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ROPOSING

A NEW VISION FOR UNDERSTANDING CITIES THROUGH CO-EVOLUTIONARY PROCESSES

PROPUESTA DE UNA NUEVA VISIÓN PARA COMPRENDER LAS CIUDADES A TRAVÉS DE PROCESOS DE COEVOLUCIÓN

Danilo Daniel García Hernández[1]
E-mail: danilodg1994@gmail.com
ORCID: https://orcid.org/0009-0007-2988-4734
Ernesto Molina-Santana[2]
E-mail: emolinasantana9734@gmail.com
ORCID: https://orcid.org/0000-0002-0611-1508
José Manuel Álvarez-Alvarado[1]
E-mail: jmalvarez@uaq.edu.mx
ORCID: https://orcid.org/0000-0002-1304-6791
Julio Cesar Ramírez Ceballos[1]
E-mail: jramirez284@alumnos.uaq.mx
ORCID: https://orcid.org/0000-0002-1926-2057
Mauricio Lavador Osorio[1]
E-mail: mlavador06@alumnos.uaq.mx
ORCID: https://orcid.org/0009-0006-8144-1458
[1] Universidad Autónoma de Querétaro, México.
[2] Universidad Autónoma Metropolitana, México.

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ABSTRACT

This study is an essay focused on a reflective proposal framed within the context of a growing ecological crisis and biodiversity loss. Firstly, it proposes an approach to how cities are structured to achieve an epistemic change in building knowledge of urban ecosystems, drawing from the field of co-evolution. The main objective of this study is to explore how the design process provides a vision from a co-evolutionary perspective and contributes to the Transitional Design framework. A reflective review is conducted to achieve this objective. It addresses the broader context of the human-environment relationship and the civilizational impact on the complex system in which they are embedded. Additionally, the study analyzes the dichotomy between resilience and re-existence. It explains strategic interventions from biophilic and regenerative approaches and their contribution to constructing knowledge about urban ecosystems, thereby facilitating a change in the epistemic framework within which cities develop.

Keywords: co-evolution, ecological crisis, bio-diversity, resilience, eco-systems.

RESUMEN

El presente estudio es una propuesta reflexiva enmarcada en un contexto de creciente crisis ecológica y de pérdida de biodiversidad. Primeramente, se propone un acercamiento a como se estructura la ciudad, para lograr un cambio epistémico para la construcción del conocimiento de los ecosistemas urbanos, desde el área de conocimiento de la co-evolución. El estudio tiene como objetivo fundamental realizar una exploración a como el diseño da una visión desde la co-evolución y proporciona el marco de trabajo del ***Transitional Design***. Para ello, se realiza una reseña reflexiva del panorama general sobre la relación ser humano-naturaleza y su impacto civilizatorio en el sistema complejo en el que se inserta, así como se aborda la dicotomía entre resiliencia y re-existencia, explicando las intervenciones estratégicas desde enfoques de desarrollo biofílico y regenerativo y como aportan a la construcción del conocimiento de los ecosistemas urbanos para el cambio del marco epistémico en que se desarrolla la ciudad.

Palabras claves: co-evolución, crisis ecológica, biodiversidad, resiliencia, ecosistemas.

INTRODUCTION

Divergence arises when a particular phenomenon is analyzed from the perspectives of natural science and social science, which is widely recognized. Natural science tends to explain natural phenomena independently of human influence. Meanwhile, social science focuses on human beings without sufficiently considering their natural environment. This divergence is primarily justified by the high degree of specialization and segmentation in social sciences, which limits their ability to address interconnected issues adequately.

An inverse dynamic is observed in the field of natural sciences. This characteristic arises from the specialization category, which allows studies to converge in addressing natural aspects and thus provides a solid foundation for their results (Lugo-Morin, 2010). This separation within the scientific field has not posed any inconvenience despite the spread of influence of human societies across various environments, particularly with the expansion of agriculture and the development of urban areas. This trend persists to this day.

The fast growth of the worldwide economy has led to adverse environmental impacts, prompting global concern due to anthropogenic challenges such as industrialization, demographic growth, and agro-pollution.

The relationship between humans and nature has been synchronized and harmonized throughout history. Initially, this connection was primarily established based on natural subsistence, with humans depending directly on the resources offered by their environment. As society evolved and small human groups formed, this relationship became a strategy for subsistence, social reproduction, and territorial domination.

Human logic towards their environment has reached interest since ancient times, dating back to the period of Aristotle (Camargo-Brito, 2007; Horneffer, 2008). The discussion surrounding this analogy has been continuous. During the Renaissance, a distinction between the divine and the natural emerged, arguing that a definitive divine precept and a natural decision required exploration and discovery. Disciplines such as Theology and Philosophy were formulated to comprehend everything but had gotten unsatisfactory results in some cases.

The mediation concept provides a perspective for autonomously understanding the relationship between human beings and nature, where constituent elements interact within their logic (Galafassi, 1998). The unity between humans and nature does not imply a relationship between equal entities or a static relationship with changing characteristics over time. Instead, it focuses on the relationship rather than the separation between them. Both nature and society are organized based on methods of change and evolution, giving rise to various forms of dynamic organization.

At this point, two fundamental aspects can be distinguished within the human-nature relationship: (1) the retention of environmental particularities by humans and (2) the transformation and utilization of such particularities at a societal level. This connection is evidenced in tasks and physical actions where social causes interact with tangible objects. The various stages of societal improvement involve diverse material execution methods of natural elements (Galafassi, 2020). The scope and nature of these stages depend on other aspects, such as the predominant mode of production in social conception. These stages also affect the aesthetic-emotional appreciation of the natural environment. Symbolic representations of nature vary according to the cultural system. Nature is perceived by specific material and ideological conceptions, which are shaped by societal evolution. Consequently, the environment and surroundings are socially constructed due to the relationship between humans and nature.

This implies the need to develop theoretical and methodological tools that not only interpret the interactions between humans and nature but also understand them, serving as a common reference point against the challenges of a globalized world characterized by a fast technological advancement, urban expansion, and the predominance of capitalist production. Additionally, the human coldness towards “others” and their environment is added to the considerations mentioned above (Cañas-Fernández, 2010; Corcuera & Ponce de León García, 2006; Rodríguez & Quintanilla, 2019). Consequently, contemporary society becomes more flexible and volatile, as social organizations do not remain in place long enough to solidify (Bauman, 2007) and do not serve as a reference framework for conceptualizing and reaching the exercise method for social actors. In this context, interdisciplinary emerges as a relevant necessity.

Throughout history, humans have actively engaged with nature in search of sustenance and protection, leading to the organization of societies to preserve and advance the species. Over time, these societies have become increasingly complex, with diverse forms and degrees of organization coexisting worldwide. Singularities, realism, individualism, and wealth accumulation are constituent elements of the capitalist model of humanity, which reached its whole conformation with the legal equilibrium of individuals (Marquez-Covarrubias & Delgado-Wise, 2011) The hegemonic class was dedicated to re-structuring the

necessities of its society to satisfy them, linking aspects from an economic viewpoint associated with human requirements and reducing change products to usage values and these last ones to human necessities. For the favored class, material accumulation became its objective, often at the expense of others. These social relations of domination were perceived as usual, becoming an existing aspect of humanity and validating domination relationships. The coupling between humans and nature ultimately aims to form a creation and allocation system. This comprehensive view of the process leads to identifying interactions in a particular society with the environment and highlighting certain aspects. These relations involve degradation, manifested in the depletion of resources and pollution.

The fundamental purpose of this study is to offer insight from the understanding of the city based on the area of co-evolution knowledge, providing guidelines from ecosystem theory and resilience to co-evolutionary vision.

DEVELOPMENT

a) Eco-system stability

Biodiversity plays a crucial role in human life and productive processes. For example, in agriculture, biodiversity contributes to maintaining environmental stability by facilitating the normal execution of global nutrient cycles, decomposing organic matter, recovering compacted or degraded soils, pests and diseases regulation, and pollination process, among other aspects. Restoring biodiversity helps reduce dependence on external factors in agricultural and forestry systems, such as fertilizers, water, and phytosanitary products.

Ecosystem balance is manifested when changes in the environment are followed by adaptive processes of other species, which evolve to survive and prosper in that environment. For example, penguins that arrived in the Galapagos Islands via marine currents adapted to the new environment by developing a more resilient beak, a sleeker figure, and less fur to dive and obtain food. Another example is the adaptation of people living in extremely high-temperature areas, such as Mexicali and Hermosillo, located in Mexico, where temperatures can exceed 50°C during the summer (Rodríguez & Quintanilla, 2019).

Resilience: An adaptive strategy

The actions to achieve healthy environment conservation are closely linked to the development strategy adopted in a region or country. A sustainable development approach that promotes responsible use of natural resources is necessary and fundamental for preserving ecosystems. However, frequent questions arise: How can we achieve this? How can we assume this responsibility in a capitalist system prioritizing the economy over nature? How can we distinguish between responsible use and unscrupulous exploitation of natural resources? What are the consequences of not implementing responsible environmental management of natural resources? How much pressure can a resource resist before being at risk of depletion or extinction? These questions find an answer in a common variable: ecosystem resilience.

Ecosystem resilience refers to the ability of such kind of systems to recover themselves from disturbances or withstand continuous pressures. This property involves complex processes, both physical and biogeochemical, where the biotic and abiotic components of the ecosystem work together to restore their original state after being affected by external factors, aiming to return to or maintain equilibrium (Ojeda-Revah, 2021)México enfrenta grandes retos en cuanto a la planeación y distribución equitativa de las áreas verdes urbanas, desde una perspectiva de los servicios ecosistémicos que éstas proveen. El objetivo de este trabajo es profundizar en el conocimiento y las causas que originan la inequidad en la distribución y provisión de las áreas verdes urbanas y los servicios ecosistémicos que proporcionan. Para ello, se realizó una búsqueda sistemática de literatura especializada, comprendiendo desde 1990 a la fecha. De 34 publicaciones seleccionadas, se codificaron y analizaron parámetros de provisión, accesibilidad, calidad, percepción y su relación con factores socioeconómicos, los problemas existentes y sus causas (método PRISMA.

The world population has experienced a remarkable increase, rising from 1.5 billion in 1902 to over 7.8 billion todays. Human actions significantly impact nature, contributing to habitat loss for numerous species due to CO2 emissions and modification of their absorption capacity, as well as unsustainable agricultural practices and consumption patterns for a finite natural system (Rodríguez & Quintanilla, 2019). This habitat loss can exert pressure on insect species responsible for critical environmental services, such as organic matter decomposition and pollination process, which can trigger imbalances in the ecosystem (Rodríguez & Quintanilla, 2019).

Ecosystem resilience is more significant when there is a wide diversity of species performing similar functions and these species variably respond to disturbances. The ability of an ecosystem to maintain its distribution and integrity is intrinsically linked to the diversity of functions it performs, resulting from interactions between its organization and processes (Benites, 2007).

Human sense of belonging to nature

People behavior is affected by their perception of the environment in which they interact. Cultural landscapes are abstract manifestations, shaped by each culture by imprinting unique typologies that, through the structure of space, convey symbols among their buildings, green areas, monuments, agricultural activities, infrastructure such as bridges and ports, recreational areas, museums, and rural environments.

The capacity of contemplation by a humanity involved in constant acceleration is difficult to find. How can humans reconnect with Mother Nature, of which they are a part of but from which they have become increasingly distant, controlling, and, in many cases, destroying? The disconnection and superficial appreciation that humans have towards other living beings endanger the survival of our species, as humans consider themselves dominant and controllers of animal and plant kingdoms. Humans must stop their frenetic style of life and return to the center, to their essence, which is nature in all its manifestations. Returning to our roots as integral parts of a whole within the planetary system known as Earth, which is part of a complex and vast universe, is fundamental.

It is required to promote a vision that connects modern humans and their animal nature, reconnecting them as an integral part of the natural system. Several strategies have been proposed to achieve this connection. These strategies require discipline, flexibility, and an exhaustive analysis of humans. How human behavior can be articulated around their natural environment is a reflection made to get a step toward sustainability.

The careful observer appreciates singular ecosystem elements. The trails these people use offer a new form of connection between humans and nature and have become a productive alternative for many communities worldwide, known as hiking or visits to ecological trails. However, it is essential to note that these activities can also generate environmental transformations. The disconnection from nature is evident in our dependence on external resources to obtain water, food, and energy, making us ignore how nature operates (Durand et al., 2019).

Appreciation of landscape towards consciousness

The connection with the natural landscape provides humans a sense of enjoyment and fulfillment, as they feel like an integral part of nature. When humans are immersed within this environment, their consciousness expands, and the ability to perceive the relations inside them increases. In this way, humans understand the unity that blends them as part of the same life system. An illustrated example of the previous statement is associated with the case when, in the middle of a country, we can hear an air whisper passing through stalks and leaves or witness lightning and thunders during a storm, announcing the promise of abundance for future harvests.

Being receptive to the joy and beauty of nature entails an advancement in our consciousness, freeing us from alienation and the overvaluation of the rational mind. According to Heidegger's philosophy, the essence of our existence lies in the simple fact of being, and this existence allows us to choose between living authentically or falling into inauthenticity.

How humans relate to the world can change based on different philosophical positions. Living in the world implies being deeply connected with nature, as Gaia de Lovelock proposed, where the biosphere, atmosphere, oceans, and earth structure a system that auto-regulates the optimum conditions for living on Earth. The condition established by human beings in the world involves a significative aspect; meanwhile, human living in the world condition implies using the environment as a process without considering it as an essential part of an essential organism of Earth.

Human links are based on fulfilling their necessities and searching for a spiritual relationship with their environment. Personal growth is produced through these interactions, and vital human experience is developed within this context. This experience wakes human senses and allows them to perceive the world around them, generating impressions and memories that shape their perception of reality.

Sense theory represents how humans grasp the world through their senses, filtering environmental information and building their understanding based on past experiences. Human capacity to perceive their environment allows them to adapt and remember their experiences, reviving past moments as they explore their environment.

The relation among all-natural elements is essential for the planet wellness. However, technological development and capitalist advances have caused a tragic rupture of these relationships, leading to ecosystem destruction and biodiversity loss. This rupture alters human perception and corrupts their environment, leading them towards chaos and degradation.

As Dalai Lama said, what we see on the outside reflects our inner state. The deterioration of the environment affects our visual aesthetics and threatens life itself and the continuity of the energy chains that sustain life on Earth. We must reconnect with our conscience and commit to preserving and respecting nature before it is too late.

b) Re-existence: Co-design process with community

Projects are developed within an existing planning regime and become repetitive due to the implementation of competitions, regardless of the typology they address. These projects are means of bidding or a legacy of community consensus. In many of these projects, the designer analyzes the context, rearranging the economic, ecological, social, and cultural aspects to serve a cultural product. Embedding design in planning is necessary to achieve documentation and manage public relations, the legislative process, and community interests (Waldheim, 2016).

On the other hand, re-existence as a communal way of imagining recreates life and should provide humans with the basis for cultural sustainability, according to (Corzo, 2015). The idea of life under conditions of dignity is non-negotiable with capital, but that does not mean that the worldview corresponds to something uncompromising. Additionally, it is commented that it benefits nature and allows long-term security for all living beings, including humans.

Re-existence aims to multiculturalise inhabitable spaces through usage and management practices, considering them as fundamentally built spaces for social and environmental relationships and epistemological production. As a result, the environment is no longer just a vital space for existence but a place where the sense of life is born (Albán & Rosero, 2016).

c) Transition of city conception from a co-evolutive vision.

Transition processes in city conception are pivotal to achieving an ecological design, and they are developed by sustainably managing complex ecosystems over long periods. Healthy ecosystems depend on reciprocal relationships and interdependence networks among living organisms and their environment (Kossoff et al., 2016).

Evolutionary urban theory considers city systems as systems of systems at multiple scales, ranging from the microscopic intra-urban level to the macroscopic level of the entire system, passing through the mesoscopic level of the city (Albeverio et al., 2007). The core idea of this concept is that entities or organizations develop in response to their environments while those environments also evolve in response to them (Porter, 2006).

Likewise, regenerative development based on co-evolution conception asserts that human and natural systems do not merely integrate but mutually co-evolve. In this case, the dynamic behavior between sociocultural and ecological systems and their interaction with the built environment is continuously evolving. Weisz proposes that: Knowledge development relies on an in-depth comprehension of the internal dynamics of societies, their interactions with the environment, and how society and ecology jointly influence their continuous evolutionary paths (Weisz, 2011)social-metabolism and sociological systems theory can be utilized to develop a concept of society–nature coevolution. The article begins with a conception of industrialization as a socio-metabolic transition, that is, a major transformation in the energetic and consequently material basis of society. This transition to industrial metabolism was essential for the emergence and maintenance of industrial societies and is at the same time the main cause of global environmental change. The article proceeds by asking what the notion of society–nature coevolution can potentially contribute to understanding environmental sustainability problems. An elaborated concept of coevolution hinges on (1.

The co-evolutionary approach offers added value beyond selection and adaptation concerns. This approach encompasses how coordinated actors are empowered to envision and drive significant changes within an institutionalized system (Seo & Creed, 2002). Cantner & Malerba (2006) highlights that coevolution can entail interactions in knowledge, learning, demand, characteristics, actor behavior, strategy, and tactics.

While biological and organizational evolution theories are compatible, the latter inherently diverges from its biological counterpart due to the absence of a direct analog for human reasoning and communication capabilities in biological models. Notably, human learning processes outpace genetic changes in biological contexts, leading to variations that give rise to hybrid formations, including unconventional organizational structures, such as novel organizational forms (Cantner & Malerba, 2006).

CONCLUSIONS

This essay aimed to generate a proposal to offer a vision that guarantees a paradigm change from knowledge construction, considering an understanding of re-existence and co-evolution concepts. These concepts are considered in design methodologies and urban development and identified as solvers of the problem described in this essay. Providing a different perspective is essential for transitions applied in ecology and evolution in urban contexts. Co-evolution is a crucial concept that transcends disciplinary boundaries, integrating biological, urban, and organizational dynamics.

The emphasis on coevolution as a feedback approach opens the door to a systemic understanding of the relationships between organisms, cities, and organizations. This concept implies recognizing that change does not occur in a vacuum but is shaped by dynamic interactions

among diverse actors. The ability of systems to adapt and evolve in response to these direct interactions and environmental feedback reveals the inherent complexity in the management and planning of ecosystems and cities.

The co-evolutionary approach emphasizes the ability of coordinated actors to catalyze significant changes from within institutionalized systems, moving beyond issues of selection and adaptation. Co-evolution implies the capacity to react to environmental changes and the ability to influence the direction of system evolution actively. Furthermore, mentioning co-evolution regarding knowledge, learning, demand, and behavior of actors highlights the complexity and multidimensionality of these evolutionary processes.

However, there is a recognition of needing to differentiate between biological and organizational evolution theories due to the peculiarities of human reasoning and communication capabilities, which operate at a different speed than genetic changes. The reference to the emergence of organizational "hybrids" underscores the possibility of innovative organizational forms that may arise from the dynamic interaction between human actors and their environments.

From the perspective of regenerative development, mutualistic coevolution between human and natural systems is necessary to understand the internal complexities of societies and their relationships with the environment to achieve more significant knowledge development. The co-evolutionary relationship between sociocultural and ecological systems provides a qualitatively different context for discussing architectural practice from a developmental approach that differs from the conventional model applied to the design and structuring of urban ecosystems. These associations imply interactions that support the gradual re-existence of sociocultural systems and their relationship with ecological systems.

From this perspective, we must reverse course and decisively engage in designing a planet that belongs to all of us, where re-existence will be a praxis that leads us to consider that living entails more than simply being alive.

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