Landscape Planning and Design Approaches for Ecologically Sustainable Cities

ABSTRACT

Rapidly increasing urbanization trends at the global level are increasing the interest in sustainable urban living, while at the same time revealing the impacts on ecological balance more clearly. In particular, increasing urban areas have negative impacts on ecosystems and quality of life through factors such as rising air temperatures and changing rainfall patterns. This rapid urbanization process negatively affects the natural ecosystems within the urban area, and ecosystems are fragmented, degraded and even at risk of complete destruction. For this reason, it has become a great necessity to develop planning methods to protect the ecological balance. These planning approaches are seen as the cornerstones of building sustainable cities. Factors such as spatial diversity and temperature changes play a vital role in understanding ecological processes. In this context, although efforts to design and maintain sustainable urban landscapes are ongoing, more effective strategies are needed to ensure the long-term sustainability of these landscapes. Over the past decades, many innovative ideas on urban landscape planning and design have been developed. However, there has been limited success in the applicability of these ideas from a sustainability perspective. Sustainable landscape planning and design helps to improve environmental quality and multiply social benefits through the integration of various materials and methods in the creation, construction and management of urban areas. Sustainability-oriented approaches to landscape planning and design include restoration and enhancement of natural systems, sustainable management of resources, efficient use of water and energy, and maintenance of the quality of the outdoor environment. The aim of this study is to discuss new strategies at the urban level. In this way, it is aimed to take ecosystem protection measures in urban areas, to create livable environments and to achieve sustainability goals more effectively.

Keywords- Urban, Ecological, Sustainable, Landscape planning, Landscape Design

Introduction

While rapid urbanisation is increasing the interest in the sustainability of cities all over the world, the effects of urbanisation movements on ecological processes, some of which are tangible, such as the increase in urban air temperature and changes in the water cycle, continue. From a formal point of view, urbanisation creates urban environments that are more heterogeneous in terms of content, more geometrically complex and ecologically more fragmented, resulting in highly complex vegetative cover and different land uses for all urban landscapes. In this context, the effects of spatial heterogeneity and spatial temperature changes, which are extremely important for understanding ecological processes, are understood more and more every day. In this direction, while efforts to create sustainable urban landscapes continue, it is also necessary to develop more effective strategies to ensure the continuity of these landscapes.

Urban landscape planning and design studies, which provide multifaceted contributions to urban sustainability, on the one hand ensure the continuity of local, natural processes, on the other hand create spaces for social communication and interaction between individuals belonging to different social classes and cultural groups, and in this direction express the interaction of natural and social processes aesthetically. Although many ideas have been developed in recent years for these contributions of urban landscape planning and design, little success has been achieved in realising them within the scope of sustainability.

Sustainable landscape planning and design integrates a variety of materials and methods in the design, construction and management of urban spaces, contributing to the improvement of environmental quality and the realisation of different social benefits. The areas of interest of landscape planning and design for sustainability include the development and restoration of natural systems, sustainable management of resources, efficient use of water and energy, and protection of outdoor environmental quality. The aim of this research is to discuss new strategies at the urban scale.

Urban Ecology and Sustainability

Numerous studies highlight cities as products stemming from a blend of social and engineering endeavors (Cadenasso and Pickett, 2008; Shakouri, 2016). Nonetheless, owing to a human-centric planning and design approach, various natural and ecological processes have been sidelined from the inception to the evolution of this invention. This trend isn't exclusive to urban locales in developing nations; examples are discernible in many developed countries as well. Consequently, safeguarding ecological aspects within urban settings has, for an extended period, been viewed as a luxury. As a result, the notion of ecological values and their conservation has predominantly been associated with safeguarded zones outside urban peripheries (Schäffler & Swilling, 2013; Shakouri, 2016). In essence, vital aspects like ecological services pivotal for upholding ecological equilibrium have been disregarded during urban planning phases. Cities operate as ecosystems due to the intricate interplay between their biological and physical components. Urban areas encompass physical regulators like air, soil, water, light, temperature, and diurnal variations, alongside a diverse array of organisms, humans included (Ahern, 2005). The realm of "urban ecology" or "urban ecosystem" delves into the exploration of urban ecosystems. Urban ecology is equally vested in scrutinizing the flow of matter and energy within the constructed milieu.

In contemporary context, urban ecology takes on a renewed significance and can be defined as "the exploration of the impact of human activities within cities on natural resources and the environment, considering conditions for urban development that encompass biodiversity and the well-being of local and global communities, including future generations" (Tjallingii, 1994; Zipperer et al., 2000; Andersson, 2006). In urban settings where ecological dynamics are overlooked, the climate and soil undergo transformations due to the gradual reduction of natural spaces, leading to the creation of an artificial living environment contaminated by pollutants stemming from residential, industrial, and vehicular sources. Consequently, an artificial "Urban Ecosystem and Climate" takes shape within cities. In recent times, terms like "sustainability," "energy-efficient planning," "ecological design," and "green building design" have become common parlance within disciplines like landscape architecture and architecture. These concepts, underpinning the optimal utilization of natural resources in spatial planning and design, are grounded in the pursuit of maintaining both economic and ecological advantages (Barış, 2008). From a designer's standpoint, sustainability can be succinctly defined as the enhancement of societal quality of life without surpassing the carrying capacity of global ecosystems, both at urban and architectural scales (Atıl et al., 2005). It embodies an essential principle that seeks heightened efficiency by envisioning the seamless continuity of functions within any social, economic, or ecological system, without depleting the utilized resources. Landscape planning, on the other hand, endeavors to achieve a harmonious equilibrium between human-nature interactions, focusing on both conservation and utilization. The deficiency of planning practices that analyze and assess these interactions stands as a noteworthy catalyst for environmental challenges. As a result, understanding the intricate relationship between humans and nature is vital for addressing these complexities and charting a sustainable course forward.

The sustainability of cities equates to the sustainability of societies themselves. Human communities both influence and are influenced by their living environments. Ensuring city sustainability translates to enhancing the lives of current and future inhabitants while preserving the environment. In this pursuit, the sustainability of urban development must run parallel with that of social advancement. Sustainable cities epitomize places where socio-economic interests align harmoniously with environmental and energy considerations, thereby ensuring a continuous transformative process. The convergence between sustainable urban development and sustainable social development is evident within their definitions. "Sustainable social development involves making development decisions while upholding the interconnectedness of the three 'E's': economy, ecology, and equality" (Atıl et al., 2005). This underscores the vital connection between holistic societal progress and the balanced stewardship of the environment, a principle essential for the sustainable evolution of cities.

The Phenomenon of Sustainable Urbanization

Sustainable urbanization first appeared in scientific literature in the 19th century. In 1804, Arthur Young drew attention to the sustainability of agricultural production in his book "General View of Agriculture of Hertfordshire". This is an example of the relationship between agriculture and sustainability. However, cities are not the main target of the concept of sustainable development. Sustainability focuses on reducing environmental problems caused by economic and technological progress and protecting the ecosystem. Sustainable urbanization represents a combination of these two concepts and is a more recently developed concept. The term sustainable urbanization or sustainable human settlements is not fully defined. However, environmental, economic, political, social, demographic, institutional and cultural objectives, which are the components of sustainable development, constitute the basic parts of sustainable urbanization. In this context, it is possible to define sustainable urbanization as "enabling the development of cities that respond to human needs better than today's cities, without preventing future generations from meeting their needs" (Bozloğan 2004).

The main goal of sustainable development is to fulfill human needs by taking into account the environmental dimension. This requires an effective institutional management and planning approach. Sustainable urbanization is driven by factors such as the contribution of cities to social and economic development, the fact that a large proportion of the population lives in cities, and the provision of housing, employment and services. However, it is also observed that rapidly growing cities cause environmental degradation. Therefore, the indispensable elements of sustainable urbanization include ecological balance, land use, transportation, natural environment, employment, public services and social welfare. As a result, the concept of sustainable urbanization shapes the future of human settlements by bringing together environmental, economic and social dimensions. This concept provides a harmonious balance between human and nature by linking cities and rural areas. Alternative urban models such as ecological cities are also important steps towards sustainable urbanization goals (Tosun, 2017).

Ecological Planning and its Impact on Sustainability of Cities

Ecological planning represents an approach where socio-economic development goals harmonize with natural systems, ensuring the optimization of long-term economic gains. To attain sustainability through responsible resource usage, a vital prerequisite, one must delve into the thorough examination of environmental natural and cultural values. These assessments, integrated into evaluative procedures, facilitate the sustainable utilization of resources, averting depletion (Atıl et al., 2005). By bridging the spatial planning process, predominantly centered on land utilization, and the assessment of natural resources' impact, ecological planning lays the groundwork for the proficient administration of these resources (Çelikyay, 2006).

Ecological planning aims to control human pressure in the protection and sustainability of natural resources (Nuissl et al., 2009). Therefore, mitigating the negative effects of rapid urbanisation, maintaining ecosystem integrity and ensuring controlled growth of cities are important problems that ecological planning approach is concerned with (Makhzoumi and Pungetti, 2003; Cortinovis et al, 2018; Oktay 2021). In order to overcome these problems, strategies for directing urban development and maintaining the functioning of the ecosystem in urban areas are developed within the scope of proper land use planning. With an ecological approach, cities are cultural ecosystems in which living organisms living in a certain area and constantly interacting with each other and their inanimate environments form a whole. For this reason, cities should be in harmony with other ecosystems in their environment and at least not harm them. However, cultural ecosystems have quite different aspects from other ecosystems. The carrying capacity, which is constant in natural ecosystems, can be increased in cultural ecosystems thanks to technology. This variable structure

causes various problems by bringing additional burdens to the ecosystem and other ecosystems around it. However, only natural structure should not be understood from the definition of environment. The environment covers everything living and non-living and includes biophysical and sociocultural elements. The first one includes the biological and physical side of human beings and the second one includes the economic, political and intellectual activities of human beings. These two elements are interrelated and inseparable (Atıl et al., 2005).

The Brundtland report and its subsequent discussions have expanded the perspective of the environment beyond being a mere repository of resources to safeguard. Recognizing its psycho-social impacts, the environment significantly influences social well-being and even stands as an economic criterion. This recognition intertwines ecological principles with the ethos of sustainable development. Hence, "ecological planning" can be perceived as the ecological facet of sustainable development. The convergence of ecological discourse and sustainable development underscores the concept of environmentally sensitive planning. The intersection of environmental challenges and degradation within communities and their environs generates socio-economic issues that demand resolution under the umbrella of sustainability. As a result, addressing these concerns aligns with the tenets of sustainable development, encapsulating the intricate relationship between ecological, social, and economic dimensions.

The ecological planning framework envisions preemptively mitigating environmental challenges by orchestrating living spaces in alignment with these objectives. This approach entails the identification of local natural resources and their meticulous allocation, factoring in their distinct attributes. The focal point is not to subject resources to undue strain through planning, but rather to safeguard them from usage-induced harm by strategizing in harmony with each resource's traits. Ecological planning operates as a comprehensive, integrated system, where the analysis extends beyond singular local activities to the cumulative effects of usage clusters on larger scales, culminating in informed land use decisions. Within this framework, all dimensions of resources—natural, artificial, and social—are accorded consideration. Renewable resources are harnessed in consonance with their regenerative potential, while non-renewable ones adhere to the principle of substitution. The initial tenet revolves around accurately appraising the inventory of potential resources. This method facilitates the comprehensive disclosure of natural endowments, thereby determining their appropriate utilization. The subsequent phase entails dissecting the structure of users or the intended use. Through the evaluation of social, economic, psychological, and ecological aspirations, judicious land use choices are made. The outcome of such meticulously crafted ecological planning is the introduction of suitable applications to target regions, concurrently preserving the natural milieu and reaping optimal benefits from these compatible uses. This process transcends the mere nexus between economy and ecology, catalyzing positive effects on users' psychological dispositions. As activities unfold in congruent spaces, the natural fabric endures, culminating in the attainment of sought-after socio-economic benchmarks (Atıl et al., 2005). Through the harmonization of ecological, social, and economic dynamics, a holistic equilibrium is forged, nurturing a symbiotic relationship between human endeavors and the environment.

Planning and Landscape with Ecological Approach

Producing a livable environment and reconsidering the human-nature relationship in urban areas, together with the concepts of ecological approach and sustainability, have made the Landscape discipline an indispensable element. The words lantscaf, which means region, area and land in German in the Middle Ages, and paysage, which means landscape in French, are the roots of the word Landscape that we use today. Landscape is a whole of ecosystems formed by abiotic, biotic and cultural components. Therefore, Landscape architects undertake 4 tasks: Design, Planning, Restoration and Conservation, and Management, considering these components. The European Landscape Convention, which was opened for signature in

Florence in 2000 and adopted by the European Parliament in 2004, aims to take policies and measures by international and national authorities for three purposes: landscape protection, landscape management and landscape planning (Council, 2000; Çetinkaya & Uzun, 2014).

The fact that cities are "an ecosystem that is externally dependent in terms of resources and formed by biological and socio-cultural elements together" requires holistic action. The loss of natural areas, which accelerated with the industrial revolution, and the aesthetic and welfare-oriented solution approaches to it have ignored natural processes and ecological structure (Onur, 2012). While seeking solutions to the changing needs of cities with ecological approach planning, the idea that "urban green areas to be managed will not only undertake the mission of creating a healthy environment in the sustainable city target, but will also make positive contributions to the economic, social and cultural structure of the city" is adopted (Onur, 2012).

However, the point interventions that were partially beneficial in the 19th and early 20th centuries in the name of producing urban green spaces have remained far from the goal of a sustainable city. In order to preserve and sustain the diversity of life, life corridors need to be created. This situation, which is considered as green infrastructure, is the whole of landscape elements that provide many benefits such as ensuring the continuity of natural flow in cities, protecting native species, protecting natural resources and improving the quality of life of people. The ecological balance in cities is supported by the relationship between natural habitats and open and green areas. Ensuring this relationship depends on the green infrastructure system, which is called differently in many countries such as green surge, green belt, ecological network. Green infrastructure systems in planning pioneered by landscape disciplines play a crucial role in sustainable urban goals. The interconnection of natural habitats with open and green areas and the creation of green corridors are preventive elements in terms of ecological balance. The ecological approach, together with the green infrastructure system, provides an economic approach to take precautions for environmental and social damages in cities, to avoid greater costs and to provide an economic approach. It combines many elements such as forests, wetlands, rivers, valleys, areas of agricultural activities, parks and gardens that exist within the city. This system, which spreads throughout the city, becomes stronger to renew itself, while reducing the impact of carbon emissions that cause climate change in the city. More importantly, it re-establishes the relationship between human and nature and makes nature more accessible. It contributes greatly to pedestrian movement in the city and creates meeting spaces (Başaran, 2018).

Ecological Planning and Design Approach

It is possible to say that the new vision of the current historical process, which is generally described as the "Ecological Era", reflected in many fields of action, is a part of postmodern thought, which is emphasised to have started in the 1970s and expresses a new era after modernism. Changing views on space planning and design can also be associated with this new vision (Şahin, 2003).

Modernist urban plans are based on the strict separation of various uses in the city. Modernist planning's view of the city clearly reflects modernism's view of space. According to this view, space is only a by-product of social relations, a phenomenon that must be shaped for social purposes. Therefore, urban space has meaning only within a specific social project. In modern thought, planning means rationality and conceptual purposefulness that brings order to disorder and organises coincidence and contingency in a humanly meaningful design. It has been understood that these tools, which seek to bring order, cannot solve the problems expected to be solved within the framework of the world view dominated by modernism and bring many more problems with them. Although there are various reasons for this, one ecologically important aspect is the tendency to see nature and its elements as "other". While modernism tended to dominate nature, classical economic views developed in this period handled nature with a utilitarian

approach. Today, it is necessary to make a fundamental change in the understanding of landscape planning and design (Şahin, 2003).

The essence of this change in terms of "ecological concerns" is to "perceive that nature has an intrinsic value". This is the basis of ecological discourse. To put it more clearly, it is insufficient to assign a value to a tree only in terms of utilising its shade or wood. Beyond this, that tree has an existence value far from the projection of human beings and this is important. The reflection of this in planning and design constitutes a field of action that takes into account ecological values, components and processes in time and space.

The societal extension of the outcomes derived from actions encompassing ecological planning and design holds significant importance within the realm of planning and design. Essentially, if spatial components and metaphors are pivotal factors in shaping society, the manner in which products from ecological design are utilized and sought-after will invariably manifest as the social manifestation of ecological discourse. Similarly, the designer's capacity to encapsulate society hinges on their adeptness in integrating the societal aspect into ecological discourse within their designs. Correspondingly, the extent to which a designer infuses their ecological philosophy into their designs can catalyze societal transformation aligned with ecological principles, encapsulating a symbiotic relationship between design and society.

Another importance of ecological discourse in landscape planning and design is that the product produced by the ways of thinking that approach the space in a fragmentary manner constitutes an important tool in ensuring ecological relations with the environment close to the whole city. In other words, while creating an ecological environment in an area or improving the existing one through landscape planning and design action, the fragmentary structure of the plan will be associated with the system as a whole, since the continuity of this area will require the consideration of larger areas when based on ecological foundations. Fragmentation in ecological environments can create very important problems. The terms "green link", "green road" or "ecological network" are planning or design products that have emerged in this context. It is not possible to create ecologically sustainable systems by isolating an area (or urban ecosystem) from the surrounding systems.

The ecological approach in shaping land use decisions is widely embraced in contemporary times. Rooted in the evolution of thought during the 1960s, it initially centered on "environmental concern" until the 1980s, later evolving to encompass notions of "quality of life" and "sustainability." Escalating resource depletion, the horizontal reach of human activities extending to polar regions, and the vertical extension beyond the atmosphere have compelled a "return to nature." This return entails harmonizing with nature's inclinations and necessities while safeguarding and nurturing it. Rather than asserting dominion over nature and its constituents, the imperative now lies in fostering a symbiotic coexistence. From a socio-cultural standpoint, this coexistence translates into a multifaceted endeavor encompassing individual, social, regional, national, international, and global tiers, each complementing the other. Understanding how nature functions and identifying the responsibilities of each element therein is the key to ascertaining the ecological impact—whether detrimental or advantageous—on the natural environment (Şahin, 2003). This proactive and holistic approach ensures that land use decisions harmonize with nature's inherent dynamics, fostering a balanced equilibrium between human activities and the environment.

Initially, technology was utilised to overcome environmental problems, but this situation has moved the problem from local to global scale. For example, the use of high chimneys to prevent air pollution in industrial areas has carried pollutants to greater distances. These developments have brought a new dimension to planning approaches, and it has been understood that environmental problems in living environments can be minimised with planning in balance and harmony with nature, in other words, with ecologically based planning, and that the decisions produced will be effective in the long term.

In urban areas, the quest for open and green spaces becomes unnecessary because they inherently belong there. The ecological planning paradigm unveils these natural pockets, bridging urban and rural domains. In nature, the urban-rural distinction dissolves; systems interconnect seamlessly. However, when urban zones sever ties with their surroundings, ecological functions fragment, giving rise to environmental predicaments. Within the urban context, spaces fostering the continuity of natural processes constitute an ecological network—integral components of open and green infrastructures. Beyond visual and recreational considerations, ecological attributes stand as primary criteria in site selection.

The ecological planning approach mandates comprehensive ecosystem analysis. Presently, ecological processes remain underrepresented as evaluation metrics in planning. In truth, the elements steering these processes' emergence and persistence identify landscapes necessitating preservation, enhancement, and restoration. These zones embody rich ecological conservation value. Furthermore, the ecological approach exposes an area's capacity to accommodate diverse uses, ensuring sustainability in the face of demands (Şahin, 2003).

The Importance of Landscape Planning and Design in Creating Ecologically Sustainable Cities

Landscape planning and design play an important role in creating ecologically sustainable cities. These approaches include various strategies to protect the natural environment, provide ecosystem services and improve the quality of human life. Here are some landscape planning and design approaches that can be used in this context:

- Green Infrastructure: Green infrastructure involves integrating natural elements such as green spaces, parks, forests, water resources and natural corridors into a network in urban areas. This approach can increase biodiversity, improve water management and provide people with places for rest and recreation (Gedikli, 2020).
- Conservation of Natural Processes: Strategies compatible with landscape design can be used to support the functioning of ecosystems and maintain natural processes. For example, areas can be created where water naturally collects and surface water percolates into groundwater sources (Erdoğan Onur & Demiroğlu, 2016).
- Diverse Vegetation: The use of different plant species can increase habitat diversity and support ecological balance. Favoring native plant species can reduce water demand and provide food and shelter for local fauna (Korkut, Kiper, & Topal, 2017)
- Water Management: Rainwater harvesting systems offer an efficient way to collect, store and use water. Sustainable water management can ensure that water resources are used effectively (Öztopcu & Salman, 2019).
- Environmentally Responsible Infrastructure: Environmentally sensitive design in infrastructure projects is vital for sustainable urbanization. For example, environmentally friendly infrastructure such as energy efficient lighting systems, waste management and green buildings can be used (Öztopcu & Salman, 2019).
- Community Participation: Community participation is of great importance in sustainable urbanization efforts. Designing with the public's ideas and needs in mind can increase the sustainability of urban areas (Karakuzulu, 2010).

Studies and examples support these approaches. For example, green roofs have been used in several cities to optimize land use, increase energy efficiency and support wildlife. Likewise, water management projects aim to manage water resources sustainably in urban areas. In summary, landscape planning and design for ecologically sustainable cities is an important tool for protecting the natural environment, providing

ecosystem services and improving the quality of human life. These approaches can be supported by various projects and practices to achieve sustainable urbanization goals.

Ecological Approach Suggestions in Urban Landscape Design

In the contemporary context, the distorted ecological equilibrium in urban environments, coupled with the proliferation of artificial living conditions due to the steady reduction of natural spaces, has led to a plethora of critical environmental challenges. Urban planning and design strategies devoid of ecological foundations are contributing to the escalating hardships, particularly noticeable in larger cities. Addressing the predicaments arising within urban areas necessitates the embodiment of a sustainable approach that extends from the macro scale to the micro level. In the Turkish context, the integration of sustainable urban practices and ecological landscape design principles into the fabric of urban planning remains elusive. The absence of these approaches within implementation policies has given rise to formidable obstacles hindering their realization. In the current landscape design endeavors undertaken by public institutions, local administrations, and housing initiatives, aesthetics tend to eclipse ecological considerations. This practice results in visually appealing yet ecologically unsound designs that clash with natural landscapes, incur exorbitant costs, demand high maintenance efforts, and rely on unsustainable building and vegetative materials. Conventional designs frequently feature expansive lawns, short-lived flower beds, and non-native plant species that necessitate specialized care. These ill-suited selections not only impose substantial burdens in terms of labor, time, energy, and finances but also contribute significantly to environmental degradation. To circumvent these challenges, urban landscape design should adhere to a set of guiding principles. The comprehensive recommendations expounded in the text regarding the significance and exigency of ecological design in urban contexts can be succinctly summarized as follows (Atıl et al., 2005; Coşgun, 2013; Birişçi et al., 2012; Kiper et al., 2016; Korkut and Kiper, 2016; Üstün Topal et al., 2016):

- Holistic planning and design of open green spaces: open and green spaces should be planned as green belts, green wedges, green braids, green hearts, etc. to create a "spatial continuity". These systems should be planned by taking into account the formation and orientation of the urban macro form, the provision of alternative accessibility and various recreational opportunities, the protection of wildlife and the creation of air corridors.
- Climate compatible planning and design: climatic factors such as insolation, wind directions, temperature, humidity and precipitation should be taken into account in settlement planning and design.
- Energy efficient planning and design: Sustainable use of natural energy sources such as sun, wind and precipitation should be ensured in structural and vegetative design.
- Planning and design in harmony with the topographic structure: data such as slope, aspect and elevation should be used effectively in settlement selection, determination of vista points and design of active and passive recreation areas.
- Planning and design in harmony with the natural vegetation texture: the existing vegetation texture should be taken into consideration in planning and design works.
- Efficient utilization of water resources: natural water resources such as rivers, streams, lakes and seas should be utilized physically, technically and sustainably.
- Design to reveal and strengthen local identity: natural and cultural resource values that characterize the city should be highlighted.
- People-oriented transportation planning: planning and design of a transportation system that prioritizes pedestrians and encourages cycling and public transport.
- Ensuring accessibility: service, residential and work spaces should be connected by road networks.

- Ecological design at the city-neighborhood-street-building scale: designs that complement and support each other at every scale should be ensured.
- Adoption of an urban agriculture approach: Permaculture, hobby gardens, etc. should be encouraged.
- Developing solutions to increase the amount of open green space: vertical gardens, roof gardens, green roofs, etc. should be made widespread.
- Design based on the principle of ecological sustainability in plant applications: instead of large lawn areas and seasonal flower parterres in plant design works, the use of local plants that do not require much maintenance, perennial, suitable for the natural structure should be preferred. However, by taking into account the different characteristics of plants in plant design (For example; deciduous trees and shrubs provide shade in summer and transmit sunlight in winter, tall and high-crowned trees can shade roofs, walls and windows, horizontal shading is more suitable for north-facing windows, winding plants can be used for this, vertical shading is more suitable for east and west directions, dense textured trees, shrubs and deciduous winding plants can be used together. Climbing plants can also provide both shade and insulation for walls) bioclimatic comfort conditions should be considered.

In conclusion, as mentioned by Rees and Roseland (1991: as cited in Korkut et al., 2017); for sustainable cities, there should be a healthy and harmonious combination of ecological systems and economic systems. This reveals the necessity of ecological planning and design of cities. For this, educational institutions, especially universities that provide environmental, planning and design education, have important duties. Meetings should be organized by university faculty members to raise awareness and raise the level of consciousness on the subject, and professional training seminars should be given. In addition, local governments, non-governmental organizations and graduates who will enter the profession should be made aware of the importance and necessity of ecological approach in urban design.

Conclusion

In crafting livable and sustainable urban environments, the development of both biotic and abiotic components must extend to encompass socio-cultural elements. The nexus between urban landscape planning and the sustainability of urban life lies in recognizing the natural environment's intrinsic value within cities as a wellspring of social factors, pivotal for enhancing human life quality. These social elements emerge as integral aspects of the sustainability paradigm. Ecological landscape planning emerges as a specialized domain that orchestrates spatial arrangements, regulates usages, and aligns land utilization with established landscape planning goals like habitat restoration and sustainability. Central to the ecological landscape planning approach is the intricate interplay between ecological dynamics and human interventions, entailing social and economic considerations. This comprehensive perspective treats landscapes as holistic systems where natural-local resources hold paramount importance. Utilizing these resources as foundational elements, ecological landscape planning strives to minimize the adverse impacts of human utilization. By capitalizing on the existing resources, this approach harmonizes human activities with nature's rhythms, thereby curbing potential damages. Furthermore, the ecological landscape planning paradigm embodies integration, merging various dimensions of planning into a coherent whole. Its ethos revolves around acknowledging the synergy between ecological patterns, natural processes, human actions, and societal well-being. This synergy substantiates a holistic approach that not only ensures environmental health but also fosters social harmony and economic stability. In essence, ecological landscape planning underscores the indispensability of aligning urban development with nature's inherent dynamics, emphasizing that sustainable and livable cities can only thrive when ecological balance coexists with human aspirations. The approach's hallmark lies in its profound comprehension of the intricate interdependence between natural systems and human activities, culminating in urban spaces that flourish as vibrant, harmonious ecosystems.

Within the scope of Landscape Planning and Design Approaches for Ecologically Sustainable Cities, first and foremost, the protection of green spaces and natural ecosystems is a major priority. In order to achieve ecological balance in cities, existing natural resources need to be used effectively. This should include the protection of green spaces and biodiversity. Furthermore, urban design projects should take into account ecosystem services. Factors such as water retention, air quality improvement and aesthetics are essential elements of a sustainable urban life. It is also important to create eco-corridors and green infrastructure networks. This approach is an effective way to connect urban areas with natural areas and ensure the movement of species. Finally, public participation and awareness should be encouraged. Communities play a major role in building sustainable cities. Awareness-raising campaigns and effective means of communication can help realize the goals of ecological sustainability.

In conclusion, landscape planning and design approaches for ecologically sustainable cities aim to maintain environmental and social balance. Effective use of natural resources, protection of ecosystems and community involvement will contribute to building a livable, healthy and balanced urban life for future generations.

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