a solution to Liverpool's post-industrial economic and social stagnation. Covering a total area

of 42 hectares, this project revitalised the city centre by bringing together mixed-use functions such as shopping, food and beverage, housing, cinema, hotel and entertainment, and transformed Liverpool into a modern centre of attraction (BDP, 2009).

The Liverpool One project has been realised with the cooperation model of the public and private sectors. While the financing of the project was largely provided by private investors, the local government focused on infrastructure works and the organisation of public spaces. This co-operation model has set a successful example in terms of ensuring financial sustainability in large-scale urban regeneration projects and increasing the viability of the projects (Parkinson, 2005).

Liverpool One is located in the Paradise Street area of the city, in a strategic location linking the city centre and the docklands. The project redefines the city centre with shopping, dining, entertainment and residential functions, offering a modern living space:

Shopping Areas: The retail areas, home to national and international brands, have made Liverpool a regional shopping centre (BDP, 2009).

Restaurants and entertainment venues: Eating and drinking places, bars and movie theatres have revitalised the social life in the city.

Hotel and Residential Areas: The project has increased the day and night use of the area by providing hotel infrastructure to support tourism and modern housing options in the city centre (Garcia, 2004).

As a major urban regeneration project supporting economic development, Liverpool One has significantly increased Liverpool's annual visitor numbers and given a new impetus to the city's economy. In particular, the project has expanded employment opportunities in the retail and tourism sectors and increased investment in the area. In addition, Liverpool One has improved the quality of life for local residents by providing a modern and accessible spatial layout for social interaction in the city (Evans, 2005).

The Liverpool One project is a successful example of a modern urban regeneration project implemented through a public-private partnership model. With 42 hectares of shopping, restaurant, cinema, hotel, hotel and residential functions, the city centre has become a centre of attraction that both supports economic development and stimulates social life (BDP, 2009; Garcia, 2004). The project offers a sustainable model of regeneration that integrates cultural and economic benefits in the redevelopment of Liverpool.

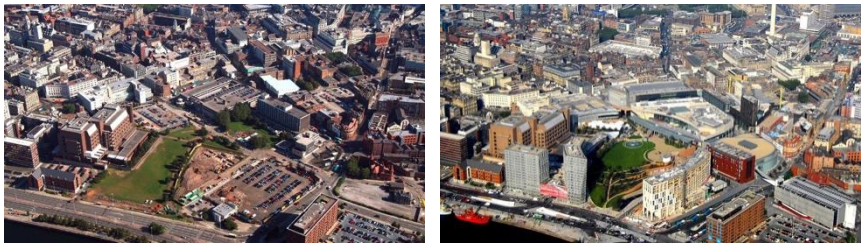

Figure 8: Liverpool One Regeneration Project Before and After

Liverpool's revitalisation process allowed the city fabric to be modernised through a combination of infrastructure and social cohesion. This transformation has made Liverpool one of Europe's leading tourism and cultural centres (Parkinson, 1985).

Role of Public and Private Sector

In both cities, public-private partnerships played a critical role in urban regeneration processes. Universities and private investors in Pittsburgh, and municipalities and developers in Liverpool, led the economic and social aspects of regeneration projects. These collaborations have increased both the long-term sustainability of the projects and their social acceptance.

The urban regeneration strategies of Pittsburgh and Liverpool are successful examples of multidimensional approaches to avoid economic and spatial decline. Models of technology-driven innovation and cultural heritage-based regeneration offer important implications for post-industrial cities to redefine themselves. These models are also guiding other cities with their potential for economic development and social inclusion.

4. CULTURAL AND SPATIAL IMPACTS

Pittsburgh's post-industrial transformation projects have profoundly affected the spatial fabric and cultural heritage of the city. The transformation of old industrial areas into technology centres has both supported economic development and reduced spatial inequalities. In particular, projects such as "Three Rivers Park" have improved the aesthetic and ecological structure of the city. These projects have increased the quality of social life of the people by converting idle areas in the city centre into green areas, and at the same time ensured environmental sustainability (Florida, 2005; Vey, 2007).

In addition, the importance given to cultural heritage in Pittsburgh's transformation process is noteworthy. For example, buildings such as the "Carnegie Museum of Art" and the "Heinz History Centre" have preserved the city's memories of its industrial past while providing a space for modern cultural events (Cowell, 2015). Pittsburgh's approach shows how spatial and cultural

transformation can complement each other. Furthermore, the so-called "Cultural District" has strengthened the city's cultural identity through theatre and performance arts (Markusen, 2006).

Spatial transformation in Liverpool has attracted attention, especially with the re-functionalisation of historic harbour areas. The Albert Dock project is one of the most important examples of this transformation. This area, which received UNESCO World Heritage status, has transformed the city into an international cultural centre with the reuse of historic warehouse buildings with museums, art galleries and restaurants (UNESCO, 2004). "Iconic art centres such as the Tate Liverpool have been integrated into the area through these projects, stimulating cultural tourism (Evans, 2005).

Another important step in Liverpool's spatial transformation was the 2008 European Capital of Culture title. In this process, the city has benefited both economically and socially through internationally recognised arts events, festivals and concerts (Garcia, 2004). These events have increased the cultural participation of local people and strengthened their sense of belonging to the city.

The spatial transformation of Liverpool was also supported by the improvement of public transport infrastructure and the creation of new pedestrian-friendly spaces. In this context, the King's Waterfront project both increased social interaction and strengthened the spatial integration of the city (Parkinson, 1985). With these projects, Liverpool has realised a multidimensional spatial transformation by combining historical heritage with modern needs.

5. SOCIAL AND ECONOMIC TRANSFORMATION

Pittsburgh's transformation process is notable for its effects that strengthen the social structure and support economic development. The increase in unemployment rates in the post-industrial period caused serious economic and social problems in the city. However, the renovation projects reversed these negativities and created new job opportunities. In particular, investments in the technology sector and innovative initiatives ensured that the qualified labour force remained in the city and reversed the brain drain (Vey, 2007). Education-oriented policies were supported through joint projects with Carnegie Mellon and Pittsburgh Universities, and employment opportunities for the young population were expanded (Cowell, 2015).

In Pittsburgh's economic transformation, social projects aimed at reducing inequalities that emerged in the post-industrial period also have an important place. Infrastructure improvements and community centres in the city's poor neighbourhoods have increased social cohesion (Florida, 2005). These

improvements strengthened social solidarity and made Pittsburgh a more livable city.

Liverpool's post-industrial transformation process has accelerated economic development and strengthened the social fabric. The city, which experienced a serious economic contraction due to job losses in the industrial sector, revitalised its economy with tourism and culture-oriented policies (Evans, 2005). Projects such as Albert Dock, King's Waterfront and Liverpool One have both increased employment opportunities and attracted investment to the region.

In terms of social transformation, Liverpool has increased social cohesion by encouraging the participation of local people in urban regeneration projects. Especially during the 2008 European Capital of Culture process, the events and festivals organised have brought together different groups living in the city and strengthened social ties (Garcia, 2004). Moreover, social housing projects and investments in public services have improved the living conditions of low-income groups (Parkinson, 1985).

Economically, Liverpool has seen significant growth in the service sector, with an increase in tourism revenues. The redevelopment of the port areas and the modernisation of the transport infrastructure have contributed to the city becoming an international hub (UNESCO, 2004). This transformation process provides a model that supports not only the economic but also the social development of Liverpool.

The social and economic transformation processes of Pittsburgh and Liverpool reflect a multidimensional approach that is not limited to physical infrastructure renewal, but also aims to reduce social inequalities and increase economic opportunities.

6. CONCLUSIONS AND FUTURE PERSPECTIVES

The transformation processes of Pittsburgh and Liverpool emphasise the importance of adopting innovative and comprehensive approaches to tackle economic and social challenges in the post-industrial era. Pittsburgh's technology and education-oriented strategies have enabled it to become a post-industrial model city by attracting a highly skilled labour force and creating new economic sectors (Vey, 2007). Liverpool, on the other hand, has both improved the quality of life of local residents and positioned itself as an international centre of attraction through the protection of cultural heritage and investments in the tourism sector (Evans, 2005).

Successful projects in both cities offer the following recommendations for sustainable urban development:

- *Public and Private Sector Co-operation:* The co-operation of the public and private sectors in urban renewal projects is critical for the economic and social sustainability of the projects (Cowell, 2015; Parkinson, 1985).
- *Encouraging Social Participation:* Involving local people in decision-making processes increases the social acceptance and success rate of projects (Garcia, 2004).
- *Protection of Cultural Heritage:* The re-functioning of historic sites in a manner compatible with modern needs supports economic development and strengthens urban identity (UNESCO, 2004).
- *Supporting Economic Diversification:* Investments in sectors such as technology, services and tourism increase economic resilience (Florida, 2005).

The transformation processes of Pittsburgh and Liverpool serve as a guide for other post-industrial cities. Their experiences show how economic and spatial development can be combined with the reduction of social inequalities. In particular, approaches based on public-private partnerships and local community participation can serve as models for long-term success.

In conclusion, post-industrial transformation requires a holistic approach not only for economic development but also for social and spatial sustainability. The experiences of Pittsburgh and Liverpool offer important lessons on how to manage this transformation process.

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Chapter 2

A RESEARCH ON NON-GRAPHIC DATA USAGE IN A DRAWING SOFTWARE[1]

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[1] Bu makale Stratcylde University, Glasgow, Birleşik Krallık'da yapmış olduğum Utilising Attributes To Increase Productivity In CAD Software isimli Master tezinden üretilmiştir.

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1. INTRODUCTION

CAD (Computer Aided Design) software is widely known as a drawing and presentation tool. However, one of the strongest aspects of CAD compared to traditional methods is that it is unique in a feature that is not found in traditional drawing methods. The ability of being able to extract data and linking objects with a database is one of powerful features of CAD software's. Attributes can be simply described as non-graphic data assigned to a block. These attributes can be used simply as annotation (for instance a title block), or can be extracted as non-graphic data, which can be used in schedules, a spreadsheet or word processor to create a bill of materials or schedules etc. These advantages of CAD systems also increase productivity and reduce design errors.

This article examines this feature of CAD systems through AutoCAD, the most widely used CAD software in Turkey and many countries around the world. This article also offers own user interface for creating and extracting attributes, which easy whole process. This is not only simply customising the software program but also the article researches aspects which are relevant to using non-graphic data.

2. NON-GRAPHIC DATA IN CAD SOFTWARE

AutoCAD offers to user the external references (XREF's) features which is probably the most advantage of the computational drafting. If a small component is created then inserted into different drawing files (such as using libraries) by way of external references, the master drawing is automatically updated when each time it is loaded. Because no block reference is loaded, master drawing's memory does not change ever many drawings are inserted. The behaviour of attributes in external references will be discussed in the article too.

The one of reasons that attributes are poorly understood by the user must be the AutoCAD's (standard) menu configuration. Most of users might not be aware of attributes. Attributes commands are hidden under the text sub-menu when they are looked from pull-down menu in most AutoCAD versions. If investigated attribute commands using side screen menu, it will not be found any command except attributes definition in many versions of AutoCAD. There is only one choose to utilise attributes, which is to enter command using command line. If have not been researched using different books written for AutoCAD, it is not possible to guess Edit commands which are vital for creating attributes. In fact, these commands are strongly related the definition of entity and block in AutoCAD interface database. If user does not have an advanced AutoCAD knowledge, he or she will struggle editing attributes.

Ralph Grabowski, who is an independent consultant and the author of a number of books about CAD expresses that the fastest hardware in the world will not speed up your drafter if you are not customised the CAD software for drawing roof trusses. He defines seven areas where most CAD packages are customisable:

- Parametric symbol libraries.
- Screen and Tablet menu.
- Icon menus and tool bars.
- Macro and Scripts.
- Built-in programming languages and links to external languages.
- Database links.
- Under Windows DDE, OLE and using Clipboard (Grabowski, 1994).

However, all things shown above cannot be customised by ordinary user because of necessity of knowledge on software' programming language. On the other hand, customising done by architects does not mean that user should learn the software's own language(s) to be able to increase his/her productivity by creating a new third party application program rather than simply customising it.

Nowadays both CAD software programs and the ones for word processed purposes offer a link to external database management systems such as dBASE's INFORMIX and ORACLE. AutoCAD has a facility for this purpose, which called AutoCAD SQL Extension (ASE). The non-graphic data in drawings can be manipulated from external database.

If attributes are not supported by using software program’s productivity tools, creating and editing them will also become tedious job for user. In this part, some utilities related attributes will be discussed. Thomas describes System Variables as a named portion of memory that stores data affecting an aspect of software' functioning. (Thomas, 1991) Using system variables, it can be set up a variety of different default drawing environments, which enable user to create his or her own prototype drawings. You might control the performance of a command using system variables. Detailed information about a drawing, even users are in the middle of the command, can be obtained using transparent commands. Some AutoCAD commands related to a view of object in the screen such as pan or zoom commands, or the ones which gives to some information about object via INQUIRE commands such as list, distance or area, and all system variables are accessible in the form of transparent comments. Most system variables except the ones declared read only can be changed using SETVAR command which you can also use transparently. Some system variables concerned with attributes are;

ATTDIA

Default value (0) no dialogue box, and (1) dialogue box use

Its function: It enables you to set up AutoCAD to display a dialogue box for entering attributes values. To see all attributes associated with a block within a dialogue box is convenient way to perceive the necessity information for the attributes block.

ATTMODE

Default value is normal, there are also off and on options.

Its function: Global editing will be mentioned in detail later in the Attributes Chapter. You can control attributes visibility in drawing by changing its mode. However, if needed to edit invisible attributes via global editing it should be used ATTMODE system variable selecting on value which cause all attributes visible. After edit process, it can be set the system variable to normal which means that all attributes and their visibility will depend on each mode.

ATTREQ

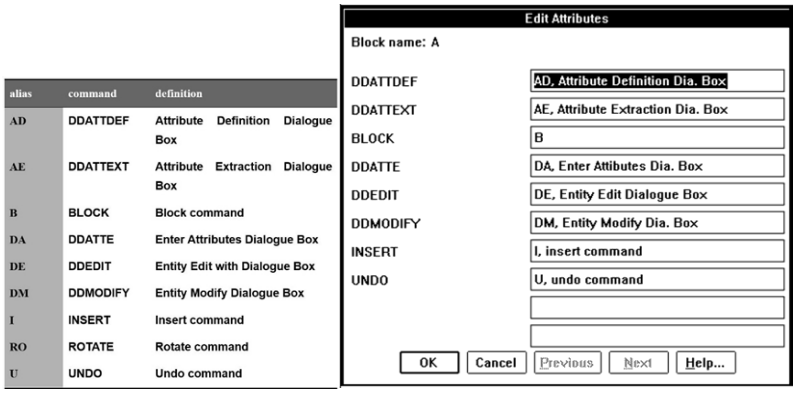
Default value (1) which means a normal prompt or dialogue box, while (0) cause no prompt that attributes use default values. If a block used in several times with the same attributes values, it is useful to set Attreq system variable to '0' to save time. If using the copy command, which is the alternative method, the block will be copied with all its attribute values. The effect is the same.

2.1. Customising Autocad To Speed Up Attributes Commands

The necessity of customising AutoCAD menu configuration for creating and using attributes has already been explained. For a sample project, AutoCAD's menu configuration has been customised editing the AutoCAD menu file and Acad.PGP file and creating some macros (Figure 1).

2.1.1. Creating Alias for Attributes Commands

For the sample project, it used both alias and macros heavily because it is not possible to remember long and meaningless command names, which it must be used repeatedly several times. For example, it has been abbreviated DDATDEF command which invokes attribute definition dialogue box, as just 'AD' which stands for Attributes Definition.



alias	command	definition
AD	DDATTDEF	Attribute Definition Dialogue Box
AE	DDATTEXT	Attribute Extraction Dialogue Box
B	BLOCK	Block command
DA	DDATTE	Enter Attributes Dialogue Box
DE	DDEDIT	Entity Edit with Dialogue Box
DM	DDMODIFY	Entity Modify Dialogue Box
I	INSERT	Insert command
RO	ROTATE	Rotate command
U	UNDO	Undo command

Figure 1. Alias For Using Attributes (on the left) and Edit Attributes Dialogue Box (on the right)

2.1.2. Creating Pull-down Menu

Acad.MNU file which contains all the menus used in AutoCAD is created using control characters which are special punctuation marks, and special syntax to define sub-menus. Although creating menus is not easy for ordinary user, editing process does not require study too much. AutoCAD standard menu file, which is Acad.MNU, is the best example to understand the logic of the program. It could be created other alternative menu files with MNU file extension, using any word processor. Once you create a ASCII text file, it can be loaded it as an alternative menu by using Menu command from File/Utility pull-down menu. When a menu file is load, a file with MNU extension, the compiled version of Acad.MNU is created. Every menu file is used together with its compiled version.

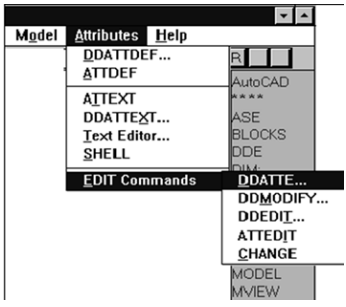


Figure 2. Proposal "Attributes" Pull-down Menu

While it is difficult for the user to recreate the whole command structure, editing the menus is possible. Editing menus is very useful capability of the software program because user can decide the name of process, she/he uses.

Because users' background about computing varys perceiving a command will be different.

3. ATTRIBUTES

Attributes can be defined as non-graphic information which is assigned to a block upon its insertion. Although attributes can be created without attaching to any block, practically there is no function of creating that kind of attributes.

The factor which makes attributes quite useful tool is the ability of carrying or extracting data to external database or word-processed application programs. Practically, attributes can be used simply as annotation, or for storing such information as material's specifications, areas or sizes, the data about supplier or manufacturers, cost for bill of materials or reports. According to a research done by Ralph Grabowski, some CAD packages limit attributes data to symbols such as AutoCAD, while others allow the data to be attached to any object such as MicroStation and Cadvance (Grabowski, 1994).

Attributes can be used in place of the text anticipated to edit later globally. For example, it is assumed that a description of a material has been used in several places. When changed the size of the material, you have to edit each text individually. However, all text values could be changed in one step using global editing feature of attributes. Describing any building elements such as doors within plan scaled in 1/50 is helpful if wishes to extract the data for a bill of materials or other sub-contractors. All descriptions and building elements could be seen on a single spreadsheet.

3.1. The Reason of Focusing on Attributes in the Article

It is not surprised that attributes are not understood for most user. The share of the chapter in the AutoCAD manual, which attributes are explained is probably great for it. The example about attributes in the manual is related to administration or facility management. In addition, the same example is published for new versions of AutoCAD without changing anything except adding the DDE section for Windows. Where attributes are used is described differently by different books written for AutoCAD.

The reason of investment on major CAD systems is that these software programs offer the wealth of data created during the drawing process. This data can be utilised using various features of the CAD package. In the article, intended to focus on one of these features, which was attributes.

3.2. Definition Of Attribute

Kyles explains clearly the most important point about attribute definition: "When you define an attribute, you are creating a program the user for data" (Kyles, 1993).

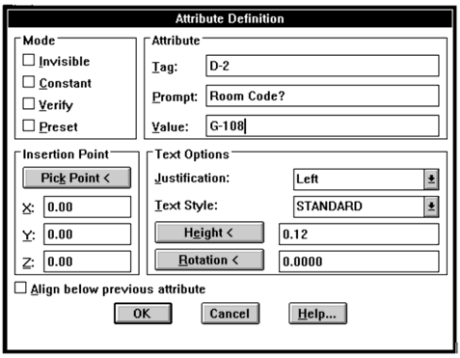


Figure 4. Attribute Definition Dialogue Box

Because some literature defines attributes as a tag attached to a block and every attribute attached a block has a block name, the function of the tag can be confused by the ordinary user. The tag is the identifier of the attributes and can be specified during extracting data to manipulate in a database or word-processed software program.

Another thing which created confusion about attributes definition is the using Constant and Preset modes. In both cases, the block is inserted into the drawing prompting any attributes value. However, no one can change constant attribute values using attributes edit command.

If needed to use an attribute repeatedly for different values, this can be done using the DDATTE command which invokes a dialogue box to enter attribute values. It should be defined attribute prompt as short as possible because it cannot seen long sentences in the Enter Attribute Dialogue Box. If desired, different text style and height can be used for each attribute value in same block. It can be enhanced text styles in the attribute definition box assigning new text styles as current from Text / Set Style... pull down menu or using the Style command. Since someone must use and define each attribute value individually, to make attribute definition dialogue box is tedious job even if he or she creates alias for that purpose as suggested before. Because to press the "ENTER" button twice invokes the previous command in AutoCAD, it can be used of this feature for Attribute Definition Dialogue Box. If you do not want to change the text options of the second attribute value, you could align below previous attribute selecting this option. This will save a considerable amount to define attribute values.

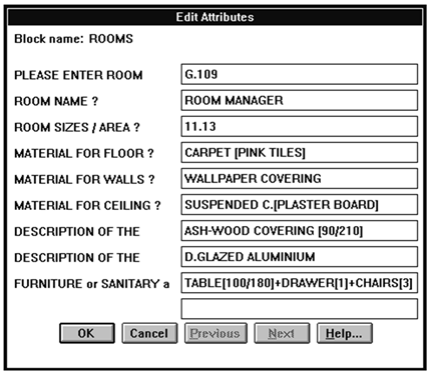


Figure 5. Edit Attributes Dialogue Box

3.3. Using Attribute In The Drawing

An attribute need not to be attached to a physical block. If are wished to produce labels for every room in a building, then a block could be created which just shows the text of these attributes. Whenever inserted a block attached an attribute, it will be asked to enter attributes value(s) after regular prompts such as insertion point, scale etc. Because the selection method causes to change the attribute prompts order, it is admirable to select attributes one by one rather than using the window option.

When inserted a block with attached an attributes, it may be prefered to use "Enter attributes Dialogue Box" to enter attribute values if the related system variable is set to 1.

3.4. Changing or Editing Attributes

Editing attributes in AutoCAD is quite confusing part of utilizing this feature of software. It could be edited attributes using several methods of which some have limited especially after they are enclosed in a block.

These edit commands are not located on a menu because attributes feature does not have a menu itself in AutoCAD. Someone should have a good knowledge about entity and block definition to be able to guess where these commands are. Different books written about AutoCAD have different comment about editing or changing attributes.

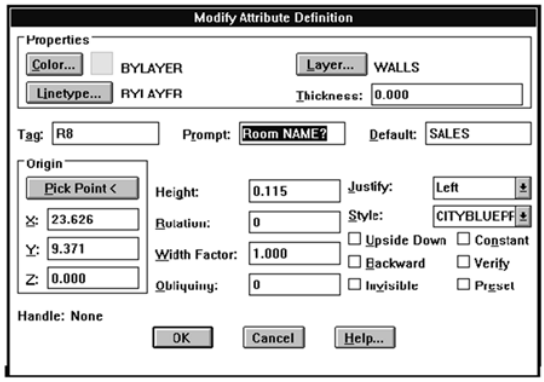


Figure 6. Modify Attribute Definition Dialogue Box.

If needed to create several attributes which are slightly different from each other, might be preferred to use Multiple-copy after creating the first one. DDMODIFY command can be used or from pull-down menu MODIFY/ENTITY... which allow to change all specification of attributes. Because attributes are accepted by AutoCAD as an entity, Modify/Entity command could be used for it. However, it cannot be used the same command to change attribute specification after attributes are enclosed in a block. When used Modify/Entity command, any information will not be seen about attributes except data about insertion point, layer, color, line type, thickness which belong to the specification of a block. DDATTE command which invokes edit attributes dialogue box can be only used to change attributes values. This dialogue box is the same as Enter Attributes Dialogue Box. Although some books recommended to use "Multiple DDATTE" command to edit several blocks repeatedly, pressing "ENTER" button after OK in dialogue box is easier than typing long command.

Someone could come across attributes commands in several place in AutoCAD menu configuration. Sometimes, they are accepted as a text, therefore, attributes could be found under the Text sub-menu, from 'Draw' pull menu. The same command can be found under the Block from side menu. To control visibility of attributes, this time, someone has to go the side menu for Display/Attdisp, and if you see ATTEXT command under the Utility command. AutoCAD allocates a 4 command-toolbox for attributes on new versions. Because it is not possible to be able understand the function of icons by looking at them, someone has to use the explaining label, which appears on the icon after 2-3 seconds.

ATTREDIT command could make a change to attributes specifying block, attribute tag and value specification or all visible attributes. After entering the command, AutoCAD prompts: Edit attributes at one time?

This is a main decision of edit process. The main difference between two options, which are "Yes" and "No", attributes can be specified block name, attributes tag and value from selected and only visible ones. If chosen "No", all visible or invisible attributes will be edited at one time, which called global editing. It will not be asked to select attributes if needed to edit invisible attributes, for the first option, the Attributes Display System Variable should be set to "On" to make them visible.

The second difference is about the ability of the steps. Attribute's value and block definitions such as position, layer, colour etc. can be edited using "Yes" option although "No" option can just change the values of attributes. After having selected attributes, the following option prompt appears: Value / Position / Height / Angle / Style / Layer / Color / Next <N>,

Because more than one attribute has been specified, in the first method a X mark appears at the text insertion points of an attributes which will be first edited. The options will be repeated after changing a property of the attributes unless not chosen the next selection set using "N" option which it defaults. This process will repeat until all attributes specified have been edited. It could be terminated the process at any time pressing control+C.

Attributes can be edited one by one using first step of ATTEDIT. However, you might make use of a an AutoLISP utility formed in the sample directory of the AutoCAD directory called ATTREDEF.LSP . It can reduce all the attributes of a block globally redefining them. This utility is quite useful because attributes should be redefined when a block which contains attributes is redefined. Although blocks redefined change their configuration to adopt the new block definition, its attributes maintain their old properties.

Because DDEDIT command can only edit a text on ATTDEF object using dialogue box, cannot be used it after enclosing in a block. If needed only to change attribute's tag, prompt and value rather than properties and text specifications, this method is the most convenient one. Max 255 characters can be input per line like other dialogue boxes, while 48 characters are displayed in the box at any one time.

If a block which contains attributes is exploded, the definition of the block entity will change, as will the attributes on the block. The attributes have been represented by the tag on the screen anymore. The entity attributes could not be edited using both change and modify entity commands. Change command can be used to edit either the properties of the attributes or the text specifications

including attributes' tag prompt and default value. However, no one can change attributes states such as visibility, constancy. Alternatively, DDMODIFY command might be used to change any specification

command	VISIBILITY and STATUS (Preset,Const. etc.)	Attributes TAG and PROMPT	Attributes VALUE	BLOCK DEFINITION (insertion p. colour,layer)	TEXT Style,Height	WHEN ?
DDATTE (ENTER or EDIT Attributes Dia.Box			YES			During and After block
DDMODIFY (Attribute ENTITY MODIFY Dia.Box)	YES	YES	YES	YES	YES	Before Block
DDMODIFY (ENTITY MODIFY Dialogue Box)					YES	After Block
ATTEDIT (If selected "Yes" for Edit Attributes one at a time?)			YES	YES	YES	Both After and Before Block
ATTEDIT (If selected "No" for GLOBAL EDITING)			YES			Both After and Before Block
DDEDIT EDIT Dialogue Box						Before Block
CHANGE If a block is exploded redined or re-created		YES	YES	YES	YES	Before Block
	'CHANGE" CAN NOT EDIT THE TEMPLATE ATTRIBUTE DEFINITION PERMANENTLY. IF YO INSERT THE SAME BLOCK, YOU WILL SEE THAT NOTHING HAS CHANGED.					

Table 1. The capabilities of EDIT commands about Attributes in **AutoCAD**

3.5. USING ATTRIBUTES

3.5.1 Using on The Drawing Without Extracting

Attributes can mainly be used in two ways. The blocked attributes could be just used utilizing its text input feature when needed to insert a block which has changeable data each time. Alternatively, Attributes can be made use of after extracted to either database management system or a word -processor and spreadsheet program.

A spreadsheet could be prepared if needed to create a schedule about your drawing. In addition, templates could be generated such as title blocks. First, user can see a title block and headings before attributes are attracted to it. After creating a block with attributes which has default value about the empty boxes on the title block, the user simply inserts the necessary information. Even attributes title can be used for prototype drawings which already have the title when starting a new drawing. If a attributed block which has not got any graphical objects is created, user could insert this block into the title entity attributes value.

User might ask that why he or she need to use attributes while using text command. Because all specifications of text such as height, style, insertion point etc. in attributes are pre-defined, using attributes is much faster and more productive than text command. When used this feature, all user has to do is to enter the necessary information using keyboard.

3.5.2 Listing and Extracting Attributes

Being able to extract non-graphic information from drawing is accepted as one of the foremost innovations in CAD. Information could be extracted to tell sub-contractors such as window components or to builders what material to use, what kind of finishes to apply to surfaces. These data could also be used for cost estimating purposes. It could be written a complete listing of all attributes values and other information by extracting text file. User could get a hard copy of the data defined during extraction process using a template file. Filename .TXT>PRN will dump the file to default printer without quitting AutoCAD using operating system commands from External Commands/File pull down menu. User might be able to extract the data from the drawing into the extract files which can be formatted using either CDF (Comma Delimited Format), SDF (Standard Data Format) or DXF (Drawing Exchange File).

When extracted attribute data attached to a block using CDF or SDF format, the attributes values of each block will compose a single record which is a description of a line in the database programming language. What the extracted data in each record will be is determined during the creation of the template file. While the number of attributes values is usually accepted the quantity of field, which is another database expression, some optional information including the block itself such as insertion point block name or scaling factors. It might be preferred to use either CDF or SDF format to extract data from the drawing because of two reasons. Because SDF format is easier to read-all field are lined up in equal columns- user can send the file to the printer without processing in a word-processed program; The second reason, could be more important one, is being readable by other both database management systems and word-processed software packages. For example, while an extracted information with CDF format can be used as a listing in WordPerfect or for calculator and evaluation in Lotus 1-2-3, for the same job in Excel spreadsheet program, SDF format should be used.

3.5.2.1 Preparing a Template File

After determined which file format will suit user needs, user needs to create a template title which shows the name of attributes tags extracted and, if desired, other optional information about the block. Because a template file is also a

separate ASCII title, its file extension must be TXT. However, any desired name might be given to it.

As mentioned before, each record line of template file must contain a tag name, a code letter that determines whether the attribute value is numeric or text, the maximum number of spaces allowed for the field in the extract file and if it is numeric value, the number of decimal places. There are necessary variables needed when set a database. You will see this data in each record of template file as three-line. For example:

BL:NAME C 008000

PRICE N 007002

The technical purpose of creating up a template file is to make up the structure of a single record. The first entry on each line of the template file is the name of the field. This may be an attribute tag or one of several pre-defined names for block characteristic. (Encyclopaedia AutoCAD, R. M. Thomas, 1991)

Except for the fields which can be manipulated mathematically, a character code is used for all fields. However, you could enter some numbers within the character field.

The maximum size of the field is determined in the next three digits. If the actual values are too long than the allowed one, AutoCAD prompt an error message:

*** field overflow in record <record number>.

Finally, the last three digit is allocated to the number of decimal places. If it is a character data, user should enter three zeroes. Even user do not assigned any decimal digits for a numeric value, '000' should be entered.

Determining what to extract is not a simple task. When put into practice, user has to make up the structure of the template file adding attributes tags one by one. In addition this, user might have some problems about attribute extraction, which will be mentioned later in this chapter. It is not advisable to use attributes extraction for simple task which are not repetitive.

The data extraction using better CDF or SDF is efficient method if you want to extract the data you need. The extracted file will not be expanded unnecessarily. When used DXF format for data extraction you could limit the number of entities using select object option in Attribute Extraction Dialogue Box. However, all information about each extracted block will be in the file.

If forgotten the names of tags, you could use "List" command from INQUIRES/ASSIST pull down menu.

3.6. Extractıng Attrıbutes

Using the ATTEXT or DDATTEXT commands, you can extract the attribute data into disk to use or evaluate into a separate ASCII file on disk. All process about the attribute extraction will be explained using Attributes Extraction Dialogue Box.

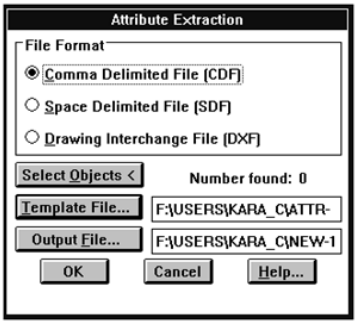


Figure 7. Attribute Extraction Dialogue Box.

3.6.1. DXF File Format

DXF file format stands for Drawing Interchange File Format. This format will be mentioned in detail the later chapters. You might want to learn the difference DXF Out command and the option in DDEXTEXT command. While DXF Out located under Import-Export/File pull down-menu converts a drawing file into a standard data exchange format for other CAD software programs, DXF output file generated by the ATTEXT command contains only the data from blocks containing attributes. Because the DXF file format does not need template file, the template file button in the edit box will be disabled.

3.6.2. CDF and SDF format:

After created the template file, the template file should be typed and outputted filenames in the template and outputted file edit box with its drivers. Alternatively, user could select the template filename, by clicking on the template filename. After entering output filename and clicking OK button, user should get the message which tells how many records in extract file. User might wants to see the contents of the extract file before printing or connecting from command line with other software programs. 'TYPE' command could be used with a proper path for the output file.

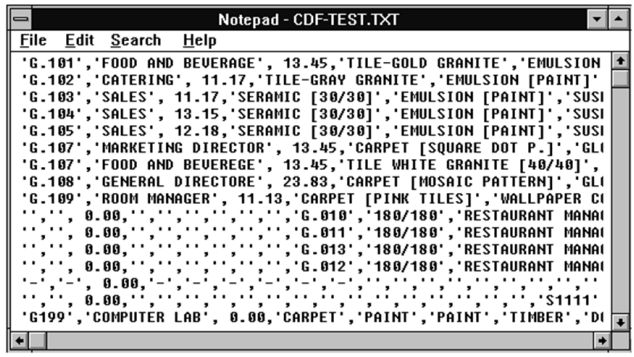


Figure 8. The Appearance of the CDF File in a text editor

It might be noticed that the individual values are enclosed in single quotes which are delimit “characters. In case of specified numeric values delimit characters do not appear. The order of individual values in each line is the same as those user has determined in the template file.

Since some database management systems and some third-party software programs require other delimit characters to distinguish character values and field separation. It could be added this statement in two special lines in the template file,

C:QUOTE' C:QUOTE"

C:DELIM; or C:DELIM/

These statements will replace the single quote with double one, and the command delimiters will substitute with the semicolon or the slash characters.

When used to type command for an output file formatted with SDF file format, it will be seen that there is no special delimiting characters. Because of this feature, SDF formatted text file can be used by most DBMS and word-processed programming. It could be even imported into a AutoCAD drawing using Text/Import from DRAW pull down menu. This format is the best one if intended to print out the attribute information. In case of all three-file format, user should use 'select objects' box in Attributes Extraction Dialogue Box to select the block whose attributes intended to extract. Certain blocks could be excluded using object filters which mentioned earlier. User should include all blocks whose attribute data will be extracted. Otherwise, the attribute data which is not selected will be ignored even if their tag names is in the template file.

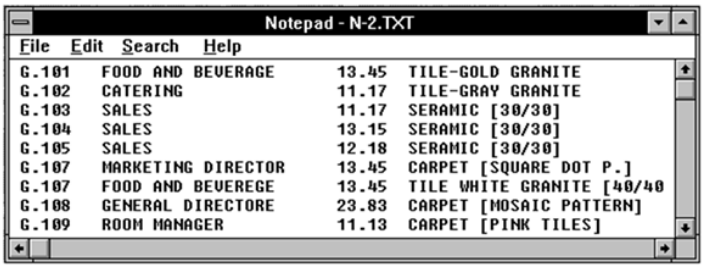


Figure 9. The Appearance of the SDF File in a text editor

3.6.3. Notes For Attributes Extraction

Data given for attributes values, when they are written to a database handling file, might need to be interpreted as numbers rather than characters. For instance, an architectural distance, which is used differently by some countries including UK and U.S.A such as 12'-6 1/2, might need to be written in decimal feet (12.54) without the apostrophe. (Stellman and Krishnan,1993)

Even if attribute display mode is OFF, it is not a hindrance for creation of output file. The same name should not be given for the template and the extract/output file. Otherwise, this will cause to lose one of the files because there is no prompt to tell that you are overwriting the first one.

A blank line cannot be had anywhere without individual attributes values in the template file. This would be understood by AutoCAD as an individual value. Therefore, you should use any character such as dash instead of blank line. For example, Block_Name

If an attribute attached to a block object is created, user may have problems about rotation, scaling and distortion. For instance, when user wish to insert a window block by changing its scale and rotation factor, the attributes values might become unreadable. User could solve this problem creating a separate block that only contains attributes.

When generating assembly drawing, users sometimes insert copies of a component in order to generate other elevations. They can run the risk of duplicating the component's attribute information, with the result that total-number component count may be wrong. The same problem can occur because the user might insert only one block, then he/she may use it to represent more. This could be achieved by providing a 'Quantity' variable attribute to the block. (Anonymous,1995)

Although users could edit attributes tag and prompt easily using DDEDIT command before they are attached to a block, there is no alternative to edit them after enclosing in a block. It would be recommended users to copy attributes

before enclosing a block entity. User will have another choice if he or she is not satisfied with the result.

Attributes values property could be changed such as text height, colour, layer etc. even after being made up block by using the ATTEDIT command. The Table.1 can be utilized in order to see the limitation of the edit commands.

If customized the DDINSERT command creating a short-cut one, user could use this command to insert blocks including the ones enclosed in attributes. This dialogue box is same as the DDATTE command' one, which called 'Enter Attributes', except its title. (when ATTDIA system variable is set to 1)

It was mentioned before that attributes could be invisible. Although an invisible attribute cannot not be plotted for the drawing file, the data stored inside the drawing file is extracted using ATTEXT. The number of spaces in the template file should be determined by considering both the length of attribute and the shape of file when printed. It is not advisable to give too much space unnecessarily.

3.7. Using Extracted Text Files Without Linking

Because the extracted files formatted using both CDF and SDF file format are actually ASCII text files, it could be imported and processed them in most word-processing program. However, user might have to change TXT file extension format to PRN for some software programs like Lotus 1-2-3. It also accepts SDF file format to import files.

Excel, which is another spreadsheet program run on windows like Lotus 1-2-3, only accepts the CDF file format. If user is going to extract a file for a database manager, he or she should find out what kind of file format it needs and whether it requires different quote and delim option for delimit characters.

The extracted attribute data cannot be linked with other programs because these files cannot be updated via AutoCAD SQL Extension (ASE). Linking to external database will be mentioned under the next title.

3.8. The Behaviour of Attributes When Used with External

3.8.1. References

The usage of Layers and Cross References can be combined to control the design process. It can also improve users' productivity by eliminating the duplication of effort for the same part of the drawing. External References, practically, enable user to use various drawing files without adding them into the current drawing. Because these are just referenced drawings, they cannot be edited unless you import into the current drawing. This process is called binding

in AutoCAD. However, each copy of external referenced drawings can be rotated, scaled or copied independently.

The same external referenced drawing can be attached to a drawing more than one times. When it is done, user might need to control visibility, the status of layers such as colours, line type, the status of lock and on/off to distinguish them from the part of current drawing. This feature of the software program can also be used to display the specified part of external drawings rather than whole drawing. Snap modes of the drawing software program can be used to insert external referenced drawings very accurately.

Different CAD packages support external referenced drawings with different capabilities. Changes made in external referenced drawings in AutoCAD are reflected in the current drawing using 'Reload' command, while Microstation drawing package updates them automatically. While Microstation can select any portion of drawing to reference it to the current drawing, AutoCAD can only clip rectangular portion of it. Both AutoCAD and Microstation can self-reference a drawing, which enable user to see different parts of the same drawing with a different scale. However, AutoCAD does it only in paper space.

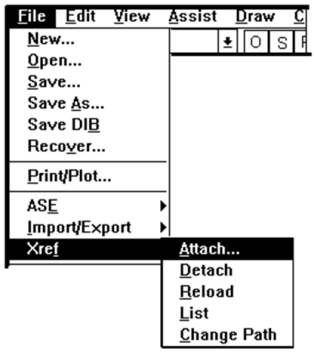


Figure 10. X-ref Pull-down Menu in AutoCAD

Even a drawing which has an external referenced drawing(s) can be referenced for another drawing(s) in both AutoCAD and Microstation. External references can be used in networked workstations allowing each member of design team to utilise other's works. This saves time and increases productivity in an office.

When an external referenced drawing is added into the current file using 'attach' command located under the XREF / File pull-down menu, AutoCAD assigns new names for the layers, blocks, line types, line and dimension styles in the referenced drawing by using vertical bars. When the external referenced drawing imported, AutoCAD replaces the vertical bars with the '0$0' symbols.

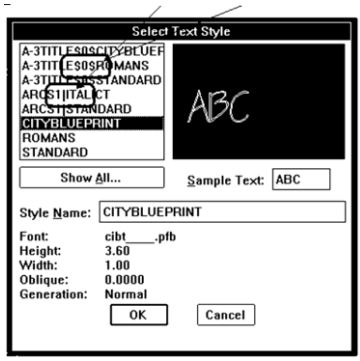


Figure 11. The representation of text styles that belong to the imported and attached entities

During the test of sample practical project for the relationship attributes and external references, It has been observed that although the information of path is stored when re-open the file, the arrangement made for the visibility of referenced drawing disappeared in AutoCAD.

Because external referenced drawings are not a block which has editable attributes, their attributes cannot be manipulated in the current drawing. However, their attributes values in the external referenced drawing can be extracted from current drawing. This enables an architect to create a bill of materials which belongs to whole project stored in the several CAD workstations. The co-operation between external references and attributes not only causes the possibility of making mistake to reduce, but also considerable time is saved in an office.

4. DATA EXCHANGE & LINKING

After creating attributes, extracted data need to be manipulated using either database management systems or spreadsheet programs for bill of materials, cost estimating etc. It could be linked non-graphic data in your drawing to a spreadsheet program using the powerful feature of Windows environment, which is DDE (Dynamic Data Exchange). Because data exchange between AutoCAD and spreadsheet program can be possible using DXF file format, the necessary information for this purpose could be found under this title.

Some parts of Excel spreadsheet program, which is used for data manipulation and links to other software programs, are presented in this chapter of the article.

A brief information will be given about ASE (AutoCAD SQL Extension) which is a built-in data manipulation tool of WINDOWS: DDE, OLE and CLIPBOARD.

Every stage of this article including printing has been created using Windows environment. Notepad was used during attributes extraction as a text editor. All images enclosed in this article are re-created by means of Clipboard and Paintbrush. The major utilising of Windows environment for the article is its data exchange capability. In the following parts of the article, Windows environment and its data exchange capabilities for graphic and non-graphic data will be discussed.

4.1. OLE & CLIPBOARD

OLE which stands for Object Linking and Embedding is a Windows feature. OLE enables objects which is pasted as text, picture to be updated automatically when you make changes as to original ones in the application. It might be linked electronic mail packages, spreadsheet data, graphics, drawings, animations (from presentation packages), pictures (from painting software packages) and movies (from multimedia program). In some cases, even user does not have to leave his or her current /client document in order to alter an embedded object because all commands and tools with all feature of several document will be on your main document when clicked on the embedded object. If both source application and destination document support OLE, it could be embedded an object using copy and paste or copy and special paste depending on application program menu configuration.

A document can also be embedded and linked to more than one different application. If they support OLE, editing the original object will cause the linked objects to change automatically or manually if desired. Using Links Dialogue Box which view link information from edit menu, it can be changed the update options as well as link via 'change link' button. It might have been noticed that there is a update command in file pull down menu of some windows applications. You could update an embedded object using 'update' command if the application is open. Even when the destination document is not open on the desktop, you could update the next time you open it.

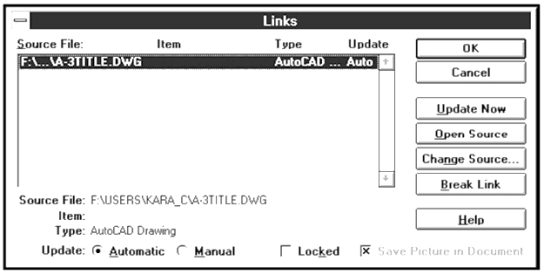


Figure 12. Links Dialogue Box in Any Application which Supports OLE

Using the Clipboard, text, graphic or picture could be copied from one application to another part of the same document or to another application program. When copied a text or graphic into the clipboard the second time, previous one will be lost if you do not save it into a disk file. Although clipboard can only save any text or image with .CLP file extension, it will not be problem if they paste later. The clipboard supports any data format sent by an application such as vector, WMF, raster, BMP, text, DWG etc.

AutoCAD on Windows has four different copy options under the 'Edit' pull-down menu; copy image, copy vectors, copy embed, copy link. Although all of them copy objects into the clipboard, each one works differently. Copy Image command might be used to copy only definite part of your drawing. It could be checked the selected area from the clipboard. If accuracy is important, it should be selected copy vectors option. When the object is printed, a vector file could show clean lines unlike a raster file. The copy link command embeds the whole AutoCAD drawing shown in the graphic screen into another applications.

4.2. Dynamic Data Exchange

You could use OLE and the clipboard features to process the image in the desktop packages or to add an image in the drawing for presentation purposes. Although it can be changed these object' scale in the drawing by dragging the corner of handles of the embedded object, it is not possible to be edited. More importantly, these are always graphical images even user have copied a text from a word- processing program.

Using the DDE (Dynamic Data Exchange) of windows, a piece of information on a document can be linked to another document without a physical copy. Unlike OLE, DDE method is concerned with data rather than graphical image. After transferring and linking the data, you could process it in the server or destination document such as preparing spreadsheets. A maximum of 16 applications can exchange data with each other in the background of Windows.

AutoCAD can communicate other applications via AutoLISP and ADS modules. This routine had been automated in previous AutoCAD versions creating the DDE commands under Edit pull down menu.

How can be used the DDE feature in a CAD software practically?

We could mainly utilise the DDE in AutoCAD both as a server/destination document and as a client application. The main division determines the way of utility it. If AutoCAD is used as a client, which is most common one, it could be extracted data to another applications such as database or word-processing programmes to create bill of materials or to estimate the cost of proposal product or buildings. If AutoCAD used as a server, you could utilities it for parametric

design. In this case, you could generate a building element such as stairs by entering its necessary values from even another application. It could be made use of this feature by simply creating looped commands in AutoLISP.

Another advantage of parametric design is stated that custom-built parametric programs can also be ensured that your designers use the correct layers, variable settings and symbols. (Anonymous, 1993)

4.3. Link Between Autocad And External Database

4.3.1. ADS

As mentioned earlier it could be extracted both attributes' data and information which describes entities using DXF file output. It has also been emphasised that extracted data could be used in other DBMS's. Why is it needed an external database to process the data? If user plans to use the data for tasks such as developing part list, assisting inventory control, development of large-scale maintenance schedules, AutoCAD' usual text-handling features will be insufficient. User will need to store the data in a external database, and access and update by multiple users is possible using a database. If AutoCAD is using on other operating system environment rather than Windows, using AutoLISP whose file access function is limited will not be solution to update data held in an external data file. These kinds of external database links can be set up utilising AutoCAD Development System (ADS) which is a language programming environment for developing AutoCAD applications.

Using ADS for small scale task if not recommended because you must have a good understanding of the C programming language, and supported compilers and development tools for each AutoCAD platform.

4.3.2. ASE

It was mentioned that you could access external database using AutoCAD Development System (ADS) applications, which is created by a complete programming interface, the AutoCAD SQL Interface. The ASE (AutoCAD SQL Extension) commands located under file pull down menus are a product of the ASI.

ASE is the latest utility of AutoCAD to perform data processing tasks after database, entity handles and extended entity data. Using the ASE basically, you could access and manipulate non-graphic data held in external database. With ASE it might be accessed most well-known DBMS's (Database Management Systems) such as dBASE III+, dBASE IV, INFORMIX, ORACLE, PARADOX etc. Theoretically, the single AutoCAD application can be connected to more than one external database via a set of drivers ASE has.

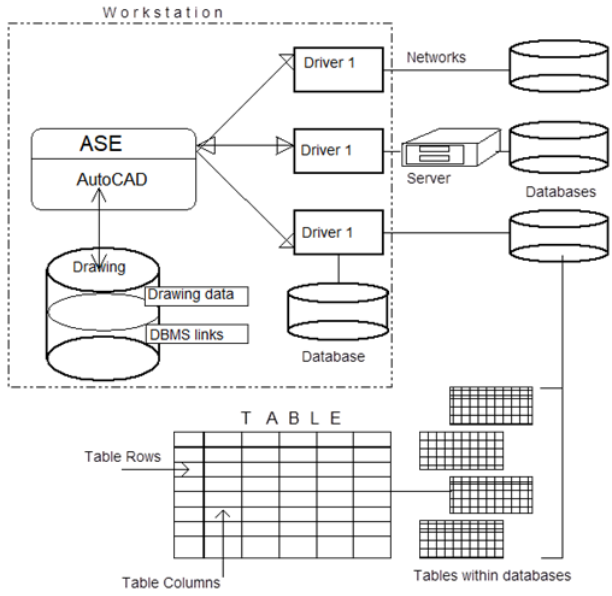


Figure 13. The Representation of Data Circulation in ASE

An user might be able to use ASE either to process the data for cost estimating, bill of materials or to access a standard parts database because ASE provides the same command set regardless of the database in use.

However, multiple users cannot access a single database using ASE in earlier version of AutoCAD. It could be performed the non-graphic data which belongs to an entity in a AutoCAD drawing in DBMS even when the drawing is not loaded because the data is stored in the native external database. Since both AutoCAD and DBMS access the same data, user could change the data values either using AutoCAD or DBMS. To view the updated data, it can be used the ASE command in AutoCAD.

This article is not intended to research ASE commands in detail such a short time. However, AutoCAD recommends some books about SQL programming and database for beginning SQL users. Therefore, it will be given very overview information of SQL.

4.3.3. SQL

SQL is only a standard database language represented by major suppliers who provides database products. Giant suppliers such as IBM, UNISYS prefer SQL as part of application architectures. SQL (Structured Query Language) is defined by some literature as a sub-language because it does not contain control commands such as IF , THEN, ELSE, GO TO , DO, WHILE etc. Therefore, SQL can only perform definitional language facilities to manipulate data by dealing

with data definition, access control definition etc. For this purpose, a module language provided by SQL has various procedures for retrieving, storing and modifying data.

Relational database management systems facilities are described by several language like SQL for defining and manipulating data. The SQL objects could be seen as tables, rows and columns. The data manipulation language (DML), which is other important part of SQL, is used to instruct the DBMS on how to manipulate the actual data stored, according to the definition in the database. Using this language data may be inserted, deleted or retrieved in various ways (Cannan and Otten,1993).

4.3.4. DBMS

Because database terminology contains different names for the same element of database depending on work area, showing this terminology will clear confusion about definition of terms in database.

Before the definition of DBMS, it would be better to explain what a database in this context is. A database is described similarly by most literature as any collection of related information grouped in the field for a specific purpose in application. Information in a database is stored in tables made up with rows and columns. Each row must be related to the others because they all contain the same kind of data. One and more tables containing data is made up a database. As seen the table, the data in the file(s) can occur in more than one tables by re-organising files. A row in the table is a record which includes variety of the constant columns of single element.

A column is a definitive constant value for rows. Finally, the intersection of rows and column in the table is allocated for a single data value. DBMS (Data Base Management System) is a kind of database programming system which contains a collection of programmes for creating and manipulating database by providing tools.

Relational is a criterion for classifying a DBMS, and refers specifically to the data model or representation of the data. In our example, data model is a collection of the tables (AutoCAD ASE Manual). While data model relational database is based on the relational, Relational Database Manager can draw data from different database files linked via the data model. DBMS languages like SQL (Structured Query Language) is developed to interact with relational database.

While most file managers and well-known spreadsheets can perform some tasks about data management such as sorting, re-arranging data etc., they are not capable of accessing two or more database files simultaneously. Practically,

'relational database manager' term is used to emphasis the capability. Some DBMS's can be imported and exported spreadsheet file formats such as Lotus 1-2-3. For comparison the capability of DBMS, in this example is dBASE IV, specifications are given the followings:

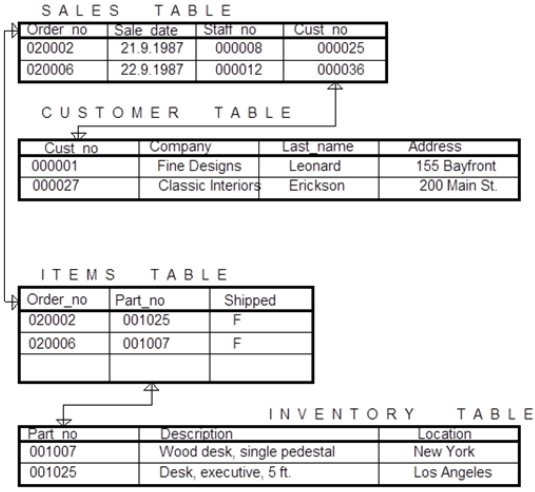


Figure 14. A representation of a Relational Data Model

AutoCAD provides very detailed DXF file format technical information in the AutoCAD Customisation Manual including general file structure, entity group codes, DXF system variables for those who intend to write their programmes to process DXF files or work with entity data obtained by certain AutoLISP and ADS functions.

4.4. Linking Process In AutoCAD

As mentioned earlier, it could be sent drawing data to another Windows application which supports DDE such as Microsoft Excel database/spreadsheet software to perform data manipulation. AutoCAD for Windows has a DDE sub-menu under the Edit menu. The first command must be 'dialogue...' which display the DDE Initiate Conversation Dialogue Box. The purpose of the dialogue box is to introduce the other application, its path in the system for optional auto start-up, and to specify the work filename in the destination application using 'work file edit box'. It could be also specified that whether automatic update is desired, by checking the related radio button. It enables the changes to be updated in the application in the AutoCAD automatically.

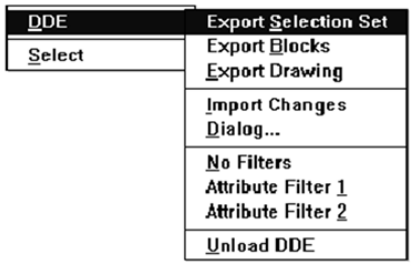


Figure 15. Dynamic Data Exchange Commands in AutoCAD for Windows

The link will remain in effect until the destination application is ended. It could be also used the radio button to terminate the link. The destination file could be manually updated when made changes in AutoCAD, using one of 'Export' command option in the DDE pull down menu.

Unless having links to other Windows applications via DDE, it is advisable to be used 'Optional Auto Start-up' box. Otherwise, user will have to use the DDE Initiate Dialogue Box whenever he or she selects a command requiring the destination application. Using three DDE sub-menu command options, which are Export Selection Set, Export blocks and Export Drawing, you could specify data to be linked. For the attributes extraction, the Export block option seems as if the best one. However, certain blocks could be specified to extract using this option. The most appropriate option for attributes extraction is Expert Selection Set. As recommended earlier in the related chapters, attributes selection is easy if you use separate layer for all attributes. User could simply turn off all layers except the one which has attributes. The second way to select only attributes the drawing is to use object filters which is explained in the previous part.

Alternatively, 'Attribute Filter1' option might be used in DDE sub-menu to select only handles, attributes and tags or 'Attribute Filter 2' option to select only handles and attributes. 'No filter' option is used to send all data without filtering. The last option of the DDE sub-menu, which is 'Unloaded DDE', terminates the DDE program and free all DDS data.

4.5. Importing A File To Excel

You could share data even those applications which run on DOS operating system because Excel loads and saves directly many file formats including Lotus1-2-3, dBASE, and text (ASCII) files. As mentioned earlier, Excel can read most word-processing file formats. If your file format does not match the ones Excel imports, you could create a text file format with TXT file extension.

Excel also export text file format, as well as CVS file format, which separate the data into worksheet cells with delimiters. It was tried to import both CDF and

SDF formatted file into Excel. As recommended earlier, Excel accepts CDF and organises your data in a worksheet by means of delimiters perfectly. Although Excel also read SDF file format, it does not notice maximum character amount determined in the template file. When imported a text file, it will be asked that what kind of text file you are importing because Excel can import both ASCII Text and CSV (column-delimited formatted text) file formats. If it is imported a file formatted using either CSV or text file format, each row of imported data will be placed into a row. In our case, each comma-separated/delimited or tab-separated segment of data appears in its own cell. This is very true to perform calculation in the worksheet. It can also be specified the type of delimiter i.e. comma, slash, quote etc.

If it is imported a text file which is not delimited, or if needed to parse the text already imported, there are some methods which organise cells to be able to use data in Excel.

User could even copy a selected the worksheet range into another application which has OLE capability such as AutoCAD, using shift + Edit and then copy picture command.

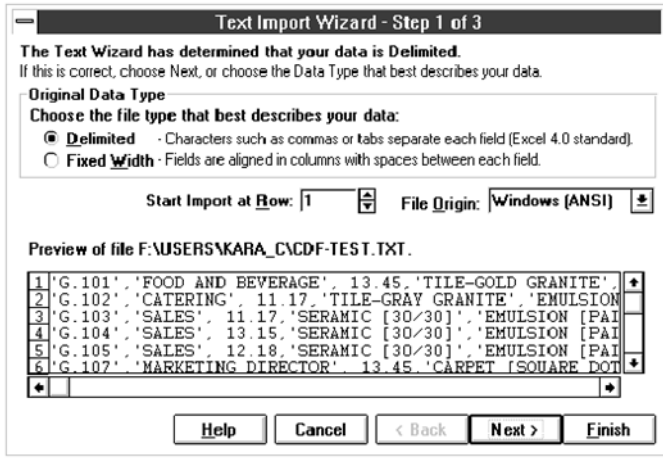


Figure 16. The First Step of Importing A Text File Into Excel Version

4.6. Linking Data Between Excel and AutoCAD

Although having hot links may not be vital for architectural tasks in an office, it may be very important if your business requires monitoring of manufacturing line inventory, or AutoCAD user has some repetitive and big scaled tasks for cost estimating such as a hotel building which has more than 1,000 beds.

Link is created through the edit menu in Excel. When 'Edit copy' and 'Edit Paste special' commands are used, Edit menu automatically creates an external reference formula. If user has knowledge about using macros, links can be controlled through it.

If not desired excel to update data, it could be deselected 'Update Remote Reference' option from Calculation tab / Options. Calculation tab also has two more options about links through DDE; Save External Link Values and Ignore Other Applications options.

4.7. AutoCAD Data Extension

Autodesk has launched a new software program which utilises the wealth of data in AutoCAD drawing. Using ADE (AutoCAD Data Extension), it could be extracted and combined drawing data many sources such as attribute information, drawing entities, related external database information.

ADE software program creates an index for each drawing when applied ADE OPEN command. You could access data across all open drawings since ADE makes them active automatically. In the next step, the ADE Query command is used to search through gigabytes of drawing file data. Using intuitive dialogue box user could specify his or her search criteria which might be location (windows, polygons etc.), properties (colour, layer, thickness, block name etc.) or external database information.

ADE could be used in workstations since each user might access and write the same drawing files simultaneously. This access can control using both built-in entity locking, administrative control and AutoCAD's layer locking feature. ADE software program's database interface allows AutoCAD entities to be linked to graphical and non-graphical data in databases to be able to access and manipulate linked data.

Because ADE physically brings into the drawing editor only those parts specified, problems about the system performance and computing time reduce minimum level. In an architectural office, ADE could be used for co-ordinating team projects, creating individual drawings for team members and, in our case, simplifying drawings and extracted data for sub-contractors.

5. CONCLUSION

CAD systems are not used enough in the building sector because there is insufficient demand from architects. They prefer not to use computers for drafting purpose because of economic reasons. Although CAD software programs create complicated objects without limitation, using them for drafting cannot be found productive yet by architects. Researching data manipulation related to attributes

in a CAD software is not to seek a solution for a particular problem. It is desired to investigate some features of the software program regarding data processing which were not available in traditional drawing. At end of the research, the user interface has been succeeded by both researching the capabilities of the commands related attributes and customising AutoCAD for using attribute commands.

It is also tried to explore the ways of increasing productivity while researching the article topic. It was customised AutoCAD creating Attributes pull-down menu and editing Acad.PGP file which allowed us to use own short-cut commands. It is also utilised AutoLISP and ADS programs loading both some simple scripts created for combined commands and the more complicated ones which was useful for attributes extraction.

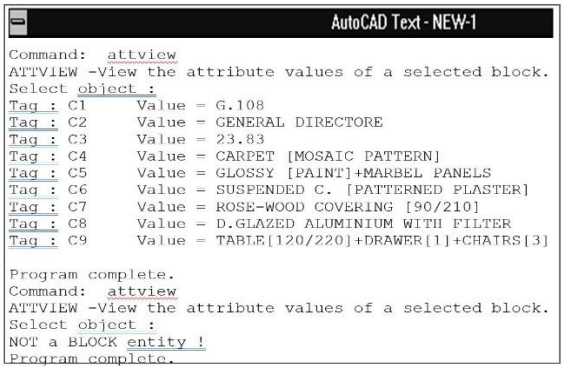


Figure 17. The Illustration of ATTVIEW AutoLISP Program. (Straka, 1992)

To utilise the AutoCAD's database interface you do not have to know the its built-in language. There are huge amount of third party software programs written for AutoCAD in the market. Some of them offer very useful utilities. If to use the individual command buttons and the floating icon menus are important for you, you could create them using a third-party application program called 'IconTOOL'. It customises user interface for both AutoCAD for Windows and AutoCAD LT.

After exploring a CAD software program's feature about data manipulation, expectations from it has formed very clearly. It got easier to assess a drawing software program by checking its data storage and manipulation capabilities, after the completion of this research. It has been also realised that attributes can be used for various purpose in a architect's office such as creating a bill of materials, using them in prototype drawings or just as ordinary text for notations. All these

kinds of usage not only improve architect's productivity in office but also it is inevitable if time is limited for bill of materials.

It has been learned how to create bill of materials using computers for a project drawn using computers as well as drawn using traditional method after digitising it. It has also been gained knowledge the capabilities of spreadsheet programs and DBMS's.

The link created using the DDE command of AutoCAD is not practical and difficult to use. Even if you only select attributes for this link, a lot of data is transferred into spreadsheet program by the AutoCAD. Because analysis of this data takes a great deal of time, it is not advisable to be used for architectural tasks. Attributes extraction is pretty efficient method for bill of materials, cost of accounting etc. if you support it with a third-party application.

Attributes, which is called by some literature as non-graphic intelligence, and using external references are very useful tools of computer drafting. They are also very good examples to understand of its own logic about describing exactly same objects with a different language. These are just beginning for the benefits of computers on design discipline.

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Chapter 3

FROM INDUSTRIAL FOODS TO URBAN GARDENS: RECLAIMING FOOD SYSTEMS THROUGH COMMUNITY-BASED URBAN AGRICULTURE

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Introduction

Over the past century, the modern food industry has experienced remarkable growth, driven by industrialization, globalization, and technological developments. Although it has increased both food production and distribution to significant levels, it has generated critical sustainability, health, and equity issues. Community-based urban agriculture has emerged as a viable and sustainable alternative in response to the challenges caused by the modern food industry. Urban agriculture refers to cultivating food within urban environments, including community gardens, rooftop farms, vertical farms, and other innovative systems. This localized approach offers numerous environmental, economic, and social benefits. In this review, we describe the problems and challenges caused by the industrialized food system and discuss the community-based approaches to overcome these problems.

Problems with the current food system

With rapid population growth, people's needs have also increased, and this has increased urbanization, economic activities, and industrialization (Tuğluer, 2023). One of the activities most affected by industrialization is agriculture. The industrialization of agriculture has led to highly centralized systems for production, processing, transportation, and retailing, which has gained the attention of numerous researchers (Hinrichs & Lyson, 2007). The majority of them concur that the existing agri-food system has created social and ethical problems in several ways in addition to serious ecological, economic, and political imbalances. For instance, the current food system relies heavily on the vast use of irrigation systems and the intense use of fertilizers and natural resources (Allen, 2004). This has caused environmental depletion from various aspects like damaged soils, polluted drinkable and groundwater, water shortage, and an increase in the pesticide resistance of insects (Hendrickson & Heffernan, 2002).

In addition to these issues, the agri-food system has become heavily centralized. For example, the agricultural system in California is a great example of a concentrated agricultural system because of its economic and political significance not only in the US but also in the world. The agriculture of California, one of the widest variety of crops and livestock products in the world, produces more than half of the fruits, vegetables, and nuts in the nation whereas its farmland acres correspond to a very small percentage (3%) of the whole country (Allen, 2004). Moreover, only 10% of the total farmers in California were capable of controlling more than 50 % of the production in the 1920s, thus resulting in highly centralized agriculture and land ownership. Anti-competitive

conditions, growth in capitalist farmers, and unjust pay for laborers were the results of this circumstance (Allen, 2004; FitzSimmons, 1990; Jelinek et al., 1979).

The principles of current global trends have not changed much as only several food companies maintain control of production and transportation processes and increase the concentration of the ownership that creates big seed and food retail corporations (Hendrickson & Heffernan, 2002).

Corporate agricultural production induces very unfair conditions that may result in severe social and economic depletion. For instance, corporate food production impacts rural economies, excludes different types of methods in farming, and also makes farmers more vulnerable to layoffs due to contract farming (Campbell, 2004).

Centralized food production also causes a disconnection between people and food because of the production of food in particular regions and their transportation to other locations globally, which prevents people from having control over their food preferences (Hendrickson & Heffernan, 2002). Furthermore, this food production system is a barrier to the providing culturally acceptable food in many parts of the nation. In addition to these problems, centralized food production induces additional investments in non-renewable energy resources resulting in both higher food prices and elevated air pollution through the excessive use of fuel (Hendrickson & Heffernan, 2002). In conclusion, the current agricultural system leads to various problems in terms of social, environmental, and food access aspects. All these aspects are briefly introduced from the justice point of view. Justice issues are briefly discussed from the three aspects, social justice, environmental justice, and food justice below. Social justice

The current food system has resulted in some social problems. For example, it has particularly caused gender and racial inequity and threatened the opportunities and dignity of a particular group of people (Allen, 2004). Also, many of the farmworkers do not have a home in California’s richest agricultural areas, and they are forced to live in crowded and communal facilities.

In these facilities, the majority of farmworkers lack access to fresh drinking water and hygienic bathrooms. Moreover. Immigrant people are mostly hired as farmworkers on a seasonal basis, and They are unable to benefit socially from their living situations because of their unstable work (Allen, 2004). All these unfair conditions have also induced racial hierarchies in society (Alkon & Agyeman, 2011). Moreover, The existing food system's highly centralized land ownership and food production led to an economic catastrophe for small family farmers and other local companies involved in food production (Feenstra, 2002).

This economic discomfort is just another aspect of unfair conditions in people's social life.

Environmental justice

To ensure environmental sustainability and justice, natural resources must be used consciously and sustainably (Tuğluer & Çakır, 2021). The current agricultural system causes numerous barriers to healthy living conditions and long-term environmental sustainability. As discussed earlier, for example, the agriculture industry is highly dependent on both natural resources and environmental processes, such as soil, water, and weather. This direct dependence raises numerous environmental concerns, such as the excessive use of fertilizers and chemicals, and water pollution and depletion (Campbell, 2004). Also, the use of pesticides affects pest and bacteria's metabolism which require the increased usage of chemicals. Furthermore, the excessive use of pesticides and other chemicals damages wildlife, beneficial insects, ecosystems, and humans (Allen, 2004; Lockeretz, 1989). Generally, low-income people and people of color are likely to live in neighborhoods that are close to industrial sites and agri-business locations dominantly contaminated by toxic materials, diesel emissions, as well as pesticides, and dust (Alkon & Agyeman, 2011). All these negative factors have an impact on natural resources and ecosystems and have resulted in unhealthy and dangerous living conditions not only for farmworkers but also for other people living in these neighborhoods.

Food justice

Unquestionably, food is an essential human right along with water for a healthy life. However, according to the Food and Agriculture Organization (FAO), at least 795 million people in the world were undernourished in 2014, and many more people do not have access to a healthy diet (FAO, 2015). Also, it was reported that thousands of people die every year because of hunger or hunger-related reasons (FSNAU, 2013). Hunger is an increasing risk not only in rural areas of Asia, Africa, and Latin America but also in several parts of the United States (Allen, 2004). Interestingly, farm workers, who produce most of the nation's food, are at the greatest risk of hunger because of the low pay, unequal living conditions, and the fear of losing their jobs. In addition, those, most likely to suffer from the lack of available food, are the people of color, the elderly, the disabled, inner-city residents, farm workers, women, and children (Allen, 2004). The social, environmental, and food justice issues are not isolated from each other and should not be considered separately. Indeed, they are all interconnected, and a desired healthy living environment cannot be considered without any of them.

It is possible to increase the number of examples and discuss justice issues in more detail, but it is quite sufficient to prove that the current system causes unhealthy, unjust, unethical, and economically unviable conditions. All these concerns contribute to a growing belief that the current system cannot be sustained in the long term. This motivation has brought many people together not only in the US but also in other parts of the world and organizes them to take further precautions toward an alternative and more sustainable food system. The general characteristics of the alternative system are discussed under the concept of the sustainable food system below.

Sustainable food system

Sustainability is a very broad and complex phenomenon and has numerous meanings for people in different disciplines. The aim of this review is not to discuss sustainability in detail, but to communicate very basic principles for a better understanding of the community-based food security actions. Developing a decentralized food production system and creating a more socially, culturally, and spiritually healthy food system that is also more economically viable for bigger populations have been the main objectives of the sustainable food system (Feenstra, 2002). Furthermore, it was well defined that the sustainable food system has a crucial protective role for both the environment and the health and welfare of humans and farm animals (Allen, 2004). Also, this system fosters all aspects of the environmentally sustainable agriculture industry and offers a setting for fair compensation not only for farmers but also for workers. In addition, the sustainable food system supplies affordable, healthy, and locally produced food for all people and helps the liveliness of both rural and urban communities, and also connects them to each other (Allen, 2004). Moreover, Hendrichson and Heffernan (2002) argue that the alternative food movement should be based on self-reliance rather than either dependence or self-sufficiency. This statement attracts attention to the fact that food availability and stability for sustainability should also be considered as one of the primary principles of the alternative food movement. Availability and long-term stability are the important dimensions of the food security concept which has a vital role in the sustainable food system. This alternative concept provides a foundation for community food security. The food security concept is briefly introduced below.

Food security

United Nations Food and Agriculture Organization (FAO) provided a widely accepted definition at the International Food and Agriculture Summit in Rome in 1996. According to FAO, food security also called antihunger that each member

of a household can access sufficient food in terms of both physically and economically, also they lack any kind of risk of losing this access to food (Hamm & Bellows, 2003). In this context, according to Hamm and Bellows (2003), there are three important dimensions of food security: *availability*, *stability*, and *access*. Food *availability* refers to the adequate amount of food that should be available to meet the average needed amount. Food consumption might fall below the recommended consumption due to difficult conditions, such as climate extremes. In this scenario, the risk of food scarcity should be overcomed. *Stability* refers to minimizing the effects of these difficult conditions in a season or during a whole year. Finally, *access* focuses on the fact that lots of people still are not able to produce, purchase, or travel to the food they need because of low income (Hamm & Bellows, 2003). As a result of food security efforts, a hunger relief network has developed since the 1980s in different forms, such as food pantries and food banks. However, these efforts still focus on short-term solutions and are dependent on the current food system to provide food for needy people (Campbell, 2004). Thus, another concept called community food security has arisen to satisfy a need for food security efforts.

Community food security

Community food security (CFS) can be named the newest development in the alternative food system and can be defined as the infinite availability of affordable, nutritious, and culturally welcoming food for all people through a growing, manufacturing, processing, and marketing system that is regionally oriented and established in the principles of justice, democracy, and sustainability (Campbell, 2004). In addition, it was described that all members of a community residents acquire both culturally acceptable and qualified diet through a sustainable food system increasing community self-reliance and social justice (Hamm & Bellows, 2003). While food justice and CFS meet the requirement on a common ground, in general, they are slightly distinct from each other in several ways. For example, CFS places a special emphasis on the communities of households rather than only individuals. CFS also addresses the political, demographic, and geographic factors at the local level and draws attention toward a comprehensive community infrastructure and local food system approaches to achieve food security (Hamm & Bellows, 2003). They also take advantage of different organizational strategies for example, food justice organizations traditionally respond to immediate needs in neighborhoods through collaborating with USDA, HHS, and social services agencies, whereas CFS organizations seek ways to build capacity at the local level, such as farmers' markets through community organizations and multi-sector partnerships (Hamm & Bellows,

2003).

Fisher (1999) identified six key principles of CFS to develop a framework for the ongoing expansion of CFS efforts.

1) Primarily focus on the food needs of low-income people.

2) Define food security as an outcome of social issues and policies such as community development and environmental management.

3) Increase the connection between locally grown food and local food consumption.

4) Emphasize long-term strategies such as self-reliance and empowerment rather than short-term solutions such as emergency food programs and charity food relief.

5) Develop a democratic and community-responsive food system through fair wages, job security, providing training and support for new farmers, and promoting farmland preservation and stronger customer relations.

6) Promote participation of new talents and diverse groups of people in the community from different ages, cultures and races, job and social status, genders, and nationalities (Fisher, 1999; Hamm & Bellows, 2003).

Within the principles of the sustainable food system and community food security, all discussed above, to reduce the drawbacks of the current agri-food system and create a more sustainable and independent food system, a number of community-based food system initiatives have been developed.

Today, the number of projects and organizations dedicated to sustainable agriculture and community food security has been increasing. In this review, community-based food systems and community gardens are discussed in the concept of community food security below.

Community-based food system

Initiatives for community food security have grown in significance, particularly in underprivileged urban neighborhoods (Ohmer et al., 2009). According to Saldivar-tanaka and Krasny (2004), these programs mostly target abandoned lots in troubled metropolitan neighborhoods to transform them into green and productive places that involve the cultivation of fruits and vegetables as well as flower beds, seating areas, and other social services. According to Guthman (2008), these initiatives can take many different forms, such as farmers' markets, community-supported agriculture in metropolitan areas, community garden initiatives, and educational programs about nutrition and the environment. These programs' primary objectives are to promote community empowerment, conservation, revitalization, and agricultural and environmental improvement. They also aim to boost social interaction and volunteerism, encourage political

activism, and improve neighborhood safety and prosperity (Ohmer et al., 2009). Along with these goals, additional significant objectives of these programs include improving self-reliance in food security and expanding access to fresher, better-tasting food (Armstrong, 2000).

As mentioned earlier, the community-based food system has arisen in several forms; however, the community garden concept is discussed in more detail.

Community gardens

In the last few decades, community-based food activities in cities have re-captured the attention and support of an increasing and wide range of people including individuals, activists, officials, academics, and organizations (Taylor & Lovell, 2014). To lessen some of the negative impacts of industrialized global agriculture and rapid urbanization, community-based agriculture—mostly in the form of community gardens—has recently gained popularity among those interested in contemporary ideas of sustainable and communal food systems. Moreover, this community-based agriculture aims to promote locally grown fresh food, utilize urban vacant lands, and decrease food-related concerns discussed in previous sections (Allen, 2004; Evers & Hodgson, 2011; FitzSimmons, 1990; Hendrickson & Heffernan, 2002; Taylor & Lovell, 2014).

Community gardens have attracted a growing number of interested people and resulted in diverse gardener profiles, age groups, and various garden types, including neighborhood gardens, residential gardens (Bauermeister et al., 2010), youth/school gardens, healing gardens (Bradley & Baldwin, 2013), therapeutic gardens (Arslan & Ekren, 2017; Ertekin & Çorbacı, 2018) entrepreneurial/farmer's market gardens (Ferris et al., 2001), and demonstration gardens (Chalker-Scott & Collman, 2006).

As a result of this diversity and shifting roles in various age groups and communities, it is challenging to provide a precise definition for community gardens. However, According to Bauermeister et al. (2010), it can be broadly described as any plot of land that is cultivated by a group of people and used to produce food and/or flowers that benefit both individuals and communities. In addition to producing food, community gardens also function as gathering places for neighborhood gatherings (Ohmer et al., 2009). According to an expanding body of research, community development and empowerment (Firth et al., 2011), social and cultural reproduction (Taylor & Lovell, 2014), increased biodiversity (Lin et al., 2015), access to locally grown fresh food (Wang et al., 2014), and improved human health, wellbeing, and justice (Clatworthy, 2012; Webber, 2013)

are just a few of the many social, cultural, ecological, and economic benefits that community gardens offer. To understand better how community-based food programs and specifically, community gardens have served the community food security throughout the years, it is important to review their historical development and popularity. Therefore, in the next section, a brief historical review of community gardens is provided.

Historic relation of community gardens to community food security

The idea of community gardening was first used in the United States (US) in the late 19th century in places like Detroit, New York, and Philadelphia, primarily as school gardens and vacant land cultivation (Birky, 2009; Lawson, 2005). Community gardening, also known as vacant lot gardens, was employed to increase the supply of affordable and accessible food during those years due to economic issues and increased migration to cities (Ohmer et al., 2009).

These gardens were specifically known as War Gardens or Liberty Gardens during World War I (Kurtz, 2001), and they were used to supply food for US homes and soldiers serving overseas (Lawson, 2005). In order to support those impacted by the economic crisis and war downturn, families planted gardens in whatever available space, producing fruits and vegetables for their own consumption. As a result, this gardening movement was seen as a national act of patriotism as well as a food action (Kurtz, 2001).

After the consequences of World War I and economic hardships subsided, vacant lot gardens lost favor (Birky, 2009). However, following the Great Depression in 1929, the number of gardens grew dramatically once more to address employment and economic issues. These gardens focused on ensuring the survival of individuals or families by giving them work and enough food (Kurtz, 2001; Lawson, 2005). These gardens were referred to as "subsistence gardens" and "relief gardens" during the economically challenging time (Birky, 2009).

Following the United States' entry into World War II, the National War Garden Commission launched the Victory Garden Program with the goal of promoting domestic food production, preserving public morale, and reducing the use of railroad services and canning metals in support of war efforts (Kurtz, 2001). Over 40 percent of the vegetables grown in the United States came from Victory Gardens, with the peak production rate occurring in 1943 (Bentley, 1998).

During another significant national recession or crisis in US history, the number of community-based initiatives increased in various forms, whereas the number of community gardens decreased again and was on the edge of

disappearing following the end of the war or national crisis (Birky, 2009). Hence, community-based food initiatives, particularly community gardens, have a long history of being linked to community food security, which has historically been challenged by wars, economic hardship, and recently by the centralized food business.

Conclusion

This review discussed some of the food-related concepts, such as problems with the current agri-food system, justice issues, and food security along with the examples of alternative food movements including community-based food programs and community gardens. The contemporary food industry's problems with the environment, human health, and society underscore the urgent need for creative and sustainable solutions. One workable and comprehensive answer to these urgent problems is community-based urban agriculture. Urban agriculture encourages environmental stewardship through better air quality, fewer food miles, and more urban biodiversity by converting unused urban spaces into productive green spaces. Additionally, by reducing food insecurity, promoting healthier eating habits, and expanding access to fresh, nutritious foods, urban agriculture improves public health. Socially, it promotes local economies by generating employment opportunities and supporting regional food systems, empowers people via education and skill development, and cultivates a feeling of community.

It is important to incorporate community-based urban agriculture into urban planning and policy frameworks as urbanization accelerates and cities deal with increasing environmental and social constraints. In addition to reducing the detrimental effects of the contemporary food industry, such integration can produce more resilient, inclusive, and sustainable food systems that improve the quality of life in metropolitan regions. To scale up urban agriculture efforts and fully achieve their potential in creating a healthier, greener, and more socially equitable future, policymakers, planners, communities, and researchers must work together going forward.

Acknowledgments and Information Note

A minor part of this review was produced from the literature review of a doctoral dissertation titled “Understanding People’s Perceptions and Attitudes Toward Community Garden Landscape in Roanoke, Virginia” prepared by the author, Sinan Kordon at the Department of Landscape Architecture at Virginia Polytechnic Institute and State University. The article complies with national and international research and publication ethics. Ethics Committee approval was not

required for this review.

Author Contribution and Conflict of Interest Declaration Information

There is no conflict of interest.

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Chapter 4

A GLIMPSE INTO LANDSCAPE PERCEPTION: THEORETICAL FOUNDATIONS, METHODS, AND INFLUENCING FACTORS

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Introduction

Over the several decates, drastic increase of population induced rapid urbanization and increased environmental challenges. This negatively affected people's social life and relationship with their environments. This expanding problem has shown the importance and necessity of environmental perception studies to maintain connection between people and the landscapes they live in (Ekren, 2021; Tuğluer & Çakır, 2021). Therefore, it is important to understand how people view and experience their environments to develop management and design solutions that meet human needs and preferences.

People's perception of a landscape is formed based on the interaction and the effects produced by cultural, psychological, ecological, and aesthetic factors (Öztürk et al., 2016). Due to the diversity of the factors, environmental perception studies have been conducted by various professionals, such as landscape architects, urban planners, sociologists, and ecological psychologists (Moser & Uzzell, 2003). As discussed by previous studies, if a landscape is designed without considering the factors influencing people's perceptions and preferences, only a limited number of people can enjoy the designed landscape. This poses a risk of failure of the design in the long term because of insufficient support of the greater community (Kordon & Miller, 2023; Kordon et al., 2022). This highlights the importance of such studies. Briefly, landscape perception research provides insights into why individuals respond differently to their surroundings and helps practitioners to design landscapes that foster well-being, cultural identity, and ecological sustainability (Olivos & Clayton, 2017).

Hence, this study aims to discuss the theoretical foundations of landscape perception theories and review the factors influencing people's landscape preferences. It also contributes to a better understanding of human-environment interactions.

Landscape perception and preference

People's interactions with landscapes are often studied in environmental perception, place attachment, sense of place, and landscape preference research contexts (Kordon, 2022). Therefore, this review was developed based on environmental perception theories. To better understand the theoretical basis of this review it is also important to review the methodological approaches and the factors influencing environmental perception and attitudes.

Researchers from different professions have developed different theoretical approaches in landscape assessment research. For instance, Zube et al. (1982) evaluated different approaches and grouped them as expert and non-expert judgments. They might be subcategories under these two groups. For example, the fine art perspective and the ecological feature perspective are two further

subcategories of the expert judgment paradigm (Zube et al., 1982). Similarly, there are different categories under the non-expert judgment paradigm. Each of them is briefly discussed below. It is important to note that because landscape assessment research is interdisciplinary, a paradigm may fall under more than one category, as noted by Maulan (2006).

The expert judgment paradigm

According to this method, "experts" refers to qualified experts with adequate background in the visual management of natural and built environments (Othman & Rosli, 2014). It is believed that qualified experts can synthesize landscape attributes and objectively assess scenic beauty, then apply them to management, planning, or design processes (Zube et al., 1982). The ecological characteristics viewpoint and the fine art perspective are the two divisions of the expert assessment approach.

The fine art perspective

According to Daniel & Vining (1983), since the proponents of this method are primarily from landscape architecture, fine art, and architecture professions, the fine art perspective's conceptual underpinnings are drawn from theories of fine art and architecture. These experts assess the landscape using its formal characteristics, such as line, color, form, and texture, as well as its inherent qualities (Daniel & Vining, 1983). Government organizations like the United States Forest Service have typically employed this strategy to produce solutions for management and design needs (Maulan, 2006; Woods, 1995). Since the fine art perspective is mostly reliant on the assessment of design specialists, this method has been criticized for failing to take public opinion into account and for producing results that are dubious in terms of validity and dependability (Daniel & Vining, 1983).

The ecological characteristics perspective

Unlike the fine art viewpoint, the ecological characteristics approach holds that a landscape's naturalness and ecological integrity are what give it its aesthetic value (Brady, 2019). Experts in biology and ecology have primarily employed the ecological characteristics approach since ecological attributes and biological value are the main assessment criteria (Tribot et al., 2018). According to Maulan (2006), the primary premise is that landscapes that are natural and unaltered are supposed to have greater aesthetic features, whereas landscapes that have undergone human impact are supposed to have lower aesthetic values. Critiques of ecological characteristics perspectives are similar to those of fine art perspectives. The primary critique concerns the linear correlation between a landscape's visual appeal and its level of naturalness (Nassauer, 1980). The landscape assessment is mostly dependent on professional assessments of

ecological feature viewpoints, much like the fine art perspective. Therefore, other criticisms of this strategy include the lack of public viewpoints and its dubious validity and dependability (Maulan, 2006).

The non-expert judgment paradigm

The non-expert judgment approach depends on the assessment of regular people, whereas the expert judgment paradigm is founded on the assessment of qualified specialists (Dupont et al., 2015). The basic premise is that to comprehend the connections between people and landscapes, researchers examine and synthesize public responses or assessments of a landscape (Kim, 2015). This paradigm is presumed to be subjective since it is thought that beauty is comprised of a certain combination of landscape elements that elicit pleasure and emotion in the observer (Lothian, 1999). This method aligns with the views of numerous other contemporary philosophers. For instance, Hume contends that people use their emotions to determine whether or not an object is beautiful (Sayre-McCord, 1994; Wilson, 2024). According to Immanuel Kant, the pleasure experienced by the viewer is a prerequisite for aesthetic quality. Thus, judging something to be beautiful is a subjective process (Lothian, 1999). Furthermore, according to Dewey (1859–1952), the assessment of beauty is a biological reaction that necessitates participation and engagement (Girod, 2007; Kaymaz, 2012; Lothian, 1999). All these, demonstrate there are numerous approaches to the non-expert assessment methods. For this study, a summary of the information processing theory which is one of the well-recognized and most cited theories in the non-expert environmental perception studies is provided below.

Information processing theory

Rachel and Stephen Kaplan are respected environmental psychologists who have mostly researched the information processing theory. Among studies on landscape perception, Kaplan's information processing theory is frequently used (Kaymaz, 2012). Information is the main concept in this theory since Kaplan claims that information controls our reality and that information originates in the environment (Kaplan et al., 1998). Thus, people’s experiences, their survival in any environment, their aesthetic judgments, and landscape preferences heavily depend on their ability to obtain information from their surroundings (Kaplan et al., 1998; Kaymaz, 2012; Kordon, 2022).

Briefly, this theory relies on people’s assessments of their environments. For instance, people seek out opportunities to engage with their environment and gain knowledge from the layout and features of their landscapes, not just to make sense of them but also to value their qualities (Kaplan et al., 1998; Kaplan, 1975; Kaplan, 1979). People are thought to feel safer and more aware of what is going

on around them when they have a greater awareness of the landscape (Lis et al., 2022). Kaplan's landscape preference approach is discussed below in more detail.

Landscape preference approach

The landscape preference approach, one of the popular techniques, commonly uses surveys to investigate people's landscape choices and attitudes. This method reveals how people perceive their environment, and it helps to figure out the important components of the landscape (Maulan, 2006). The content identification method via a landscape preference rating survey is applied to conduct such research (Kaplan & Kaplan, 1982). Scene rating and content identification procedures help to identify important factors underlying people's preferences and their responses to the environment (Maulan, 2006). Environmental perception studies have made extensive use of the landscape preference methodology, which is a well-established, valid, and reliable way to gauge people's preferences for certain landscapes (Kaltenborn & Bjerke, 2002; Maulan, 2006; Miller, 1984).

Content identifying method

One image-dependent empirical psychological research technique for gathering information on people's landscape preferences in a given setting is the content-identifying method (CIM) (Woods, 1995). This method was predominantly developed and used by Kaplan (1977a), (1989) and Wendt (1972). Because humans primarily rely on visual information to perceive their surroundings, photographs are employed as representative replacements for an environment in this technique (Hull & Revell, 1989; Kaplan & Kaplan, 1989; Kordon, 2022; Kordon et al., 2022). Accordingly, this method asks participants to assign a preference rating to a set of photographs or generated images of a setting during a scene rating survey (Kaplan & Kaplan, 1989; Kim, 2015; Maulan, 2006). Given the drawbacks of getting participants to the study location, many researchers concur that using images is a helpful technique (Kaplan & Kaplan, 1989). Furthermore, a study revealed that there was no discernible difference in the preference ratings of real scenes and photos (Shuttleworth, 1980). Additionally, a different study found no discernible difference in preference ratings between online and paper photo questionnaires (Wherrett, 1999). Accordingly, preference rating in environmental perception studies is unaffected by the use of images in surveys, whether they are conducted online or in hard copy (Pitt & Zube, 1987). To examine the assessments of the scenes in the landscape preference rating survey, researchers employ a data reduction method known as factor analysis or dimension analysis (Maulan, 2006).

In the past, the data was reduced using non-metric factor analysis methods such as the Guttman-Lingoes Smallest Space Analysis (SSA III) and ICLUST

(Maulan, 2006). However, multiple research has demonstrated that factor analysis through the Statistical Package for Social Scientists (SPSS) has become an effective method for content-identifying studies because it is useful for extracting landscape preference dimensions (Kim, 2015; Kordon, 2022; Lekagul, 2002; Maulan, 2006). Each preference dimension consists of landscape scenes with stimuli to which the participants responded similarly (Maulan, 2006). To determine the degree of choice and the content of the favored scenes for a given setting, the scenes are examined for data interpretation by the researcher (Kaplan, 1985; Kaplan, 1979). Kaplans interpreted the data according to the sceneries' spatial quality and substance. Additionally, Ulrich (1983) showed that ground texture and landscape openness can be important stimuli for humans. When combined, the results of the data can reveal significant elements that affect survey respondents' preferences for a specific study setting (Maulan, 2006). To identify people's tendency of preferences, preference dimensions can also be ranked according to their mean scores after a scene rating survey (Miller, 1984). Also, by using this method, important information can be gathered by identifying the relationship between preference dimensions and other variables including perceived danger, obtained benefit, and participant demographics like age, gender, ethnicity, and participant background (Kim, 2015; Kordon, 2022; Maulan, 2006).

In addition to scene rating, a verbal evaluation survey in which participants are asked to describe landscape scenes using their own words can be applied in landscape preference research (Kordon, 2022). Further, a heat map representation technique can be used as complementary to increase the strength and validity of the data (Kordon, 2022). For instance, Kordon (2022) used the heat map method along with verbal descriptions and scene rating surveys. This method provided understandable and graphically supported results and visually demonstrated the landscape elements and arrangements that highly affect participants' landscape preferences (Kordon, 2022). Other methods such as semi-structured interviews, visualization tools, and on-site observations may also be used in landscape preference studies. Each method can be applied separately or in combination. The use of combined methods improves the validity and reliability of the findings.

In conclusion, the information obtained from the spatial arrangement and content of a landscape is important for the creation of more successful and socially acceptable landscape designs.

Factors Influencing Landscape Preference

Potential influences on people's landscape preferences can be grouped into two main categories: personal traits and environmental aspects (Kim, 2015). This

section reviews the effects of environmental conditions on landscape choices first, then the aspects of personal characteristics.

Environmental factors

Humans react to the objects and configurations in their surroundings as well as the opportunities that these configurations present. Accordingly, scene content and spatial configuration are the two categories of environmental factors influencing people's landscape preferences (Kaplan, 1983). Below is an explanation of each of these elements.

Scene content

According to several research by Rachel and Stephen Kaplan, people tend to favor settings that provide information for understanding their surroundings and chances for participation (Kaplan, 1977b, 1985; Kaplan et al., 1998; Kaplan, 1979). Accordingly, people prefer environments in which they can quickly comprehend and make sense of what is occurring in the larger context. The term "making sense" refers to this cognitive process (S. Kaplan, 1973; Kaplan, 1979). Moreover, people often investigate and stay interested in a landscape to learn more about it and gain a deeper understanding of it. This is called "involvement" by Kaplans (Herzog, 1984; R. Kaplan, 1973; S. Kaplan, 1973). They claim that people use landscape elements and spatial arrangements to gather information for "making sense" and "involvement." Therefore, scene content and spatial structure of an environment are crucial for people to favor and participate in a landscape (Kaplan & Kaplan, 1989; Kaymaz, 2012). For instance, past research by Kaplan et al. (1972) showed that the availability of trees and water in a landscape is a significant factor for landscape preference. Similarly, residents felt safer when there were trees and well-kept grass in their surroundings (Kuo et al., 1998). In addition to scene content, Yang and Brown (1992) discovered that people's preference is also influenced by the spatial arrangement of the environment.

Spatial organization

According to Kaplan (1979), people perceive their surroundings using two- and three-dimensional patterns. The surface of a scene or image is represented by the two-dimensional pattern, which is also referred to as the "picture plane" or "visual array." At this stage, individuals can evaluate the scene's or image's measurable fundamental information, such as light and dark, texture, landscape features, and how they are grouped and positioned (Kaplan et al., 1998; Maulan, 2006). Conversely, the three-dimensional pattern offers insights into the scene's deeper events (Kaplan et al., 1998). Additionally, Kaplan identified four landscape characteristics to forecast people's preferences. "Coherence" and "legibility," two of these qualities, are associated with "making sense." "Complexity" and "mystery," the other two qualities, are associated with

"involvement." In a preference matrix, he arranged these qualities. For your better understanding, these qualities are described below (Table 1).

Table1. Kaplan's preference matrix

Level of interpretation	Making Sense	Involvement
The visual array (2D)	Coherence	Complexity
Three-dimensional space 3D	Legibility	Mystery

Kaplan's preference matrix. Generated from (Kaplan, 1979).

Coherence refers to the elements of a surface-level analysis in a landscape. It contains the elements that facilitate the recognition, understanding, and organization of the picture plane. To put it briefly, it concerns the arrangement and arrangement of scene content that hangs together or has recurring textures, structural elements, and other elements (Herzog et al., 1982). Herzog discovered that people's preferences in both urban and natural settings are generally positively impacted by coherence (Herzog, 1984, 1989). However, coherence has a beneficial effect on riverside habitat selection, according to Kaplan (1977a), but it has minimal correlation to landscape preference in woodland environments.

Legibility is the arrangement of a scene's three-dimensional ground plane (Kaplan et al., 1998). It has to do with how readable a setting is. According to Rachel Kaplan et al. (1998), the scene becomes more readable when it has landmarks, focal points, or other distinguishing and memorable elements. Lynch's explanation of imageability in "Image of the City," where it refers to instantly identifiable symbols in a scene, is comparable to the idea of legibility (Lynch, 1960). There is enough open space and easily identifiable landscape features in a readable landscape for viewers to read the surroundings, make sense of them, get orientation, and navigate. People's preference for landscapes is positively impacted by high readability, according to the majority of studies (Kim, 2015; Kordon, 2022; Kordon et al., 2022; Lynch, 1960).

The richness and diversity of the components that keep an individual engaged in an environment are referred to as *complexity* (Kaplan, 1979). There are numerous separate components to identify in a complex context. Complexity might promote desire to investigate the setting while too much complexity could lead to confusion (Kaplan et al., 1998; Kaymaz, 2012). For instance, complexity has a favorable impact on preference in metropolitan environments, according to Herzog (1992). Kaplan, however, discovered a negative relationship between preference and complexity. Accordingly, complexity is thought to play no unique role in influencing landscape preference, particularly in natural settings (Kaplan, 1977a, 1977b).

The need to investigate and discover more about the setting's potential for revealing information might be characterized as a *mystery* (Kaplan, 1979). For example, a scene's mystery can be enhanced by a variety of elements, such as a tangle of flora, curved paths, or obscured views (Kaplan et al., 1998). The mystery may have varying effects on preference. For instance, mystery had a low preference in urban settings but a high preference in woodland surroundings, according to Herzog (1989). Similarly, another study contrasted an urban alley landscape with a natural canyon habitat. According to the findings, the mystery had a detrimental impact on preference in urban settings and a favorable impact on preference in canyon landscapes (Herzog & Smith, 1988). However, in Strumse's study (1996), a high degree of mystery led to a reduced preference for densely vegetated, natural-looking landscapes, whereas old structures were preferred more.

According to the Kaplans, people may still appreciate a landscape that only has one or two of these aesthetic qualities, but they will greatly prefer a landscape that has a balanced degree of each of these elements (Kaplan & Kaplan, 1989). Furthermore, Kaplan (1985) contends that individuals view and classify the terrain according to certain physical landscape features. Four fundamental visual components: *form, line, color,* and *texture* are used by United States Forest Services (USFS) to characterize these traits (Kaplan, 1985; U.S.F.S., 1974) components have frequently been cited as fundamental physical attributes of a landscape (Kaymaz, 2012; Klein, 2013). It is helpful to introduce these traits and how they contribute to the creation of the landscape characteristics listed in Kaplan's preference matrix for a better understanding.

According to USFS (1987, p. 7), *form* is defined as the mass of a thing or collection of things that seem to be harmonious. In landscape studies, the term "form" is typically used to refer to landforms, which include flat plains, slopes, mountains, and so forth (Litton, 1977). It also describes how a collection of landscape components, such as a group of trees, construction pieces, etc., are arranged in space (Lynch, 1960). Occasionally, it describes the physical characteristics or form of a single landscape feature, as a waterscape (Kaplan et al., 1998). A landscape's various forms offer the spectator fresh viewpoints and points of interest. This makes the terrain easier to read. For instance, an observer can examine the overall context of a landscape by looking down on a slope. Kaplan discussed how it is simpler to comprehend the landscape when one observes more of the local surroundings at once (Kaplan et al., 1998). Form is also essential for identifying individual landscape components, which is crucial for determining how much a scene or object makes sense. As an example, Clear-

shaped landmarks are more likely to be recognized and valued as significant landscape features (Lynch, 1960).

In a landscape, a *line* may refer to everything that is arranged in a row or order (U.S.F.S., 1987). The straight or curved alignment of continuous landscape features, such as roads, walkways, and trees, can be referred to as the line in landscape studies. Because they make it easier for humans to navigate and find other pictures while moving across a landscape, linear structures like paths are often the most important components for a good grasp of that scene (Lynch, 1960). Curved or straight, linear features also aid the observer in differentiating between the landscape's primary and secondary sections. Curvilinear pathways that partially obscure views can also heighten the depth, curiosity, and desire of an individual to learn more about the surroundings. According to Kaplan et al. (1998), all of these give people more chances to engage with and understand a landscape.

Since *color* and *texture* are commonly used together to describe the physical characteristics of landscape elements, they will be covered simultaneously. The ability to distinguish between things with similar forms, lines, and textures is made possible by color (U.S.F.S., 1987). The surface characteristics of landscape elements, such as their smoothness, roughness, or fineness, are referred to as texture. To better comprehend the environment and its elements, color and texture aid in the clear identification of various landscape items (Lynch, 1960). It has been demonstrated that people's preferences for landscapes are negatively impacted by very rough-grained textures, while they are positively impacted by very smooth and fine-grained textures. For instance, soft landscape elements like water and vegetation with a smooth surface were preferred over landscapes with tall grass, rugged foliage, and irregular rocks (Herzog, 1984; Yang & Brown, 1992). It is crucial to remember that an excessive amount of smooth ground cover raises the degree of coherence and results in monotony, which bores people (Kaplan & Kaplan, 1982). When blended in various ways, diverse hues and textures create more intriguing settings and aid in identifying various groups and regions within a landscape (Kaplan et al., 1998). Furthermore, the information provided by color and texture aids in understanding the organization of the landscape. For instance, in a Japanese garden, the placement of things with lighter colors and bolder textures in the forefront and finer textures and darker colors in the background creates a welcoming and understandable landscape (Kaplan et al., 1998). Form, line, color, and texture are helpful aspects of a landscape that aid in recognizing various landscape attributes in both natural and constructed environments because they aid in identifying the elements of engagement and making meaning.

Additionally, openness, spaciousness, and accessibility are other crucial aspects of spatial organization that all favorably affect landscape preference. Physical accessibility and visual openness are highly valued, particularly in urban settings, according to Herzog's (1992) research. Herzog and Chernik (2000) discovered a negative relationship between openness and a feeling of danger. They also observed that those who are viewed as having poor openness are more likely to be entrapped or trapped in their surroundings. Similarly, Herzog (1984) and Kaplan (1979) noted that a well-organized, spacious environment enhances the scene's coherence and can aid in its interpretation, both of which are critical for processing environmental information (Herzog, 1984; Kaplan, 1979). The degree of environmental maintenance is the other element affecting people's preferences for landscapes. Herzog (1989) asserts that tidy and well-kept landscape features improve the environment's coherence, which in turn influences people's degree of preference. In a different study, Kordon (2022) and Herzog and Chernik (2000) found that scenes that were well-kept and manicured were rated higher. They also found that tranquility and maintenance level were positively correlated, while neatness and danger perception were negatively correlated (Herzog & Chernick, 2000). Furthermore, Kordon and Nassauer found that order and neatness are signs of maintenance and care, both of which are characteristics of highly favored surroundings (Kordon, 2022; Nassauer, 1995).

Personal Characteristics

People's preferences for landscapes are influenced by both environmental and human variables. Those aspects include familiarity with the area, understanding of the landscape by both specialists and non-experts, individual interests, and demography and culture (Kim, 2015; Maulan, 2006).

Familiarity with environment

One of the factors influencing people's choices for landscapes is their familiarity with the surroundings. People’s familiarity with their environment may take shape based on their education about their surroundings, environmental experience, and length of stay in a place (Ryan, 1997; Ryan, 1998). People become more familiar and knowledgeable about an environment when they receive education about it. According to Maulan (2006), education in this context can be derived from a variety of sources, including reading, observation, and firsthand experience in the environment. For instance, research conducted for a Midwestern River corridor revealed that farmers favored agricultural landscapes above other participant groups, while local people gave the local environment a higher preference rating (Ryan, 1998). Ryan also clarifies the findings by stating that people favor familiar surroundings (Ryan, 1998). According to another study, people like familiar scenarios because they are familiar with the

surroundings, feel comfortable there, and aren't hesitant to participate in them (Kaplan et al., 1998; Ryan, 1998). Similarly, Arslan and Ekren (2017), in their study on therapy gardens organized for elderly people, stated that elderly people prefer gardens containing plants commonly used in their youth and that they enjoy growing these plants (Arslan & Ekren, 2017). Additionally, unfamiliar surroundings might make people feel irritated and unsafe, which lessens their choice of landscapes (Kaplan et al., 1998). However, riverfront landscape preference research revealed that residents who lived close to the river had a lower preference because they were aware of the river's eroded banks and litter (Kaplan et al., 1998). This implies that, depending on the scene's setting, substance, and level of hazard, familiarity might influence preference either favorably or unfavorably.

Experts' vs nonexperts' knowledge about landscape

Knowledge of a landscape in the context of this review refers to education obtained solely via formal education in schools and colleges. It was discovered that there are disparities in the landscape preferences of experts and non-experts based on several research comparing experts' and non-experts' understanding of different environments. For instance, Maulan (2006) examined the preferences of the general public and landscape architects for wetlands and discovered that the lay-people favored more park-like landscapes, large bodies of water without submerged vegetation, and large trees for shade, while the professionals favored more natural wetlands scenes with clean water and submerged vegetation on the water's edges and surfaces. Significant variations were discovered between student groups in another study by Kaplan (1973) that evaluated the preferences of architecture, landscape architecture, and psychology students with varying degrees of design proficiency. Specifically, trained landscape design students chose structures with pristine natural features because of their training and understanding of the building's composition and setting, even while the untrained group tended to favor closed wooded landscapes (R. Kaplan, 1973; S. Kaplan, 1973).

Individual's motivation and interest

Other elements that may affect people's landscape preferences include their motivation and interests, as they may favor settings that provide opportunities to satisfy people's demands and expectations or necessities (Kim, 2015). According to two distinct studies, people's motivation to gain the benefits of an environment determines how they utilize and like it (Driver et al., 1991; Manfredo et al., 1996). For instance, Maulan (2006) discovered that participants' preferences are highly influenced by their willingness to use a wetland habitat. For example, people who enjoy passive activities, such as resting and sitting, favored park-like

surroundings, while People who enjoyed active outdoor activities, such as ball games and skating, favored all kinds of scenery (Maulan, 2006). For instance, participants who wanted to explore the landscape naturally preferred natural wetland landscapes. Furthermore, another study contended that farmers' negative reactions to misty rocky vistas in unfavorable weather and water-dominated landscapes were likely caused by their interest in agricultural productivity and farm labor (Kim, 2015; Yu, 1995).

Culture and demographics

Finally, culture and demographics are human characteristic elements that influence landscape preference. According to a preference study by Stamps and Nasar (1997), individuals who are raised in a specific culture are likely to share similar preferences due to their shared experiences. Furthermore, the preferences of American and Australian students were examined in another study regarding Australian landscapes, such as woodlands, valleys, and cliffs. The results showed that American students grouped the images according to their ground texture and spaciousness, while students in Australia classified scenes according to the characteristics of Western Australia (Kaplan & Herbert, 1987). Furthermore, a study comparing the landscape style preferences of Korean and Western tourists revealed that Koreans are more inclined to like the Western style than the Korean one (Eyang & Kaplan, 1990). Last but not least, another study comparing the landscape preferences of Black and White Americans found that the former favored more open areas while the latter favored semi-enclosed ones (Kaplan & Talbot, 1988). Age and gender are referred to as demographics in this review. A study found that participants' age has a substantial impact on their environmental choices, even though there aren't many studies examining how these factors affect landscape preference. For instance, children responded more favorably to pictures featuring water, but younger and middle-aged groups reacted more favorably to scenes featuring woodlands (Zube et al., 1983).

In addition, Herzog et al. (2000) discovered that people's preferences for landscapes can vary as they grow older and result in unique preference patterns as they mature. In terms of gender, Kaplan and Kaplan (1989) found that male participants liked open and roomy landscapes where they could easily see the surroundings. On the other hand, female participants favored enclosed scenarios that provided a sense of refuge where they could hide (Kaplan & Kaplan, 1989). Kaplan used evolutionary theory to explain this. In the prehistoric era, females preferred enclosed areas for hiding and gathering, while males preferred open areas where they could observe their surroundings and hunt (Kaplan & Kaplan, 1982).

Conclusion

In summary, it is important to remember that this review is not able to cover all the theoretical or methodological aspects of environmental perception research. Indeed, it provides a glimpse into the theoretical approaches, research methods, and influencing factors that are commonly mentioned in landscape perception studies. Additionally, it brings attention to the complex relationship between people and their surroundings and highlights the significance of comprehending how landscapes are viewed and valued by various users in different settings.

This review demonstrated how environmental characteristics, such as physical features, spatial arrangements, ecological value, and visual quality, and personal characteristics like cultural background, individual experiences, and psychological factors, interact dynamically to produce landscape perception and shape people's landscape preferences.

Ultimately, this review highlights that landscape perception research serves as a bridge between theory and practice, offering valuable insights for creating environments that are functional and emotionally satisfactory. As future studies build upon these foundations, there is an opportunity to further refine our understanding of the human-landscape relationship, ensuring that landscapes continue to serve as sources of inspiration, comfort, and identity in an ever-changing world.

Acknowledgments and Information Note

Most of this review was produced from the literature review of a doctoral dissertation titled "Understanding People's Perceptions and Attitudes Toward Community Garden Landscape in Roanoke, Virginia" prepared by the author, Sinan Kordon at the Department of Landscape Architecture at Virginia Polytechnic Institute and State University. The article complies with national and international research and publication ethics. Ethics Committee approval was not required for this review.

Author Contribution and Conflict of Interest Declaration Information

There is no conflict of interest.

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Chapter 5

UNSUSTAINABLE POLICIES OF SUSTAINABILITY: AN EVALUATION THROUGH REGIONAL PLAN PROVISIONS[1]

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UNSUSTAINABLE POLICIES OF SUSTAINABILITY: AN EVALUATION THROUGH REGIONAL PLAN PROVISIONS[4]

ABSTRACT

The concept of sustainable development, whose conceptual structure was first proposed by a series of international organizations after the 1970s, has significant implications for regional and urban planning policies. In today's social and economic context, characterized by a complex and dense structure and excessive consumption/use pressure on natural resources, the concept of sustainable development plays a pivotal role in guiding the understanding of planning, particularly in terms of managing this defined structure and solving its inherent problems. However, as sustainable development cannot be confined to sub-scale applications, it also requires the development of applications on the regional scale. In order to assess the capacity of the planning system to implement sustainability, it is first necessary to examine the policies and provisions of the plans. In this context, the aim of this study is to measure the level of coverage of regional scale plan provisions in Tekirdağ and Kocaeli settlements by comparing them with the indicators presented for sustainability and climate change. At the conclusion of the study, the level of integration of the plans with sustainability will be revealed, and evaluations will be presented.

Keywords: Sustainable Planning, Plan Provisions, Regional Planning, Tekirdağ, Kocaeli.

ÖZET

1970'lerden sonra gerçekleştirilen bir dizi uluslararası boyutlu organizasyon sonucunda kavramsal yapısı ortaya konan sürdürülebilir kalkınma kavramı, bölgesel ve kentsel ölçekte planlama politikaları için büyük bir önem ve ağırlığa sahiptir. Günümüzdeki sosyal ve ekonomik mekânda görülen karmaşık ve yoğun yapı ve doğal kaynaklar üzerinde görülen aşırı tüketim/kullanım baskısı ele alındığında sürdürülebilir kalkınma kavramı tanımlanan bu yapının yönetilmesi ve sorunlarının çözümlenmesi noktasında planlama anlayışına yön verici niteliktedir. Ancak sürdürülebilir kalkınmanın sadece alt ölçek uygulamalar ile sınırlandırılamaz yapısı nedeniyle bölge ölçeğinde uygulamaların geliştirilmesini de gerekli kılmaktadır. Planlama sisteminin sürdürülebilirliği uygulayabilme kapasitesinin incelenmesi için ilk olarak planların politika ve hükümlerinin incelenmesi gerekmektedir. Bu bağlamda çalışmanın amacı Tekirdağ ve Kocaeli

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yerleşimlerdeki bölgesel ölçekli plan hükümlerini, sürdürülebilirlik ve iklim değişikliğine yönelik sunulan göstergelerle karşılaştırarak kapsama düzeylerini ölçmektedir. Çalışma sonucunda ise planların sürdürülebilirlik ile entegrasyon düzeyi ortaya konmuş ve değerlendirmeler sunulmuştur.

Anahtar Kelimeler: Sürdürülebilir Planlama, Plan Hükümleri, Bölge Planlama, Tekirdağ, Kocaeli.

INTRODUCTION

The concept of sustainable development, which first emerged in discourses during the 1970s (Alshuwaikhat & Aina, 2005), gained prominence with the publication "Our Common Future Report" (United Nations, 1987). The conceptual structure of sustainable development was further developed in the 1992 Rio Declaration (United Nations, 1992) and the 1996 Habitat-II Conference (Ekmekçi Güven, 1995). These developments have significantly influenced the understanding of planning (Çetinkaya & Görer, 1995; Özer, 1995). In detail, the evolution of planning has progressed from an approach that remained within the boundaries of the ***"react and cure"*** strategy until the 1970s, where solutions were developed in response to pollution or hazards, to a systematic approach that aims for integration across scales and is constantly updated (Özkök, 2016). The concept of sustainability can be succinctly defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. This can be more fully explained as ensuring the fulfillment of needs in the economic, social, and environmental spheres through the balanced use of resources over the long term and the consideration of the needs of future generations. The sustainable planning approach presents a strategy that includes the goals and principles of economic, social, and environmental sustainability (Jepson, 2004).

The sustainability of cities is of great importance for national and regional development, improvement, and resource management. To examine the capacity of the planning system to implement sustainability, it is first necessary to analyze planning policies and actions (Conroy & Berke, 2004). Integrating sustainability into planning practices, particularly at the spatial scale, may give rise to challenges. This is because problems may emerge in the actions developed based on strategies, or some policies may be overlooked at the action stage. Furthermore, the reality that the sustainability of cities cannot be guaranteed solely through lower-scale planning practices underscores the necessity for upper-scale practices, where more comprehensive policies will be established. In this regard, regional institutions and regional plans emerge as pivotal actors (Demiral, 2005). It can be argued that economic decisions (industrial facilities, energy facilities, etc.) made with the objective of adapting to the competitive global 001environment have far-reaching implications for natural resources and result in significant shifts in the social structure.

It is therefore evident that the effects of spatial decisions cannot be monitored solely at the lower scale within city boundaries; rather, they necessitate higher scale implementations at the regional and national levels, where more comprehensive policies will be formulated. Furthermore, it is essential to present

a set of principles and strategies that will ensure social, economic, and environmental management and development at the regional level. This will entail ensuring the participation of actors at the regional scale and establishing a connection between the strategies prepared at the national scale and those prepared at the urban scale (Nrg4SD Network, 2003; Newman, 2005; NYSERDA, 2013). It can be argued that strategic planning decisions made at the regional level will extend the scope of sustainability beyond the spatial planning scale, encompassing non-spatial issues such as climate change policies, energy resource management, recycling and reuse, and greenhouse gas emissions[5] (United Nations, 2015). Upon examination of regional plans developed through a spatial planning approach, it becomes evident that the majority of studies concentrate on identifying optimal locations for facilities and activities within a given area, as well as formulating spatial development decisions (Martins, 1986; Dimitriou & Thompson, 2008). In contrast, strategic planning introduces flexibility and diversity to regional planning, allowing the development of distinct planning approaches for regions with varying characteristics and experiencing disparate globalization processes and impacts (Dimitriou & Thompson, 2008). The following section presents a synthesis of literature on the relationship between planning scale, content approaches, and sustainability, illustrated through examples[6]:

- (Campbell, 1996, 2016) poses the question, ***"Green Cities, Growing Cities, Fair Cities?"*** which interrogates the nexus between sustainable planning and urban development. It is asserted that the foundation of sustainable planning is environmental awareness and the rectification of economic stagnation. This situation is purported to be the result of missteps in the fundamental principles of sustainable planning. In the study, a graphic designated as the "Planner's Triangle," was constructed, and the shortcomings of sustainable planning were assessed within this framework. Upon analysis of the graph, the three primary factors—economic, social, and environmental space—and their interrelationships, which form the foundation of sustainable planning, become evident. The argument is made that when conflicts between these main factors are resolved, plans and therefore cities will be green, economically profitable, and fair. Additionally, it is posited that the structure of the sustainable development movement may inadvertently prioritize certain groups within the

[5] In contrast, (Polat, 2010) found that the strategic plans developed in Turkey did not adequately address the interrelationships between plan scales and decision-making processes, hindering the effective guidance of environmental plan studies at 1/100.000 and 1/25.000 scales. Also, asserts that the interrelationships between the resulting decisions and spatial decisions are not clearly delineated, and the intended applications of these decisions within the context of the spatial development and regulation process remain undetermined.

[6] The studies are listed according to the year of publication.

social structure, which could potentially contravene the tenets of social justice. Consequently, it is proposed that applications based on the principles of sustainable development should be developed with consideration for the needs of disadvantaged and underdeveloped regions. This approach would facilitate the integration of a more inclusive and socially just understanding of sustainable development, providing a means of safeguarding the interests of marginalized groups and promoting balanced and orderly development.

- (Hales, 2000) examined the effectiveness of sustainability in planning actions. The study posits that the creation of a conceptual framework, termed "sustainable knowledge," can facilitate the strengthening of practices in alignment with sustainable development principles. The key principles for sustainable knowledge are as follows: (1) the Precautionary Principle, (2) Environmental Limits and Thresholds, (3) Environmental Compensation, (4) Demand Management, and (5) Pragmatic Environmental Options. The implementation of these principles demonstrates the necessity for the integration of sustainable development into the policy-making process.
- (Conroy & Berke, 2004) analyzed 30 plans based on certain indicators in their study asking the question ***"can sustainable development be planned?"***. The indicator themes are as follows: (1) Harmony with Nature, (2) Livable Built Environment, (3) Place-Based Economy, (4) Equity, (5) Polluters Pay, (6) Responsible Regionalism. The analytical evaluation revealed no significant difference between the plans that address sustainable development and those that do not. Consequently, the main requirements for supporting sustainable development principles in plans are the existence of upper-scale planning authority and the participation of many different groups in the planning process.
- (Jepson, 2004) examined the effectiveness of 39 indicators of sustainable development in American cities and planning systems. The study revealed that the primary reasons for the lack of implementation of policies were financial constraints, management constraints, differences between social groups, a lack of information, low public interest etc. Consequently, local governments demonstrated proficiency in land management but exhibited shortcomings in addressing detailed issues related to the environment, the economy, and social structure. This highlights the necessity for the development of policies on the upper scale.
- (Aydın Yönet et al., 2005) developed a matrix system for the examination of the sustainability potential of projects. It is asserted that the prevailing urban-oriented planning approach is inadequate in addressing ecological and environmental health concerns. Accordingly, planning for a sustainable space must prioritize the integration of economic, social, and environmental

considerations. In this context, the primary themes to be addressed are as follows: The following themes were identified as requiring further investigation: (1) Public Health and Safety, (2) Maintenance and Repair, (3) Socio-Economic Impact, (4) Neighborhood Relations at the Urban Scale, (5) Social Justice, (6) Alternative Finance, (7) Coordination between Scales and Projects, (8) Land Use, (9) Air, (10) Water, (11) Energy, (12) Biology, (13) Other Environmental Indicators.

- (Demiral, 2005) comments on the concepts of sustainable development and sustainable cities at the regional scale. In the study, it is stated that the sustainability of cities is of great importance for national and regional development, development and resource management. Furthermore, the study posits that strategies and policies related to sustainable development cannot be achieved solely through lower-scale planning practices. Consequently, he emphasizes the necessity of planning, policy and implementing institutions at the regional scale.
- (Sinemillioğlu, 2009) examined the concept of sustainable regional development in terms of planning processes in Turkey. It is stated that there are reasons such as lack of infrastructure, unbalanced distribution of GDP (Gross Domestic Product) and problems in planning policies in the inequalities between regions, and GAP (Southeastern Anatolia Project), DAP (Eastern Anatolia Project) and DOKAP (Eastern Black Sea Project) prepared for regional development in Turkey are discussed as case studies. As a result, it is stated that although the planning policies in the relevant projects offer opportunities for sustainable development, the plans cannot be fully implemented due to reasons such as the lack of binding effects of plan decisions on institutions, financing problems related to the plans, and lack of integration between regional plan decisions and the country development plan.
- (Atay, 2009) employed content analysis to assess the efficacy of sustainability principles in urban planning. The study examined the manner in which sustainability concerns are addressed in four 1/100.000 scale environmental plans developed in the Aegean region through an analysis of planning actions and policies. The findings revealed that while the plans encompass the majority of policies pertaining to sustainable development, they are not fully reflected in the decision-making process.
- (Yalçıner Ercoşkun, 2010) has assumed that Turkey's urban planning legislation is inadequate in ensuring sustainability. Considering this assumption, the study has developed recommendations for a more sustainable urban planning system in Turkey, drawing on examples from abroad. It is asserted that the logic underlying today's zoning plans ignores the urban identity, social fabric, and

ecological structure of a given area. Furthermore, it fails to address ecological issues such as climate, natural structure, insulation, air circulation, water resources, and energy in the context of spatial decisions. Additionally, the green area standards defined by the legislation are deemed to be inadequate in comparison to the standards set forth in the examples examined.

- (Yıkmaz, 2011) developed a set of indicators and index recommendations for Turkey with the objective of monitoring and evaluating sustainable development. The principal indicators within this context are as follows: (1) Environment [natural resources, climate, resource use and waste], (2) Economy [economic growth, public finance, climate and energy, sustainable transportation, agricultural productivity, innovation], (3) Social [demography, education, health, labor and employment, income balance, participation, housing sector, communication].

One of the most crucial areas of research and practice in the present era is the assurance of sustainable spatial, social, and economic development in planning studies. In this regard, it is essential to examine the capacity of planning to ensure sustainability and the quality of the decisions taken in this context. From this perspective, it is necessary to create more liveable spaces, beginning with the design and planning of individual buildings and extending to the urban and regional scale. When the literature (ERM, 1999; GWA, 2003; Conroy & Berke, 2004; SCI & CIDA, 2012; FA, 2013; Krishnan et al., 2023; Keith et al., 2024) on the factors that should be considered in regional scale planning studies is examined, the factors that should be taken as a basis can be summarized as follows:

1. Develop opportunities for technical assistance, sustainable financing and cooperation to improve regional planning,
2. Regional and local governments support and partner with projects and services that prioritize sustainability and social structure,
3. Preparation of region-specific strategic plans and identification of key indicators for sustainability,
4. Preparation of strategies and land use plans for the protection of agricultural, forest and pasture areas at regional scale,
5. Encouraging recycling and implementing incentives for the use of these materials in the manufacturing sector,
6. Promoting energy efficiency programs and the use of alternative energy sources, developing and monitoring regional strategies for energy efficiency,
7. Development of strategies to reduce greenhouse gas emissions,

8. Establishing strategies for sustainability in basins, providing training on water infrastructure and water conservation,

9. Providing technical assistance and financing to municipalities for the reuse and revitalization of abandoned/derelict areas and structures, and creating strategies and incentives for this,

10. Preparation of sustainable plans and strategies that will ensure public access to regional coastal areas and protect coastal areas against development pressures,

11. Supporting small and medium-sized enterprises, connecting farmers and agribusinesses on a regional scale and establishing the necessary partnerships and cooperation in all these areas,

12. Establishing inter-institutional partnerships on reducing social disadvantages, supporting social inclusion policies, creating programs to combat discrimination, inequality, etc. for social sustainability,

13. Ensuring equal participation of all in the local economy and equal access to employment opportunities,

14. Inclusion of sustainability issues in formal and informal education strategies.

The principal aim of this study is to examine the efficacy of the concept of sustainable development in planning approaches and practices, and the quality of the principles and policies produced with this approach. In this context, in accordance with the methodology outlined in the following section, the content of the provisions of regional scale plans is analyzed through the indicators defined, and concluding comments are developed.

CASE STUDY and METHODOLOGY

Within the scope of the study, Tekirdağ and Kocaeli were selected to examine the level of policy coverage for sustainable development in regional scale plan provisions. In this context, the characteristics of the regional scale plans selected in the settlements are presented in Table 1 (Figure 1). The main reasons for selecting these areas are as follows:

- The formation of an Istanbul mega-region, a process that commenced in the 1960s and continued into the 1980s, gave rise to industrial decentralization in the TR42 region, centered in Kocaeli, following 1965. In the TR21 region, centered in Tekirdağ, commenced this process after 1970 (DPT, 1985; Gezici, 1996; ÇEKÜL, 2012; Özkök, 2016). Because of the migration of the industry to these locations, which are of great strategic importance in terms of transportation and where there are economic incentives, the conservation-use balance in land

use has gradually deteriorated. It is therefore essential to establish sustainable policies in these settlements.

- In the TR21 region, which is centered in Tekirdağ, an industry-driven development process occurred between the years 2000 and 2018. In the present day, the economy is characterized by a prominent industrial sector, with services and industry representing the primary sources of employment. In the TR42 region, which is centered in Kocaeli, the economic structure shifted from an industrial and service-oriented focus between 2000 and 2012 to a more pronounced emphasis on trade and finance-banking sectors, along with services and industry in employment (Özkök & Kuru, 2024). Consequently, it is crucial to assess the equilibrium between the protection and utilization of regional natural resources (soil, air, water, etc.) within the evolving economic landscape.
- A review of projections based on current land use change trends indicates that the built environment, particularly in the Tekirdağ, is expected to expand approximately two and a half times over a ten-year period (Gündoğdu & Özkök, 2020). This anticipated growth underscores the importance of safeguarding natural areas, including agricultural, pasture, and forest lands, against the pressures induced by macroform development.
- In addition, preventive/regulatory decisions should be developed for the heat accumulation -and for the effects of climate change in a broader sense- above the surface in macroforms such as Tekirdağ and Kocaeli, which are growing on the industrial axis.

Table 1.Information on the plans covered in the study

Study Area	Year of Plan Approval	Name	Scale
Tekirdağ	2011	Environmental Plan (EP)	1/25000
Tekirdağ	2023	Edirne-Tekirdağ-Kırklareli Provinces Integrated Coastal Areas Plan (ICAP)	1/50000
Kocaeli	2024	Environmental Plan (EP)	1/50000
Kocaeli	2015	Izmit Bay (Kocaeli-Yalova) Integrated Coastal Areas Plan (ICAP)	1/50000

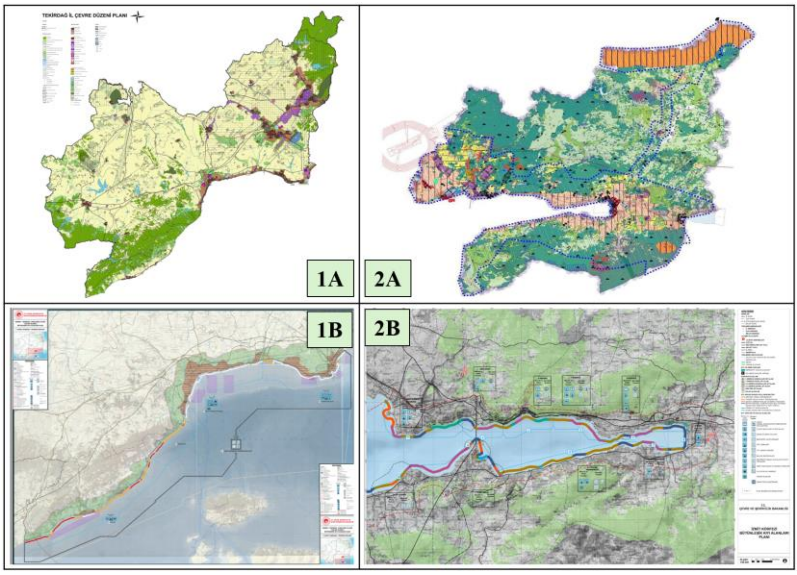

Figure 1. The plan layouts *(1A: Tekirdağ Environmental Plan, 1B: Edirne-Tekirdağ-Kırklareli Provinces Integrated Coastal Areas Plan, 2A: Kocaeli Environmental Plan, 2B: Izmit Bay (Kocaeli-Yalova) Integrated Coastal Areas)*

In the study, an evaluation was conducted on the specific plan provisions. The indicators presented in (Özkök, 2015, 2016; Keith et al., 2024) on regional scale sustainability and climate change were utilized as a basis for evaluation, and the level of coverage of the plan provisions on these indicators was assessed. Additionally, a scoring system was employed as a result of the comparison, and numerical results were calculated. There are a total of 49 indicators in the scoring matrix and their criteria are as follows: NP- (not present) [0 points], PP-1 (conceptual reference in plan provisions but no comprehensive action) [0.5 points], PP-2 (definition of indicators in plan provisions but partially addressed) [1 point], P+ (present) [2 points]. In this context, a plan that covers all indicators is expected to score a maximum of 98 points.

FINDINGS and DISCUSSIONS

The evaluation tables from the study are presented in Appx.1 and Appx.2. Table 2 illustrates the sustainable policy coverage levels that emerged as a consequence of the evaluations. Accordingly, Tekirdağ is found to have the highest level in the study area (98/40). While the Tekirdağ EP (ÇŞB, 2011) presents relatively comprehensive policies, the level of policy coverage is low in the ICAP (ÇŞB, 2023a), despite its status as an up-to-date plan. The situation in Kocaeli is distinct. Although the score is high in the ICAP (ÇŞB, 2015), it is approximately half the score in the EP (ÇŞB, 2024), which is also an up-to-date

plan. As a preliminary conclusion, it can be observed that the scope framework for regional-scale sustainability and climate change indicators, regardless of scale and content, has narrowed in the plans in the study areas as we move towards the present day. Further detailed assessments are presented below.

Table 2. Scores for plan provisions meeting regional scale sustainability and climate change indicators

Plans		Year of Plan Approval
Tekirdağ EP	**40.5**	2012
Tekirdağ ICAP	**26.5**	2023
Kocaeli EP	**16**	2025
Kocaeli ICAP	**32.5**	2015

Regional scale plan provision evaluations (Tekirdağ) (see Appx.1)

- In line with the reviews under the management heading, it is stated in the plan reports that partnerships and collaborations should be established. Although necessary decisions and strategies have been developed in the EP on waste and recycling issues in parameter 5, which is also under the management heading, they are not fully compliant. In ICAP, it is referred to as ***"should include an emergency and response plan to reduce the risk of contamination in case of leakage of wastes and chemicals"***, but it is seen that no provision has been developed accordingly. However, the ICAP Management Plan Strategic Environmental Assessment Report (ÇŞB, 2023b) includes action plans to reduce waste generation. In addition, while the preparation of strategic plans under parameter 9 is available in detail in ICAP, the same is not the case for the EP.
- Upon examination of the section pertaining to natural resources and waste management, it becomes evident that while the EP does mention energy efficiency programs, these are not entirely aligned with the indicator framework. A comprehensive study or recommendation pertaining to this theme is absent within the ICAP framework. However, suggestions have been put forth indicating that energy efficiency should be optimized through the utilization of green energy sources within the proposed ecological marina. Nevertheless, these suggestions are merely referenced within the report, rather than being explicitly outlined as provisions. Additionally, both plans demonstrate a commitment to researching renewable energy sources and promoting their use.
- In accordance with the findings of the research on air pollution, which is included in the 14th parameter, it has been established that the primary contributing factors to the current air pollution in Tekirdağ are industrial and

heating-induced air pollution. In densely populated settlements (such as Çorlu, Süleymanpaşa, Çerkezköy, and Kapaklı), air pollution values exceed the permitted limits due to the use of low-quality fuels. The proximity of the province to domestic lignite coal mines and economic considerations has a deleterious impact on air pollution caused by heating. In densely populated areas, transportation-related pollution is also a significant concern, largely due to inadequate transportation infrastructure and heavy traffic resulting from unplanned construction activities. Furthermore, the province's location along the International Motorway (TEM) and E-5 Highway results in additional transportation-related pollution from transit routes. The pollution caused using fossil fuels in the intensive industry in Tekirdağ province is increasing, particularly in the context of the balance between natural gas and coal. Furthermore, the pollution caused by industrial processes is also a significant concern (ÇŞB, 2020). While there are strategies and studies to reduce air pollution in the Clean Air Action Plan of Tekirdağ province within this subject, it is evident that the plan decisions and strategies have not been developed in a comprehensive manner to effectively address air pollution, or that the strategies developed are inadequate (ÇŞB, 2020).

- Regarding improvements in existing water systems and increasing infrastructure efficiency, ICAP includes references to conservation of water resources and the restoration of damaged regions, but no provision for this.
- There is no provision in either plan for the reuse and recycling of by-products of agricultural and forestry production, and materials from construction and demolition. In addition, there is no provision in ICAP to promote the use of recycled materials in businesses and industries in the region.
- In the theme of managing rainwater and runoff, ICAP states ***"Implement stormwater management solutions such as rain gardens, permeable pavements and surfaces, sponge parks, rain ditches, water retention and retention ponds in coastal areas to reduce the burden of sudden and heavy rains on the drainage system"***. In addition, provisions have been developed to give importance to rainwater collection and treatment in the proposed ecological marina.
- Although the Eleventh Development Plan (TC-SBB, 2019) contains strategies related to biodiversity, it is evident that the plans under examination refer to the importance of ***"ensuring the conservation and sustainable use of biodiversity and minimizing environmental risks"***. However, it is notable that no provisions have been developed.
- In line with the definition of climate change as a social problem or a threat to the city and the production of decisions accordingly in the theme of heat resilience, there is a plan provision in the ICAP stating that ***"Detailed analyzes***

will be made by the relevant administration regarding the coastal structures located in areas where there are possible risks due to climate change or other natural disaster hazards, coastal structures that are in a risky situation will be identified and necessary improvement works will be carried out", but it is not possible to say the same for EP. There is no study, decision or strategy on this issue in the EP report.

- There is no mention of climate change as a social problem, and there are no provisions on future climate projections in either plan, but in the ICAP Management Plan Strategic Environmental Assessment Report (ÇŞB, 2023b), past temperature data and future temperature values for the study area are projected.
- In the 27th parameter, there are studies on the reuse of idle areas and structures in both plans examined. In ICAP, the proposal to reorganize and put into service areas such as Tekirdağ Marina and Şaraphane Pier, which are idle, within the framework of special standards can be shown as an example of this issue.
- While the theme of setting standards for agriculture at regional scale and preparing plans to protect rural areas is present in the EP, it is referred to in the ICAP, but no strategy or provision is produced. However, it is seen that this issue is included in the EP for Ergene Basin in Thrace Region (ÇŞB, 2009) and targets are set.
- It is observed that alternative transportation programs that integrate transportation in order to reduce vehicle use are not established, and there are no mentions of the use of clean fuel types such as electric vehicles and biodiesel.
- Plan provisions have been developed in both plans for protection from natural disasters in the socio-economic theme.
- In the economic theme, there are no detailed provisions on reducing social disadvantages, ensuring equal participation of all in the local economy, ensuring equal access to employment opportunities for all, and combating discrimination and inequality for social sustainability.
- In the theme of agribusinesses, it is seen that incentive and entrepreneurship programs are proposed, the establishment of regional cooperation for farmers and agribusinesses is mentioned, but strategies and provisions are not formed on this. This creates a negative factor for social sustainability.

A comprehensive examination of the Tekirdağ EP and ICAP documents reveals that the evaluations in Appx.1 encompass a limited scope, and the staging

timeline is delineated in the plan reports. In this context, the coverage level is calculated to be 40.5 points for the EP and 26.5 points for the ICAP.

Regional scale plan provision evaluations (Kocaeli) (see Appx.2)

- For the indicator ***"providing training to farmers on the use of techniques and technologies, energy efficient agricultural practices and sustainability"*** in the 3rd parameter in the management theme, there is a strategy in ICAP as ***"Raising awareness of decision makers on environmental management and ensuring the dissemination of environmental education in the society"***, but it is not fully addressed in the provisions. However, in the EP, there is no reference to this issue.
- In the waste and recycling themes, the ICAP has produced a plan strategy of ***"Improving solid waste management to prevent environmental pollution and supporting the necessary measures to prevent air pollution"*** and a broad private-public sector-public sector cooperation. In addition, specific reports were prepared (KBB, 2022) and targets and strategies on waste and recycling were formulated. There is no provision for this indicator in the EP.
- Neither of the two plans under examination make any reference to energy, energy efficiency, or renewable energy. However, the relevant strategic plans (KBB, 2018, 2022) set targets and strategies in this regard.
- In line with the 14th parameter, there is a provision in the ICAP stating that ***"In order to control air pollution caused by transportation, the necessary control mechanism regarding exhaust and emission measurements will be activated and vegetative screening measures will be taken on the roadsides"***. In addition, there are plan provisions to support rail system projects and to take necessary measures to prevent air pollution, but this is not present in the EP.
- In the ICAP on sustainability in basins, it is seen that it is recommended to identify and prevent activities that cause pollution of water resources. However, in the EP, this is only at the level of informing that the issues specified in the relevant regulations are valid.
- There are findings in the plans that rainwater is an important problem in settlements. In the EP, it is stated that sewerage lines should be laid around stream beds. In ICAP, it is seen that there is a strategy to expand rainwater transmission lines, to collect rainwater in suitable receiving environments and to investigate its usability, and to provide the necessary incentives to ensure its use as irrigation industrial water by storing it.
- There is no provision in either plan for the reuse and recycling of by-products of agricultural and forestry production, and materials from construction

and demolition. In addition, there is no provision in ICAP to promote the use of recycled materials in businesses and industries in the region.

- As evidenced in the plan report, ICAP has established a series of scientific and administrative measures aimed at protecting biological diversity. However, a review of the EP reveals that no strategies or provisions addressing this issue.
- There is no provision on climate change in either plan, but other strategic plans (KBB, 2018, 2022) address these issues.
- It is observed that alternative transportation programs that integrate transportation in order to reduce vehicle use are not established, and there are no mentions of the use of clean fuel types such as electric vehicles and biodiesel.
- It is seen that the ICAP refers to the reuse of idle, abandoned areas/structures as ***"Restoring and, where possible, Regaining Lost Natural Values"***, but detailed provisions have not been established accordingly. There is no strategy or provision on this issue in the EP.
- It is seen that the EP refers to the protection of rural areas as ***"the most appropriate protection of land and natural resources in rural and urban areas"***, but there are no detailed provisions on this issue. There is no reference to this in ICAP.
- In line with the thirty-third parameter, there are no detailed provisions in the EP for protecting coastal areas against development pressures, whereas there is a plan provision in the ICAP stating that ***"no measure can be taken from this plan and no direct implementation can be made through this plan, since it sets out guiding strategies for the practices of authorized institutions and organizations, local administrations and investors on planning, site selection, land allocation, implementation, construction and operation permits, inspection and monitoring of coastal structures and other arrangements to be made in coastal areas"***.
- The province of Kocaeli is prone to seismic activity, as evidenced by the 7.4 magnitude earthquake that struck the region in 1999, resulting in significant loss of life and property (AFAD, 2021). The ICAP and EP offer insights into the protection of natural disasters, and relevant plan provisions are presented.
- It is seen that there are no studies in both plans for the issues specified in the thirty-ninth and fortieth Parameters, but targets and strategies are set in other strategy plans (KBB, 2022).
- It is seen that there are no detailed provisions in both plans on reducing social disadvantages, ensuring equal participation of everyone in the local economy, ensuring that everyone benefits equally from employment

opportunities, combating discrimination and inequality for social sustainability. However, in ICAP, there is only a reference to ***"equitable distribution of resources among stakeholders is essential"*** for the purpose statement.

A comprehensive examination of the Kocaeli EP and ICAP documents reveals that the evaluations in Appx.2 encompass a limited scope, and the staging timeline is delineated in the plan reports. In this context, the coverage level is calculated to be 16 points for the EP and 32.5 points for the ICAP.

CONCLUSION

The area with Istanbul as its center, comprising the Edirne, Kırklareli, and Tekirdağ provinces in the west (TR21) and the Kocaeli, Sakarya, Düzce, Bolu, and Yalova provinces in the east (TR42), is designated as the Mega-Region. The growth of Istanbul also affects the surrounding provinces. In this context, Environmental Plans and Integrated Coastal Area Plans were analyzed to evaluate the extent to which sustainable development and climate change strategies were considered in the plans prepared for Kocaeli and Tekirdağ provinces, which have been significantly impacted by Istanbul's growth.

The concept of sustainability comprises economic, environmental, and social components, which should be considered not only on the urban scale but also at the regional scale. Consequently, decisions should be made in accordance with these considerations. In this context, an examination of the plans reveals that the strategies and provisions introduced do not address sustainability in all its dimensions and do not fully comply with sustainability indicators. Furthermore, decentralization in the Istanbul metropolitan area affects both provinces and has led to changes.

In the plans prepared for the solutions to pollution issues caused by industry, it is seen that detailed plan decisions are included in the Kocaeli Integrated Coastal Areas Plan, but not in the other plans examined. In addition, it is seen that the provisions on the use of clean fuel products and encouraging recycling are insufficient. It can be argued that there are currently no provisions in place to address the issues surrounding temperature and climate change, which represent a significant challenge in the present era. The indicators pertaining to the built environment and land use are discussed in more detail in the Tekirdağ plans. For Kocaeli, the Integrated Coastal Areas Plan provides the most comprehensive set of detailed provisions; however, there is a lack of a structured framework to guide the implementation of urban-scale practices.

Another important issue is that detailed discourses in line with indicators are included in strategic plans instead of spatial plans. However, the incompatibilities between strategic plans and spatial plans in Turkey and the structure of the

legislation that sees strategic plans as independent from the planning system prevent integration between decisions. In this respect, although strategic plans aim for sustainability, the fact that they are not included in spatial plans leaves these plans only at the level of a report.

As a result of all these evaluations, in order to ensure balanced growth on the regional scale and to prevent regional inequalities, planning decisions and policies need to be reconsidered in a rational, problem-oriented and egalitarian structure.

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APPENDIX

Appx.1: Regional scale plan provision evaluations (Tekirdağ)

Appx.2: Regional scale plan provision evaluations (Kocaeli)

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