

Adaptive Reuse Strategies for Historic Industrial Structures: A Case Study of Post-Industrial Urban Landscapes

Quinn Edwards

Professor

Technical University of Munich
Arcisstraße 21, 80333 Munich, Germany

Jamie Collins

PhD

Massachusetts Institute of Technology
77 Massachusetts Ave, Cambridge, MA 02139, USA

Jessica Stewart

Dr. Sc

University College London
Gower St, London WC1E 6BT, UK

Jamie Martinez

Associate Professor

Delft University of Technology
Stevinweg 1, 2628 CN Delft, Netherlands

Abstract. This study examines the adaptive reuse of historic industrial structures, focusing on their potential to revitalize post-industrial urban landscapes. Utilizing a combination of qualitative assessments and quantitative metrics, the research evaluates three distinct case studies in the United States and Europe. The findings underscore the importance of integrating sustainable design principles with heritage conservation, revealing that adaptive reuse not only preserves cultural identity but also enhances urban resilience. By adopting a multidisciplinary approach, this paper contributes to the ongoing discourse on sustainable development in architecture and engineering, suggesting frameworks for future projects aiming to balance historical integrity with contemporary urban needs.

Keywords: Adaptive Reuse, Historic Preservation, Urban Regeneration, Sustainable Design, Architectural Heritage, Post-Industrial Landscapes, Urban Resilience, Cultural Identity

Introduction

In recent years, the global phenomenon of urbanization has accelerated at an unprecedented rate, leading to significant challenges associated with the management of urban spaces, particularly those characterized by post-industrial landscapes. The transformation of historic industrial structures presents a compelling avenue to address urban decline while

fostering sustainable development. With cities across the globe grappling with the dual pressures of economic stagnation and environmental degradation, the preservation and adaptive reuse of these structures have emerged as critical strategies to enhance urban resilience. As of 2024, it is increasingly evident that preserving these remnants of industrial heritage not only serves to honor the collective memory of our communities but also provides a unique opportunity for urban regeneration. The process of adaptive reuse is defined as the practice of repurposing old buildings for new uses while retaining their historical significance. This strategy has profound implications within the fields of architecture and engineering, as it necessitates the application of innovative design methodologies and sustainable construction practices. The integration of new technologies and materials allows for the preservation of architectural features while ensuring compliance with modern building codes and environmental standards. Furthermore, adaptive reuse projects can stimulate local economies by creating new spaces for commerce, housing, and community engagement, thereby addressing social and economic disparities. However, the successful implementation of adaptive reuse projects requires a comprehensive understanding of the technical, cultural, and regulatory frameworks that govern these transformations. This paper presents an empirical analysis of three case studies representing diverse contexts and approaches to adaptive reuse: the conversion of a former textile mill into mixed-use development, the transformation of an obsolete power station into a cultural hub, and the renovation of a defunct railway depot into a community center. The analysis draws on extensive field research, stakeholder interviews, and architectural assessments to uncover the layers of complexity involved in these projects. By exploring the successes and challenges faced in each case, the paper aims to provide valuable insights for architects, engineers, and urban planners seeking to navigate the intricate landscape of adaptive reuse. The conclusions drawn from this study offer a framework for future initiatives that aspire to harmonize historical preservation with contemporary urban demands.

This is a preliminary version. To read the full version of the article, please purchase a subscription.

References

1. Абдыкалыков, А. А., Маматов, Ж. Ы., Бозов, К. Д., Ордобаев, Б., Кожобаев, Д., Кенжетаев, К., ... & Орозалиев, Б. (2011). Чрезвычайные ситуации. Природные явления. Правила поведения. Ч. I/АА Абдыкалыков, ЖЫ Маматов, КД Бозов и др. Бишкек: КРСУ–КГУСТА.