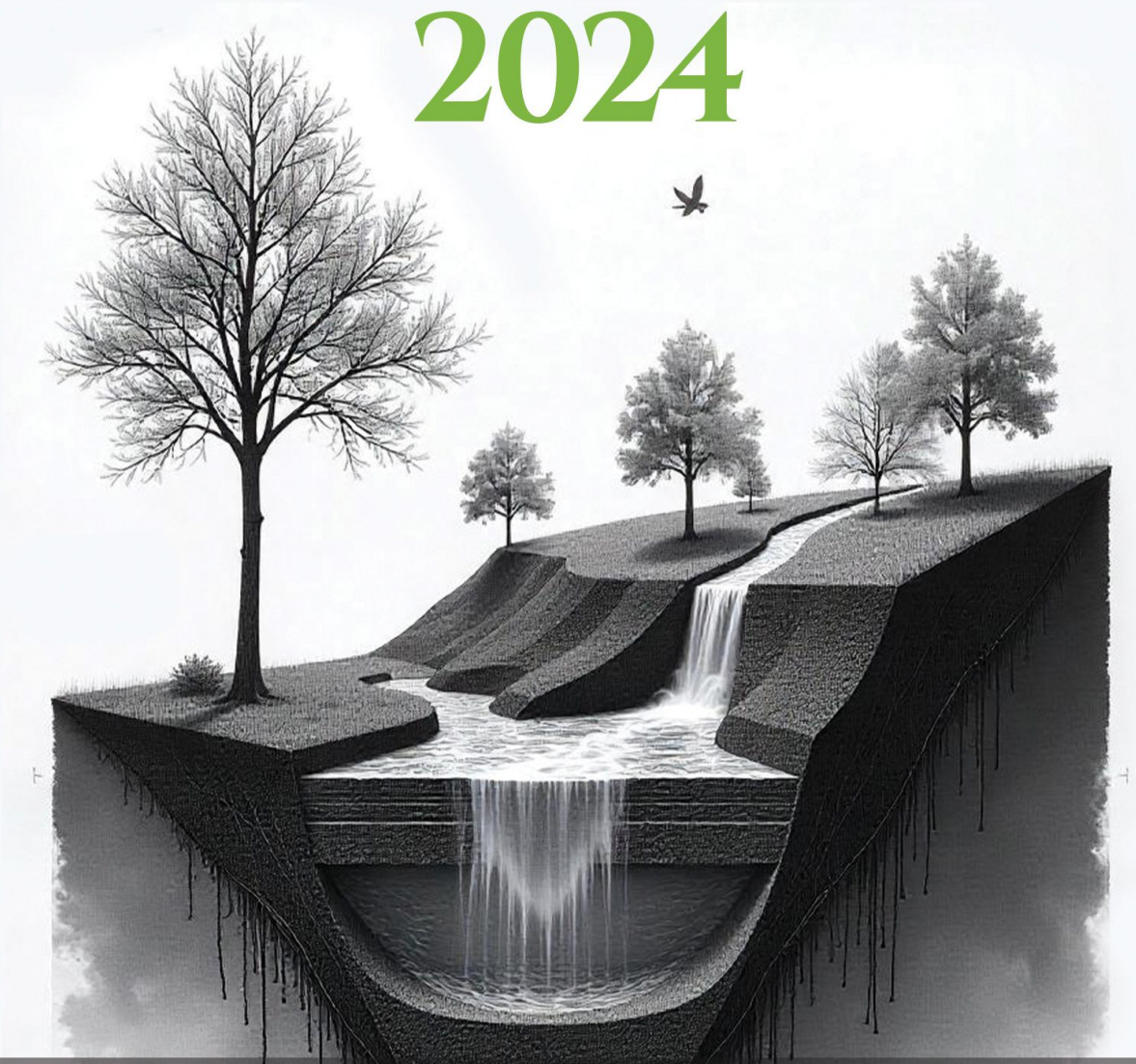
SCIENTIFIC APPROACHES IN LANDSCAPE ARCHITECTURE 2024



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PREFACE

This book addresses issues related to ecological planning and design approaches, sustainable economy perspective and combating climate change. Today, problems such as rapid urbanization, climate change and depletion of natural resources make the effects of human activities on nature even more evident. In this context, the necessity of an ecological approach to build a sustainable future has become more important than ever.

In different sections, planning strategies for coastal areas in the global climate change process are presented, and these areas are evaluated in the context of urban morphology, and recreational opportunities of coastal regions are also mentioned. Then, the place of the sustainable economy approach in landscape planning is discussed. The role of plants in creating a sustainable environment and the importance of xeriscaping applications against climate change are also emphasized.

The book also aims to provide people with more effective and sustainable movement in living spaces by presenting innovative approaches to vehicle and pedestrian integration in urban transportation. The biomorphic design approach, on the other hand, enriches the user experience with solutions in the entrance areas of spaces inspired by nature.

In addition, studio experiences for landscape architecture education aim to provide students with practical information. Finally, a comprehensive review is presented on how medicinal and aromatic plants can be used in landscape design. These plants have an important place in protecting local ecosystems and preserving cultural heritage.

This book aims to inspire professionals, academics, and students working in the field of ecological planning and design, and it aims to be an important resource in building a sustainable future. We hope that our content will provide readers with new perspectives and encourage them to deal with environmental problems.

We wish you a pleasant reading.

Assoc.Prof.Dr. Elvan ENDER ALTAY
Assoc.Prof.Dr. Zeynep PİRSELİMOĞLU BATMAN

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CHAPTER I

ECOLOGICAL PLANNING AND DESIGN APPROACHES

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1. Introduction

Since the human species evolved into *Homo sapiens*, it has begun to shape the landscape by developing a culture based on more intense interaction with the environment. While this culture had a profile in harmony with nature for a long time, it turned into a struggle for dominance following the Industrial Revolution. While the natural processes of the Earth shape humans, they have become a subject that changes it to their own advantage (Jolly, 2001; Stringer, 2002; Wolpoff and Caspari 2007; Klein, 2009; Stringer, 2016; Yolcu and Aça 2019).

Awareness of environmental problems is increasing daily due to large-scale crises such as climate change and global warming. Theoretical and practical research on making living spaces sustainable results from ecological issues. Sustainable settlement models that stand out in the fight against these problems are increasing and encouraged (Wu et al., 2009; Mataval and Maton, 2013; Shahzad, 2015).

The essential eco-scientific feature distinguishing humans from other living things is that humans can control environmental conditions, even to a certain extent. Societies have been able to control their natural environment in various ways in parallel with their scientific and technological progress. This phenomenon is essential for humans to live in mutual relations with their natural habitat and to obtain the necessary inputs from their natural environment. The fact that the functioning of natural environmental systems, which form integrity and consist of various relationships, has become a problem for humanity is a

result of multiple social activities disrupting natural environmental relations and straining the carrying capacity. The rapid depletion of non-renewable resources, destruction of renewable resources, and pollution of the physical environment are worsening due to societal activities that disrupt natural environmental relationships and strain the carrying capacity, leading to growing concerns about the future and health of living things (Alland, 1975; Rappaport, 1977; Jarosz, 2004; Dearing et al., 2006; Brondizio, 2012; Ertürk 2018).

Since it is generally accepted that environmental problems started with capitalism, the ecological crisis, which is tried to be resolved with existing public interventions and various other regulatory mechanisms, is a complex area to understand without analyzing capitalism (West and Brockington, 2012). First, environmental problems must be addressed within a cause-and-effect relationship required by the understanding of dialectical materialism. Nature, which has gone through a long evolution process, and all the living things it contains today suffer significantly from the destruction of nature. It is noteworthy that in the early periods of capitalism, which began to show its existence in the 18th and 19th centuries, the environment started to be heavily polluted due to heavy industrial waste, the number of child deaths increased, and the death rates in this period were inversely proportional to class position (Engels 1994, Foster 2001, Foster 2002; Bakker, 2009). The pollution primarily affected the poorest segments, but the problems experienced were never to the extent they are today. In the system that exists today, pollution can neither be limited to a region nor are its effects limited to poor people only (Kılavuz 2015; Dabla-Norris et al., 2015).

When the concept of ecological crisis is examined, it can be seen that it covers a wide area. Events such as global warming, extinction of animal and plant species, uncontrolled hunting, climate change, ozone layer, plunder of wetlands (dams), pollution of the seas, nuclear pollution, toxic waste, chemical fertilizers and pesticides used in agriculture, crowded cities, depletion of non-renewable energy resources, increase in the world population, and the emergence of more energy requirements for more production form the basis of the ecological crisis.

The most basic precaution that can be taken against climate change is to stop the use of fossil fuels, which release intense carbon into the atmosphere, as soon as possible. A transition to energy obtained from renewable energy sources should be ensured in every area where fossil fuels are used. Renewable resources, especially solar and wind, are the only options for sustainable

energy production. In addition, other basic practices that need to be done (350.org 2019):

- Protecting and increasing forests and green areas;
- Increasing energy efficiency and savings;
- Reorganization of the transportation, agriculture, and livestock sectors to be based on sustainable and renewable energy;
- Planning and construction of clean, environmentally friendly, and sustainable cities;
- It is the transformation of consumption habits, especially energy use.

Ways to combat climate change are grouped under two main categories. Mitigation is the general name of practices aimed at reducing/resetting greenhouse gases that cause climate change and protecting/increasing carbon sinks that hold carbon on the planet. Giving up fossil fuel consumption is vital to reducing/stopping greenhouse gases. Adaptation, conversely, is the effort to enable society and communities to live in a manner that minimizes the harmful impacts of climate change. Mitigation and adaptation solutions should be addressed in a coordinated and complementary manner (350.org 2019). In sustainable settlement models, it is essential to reduce unnecessary energy use, waste production, and food waste within the scope of reduction and to observe the ecological tolerance of buildings, landscapes, and agricultural activities to adapt to the changing climate within the range of adaptation.

When we look at environmental movements worldwide and in Turkey, we see that even political parties were established for environmental problems, but discourses regarding sustainable settlements were never expressed. When considered chronologically, the use of fossil fuels was first protested due to carbon emissions, and over time, cities were put under the spotlight, and the focus was on combating environmental problems on a city scale. The Stockholm Conference, where environmental problems were discussed on a global scale for the first time, had a significant impact as thousands of people gathered in Stockholm and organized forums parallel to the conference. In these forums, environmentalists from different countries, those who experienced commune life or a return to nature (ecovillage residents from the ecovillages Findhorn, Auroville, Solheimar), and participants in the 1968 student movement discussed current environmental problems and solutions. In the forums, topics such as exchanging information on extinct cultures, plants, and animals, the idea of state

immunity, and how to carry out sustainable settlement initiatives against state oppression were discussed. Although the ecovillage movement was conceptually born at the Stockholm Conference, it made its voice heard on a global scale with the establishment of the Global Ecovillage Network in 1996 and the Global Ecovillage Network starting to advise the United Nations Economic and Social Council in 2001. It has been observed that the literature on sustainable settlement models has expanded, and applications have increased since the 2000s. In the environmental movement in the world, the ecovillage movement has been tried to be supported primarily by political methods. International congresses on the environment manifested themselves with opposition political groups established on a country basis. When they could not find the support they expected, they turned into subjective structures in the form of commune initiatives over time. All successful ecovillages today are initiatives that have established their sustainability and struggled alone until the Global Ecovillage Network was established.

Trying to balance human activities in line with ecological concerns has become one of the most critical issues of the 21st Century. Influential visionaries living in the 18th and 19th centuries, such as George Catlin, Ralph Waldo Emerson, Frederick Law Olmsted, George Perkins Marsh, and Ebenezer Howard, predicted that the adverse effects of human activities on urban and rural landscapes would increase and that approaches based on ecological concerns were adopted at the planning and design scale. They suggested that it should be used. Almost two centuries after the suggestions of these visionaries, human activities have moved upscale and become more complex (Ndubisi, 2014).

Landscapes function as essential life support systems for humans and other organisms. However, even if promising solutions to repair the damaged ecological balance are offered and implemented, they must be more compelling. Therefore, it is increasingly vital to reorganize human activities by considering ecological concerns and to plan and design living spaces by considering ecological concerns (Ndubisi, 2014).

Landscapes are dynamic structures that are specialized according to environmental conditions and contain many living and non-living creatures interacting with each other. People change as they influence natural processes and shape them. When changes in the landscape are adverse, ecological problems arise, and their effects begin to be seen on a local, regional, and even global scale (Steiner, 2002).

Over the past few decades, the nature, extent, severity, and complexity of ecological issues have grown and intensified due to shifting demographic, social, economic, and technological developments. These developments have become the primary catalysts for landscape change. With the rapid increase in the world population, ecological problems are diversifying and escalating both regionally and globally (Steiner, 2011).

While naming sustainable settlement models, whose importance is increasing daily due to these ecological crises, the word ecology and the settlement scale are taken as basis. These names are obtained by combining the prefix eco-, which represents the word ecology, and the settlement scale. If the sustainability criteria are planned at the city scale, it is called eco-city; if it is planned at the neighborhood scale, it is called eco-neighborhood; if it is planned at the site scale, it is called ecosite; and if it is planned at the village scale, it is called ecovillage.

Ecological planning and design offer promising solutions to harmonize human activities with the natural environment. According to Ndubisi (2002), ecological planning and design involve managing landscape changes to ensure that human activities align better with natural processes. This approach allows for predicting the nature and dynamics of landscape changes, managing both positive and negative impacts, and producing suitable designs through effective planning. Ecological design, on the other hand, applies ecological planning principles to skillfully and artistically create objects and spaces within the landscape mosaic (Steiner, 2008).

Ecological planning and design are deeply interrelated. As ecology has evolved into both a theoretical and practical science, there has been a growing interest in integrating ecological principles into design and planning practices. Since the 1960s, there has been a substantial increase in environmental protection and resource management legislation on a global scale and across various spatial levels. These laws and policies tackle a broad range of ecological concerns, such as safeguarding natural resources and habitats, maintaining air and water quality, minimizing landscape fragmentation, and addressing landscape degradation through prevention and restoration efforts.

The growing interest in ecological planning and design has sparked a wave of theoretical advancements and methodological innovations focused on understanding and assessing landscapes to better align human activities with ecological systems. This has led to the emergence of various movements and subdisciplines, including eco-design, green design and architecture, green

infrastructure, low-impact development, sustainable development, smart growth, sustainable regionalism, ecological urbanism, and landscape urbanism. While these diverse approaches offer impressive strategies for reconciling ecological concerns with human activities, it is essential to grasp the extent of ecological degradation in landscapes and the core concepts and methods needed to tackle these issues effectively.

2. Ecological Planning

Within ecological planning, factors such as lands requiring large-scale protection, or the migration routes of animals have led to the emergence of some international agreements. Countries that are parties to these agreements undertake that they are obliged to fulfill the ecological planning criteria specified within the scope of the agreements. Except for a few, most regional or global scale and multilateral documents related to the environment were prepared after the United Nations Conference on Human and Environment held in Stockholm in 1972. These texts reveal the common will of many states. According to the legal literature, documents such as treaties, contracts, conditions, and protocols are classified as “hard law” (must be followed). In contrast, documents such as declarations, recommendations, and action plans are classified as “soft law” (compliance is recommended and encouraged) (Union of Turkish Bar Associations 2014). International environmental protection agreements to which Turkey is a party are compiled from the relevant sources of the Union of Bar Associations of Turkey (2014) and the Ministry of Foreign Affairs of the Republic of Turkey (2020) and are given in chronological order in Table 1.

Table 1: International environmental protection agreements to which Turkey is a party.

	Abbreviation	Name	Date	Place	Türkiye Approv.
1	LBS Protocol	*Protocol* for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources Adopted	(1980) 1996	Madrid	2002
2	Barcelona Convention	The Convention for the Protection of the Mediterranean Sea Against Pollution	(1976) 1995	Barcelona	2002
3	The Dumping Protocol	The Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft	(1976) 1995	Barcelona	2002
4	-	Antarctic Treaty System	1959	Washington	1996
5	ICCAT	The International Commission for the Conservation of Atlantic Tunas	1966	Rio de Janeiro	2003
6	The Ramsar Convention	The Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat	1971	Ramsar	1994
7	CITES	Convention on the International Trade in Endangered Species of Wild Flora and Fauna	1973	Washington	1996
8	CLRTAP	Convention on Long-Range Transboundary Air Pollution	1979	-	1983
9	Bern Convention	Convention on the Conservation of European Wildlife and Natural Habitats	1979	Bern	1984
10	EMEP Protocol	Protocol to the 1979 Convention on Long-range Transboundary Air Pollution on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)	1984	Genova	1985
11	Vienna Convention	The Vienna Convention for the Protection of the Ozone Layer	1985	Vienna	1991
12	Montreal Protocol	The Montreal Protocol on Substances that Deplete the Ozone Layer	1987	Montreal	1991

13	Basel Convention	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1989	Basel	1994
14	Madrid Protocol	The *Protocol* on *Environmental Protection* to the *Antarctic* Treaty	1991	Madrid	2017
15	UNFCCC	United Nations Framework Convention on Climate Change	1992	Rio de Janeiro	2004
16	CBD	Convention on Biological Diversity	1992	Rio de Janeiro	1996
17	Bucharest Convention	Convention on the Protection of the Black Sea Against Pollution	1992	Bucharest	1994
18	LBS Protocol	Protocol On Protection of The Black Sea Marine Environment Against Pollution from Land Based Sources	1992	Bucharest	1994
19	Emergency Protocol	Protocol on Cooperation in Combating Pollution of the Black Sea Marine Environment by Oil and other Harmful Substances in Emergency Situations	1992	Bucharest	1994
20	The Dumping Protocol	Protocol On Protection of The Black Sea Marine Environment Against Pollution from Land Based Sources	1992	Bucharest	1994
21	UNCCD	United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa	1994	Paris	1998
22	The SPA/BD Protocol	Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean	1995	Barcelona	2002
23	BAN	Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1995	Genova	2003
24	Hazardous Waste Protocol	Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal	1996	İzmir	2004

25	Kyoto Protocol	United Nations *Framework Convention on Climate Change*	1997	Kyoto	2009
26	Cartagena Protocol	The Cartagena Protocol on Biosafety to the Convention on Biological Diversity	2000	Cartagena	2004
27	-	European Landscape Convention	2000	Florence	2003
28	Stockholm Convention	The *Stockholm Convention on Persistent Organic Pollutants*	2001	Stockholm	2009
29	Response and Emergency Protocol	Protocol concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency	2002	Malta	2003
30	Biodiversity and Landscape Protocol	The Black Sea Biodiversity and Landscape Conservation Protocol to the Convention on the Protection of the Black Sea Against Pollution	2002	Sofia	2004

All contracts shared in Table 1 have ecological planning criteria specific to their subjects and objectives. Participating countries must also integrate these criteria into their internal management and control systems.

Ecological planning aims to minimize or eliminate the effects of human activities on natural systems. To achieve this, it is essential to thoroughly analyze the consequences of human activities on both local and global scales.

In 2012, the United Nations Conference on Sustainable Development took place in Rio de Janeiro, with the goal of establishing global objectives to address environmental, political, and economic issues that disrupt ecological balances. Prior to this event, notable progress had been made under the Millennium Development Goals established by the United Nations in 2000. These efforts led to the lifting of over 1 billion people out of extreme poverty and a reduction of child mortality rates and school dropout rates by more than half.

Seventeen targets were determined within the scope of the Sustainable Development Goals. New targets, primarily focused on ecology, were added to the legacy and achievements of the Millennium Development Goals. The primary purpose here is stated as making the lives of future generations better (Anonymous, 2023a). The Sustainable Development Goals are a universal call to action to protect the planet, ensure peace and prosperity, and eliminate poverty. UNDP chief Helen Clark emphasized the program's purpose by saying,

"The sustainable development goals were established to provide a common plan and agenda to address some of the challenges facing our planet, such as poverty, climate change, and conflict." The Sustainable Development Goals, which were put into effect by the United Nations in 2016, are planned to achieve 17 targets by 2030, with the precondition that 170 countries will be integrated (Anonymous, 2023b). Within the scope of these 17 goals, the following topics were emphasized (Anonymous, 2023a):

1. Ending poverty
2. Solving the hunger problem
3. Ensuring a healthy and quality life for everyone
4. Providing quality education opportunities to everyone
5. Ensuring gender equality
6. Making clean water and sanitation services accessible to everyone
7. Dissemination of accessible and clean energy resources
8. Increasing job opportunities at specific standards and making economic growth sustainable
9. Controlled development of industry, innovation, and infrastructure initiatives
10. Reducing inequalities
11. Increasing sustainable settlements and communities
12. Ensuring a responsible production and consumption chain
13. Spreading climate awareness and taking action
14. Improving the quality of life in water
15. Improving the quality of terrestrial life
16. Establishment of peace, justice, and strong institutions
17. Establishing strong partnerships toward common goals

The Sustainable Development Goals serve as a vital framework for ecological planning by promoting an integrative approach that balances economic, social, and environmental considerations. Their implementation can lead to more sustainable practices, enhance community resilience, and ensure the responsible use of natural resources, thereby contributing to the overall well-being of both people and the planet.

3. Ecological Design

The origin of ecological design practice dates back to prehistoric times. People who settled down in the Neolithic Age designed their settlements by taking into consideration underground factors such as earthquakes, volcanoes, hot springs, mines, usable rocks, and aboveground factors such as climate, prevailing wind, precipitation regime, sunshine duration, material possibilities in the natural environment, and biodiversity. The most suitable structural use types for the settlement's location were determined and adapted to life in the region. Ecological design principles have been applied in small settlements for thousands of years, starting from the first villages.

According to Shu-Yang et al. (2004), organic farming and permaculture principles are thousands of years old. Considering plant sociology, planting plants suitable for growing side by side, following the nitrogen cycle, using plants with similar water and light needs together, using plants affected by the same diseases and pests away from each other, etc. Issues such as these are ecological design practices in terms of agricultural activities. Likewise, the use of local materials in the construction of buildings, the orientation of buildings to meet optimum heating, cooling, and light needs, facade features, etc. The parameters are structural ecological design principles. For example, adobe, animal skins, soft rocks, and suitable stones were preferred for buildings depending on the climate, altitude, and natural resources.

According to Aytıs (2010), a residential area designed with an ecocentric (ecology-centered) approach to its ecosystem will experience minimal stress. Aytıs examines the ecological design process on two levels: structural and social. At the structural level, key considerations include the use of ecological materials, indoor air quality, lighting, renewable energy, adaptation to climate, wind, and orientation, energy efficiency, thermal comfort, recycling, and the use of rainwater and wastewater. At the social level, important factors include altering consumption habits and fostering cooperation among the state, local governments, industry, non-governmental organizations, professional bodies, and the public.

The concept of design with nature, which McHarg (1969) mentioned in his book Design with Nature, pioneered the multifunctional landscape design paradigm. McHarg focuses on natural, social, and cultural processes and views design as an iterative process primarily shaped by interactions between people and ecosystems. The design should leave maximum space for nature and should not hinder the functioning of nature (Yang et al., 2013).

Ecological design seeks to create sustainable livelihoods within individual settlements or small villages. The goal is to ensure that these communities are self-sufficient and make intelligent use of limited resources, while also considering the needs of future generations. Ecovillages are among the most successful examples of achieving these objectives.

Any design that reduces environmentally harmful effects by emulating and integrating with natural ecosystems can be termed ecological design. Thus, ecological design aims to establish a framework for proposing environmentally suitable design and management systems by considering both human and ecological values across spatial and temporal scales. The concept of ecological design emphasizes the following elements, as detailed in the design process by Shu-Yang et al. (2004):

- *Meeting people's natural needs:* People need to use natural resources to maintain their existence and protect the economic order they have established. At the same time, people tend to maintain a certain standard of living to which they are accustomed. Therefore, economics lies at the root of the inevitable environmental damage. Economics is often the underlying cause of unavoidable environmental damage. Therefore, making economically driven human activities sustainable involves ensuring that resources are not depleted and that damage to the natural world remains within the tolerance and habitability limits of species and ecosystems. One objective of ecological design is to support the vision of ecological sustainability by finding ways to plan industrial production and urban expansion while minimizing resource consumption and ecological impact.
- *Ensuring the sustainability of resources:* Ecological design seeks to increase dependence on renewable energy and resources while maintaining high-quality standards for products and services. It emphasizes cutting down on total resource use, waste production, and environmental harm through strategies like using, reusing, and recycling materials. These concepts are applicable to the design and management of buildings and urban areas, the production of goods, and a range of other economic practices.
- *Maintaining ecological integrity:* Ecosystems are environments that sustain, host, and protect biodiversity while offering limited support for human needs. Ensuring the integrity of ecosystems is a crucial aspect of economic sustainability. One objective of ecological design is to harmonize human activities with ecological balance. This involves understanding the ecological context of

specific design challenges and developing suitable solutions. Designers must be aware of both the economic activities required and the natural capacity to support them. For instance, they should predict the impact of human activities on endemic species, their role within the ecosystem's holistic structure, and the effects on essential ecosystem services like clean water, air, soil, and carbon storage. Essentially, designers need to gather comprehensive data on the local ecosystem, including climate, topography, soil, water, energy cycles, material resources, endemic species, and risk factors.

- *Mimicry of ecosystems:* Natural ecosystems display intricate patterns and dynamics of biodiversity, materials, and energy across different spatial and temporal scales.Ecological design should aim to replicate this balance, whether on a large or small scale. This involves accurately managing inputs and outputs within the system, as well as precisely regulating the cycles of materials such as nitrogen, carbon, oxygen, and water.
- *Compensating for damage to nature:* Many economic activities cause environmental harm that often goes unaddressed or unrepaired. As a result, businesses' reported profits typically overlook the full environmental costs of production, resulting in a "debt to nature." For example, a building powered by fossil fuels indirectly contributes to pollution of soil, air, and water, raises levels of sulfur dioxide and nitrogen oxides (leading to acid rain), and increases carbon dioxide emissions, a key greenhouse gas. Ecological design must consider these environmental costs when developing solutions.
- *Protection of habitats:* Despite significant efforts to prevent ecological damage through ecological design, changes are inevitable with the implementation of any project. Economic activities can particularly threaten elements of local biodiversity. Therefore, an ecological risk analysis should be conducted to anticipate which species might be affected by human activities, identify those likely to be harmed, and assess potential imbalances in the species populations within the habitat.
- *Increasing environmental awareness:* Those who use spaces designed by professionals are also the ones who will monitor their sustainability most closely. Therefore, educating people about the environment is crucial so they can recognize the impacts of projects and seek help or intervention from relevant authorities if needed. Environmental protection is a broad social responsibility involving not just experts but also the entire community. Ecological design requires close collaboration between designers, government, businesses, and citizens. When citizens lack awareness of the causes and consequences of

ecological damage, their choices, demands, and recommendations may not always be environmentally friendly.

Ecological design involves a sequence of actions that begins with developing design concepts to enhance environmental health. These concepts are then transformed into plans tailored to the specific characteristics and processes of the areas in question, followed by the implementation of detailed plans that adapt to ongoing changes. Ecological design incorporates renewable systems and components into built environments. It can be applied to various infrastructures, from parks and nature reserves to buildings and streets, integrating into societal structures. Ecological design aims to enhance ecological functioning, safeguard and generate resources for human use, and promote a more flexible approach to designing and managing built environments. This interactive approach involves collaborating with human communities and various living and non-living systems, using the latest scientific theories and evidence to achieve resilient and sustainable environmental quality (Rottle and Yocom, 2010).

The most important outcomes of ecological design at the local scale can be seen in examples of vernacular architecture. Vernacular architecture is the primary expression of a society's culture and its relationship with its land, and also a reflection of the cultural diversity in the world. Vernacular construction is the traditional and natural way communities shelter and protect themselves. It is a constantly updated process depending on the necessary changes and social and environmental restrictions. The economic, cultural, and architectural uniformity experienced worldwide threatens traditional building techniques. Protecting against these adverse effects of globalization is a fundamental problem that needs to be addressed in a multidisciplinary manner, involving not only societies but also governments, planners, architects, and landscape architects. Due to the uniformity of cultures and global socio-economic transformation, traditional structures remain unprotected, facing severe problems such as abandonment and disruption of internal balance (ICOMOS Vernacular Architecture Charter 1999).

The protection of the characteristics of a region requires the recognition of natural systems. The developments envisaged to meet the needs of societies can be achieved by shaping the natural, cultural, social, and economic resources by correlating them at local and global scales. Sustainable development and development and sustainable building design aim to protect the balanced relationship between humans and their environment; the long-term goal is to minimize resource consumption. Sustainable traditional settlements are

ecologically balanced settlements that balance human needs with the carrying capacity of natural and cultural environments. They are built with natural/sustainable materials that can be easily obtained from the region, and renewable resources provide some of their energy. In this context, traditional settlements are environments that are realized with renewable local resources, have energy-efficient planning as in traditional housing solutions, are compatible with the nature and topographic data of the region, and are shaped by cultural and social events (Erdoğan, 1996).

When traditional houses built in Anatolia, which has hosted many civilizations, are examined, it is seen that their architectural features have been shaped over time according to climate, topography, cultural and social structure (Bozkurt and Altınçekiç 2013). Because the evaluation of vernacular Turkish architecture in terms of ecological design principles with its components will be a main research topic and include numerous details, it is not discussed in this chapter.

4. Conclusion

International environmental protection agreements play a crucial role in shaping effective ecological planning approaches, particularly in an increasingly interconnected world. These agreements establish a framework for collaboration among nations, allowing for the sharing of best practices, technologies, and resources to address global environmental challenges. By setting legally binding targets and commitments, such agreements encourage countries to prioritize sustainability and integrate ecological considerations into their planning processes. They also promote the alignment of national policies with global goals, fostering a sense of shared responsibility for the planet's health. Moreover, these agreements can facilitate financial and technical support for developing countries, empowering them to implement innovative ecological planning strategies that account for local contexts and needs. Ultimately, international cooperation through environmental agreements enhances the capacity of nations to develop holistic and resilient ecological planning approaches, contributing to the overall goal of sustainable development.

In conclusion, the intricate relationship between capitalism and the ecological crisis underscores the urgent need for transformative approaches in planning and design. This chapter has explored how ecological planning and design can serve as critical frameworks for addressing the multifaceted environmental challenges we face today. By recognizing the

interconnectedness of issues such as climate change, biodiversity loss, and resource depletion, we can create strategies that not only mitigate harm but also promote sustainability.

Moving forward, it is imperative that practitioners, policymakers, and scholars collaborate to integrate ecological principles into all facets of planning and design. This integration is not merely a theoretical exercise but a necessary step toward cultivating resilient communities and ecosystems. As we confront the ongoing ecological crisis, embracing innovative and holistic approaches will be essential for fostering a more sustainable and equitable future.

Ultimately, the call for ecological planning and design is a call for a fundamental shift in our understanding of human-environment interactions. By prioritizing ecological integrity and sustainability, we can pave the way for a new paradigm that harmonizes economic development with the health of our planet.

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