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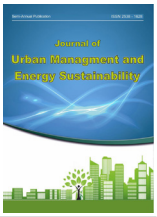

ORIGINAL RESEARCH PAPER

Exploring New Paradigms in Redefining Human-Environment Relations and Their Impact on Design Theory in the concept of Post-Anthropocene architecture

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ABSTRACT

The Anthropocene is a theoretical concept that redefines the place of humans within the environmental and ecological framework, emphasizing phenomenological processes such as symbiosis, inter-familial networks, and non-linear human interactions with natural and artificial systems. Therefore, the key difference from green or sustainable architecture is that the Anthropocene is about redefining epistemological practices and the way design is narrated, and not simply about practical-technical criteria of reducing resource consumption or improving energy efficiency, although it can benefit from these criteria as practical representations. The research is analytical in nature and has a developmental and applied purpose, and at the same time, the fundamental type of purpose is also quite tangible in the studies. The type of this research is qualitative and is carried out with analytical, inductive approaches and interpretive paradigm. The method of collecting materials is documentary and library, and parallel sources and research are also used in the analytical approach. The aim of this research is to explore and analyze new paradigms in redefining the relationships between humans, the environment and architecture in the Post-Anthropocene era, and its impact on the theory and practice of architectural design. First, based on the content analysis method, basic concepts such as the significance of the Anthropocene in architecture and the relationship between humans and the environment are examined, and then, by taking into account the synthetic view in examining the theories of scholars, the theoretical framework of the subject is presented. Findings shows The findings show that 20 factors were effective in the subject, which can be used in future research by considering their frequency and repetition as well as their importance. The results indicate the high impact of the factors of coexistence, technology, dynamic design, and culture-building in design.

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INTRODUCTION

In recent decades, the concept of architecture has undergone fundamental changes in the face of environmental crises and massive changes in the concept of man. The context of these changes has been in the form of multiple phenomena known as the "post-Anthropocene era", a period in which the role and place of man in the world has been revised and rethought (Barke, 2018). Contrary to the traditional idea that considered human-centered development and industrial advances as the main engine of global change, the post-Anthropocene phenomenon shows that man is no longer the superior agent in the international space and natural ecosystems, but is instead part of a complex network (Cross, 2021). This change in perspective has had profound effects on the field of architecture and urban planning; to the extent that it requires a redefinition of the relationship of man with his surrounding environment (Farrelly, 2007). Meanwhile, new paradigms in architectural philosophy and related sciences attempt to provide critical, multifaceted, and sustainability-oriented responses. These paradigms emphasize the need to strengthen the connection between design and the environment, as well as the application of ethical and philosophical approaches in design processes (Hayward and Samuels, 2018). Globally, we are currently living in an era known as the "post-Anthropocene era", a period in which the role and place of humans in ecological formation and change has changed. The concept of the Anthropocene, which emphasizes the role and activities of humans in the formation of the environment, requires a deep review and revision with the emergence of challenges such as climate change, biodiversity loss, and environmental crises (Kropf, 1998). These changes have also had an impact on the field of architecture, as previous patterns of construction, development, and urban spaces are no longer responsive and sustainable. Designs that focused solely on human-centered needs must now be replaced by perspectives that understand and enhance the relationship between humans and the environment and strive to They seek to re-establish a meaningful balance between these elements. In particular, the examination of these new paradigms in architecture shows how concepts such as anthropocentrism, sustainability, and cooperation with the environment are shaping new perspectives that seek to transform the conceptual and operational structures of architecture. This process requires deep and analytical exploration to clarify their differences and connections (Leupen et al., 1997).

The Anthropocene is a theoretical concept that redefines the place of humans in the environmental and ecological framework, emphasizing fratricidal processes such as symbiosis, inter-human networks, and nonlinear interactions of humans with natural and artificial systems. The boundaries of this concept are largely drawn in contrast to traditional anthropocentric views: The Anthropocene attempts to represent the place of humans as an internal agent in a chain, always exposed to the influence and It is the interaction with other agents (environment, other organisms, technology and socio-cultural context). (Hanson, 2020) Therefore, the key difference with green or sustainable architecture is that the Anthropocene redefines epistemological practices and the way of design narrative and not simply the practical-technical criteria of reducing resource consumption or improving energy efficiency, although it can benefit from these criteria as practical representations. In contrast, green architecture focuses on the use of green resources, reducing the environmental impact of construction spaces and improving the ecological function of projects, and sustainable architecture also leads to a long-term balance between the economy-environment-society triad with a systemic approach, but both often remain dependent on the representation and questioning of the human place within their pre-established ideological or philosophical frameworks. In this regard, the main boundary between these three concepts becomes clear at the level of analysis and the purpose of the architectural project: The Anthropocene leads to the creation of a theoretical framework for changing the narrative of human place in the world and redefining relationships with the environment and technology, while green architecture and sustainable architecture address practical issues and design decisions centered on environmental and functional sustainability and directly address the evaluations of the efficiency, durability, and environmental impacts of projects, although by integrating all three concepts, designs can be achieved that are sustainable from both a philosophical-historical

and a functional and operational perspective.

In addition to these theoretical changes, studies have shown that the practical and executive aspects of architectural and urban planning projects still respond less to the reflection of philosophical concepts and new paradigms. This gap is a serious gap in the use of these concepts in the field of practice and requires research that applies these paradigms operationally in architecture (Moudon, 1994). In addition, the lack of continuous and focused studies on the impact of these new paradigms on architectural form, space and processes is one of the most important challenges that must be addressed in the present research. Investigating how new philosophies can be effective in building sustainable and human-centered cities is of particular importance (Salama, 2008). Also, analyzing these paradigms in a temporal and cultural context is another step in a deeper understanding of the relationships and processes of evolution. Observing global trends and analyzing successful examples can be an effective guide for the development of practical and theoretical approaches (Schön, 1988). As, so far, most of the existing research in this field has focused on critical or theoretical aspects, and there is a lack of practical and applicable analysis for the development of sustainable and human-centered urban projects. Undoubtedly, this gap means ignoring practical opportunities that can affect the future of cities and ecosystems (Strappa, 2023).

Therefore, the subject of the present research focuses on the gap that exists between the theoretical development of philosophical paradigms and their application in the field of architecture. The goal is to find solutions that can effectively and practically introduce these paradigms into design processes and give more cities and urban spaces stability and coherence. In summary, this issue not only requires a critical understanding of philosophical and theoretical concepts, but also must focus on practical and strategic ideas in the field of urban design and planning, because the future of cities depends on the understanding and proper use of these new paradigms. In addition to all these, it should be noted that facing environmental challenges, environmental crises, and climate change has doubled the need to rethink architectural concepts and approaches. This leads the present research to an in-depth study and critique of philosophical paradigms related to humans, the environment, and architecture. The key question is: How can new paradigms in architectural philosophy be redefined and implemented in a way that not only reduces environmental crises, but also regulates the relationship between humans and the environment in a livable, sustainable, and ethical manner? In this regard, there is a need to deeply examine the intellectual and theoretical processes that have led to the formation of these paradigms. Moreover, in many architectural and urban planning projects, new concepts and paradigms are still applied superficially and symbolically, and the deep philosophical implications, theoretical framework, and practical solutions of these paradigms have not been sufficiently revealed in practice. This gap between theory and practice is the most important gap in the field of research that needs to be seriously addressed. As a result, one of the main challenges is to examine and analyze these new paradigms in the form of multidisciplinary approaches; so that it is possible to go beyond mere theoretical frameworks and develop tangible and applicable solutions in design and urban planning. (Holton, 1987) Therefore, there is a need for a pivotal and in-depth study of how to translate these concepts into architectural projects, policies, and processes. Ultimately, the aim of this study is not only to provide a deep and analytical understanding of new paradigms in architectural philosophy, but also to focus on deriving practical solutions and guidance for architects and urban planners to have a more comprehensive understanding of the relationship between humans and the environment in the post-Anthropocene era. This can lead to the development of new policies and approaches in architectural and urban design.

In general, the products of philosophical thought in architecture should be practical, transferable and applicable solutions in real urban and architectural projects. This work requires the development of critical theories, cultural analyses, and a deeper understanding of the relationship between humans, space and the environment. In this direction, it requires philosophers and architects to work closely together to try to better articulate philosophical principles and foundations in the form of practical projects and public policies.

Finally, the future of architectural philosophy

should be based on fundamental questions, including:

•How can space be a symbol, a narrative and a means of building culture and society?

•What philosophical assumptions should be observed in new designs to ensure sustainability, justice and human dignity?

•How can critical, cultural and ethical approaches be integrated with new technologies in the process of designing and building human spaces?

Answering these questions will only be possible through deep philosophical research, theoretical rethinking, and active collaboration between architects, philosophers, and policymakers. In this framework, architectural philosophy plays a role not only as a theoretical and critical field, but also as a strategic reference in the formation of "meaningful," "human-centered," and "sustainable" architecture in urban and interior spaces.

MATERIALS AND METHODS

The concept of the post-Anthropocene era and architecture

The concept of the post-Anthropocene, as the period after the Anthropocene, is a concept that refers to the change in human attitudes towards their place and impact on Earth. In the past, humans were predominantly seen as creatures focused on controlling and exploiting nature, but with the intensification of environmental crises, this role has gradually been revised. (Crutzen, 2002) first used the term "end of the Anthropocene" and introduced its concept to explain that human activities have clearly changed the course of the Earth. This change of perspective has been influential not only in the fields of geography and climatology, but also in philosophy, policymaking and design (Malm & Hornborg, 2014, Zhang et al., 2025). This period has provided new intellectual structures for changing attitudes about the role of humans in the natural system. New approaches to architecture have emerged in this intellectual space, based on which the role of humans as active agents in sustainable design that benefits from nature is redefined (Steffen et al., 2017, Yan et al., 2025). In this regard, architectural approaches have emerged that, instead of focusing solely on form, include ecological and technological aspects, such as green architecture, ecological architecture, and smart cities. These projects are living examples that show that architecture in the post-Anthropocene era must be designed and implemented in a way that serves balance and coexistence with nature. In this approach, the concept of "sustainable" plays a central role and has moved away from conventional trends that focused solely on reducing resource consumption. Modern and postmodern architectures are now seeking to exploit new technologies such as renewable energy, recycling systems and living buildings, in which biological systems and technology are integrated to create sustainable and efficient spaces (Kieran & Timberlake, 2012, Türkmen, 2025). These changes require not only new design approaches, but also cultural reforms and supportive policies, as biological instabilities directly affect the future of urban operations and development (Clark et al., 2019, Tondelli & Marzani, 2025, Sommese et al., 2023). Some activists and theorists raise the issue of "meaning change" in this field, in which the role of humans should be defined in such a way that an interactive and symbiotic understanding of nature is formed. Taksin (2015) believes that nature is no longer seen as an endless resource for exploitation, but as a dynamic ecosystem, in the process of interaction with human activities. As a result, architectural designs need to be based on a greater understanding of these systems and their interactions. Past designs often relied on human-centered assumptions, but now a deeper understanding of the relationships between humans and nature must be achieved.

In this context, new approaches emphasize greater participation in the design process. Examples of architectural projects that try to actively collaborate with natural ecosystems prioritize issues related to creating balance and preserving natural resources (Manschot et al., 2020, Sitton et al., 2025). At the same time, emerging technologies such as the Internet of Things, artificial intelligence, and green buildings play an important role in realizing these approaches, as the capacity to collect and analyze data has enabled designs based on environmental realities (Hawkins, 2016). Along with technology, cultural and social approaches play an important role in shaping new attitudes. Awareness and education, policy platforms, and international cooperation are among the tools that can be effective in the transfer of post-Anthropocene approaches. Ultimately, the goal is for architecture in such an era to no longer be a symbol of domination and control, but rather an example of coexistence and balance that helps to preserve and promote biological and cultural values (Hickman, 2017, Mobaraki et al., 2025). As a result, the concept of the post-Anthropocene has had a profound impact not only in the fields of philosophy and science, but also in architecture and the fine arts, leading to fundamental changes in design theory and practice. This era is an opportunity to reconsider bio centric principles and develop projects

in which technology and culture are used in harmony to achieve sustainable and coexistence ideals. Futures studies in architecture should be based on these assumptions and at its center are responses to environmental and social challenges. Ultimately, it can be said that the concept of the post-Anthropocene is an opportunity and a challenge to recognize the role of humans in the world, and a way to redefine architecture as an active part of environmental and social processes (Steffen et al., 2015, Odhiambo et al., 2022).

Methodology

The research is analytical in nature and has a developmental and applied purpose, and at the same time, the fundamental type of purpose is also quite tangible in the studies. The type of this research is qualitative and is carried out with analytical, inductive approaches and interpretive paradigm. The method of collecting materials is documentary and library, and parallel sources and research are also used in the analytical approach. The aim of this research is to explore and analyze new paradigms in redefining the relationships between humans, the environment and architecture in the post-Anthropocene era, and its impact on the theory and practice of architectural design. First, based on the content analysis method, basic concepts such as the significance of the Anthropocene in architecture and the relationship between humans and the environment are examined, and then, by taking into account the synthetic view in examining the theories of scholars, the theoretical framework of the subject is presented.

DISCUSSION AND FINDINGS

The evolution of the perception of the relationship between humans and the environment in architecture

Throughout history, the relationship between humans and the environment in the field of architecture has undergone significant changes and developments. Initially, architecture was based more on basic human needs and the direct exploitation of natural resources. In the early periods, architects and builders relied more on natural materials, traditional technologies, and indigenous methods, and nature was considered a rich but endless resource. In past eras, this attitude emerged in the form of traditional houses and indigenous architecture, in which structures were built according to the climate, culture, and resources of the region. With the advent of the Industrial Revolution, attitudes toward the relationship between humans and the environment changed. New technologies, new materials, and mass production methods made it possible to build larger and faster buildings, but at the same time, negative effects such as pollution, ecosystem destruction, and excessive consumption of natural resources also intensified. This period often had an instrumentalist and exploitative attitude towards nature, in which nature was considered merely a resource to meet human needs. In the 20th century, environmental concerns gradually increased and the concept of sustainable development was formed as a logical response to environmental crises. Architectural perspectives during this period also tended towards concepts such as “green architecture”, “sustainable design” and “coexistence with nature”. These developments indicate a transition from a hegemonic attitude to a responsible and participatory attitude towards the environment, in which conservation of resources, reduction of pollution and respect for the ecosystem are key elements.

Main Theories and Approaches in the Relationship between Humans and the Environment in Architecture

In theoretical foundations, several main approaches and theories in the field of human-environmental relationships in the field of architecture can be distinguished, each of which emphasizes the institutionalization of specific principles:

•The theory of domination over nature: This approach is the legacy of modern theories that encouraged a hegemonic view of nature. According to this theory, humans should dominate nature, natural resources should be exploited indiscriminately, and constructions should be such that complete control over the environment is achieved. This approach, at the beginning of the modern era, offered many solutions in the field of architecture, but has now been criticized due to its harmful consequences.

•The theory of symbiosis and interaction: Based on the concepts of sustainable development, this theory emphasizes the positive and mutual interaction between humans and nature. In this view, architecture should act as a ring of the environmental cycle that focuses on the principles of productivity, regeneration, and protection. In this approach, green technologies, sustainable materials, and climate-based designs are proposed as tools for creating productivity and coexistence.

•The theory of indigenous and contemporary creativity: In this approach, the emphasis is on preserving culture and using local materials, traditional techniques, and at the same time, environmentally friendly. This theory estab-

lishes a link between the concept of sustainable development and culture and considers architecture as a tool for strengthening the cultural and natural ties of the region.

These approaches help to provide comprehensive and innovative solutions for the development of sustainable architecture and alignment with natural and environmental cycles. In this regard, the use of new technologies, green materials, and compliance with climate design principles, in line with the theories of coexistence and interaction, can contribute significantly to the creation of human spaces that are at the same time environmentally friendly.

The role of theories in shaping practical approaches

The theory of domination over nature, although it offered effective solutions in the development of technology and construction at a certain period in history, is now considered an outdated perspective or in need of revision. Today, the focus on approaches based on sustainable development and ecological design emphasizes the principles of responsibility and protection of natural resources. These approaches, in addition to promoting a culture of responsible consumption, replace practical solutions such as low-energy buildings, the use of renewable resources, and the promotion of energy management systems. On the other hand, the theory of coexistence and interaction, which is based on the concepts of sustainable development, is mostly used in urban planning, the design of green spaces, and smart buildings. This approach was developed based on the principle that humans should live alongside nature, not against it, and its ultimate goal is to create spaces that both meet human needs and play a role in maintaining environmental health. Finally, the theory of indigenous and contemporary creativity emphasizes the emphasis on culture, local materials, and traditional technologies to build sustainable spaces that are relevant to the local environment. This theory, with contemporary approaches, suggests design solutions that are appropriate to the local climate and culture, which, in addition to saving energy and resources, preserve regional culture and values. The relationship between humans and the environment has always been a vital and evolving issue in the field of architecture, especially in recent decades when environmental crises, climate change, depletion of natural resources, and ecological damage have demonstrated the importance and urgency of this relationship more than ever. In the past, architecture was shaped more based on individual, economic, aesthetic, and human comfort needs, and nature was often viewed as an endless source of exploitation, but today, attitudes have changed and the concept of the relationship between humans and the environment is evolving.

According to Feng (2021), in the contemporary era, design approaches should be based on mutual respect, cooperation, and balance between humans and nature to reduce biological and environmental damage and establish a sustainable and symbiotic relationship. In this new perspective, nature is no longer simply a resource to meet human needs, but a living system that is in constant interaction with human activities. According to Lu (2015), the new understanding of nature sees it as a dynamic system with specific laws and harmonies that require intelligent management and respect. Accordingly, green and ecological architecture has emerged, which is built based on the use of new technologies, sustainable materials, and reduced resource consumption. Examples such as buildings with green walls, living spaces, and the use of recycled materials represent a model in which the role of humans is considered as a co-factor with nature and its protector (Schäfer et al., 2019).

New technologies and smart systems play a significant role in the construction of projects that establish a positive and harmonious relationship with the environment. Technologies such as water collection and purification systems, renewable energies, low-energy buildings, and the Internet of Things have enabled the design of balanced, sustainable, and human-centered spaces (Jones et al., 2018, Li et al., 2025). As tools for realizing biocentric approaches, these technologies play an important role in modifying the consistency and habits of construction and operation, and identify opportunities for creating living and working spaces that have the least destructive impact on the environment. In practice, we see examples of credible projects that are designed based on a positive relationship with nature. Living buildings, smart cities, vertical gardens, and green public spaces are examples that show that architecture should play a facilitating role in the permanent coexistence between humans and the environment. A clear example of this approach is projects that, instead of destroying natural resources, try to improve and restore them and take steps towards sustainable development (Hickman, 2017). These projects show that design based on respect for biodiversity, cooperation with natural elements, and the use of green technologies can help improve the quality of life and reduce destructive effects. In addition to practical matters, education and culture play a key role in improving human attitudes towards the environment. Educational programs, public awareness, and collective activities play an important role in changing individual and collective behaviors (Hornborg and Malm, 2014). They also emphasize

the importance of government policies and international policymaking that should take steps to encourage green construction and regulations to reduce waste and pollution. Measures such as providing financial incentives, facilitating green permits, and promoting the concept of sustainable development are examples that provide the basis for a fundamental change in design, construction, and operation behaviors. As a result, the relationship between humans and the environment in the field of architecture has now changed from a relationship of mere exploitation and domination to one of interaction, coexistence, and responsibility. The future of this relationship depends on joint actions, intelligent policymaking, the proper use of new technologies, and cultural and attitudinal changes in society. Architecture must play the role of mediator and facilitator of this relationship, so that built spaces not only cover temporary human needs, but also the preservation and sustainable use of natural resources and ecological balance. This new approach provides opportunities for creating green cities, efficient, and livable buildings that, along with optimal use, help protect and restore the environment. Overall, the focus should be on developing operational solutions, new technologies, and public education to foster a culture of coexistence and respect. That is, humans and nature should be institutionalized as a fundamental principle in the design and construction of future buildings. These developments will pave the way for a sustainable, healthy, and balanced future for future generations and show that a proactive and responsible attitude towards the environment is the only way to manage current crises and is based on a philosophy based on respect, cooperation, and responsibility.

The relationship between humans and the environment in the field of architecture: challenges and opportunities

Given the extensive developments in the field of environment and the development of new technologies, the relationship between humans and the environment in the field of architecture is facing numerous challenges and opportunities. One of the most important challenges is dealing with environmental crises such as climate change, depletion of natural resources, air and water pollution, which requires new approaches and comprehensive policies. In this regard, architects and designers should move towards designing spaces that prioritize sustainability, green spaces, energy efficiency, and ecosystem restoration. On the other hand, there are also many opportunities. Advanced technologies such as smart buildings, renewable energy collection systems, green technologies, and local and sustainable materials have made it possible to build better and less expensive spaces. These possibilities, along with design methods based on ecological principles, have the opportunity to transform architecture into a tool for improving the relationship between humans and nature.

One important path is to promote green architecture and sustainable cities, in which all urban elements, including green spaces, clean transportation systems, and flexible designs, interact with the environment. Also, the participation of local communities, citizens, and stakeholders in the design and decision-making process plays a key role in creating symbiotic and sustainable spaces. This approach strengthens culture, conserves resources, and reduces negative environmental impacts.

Another important opportunity is the development of government and international policies that support sustainable architectural innovations. Formulating appropriate laws and regulations, providing financial incentives, and promoting a culture of responsible resource conservation and utilization are solutions that can play an effective role in changing design attitudes and behaviors. Ultimately, the relationship between humans and the environment in architecture should be based on the principles of coexistence, responsibility, and harmony with nature. The future of this relationship depends on the level of societal capabilities, ideological policies, and new technologies that, while preserving the environment, provide a better, healthier, and more sustainable life for future generations. (Tab. 2)

Table 2: Summary of theories and ideas related to human cognition in relation to the environment in the architectural process

No.	theorist/author	Year	Subject of the book/work	Description
1	Ivan McHarg	1969	*Design with Nature*	Introducing ecological design concepts and the importance of respecting ecosystems in architecture
2	William McDonough	2002	*Cradle to Cradle Design*	Principles of sustainable design and consideration of the life cycle of materials in buildings
3	Stuart Brand	1994	*How Buildings Learn: What Happens After They're Built?*	Adaptation of buildings to environmental changes and human needs
4	Rachel Carson	1962	*Silent Spring*	The impact of human activities on the environment and the need for responsible approaches to design
5	David Orr	1992	*Ecological Literacy*	Teaching and promoting biological understanding and human connection with nature in architecture
6	Christopher Alexander	1977	*The Timeless Way of Building*	Humanistic and harmonious design approach with the natural and cultural environment
7	Peter Newman and Ken Young	1996	*Green Urbanis*	Green architecture, metropolitan design and interaction with nature
8	Michael Ho	1984	*Cities and Natural Process*	The impact of natural processes on the formation and development of cities and architectural spaces
9	Johnny Banios	2002	*The Upcycle*	Reuse and improvement of the material cycle in sustainable architecture
10	John Tucker	1997	*Biomimicry*	Modeling nature in the design of buildings and urban spaces
11	Richard Rogers and Renzo Piano	2005	*In the Bubble*	Design approaches based on "sustainability" and the coexistence of humans and the environment
12	Sarah Wilkinson	2011	*Building for a Limited Planet*	Green architecture and responsibility in building sustainable buildings
13	Peter Newman and Ken Young	2010	*Urban Ecology and Design*	Architecture and connection to local ecosystems
14	David Gibson	2010	*Subnature: Architecture's Other Environment*	The influence of underlying and unconscious processes in architecture and the relationship with nature
15	Nari Sanov	2000	*Participatory Design in Architecture*	Stakeholder participation in the design process and relationship with the environment
16	William Mitchell	2009	*Me++: The Cyborg Self and the Networked Cit*	The impact of technology and the relationship between humans and the environment in urban architecture
17	Susan Sanzi	2007	*Eco-Friendly Architecture*	Responsible architectural solutions and environmental impacts
18	Kristen Van Wilde	2014	*Ecological Urbanis*	New approaches in green architecture and urban planning

19	Michael Speaker	2010	*The Social Logic of Space*	The impact of architectural space on human relations and the environment
20	Bell McKibbe	2007	*Deep Economy*	Green economy, productivity and coexistence with nature in construction

CONCLUSION AND RESULT

In the field of architecture in the post-Anthropocene era, new concepts and approaches are being formed based on new theories on the relationship between humans and the environment. One of the key principles in this framework is the emphasis on the intelligent and sustainable "symbiosis" of humans and the environment, which seeks to continue a harmonious and responsible interaction between humans and nature. In addition, the development of green and smart technologies plays a vital role in improving efficiency and reducing negative impacts on the environment, so that future building systems must be designed based on modern technologies and clean energy systems.

The concepts of ecosystem and biocompatibility in architectural design show that construction must be carried out in a way that ensures compatibility with ecosystems and natural processes, rather than relying solely on resource extraction. In this regard, focusing on "sustainability" and resource management is a fundamental solution to reduce resource consumption and minimize waste; So that buildings and cities are built in a self-sufficient and recyclable way, and the role of digital and smart technologies in this direction increases. Biomimetics, or technology based on natural systems, is considered as a new approach in architectural design. This concept believes that natural strategies and biological adaptations can provide long-term solutions to environmental issues. In the meantime, the concept of "human" in architecture today is being redefined; from a purely human-centered perspective, it has changed to a conscious and responsible individual, whose concept in built spaces is in a way that emphasizes biological awareness and a deep connection with nature.

The role of digital and smart technologies in the design and construction process is another concept that has various ramifications; from smart structures based on the Internet of Things to images that are analyzed with artificial intelligence and play a role in the production of flexible and multipurpose architectures. Also, the development of clean energy sources and interactive energy production systems plays a strategic role in reducing the negative impacts of buildings on the environment and, as a result, creates resilient and flexible urban areas against climate and natural crises. In addition to these factors, paying attention to the formation of flexible and multipurpose spaces, while paying attention to crisis tolerance and resilience, is of great importance. Culture and public awareness about environmental responsibility in architecture play a fundamental role in instilling the values of sustainable development. The use of recycled and low-consumption materials, along with dynamic designs that are compatible with changing conditions, are other fundamental elements in new approaches to post-Anthropocene architecture. Finally, the development of smart cities that are responsive to biological needs, along with sustainable development goals, determine the direction of future architecture. Finally, based on the summary of opinions on theoretical foundations, research background, as well as possibilities regarding the subject and research variables, 20 possible factors affecting the main subject can be explained as follows: (Tab. 3)

Understanding the relationship between humans and the environment in the field of architecture is a complex and multifaceted process that has gained special importance due to intellectual developments and the needs of society, especially in the post-Anthropocene era. This relationship not only includes the direct interaction of humans with nature but also includes the way of thinking, values, policies, and philosophical attitudes in the design and construction of environmental spaces. Architectural philosophy, as the main axis of this relationship, tries to apply ethical, cultural, and environmental principles in the form of new approaches, and based on that, design spaces that both meet human needs and at the same time preserve the natural environment. In this path, the historical, symbolic, and cultural concepts of spaces, along with approaches to sustainability and social responsibility, play a fundamental role and make architecture, as an ethical and expedient activity, move towards improving and continuing the mutual relationship with nature. In this perspective, the nature of architectural spaces is not limited to form and beauty, but rather becomes a symbolic, cultural meaning that narrates the history, culture, and values of society. These spaces should strengthen the sense of coexistence and belonging in the human and environmental spheres In the meantime,

the role of man as an agent of construction and change is responsible and, with a deeper understanding of the effects of his actions on the environment, he should show more responsible behavior in the exploitation and protection of natural resources. The application of the principles of sustainability, reducing energy consumption, recycling materials, and climate-friendly design are essential tasks in this direction that the philosophy of architecture should guide. In this way, built spaces should not only respond to today's needs, but also prepare for future generations and maintain biological and ecological diversity.

In the post-Anthropocene era, environmental crises and climate change have forced us to deeply rethink the relationship between man and nature. These crises show that old approaches, which considered human's superior and separate from nature, are no longer responsive. Therefore, architecture must move towards approaches of coexistence, synergy and respect for nature. Designing green spaces, using local materials, reducing carbon footprints and creating infrastructures to defend against climate crises are among the main tasks that architectural philosophy must consider. This approach, along with ethical values, shows that architects and designers are responsible for creating spaces that contain crises and contribute to the balance and continuity of the ecosystem, with a deeper understanding of their role and the importance of mutual relationships. Finally, a philosophy that emphasizes the importance of responsibility, sustainability, and respect for nature can play a strategic role in shaping new movements of environmentally-friendly architecture and provide practical solutions for building a sustainable future.

The model shows that human knowledge of the environment plays a central role in the architectural process and influences the formation of attitudes and behaviors. Environmental perception includes the ability to receive and interpret sensory and visual information from natural and artificial spaces, which is the basis for understanding the environment. Knowledge and awareness of biological processes, environmental crises, and sustainability principles influence the formation of attitudes and decision-making. Valuation and meaning are related to cultural, ethical, and personal values related to nature and affect how to prioritize in the design and use of spaces. Also, human memory and experience, which include positive or negative memories of specific spaces, lead to long-term attitudes towards the environment and spatial behaviors. Together, these factors constitute a set of cognitive components that influence the behaviors of architects, designees, and end users. As a result, the architectural design process must be based on a correct and deep understanding of these components so that the built space can effectively play a role in strengthening positive attitudes and responsible behaviors towards the environment. In fact, strengthening awareness, cognitive education, and promoting environmental values are important foundations for the development of sustainable architecture in harmony with nature.The following table can be used to explain the various components and concepts related to human cognition in relation to the environment in the architectural process with regard to the concept of the post-Anthropocene era, in the form of a matrix. (Tab. 4)

Table 3: Summary of effective and relevant factors related to the issue of human cognition in relation to the environment in the architectural process in the post-Anthropocene era

No.	Key factor	Concept type	Description	Importance	Application example
1	Intelligent coexistence between humans and the environment	Biocentric concept	Continuing the harmonious and responsible interaction of humans with nature	Very important	Designing green and sustainable cities
2	Green and smart technologies	Technology	Using new technologies to improve efficiency and reduce environmental impacts	Very important	Energy efficient buildings
3	Ecosystem and biocompatibility	Design approach	Compatibility and overlap of design with natural processes	Important	Ecological spaces
4	Sustainable concept and resource management	Strategic approach	Reducing resource consumption and increasing productivity in construction	Very important	Using low-cost and recycled materials tain

5	Digital and smart technologies	Technology	Smart and digital tools in the design and manufacturing process	Important	Smart buildings and the Internet of Things
6	Biomimetic technology and natural systems	Innovative approach	Modeling nature to solve design problems	Important	Buildings based on natural structures
7	Redefining the concept of human in architecture	The topic of culture and ethics	Humans in today's architecture are responsible and aware, together with nature.	Important	Interactive and informative spaces
8	Clean energy systems and interactive production	Technology	Renewable energy sources and smart production and consumption systems	Very important	Solar and wind systems
9	Formation of flexible and multipurpose spaces	Architectural design	Diverse and multifunctional spaces with the ability to change	Important	Convertible office and residential buildings
10	Resilience and design against crises	Design approach	Building resilient and flexible spaces in the face of biological crises	High importance	Earthquake and flood resistant structures
11	Environmental culture and awareness	Materials and structure	Promoting responsible and desirable environmental behavior among society	Important	Educational programs and cultural campaigns
12	Recycled materials and energy-efficient buildings	Materials and structure	Using recycled materials and designing energy-efficient and sustainable buildings	Important	Buildings with low-consumption and recycled materials
13	Dynamic and changeable design	Architectural approach	Creating spaces that are adaptable to changing needs	Important	Multipurpose buildings and flexible spaces
14	Developing smart and responsive cities	Urban approach	Design and development of smart cities with a focus on resource scarcity and sustainability	Very important	Smart urban management systems
15	New technologies in architecture	Technology	Using technologies such as artificial intelligence and robotics in design and manufacturing	Important	Automated and robotic systems in construction
16	Biodiversity and natural landscape	Aesthetic approach	Paying attention to natural landscapes and biological landscapes in design	Medium	Parks and green spaces in cities
17	Establishing human-nature communication	Social approach	Spaces with greater interaction between humans and nature to improve the quality of life	Important	Open space and community centers
18	Development of new and clean energy sources	Technology	Exploiting renewable resources and reducing dependence on fossil fuels	Very important	Standalone wind and solar systems
19	Community-based and participatory design	Participatory approach	Actively engage stakeholders and implementers in the design process	Important	Urban planning based on public participation
20	Energy storage and recovery technologies	Technology	Energy storage systems to improve sustainability and efficiency	Important	Large batteries and energy storage systems

Table 4: Various components and concepts related to human cognition in relation to the environment in the architectural process

Component / Concept	Environmental Perception	Knowledge and Awareness	Valuation and Meaning	Memory and Human Experience	Influence on Behavior and Decision-Making
Environmental Cognition	Visual and sensory perception of natural and built spaces	Awareness of biological processes and environmental crises	Interpretation of the importance of harmony with nature and cultural values	Spatial memories and psychological influences on the individual important	Environmentally informed decision-making
Awareness and Knowledge	Understanding natural dimensions and designing spaces in harmony with the environment	Learning about natural resources and biological processes	Valuing sustainability and natural heritage	Personal experience of benefiting from green spaces	Decisions grounded in knowledge lead to responsible approaches
Valuation and Prioritization	Emphasizing positive interaction with nature in design	Prioritizing resource use and improving living quality	Valuing the natural environment and biological culture	Positive experiential recollections in nature-friendly spaces	Design decisions based on values and cultures
Memory and Human Experience	Positive and negative memories in natural spaces	Awareness of spatial experiences as a source of learning	Preserving and transmitting values in architectural spaces	Impact of experiences on long-term attitudes	Future spatial behaviors and interactions based on experiences
Influence on Behavior	Improving spatial behaviors in natural and built environments	Promoting responsible behaviors in utilization	Fostering a culture of environmental protection in society	Psychological and emotional influences on humans	Decisions and designs based on knowledge and values

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