ПЛАТФОРМА 5
ПЕРСПЕКТИВИ РОЗВИТКУ ДИЗАЙНУ АРХІТЕКТУРНОГО СЕРЕДОВИЩА

УДК [72.012+711.4]:502.1

PERSPECTIVES ON THE USE OF REGENERATIVE DESIGN IN ARCHITECTURE AND URBAN PLANNING

BLINOVA Maria, PROTSENKO Danylo
O. M. Beketov National University of Urban Economy in Kharkiv, Kharkiv, Ukraine
danylo.protsenko@kname.edu.ua, mariia.blinova@kname.edu.ua

This article is dedicated to a review of regenerative design in architecture, which represents a progressive approach to creating a sustainable future. In the context of escalating ecological challenges, regenerative design serves not only as a means to minimize environmental damage, but also as an active strategy for restoring and enhancing natural and social systems through architectural initiatives. The article highlights the key principles of regenerative design, such as integration with nature, ecosystem restoration, and the importance of social and cultural integration in the design process. It focuses on the challenges faced by architects and designers in implementing regenerative approaches and reveals possible ways to overcome these obstacles through innovation and interdisciplinary collaboration.

Keywords: *regenerative design, sustainable development, green architecture.*

INTRODUCTION

In today's world, where global ecological challenges are becoming increasingly significant, the relevance and necessity of finding new approaches in architecture and urban planning become an integral part of professional activity. The idea of regenerative design in architecture, aimed not only at reducing the negative impact on the environment but also at actively restoring and improving it, opens new horizons for sustainable development. Entering an era where the interaction between humans and nature requires rethinking and new, more harmonious forms of coexistence, regenerative design offers an innovative and holistic approach to creating living spaces.

PURPOSE

The aim of this work is to explore and clarify the concept of regenerative design within the context of contemporary architecture, its distinctions from traditional approaches to green architecture, and its potential in the restoration and transformation of urban environments.

RESULTS AND DISCUSSION

Contemporary architecture stands at a crossroads. On one hand, there is unprecedented technological progress and innovative capabilities. On the other, we face acute ecological challenges that demand immediate and well-considered

solutions. In this context, sustainability is not a passing trend or a temporary requirement; it is a necessity that defines how we must live on our planet to ensure the well-being of future generations. This involves not only the conservation of natural resources but also the creation of a fair and resilient society that can adapt and thrive in a changing world.

Among the existing concepts in architecture that directly influence sustainable development is green architecture. As a manifestation of sustainable development in the construction industry, it focuses on the development of buildings that minimize environmental impact and enhance the quality of life for their users. This is achieved through intelligent planning, the use of environmentally friendly materials, energy-efficient technologies, and the incorporation of natural elements that promote health and well-being.

Mostly, green architecture focuses on implementing innovative technologies to reduce the harmful impact on the environment during construction, as well as the subsequent operation of the building. Among these are the use of green, or eco-friendly, materials, the arrangement of vertical "green facades," and the active use of natural energy sources, among others. However, even with this in mind, the question of restoring the urban eco-environment remains, as while green architecture aims for sustainability and makes new structures more "safe," the issue of restoring the city's natural elements remains open.

In this context, regenerative design in architecture can open new horizons for sustainable development, going beyond the traditional understanding of sustainability and bringing us closer to harmonious interaction with the natural environment. As a professor of architecture, I am deeply convinced that the future of architecture lies not just in minimizing environmental damage but in creating designs that actively restore and improve the natural and social environment.

Regenerative design is an approach that goes beyond sustainability, aiming to actively improve ecology and social systems through architectural projects. This approach aims not just to reduce the negative impact of construction but to restore, renew, and enhance the natural and social systems with which it integrates. It represents a radical review of architectural and planning approaches, focusing on harmonious interaction with the natural environment and social systems. From this perspective, the key trends in regenerative design unite technologies, materials, and methods that promote restoration and positive impact on the environment.

Among renowned architects, Richard Rogers stands out for advocating the ideas of sustainable development and the regeneration of neglected urban areas through innovative architectural projects; Bjarke Ingels is known for his innovative approaches to green architecture and natural integration. Michael Pawlyn, an architect known for his work on the Eden Project and a proponent of biomimicry in architecture, has been a significant voice in this field. His approach involves learning from nature to solve human problems, leading to buildings that not only reduce their environmental footprint but also contribute positively to their surroundings. For instance, Pawlyn's Sahara Forest Project aimed at creating a regenerative system that combines renewable energy, water management, and food production in desert areas, demonstrating the potential of regenerative architecture to address environmental challenges.

Regenerative design views an architectural object not as an isolated structure but as part of a broader ecosystem. It requires architects to have a deep understanding of ecological processes, cultural contexts, and social interactions. This approach encourages us to think holistically, considering a building not as an end product but as an element that impacts the health of the ecosystem and the well-being of the community.

One of the key aspects of regenerative design is its focus on restoring natural environments that have been damaged or altered by human activity. This means that projects not only avoid negative impacts on the environment but also actively contribute to improving biodiversity, enriching soils, and purifying water and air. Such an approach may include creating green roofs and vertical gardens, using rainwater harvesting systems, phytoremediation stations for wastewater treatment, and other innovative technologies.

Another important element is social and cultural integration. Regenerative projects take into account the needs and values of local communities, aiming not only to ensure ecological sustainability but also to promote social cohesion, cultural development, and economic well-being. This can mean involving local residents in the design process, using local materials and construction techniques, and creating spaces that foster communities and support local identity.

Among the principles of regenerative design, the following key ones can be highlighted:

1. Holistic approach: Recognizing that all components of the ecosystem are interconnected, from individual buildings to entire cities, landscapes, and the biosphere as a whole.
2. Collaboration with nature: Regenerative design leverages natural processes and systems to create effective solutions for building operation.
3. Restoration of ecosystems: Deep integration of buildings and landscapes with the surrounding natural environment, using biomimicry and greening as integral elements in the structure of buildings.
4. Social and cultural integration: Considering the needs and values of local communities, facilitating the creation of socially significant projects.

Examples of such projects include the Nanyang Technological University (NTU) in Singapore, or the Farming Kindergarten in Vietnam, Omega Center for Sustainable Living in Rhinebeck, New York. These projects beautifully demonstrate that the approaches inherent in regenerative design can easily be implemented in reality.

Of course, regenerative design faces certain challenges. High initial costs, the need for innovative technologies and materials, and the complexity of integration with existing urban structures are just a few of them. However, the benefits it offers in terms of ecosystem restoration, increased biodiversity, and improved quality of life for people make this approach indispensable in creating a sustainable future.

CONCLUSIONS

Confronting challenges such as high initial costs, technical limitations, the absence of standards, and the need for social adaptation requires innovative thinking and close collaboration among all stakeholders. The development of regenerative design is associated with the application of advanced technologies, a

deep understanding of local ecosystems and cultures, and the creation of a regulatory framework that would support and encourage regenerative practices.

Implementing regenerative design in architectural projects not only contributes to creating healthier and more harmonious living spaces but also represents a crucial step in addressing ecological challenges such as climate change, biodiversity loss, and pollution. Public engagement and educational initiatives play a key role in ensuring the widespread acceptance and implementation of regenerative approaches.

It can be said that regenerative design is not just an architectural choice but a responsibility to our descendants. It reflects a strategy that can lead us to a more sustainable future, ensuring not only the reduction of environmental harm but also the active restoration and improvement of the environment. This approach lays the foundation for a future where architecture and design work not only to meet human needs but also for the benefit of the entire planet.

REFERENCES

1. Shevchenko L., Novoselchuk N., Toporkov V., Kuznietsova, Y. Landscape Design of the Urban Environment: Ecological Aspects. *International Journal of Engineering & Technology*, Vol. 7, No 4.8, London (UK), 2018. P. 765-771. DOI: https://doi.org/10.14419/ijet.v7i4.8.27456
2. Кузнєцова Я. Ю. Сучасний досвід реновації промислових територій і споруд в екоконтексті. *Проблеми архітектури та містобудування в умовах сучасної глобалізації :* мат. всеукр. наук.-техн. конф. Харків, 2016. С. 220–222.
3. 4 Principles of Regenerative Design. URL: https://www.buildings.com/resiliency-sustainability/article/10196146/4-principles-of-regenerative-design/
4. Kobylarczyk J., Kuśnierz-Krupa D., Paprzyca K. Art-klaster jako wynik działań rewitalizacyjnych w przestrzeni miejskiej. Містобудування та територіальне планування. КНУБА. Київ, 2018. Вип. 68. С. 230-248.

БЛІНОВА М., ПРОЦЕНКО Д.

ПЕРСПЕКТИВИ ВИКОРИСТАННЯ РЕГЕНЕРАТИВНОГО ДИЗАЙНУ В АРХІТЕКТУРІ ТА МІСТОБУДУВАННІ

Стаття присвячена огляду регенеративного дизайну в архітектурі, який представляє собою прогресивний підхід до створення сталого майбутнього. В контексті зростаючих екологічних викликів, регенеративний дизайн виступає не тільки як засіб мінімізації шкоди для довкілля, але й як активна стратегія відновлення та покращення природних і соціальних систем через архітектурні ініціативи. Стаття висвітлює ключові принципи регенеративного дизайну, такі як інтеграція з природою, відновлення екосистем, та важливість соціальної та культурної інтеграції у процесі проектування. Акцентується увага на викликах, що стоять перед архітекторами та дизайнерами при імплементації регенеративних підходів, та розкриваються можливі шляхи подолання цих перешкод через інновації та міждисциплінарну співпрацю.

Ключові слова: *регенеративний дизайн, сталий розвиток, зелена архітектура.*