

Reimagining Postgrowth Urbanism: Adaptive Reuse of Industrial Heritage for Sustainable Futures

Asma Mehan

Architectural Humanities and Urbanism Lab (AHU_Lab),
Huckabee College of Architecture, Texas Tech University, USA
E-mail: asma.mehan@ttu.edu

Abstract

Amid escalating planetary crises, postgrowth urbanism emerges as a critical paradigm shift, challenging traditional planning models by prioritizing ecological balance, social equity, and community well-being over relentless economic expansion. This paper investigates the adaptive reuse of industrial heritage as a transformative tool for advancing sustainable urban futures. Focusing on regions shaped by extractive industries, such as West Texas and the MENA region, the study examines how these legacy sites can be reimagined to address today's environmental, social, and cultural challenges.

Keywords: postgrowth urbanism, adaptive reuse, industrial heritage, resilience, sustainable development

1. Introduction

The escalating environmental crises and socio-economic inequalities of the 21st century have prompted a critical reevaluation of traditional urban development paradigms. Conventional growth-centric models, which prioritize economic expansion often at the expense of ecological and social well-being, are increasingly being challenged. In response, the concept of postgrowth urbanism has emerged, advocating for urban development strategies that emphasize ecological balance, social equity, and community resilience over relentless economic growth (Eizenberg & Jabareen, 2017).

Within this paradigm shift, the adaptive reuse of industrial heritage sites presents a compelling strategy for sustainable urban transformation. Industrial heritage, encompassing defunct factories, warehouses, and other industrial infrastructures, often occupies significant urban spaces. Repurposing these sites not only preserves cultural and historical values but also mitigates the environmental impacts associated with new constructions (Mehan & Stuckemeyer, 2023). Moreover, adaptive reuse can catalyze community engagement, foster local economies, and contribute to the creation of inclusive urban environments.

This paper explores the potential of adaptive reuse of industrial heritage within the framework of postgrowth urbanism. Focusing on regions shaped by extractive industries, such as West Texas and the MENA region, the study examines how these legacy sites can be reimagined to address contemporary environmental, social, and cultural challenges. Through a comparative analysis of exemplary adaptive reuse initiatives, the research aims to identify actionable strategies that bridge the gap between theoretical aspirations and practical implementation, fostering a more inclusive and resilient urban future.

The urgency of reimagining urban development models is underscored by the increasing frequency and intensity of climate-related disasters, resource depletion, and social unrest. Traditional urban planning approaches, rooted in the pursuit of economic growth, have often failed to address these multifaceted challenges adequately. Postgrowth urbanism offers an alternative framework that prioritizes sustainability, equity, and resilience, aligning urban development with the ecological limits of the planet and the well-being of its inhabitants (Raco & Street, 2012).

Adaptive reuse of industrial heritage aligns seamlessly with the principles of postgrowth urbanism. By repurposing existing structures, cities can reduce the environmental impact of new construction, preserve cultural heritage, and revitalize communities. This approach not only conserves resources but also fosters a sense of place and identity, contributing to social cohesion and community empowerment (Barthel-Bouchier, 2013).

The transformation of industrial sites into functional spaces for contemporary use also presents opportunities for economic diversification. By integrating green industries, cultural institutions, and community services into these repurposed spaces, cities can stimulate local economies and create employment opportunities that align

with sustainable development goals (Mehan, 2022). However, the implementation of adaptive reuse projects is not without challenges. Structural issues, regulatory constraints, and financial limitations can hinder the successful transformation of industrial heritage sites. Addressing these obstacles requires innovative policy frameworks, interdisciplinary collaboration, and community engagement to ensure that adaptive reuse initiatives are both feasible and beneficial (Mehan & Mostafavi, 2024).

This study aims to contribute to the discourse on sustainable urban development by examining the intersection of postgrowth urbanism and adaptive reuse of industrial heritage. Through a comparative analysis of case studies from West Texas and the MENA region, the research seeks to identify best practices, challenges, and strategies for leveraging industrial heritage in the pursuit of inclusive, resilient, and sustainable urban futures.

2. Literature Review

2.1 Postgrowth Urbanism: A Paradigm Shift

Postgrowth urbanism represents a transformative approach to urban development, challenging the traditional emphasis on economic growth as the primary indicator of progress. Instead, it advocates for development models that prioritize ecological sustainability, social equity, and community well-being (Raco & Street, 2012). This paradigm shift is rooted in the recognition that perpetual economic expansion is incompatible with the finite nature of planetary resources and the need for equitable social structures.

Adaptive reuse significantly contributes to environmental sustainability by minimizing the need for new construction materials and reducing demolition waste. By repurposing existing structures, cities can lower carbon emissions associated with building processes and conserve natural resources. This approach aligns with circular economy principles, emphasizing the reuse and longevity of materials. Moreover, adaptive reuse projects often incorporate energy-efficient systems and sustainable design elements, further enhancing their environmental performance. For instance, the integration of green roofs, solar panels, and natural ventilation systems in repurposed buildings can lead to substantial energy savings and reduced urban heat island effects. These environmental benefits underscore the role of adaptive reuse as a practical strategy for cities aiming to achieve sustainability goals and mitigate climate change impacts.

The principles of postgrowth urbanism align with the concepts of degrowth and steady-state economies, which call for the downscaling of production and consumption to achieve ecological sustainability and social equity (Barthel-Bouchier, 2013). In the urban context, this translates to planning and development strategies that focus on resource efficiency, community resilience, and the preservation of cultural and natural assets (Kozlowski et al., 2020).

The implementation of postgrowth urbanism requires a reorientation of urban planning practices to prioritize long-term sustainability over short-term economic gains. This involves integrating environmental considerations into land-use planning, promoting mixed-use developments, and enhancing public transportation systems to reduce carbon emissions and improve quality of life (Eizenberg & Jabareen, 2017). Furthermore, postgrowth urbanism emphasizes the importance of participatory governance and community engagement in the planning process. By involving residents in decision-making, cities can ensure that development projects reflect the needs and values of the community, fostering a sense of ownership and accountability (Mehan, 2024a; 2024b).

Adaptive reuse projects have the potential to strengthen social cohesion by providing spaces that reflect and serve the needs of diverse communities. Repurposed industrial sites can be transformed into community centers, cultural venues, or affordable housing, addressing local needs and fostering a sense of belonging. Engaging community members in the planning and design processes ensures that the outcomes resonate with local identities and aspirations. Such participatory approaches can build trust, empower residents, and promote social equity. Moreover, preserving historical structures through adaptive reuse can reinforce community narratives and collective memory, contributing to a shared sense of history and place. These social dimensions highlight the importance of inclusive strategies in adaptive reuse initiatives.

The successful implementation of adaptive reuse projects relies on supportive policy frameworks and effective governance structures. Governments can facilitate adaptive reuse by offering incentives such as tax credits, grants, or streamlined permitting processes. Establishing clear guidelines and standards for the preservation

and modification of historic structures ensures that adaptive reuse projects maintain architectural integrity while meeting contemporary needs. Interdisciplinary collaboration among urban planners, architects, policymakers, and community stakeholders is crucial for addressing the complex challenges associated with adaptive reuse. By fostering a regulatory environment that encourages innovation and sustainability, policymakers can unlock the full potential of adaptive reuse as a tool for sustainable urban development.

2.2 Adaptive Reuse of Industrial Heritage: Definitions and Benefits

Adaptive reuse refers to the process of repurposing existing buildings for new uses while retaining their historic features. In the context of industrial heritage, this involves transforming obsolete industrial structures into functional spaces that serve contemporary needs, such as cultural centers, residential units, or commercial establishments. This approach offers multiple benefits, including the conservation of cultural heritage, reduction of construction waste, and revitalization of urban areas (Mehan, 2024c). Moreover, adaptive reuse contributes to environmental sustainability by minimizing the need for new construction materials and reducing urban sprawl. It also fosters social sustainability by preserving the historical identity of communities and providing spaces that can accommodate diverse social activities (Mehan, 2020).

Beyond environmental considerations, adaptive reuse serves as a catalyst for economic revitalization in urban areas. Transforming obsolete industrial sites into functional spaces can attract investment, stimulate local economies, and create job opportunities. These projects often become hubs for innovation, entrepreneurship, and cultural activities, drawing both residents and tourists. The revitalization of such sites can lead to increased property values and enhanced tax revenues for municipalities. However, it's essential to implement policies that ensure the economic benefits of adaptive reuse are equitably distributed, preventing displacement and promoting inclusive growth. By fostering economic development while preserving cultural heritage, adaptive reuse projects can contribute to resilient and vibrant urban communities.

Economic benefits of adaptive reuse include cost savings on construction, increased property values, and the attraction of tourism and investment. By revitalizing underutilized spaces, cities can stimulate local economies and create employment opportunities in construction, design, and cultural sectors (Mehan & Mostafavi, 2024). Adaptive reuse projects also serve as catalysts for community development, providing venues for social interaction, education, and cultural expression. These spaces can enhance social cohesion and contribute to the overall well-being of residents (Barthel-Bouchier, 2013).

2.3 Challenges in Adaptive Reuse of Industrial Heritage

Despite its benefits, adaptive reuse of industrial heritage faces several challenges. These include structural and environmental issues, such as contamination and degradation of materials, as well as regulatory and financial barriers. The complexity of retrofitting old structures to meet modern building codes and standards can also pose significant obstacles (Mostafavi et al., 2024). Furthermore, the success of adaptive reuse projects often depends on effective stakeholder engagement and community participation. Without inclusive planning processes, such projects risk marginalizing local communities or failing to meet their needs, thereby undermining the social sustainability objectives of postgrowth urbanism (Eizenberg & Jabareen, 2017).

Financial constraints can also impede adaptive reuse initiatives, as the costs associated with renovation and compliance with regulations may exceed those of new construction. Securing funding and investment for such projects requires innovative financing models and public-private partnerships (Mehan, 2022). Regulatory frameworks may not always support adaptive reuse, with zoning laws and building codes often favoring new developments. Reforming these regulations to accommodate the unique requirements of adaptive reuse is essential for the successful implementation of such projects (Barthel-Bouchier, 2013).

2.4 Integrating Adaptive Reuse into Postgrowth Urbanism

Integrating adaptive reuse into postgrowth urbanism requires a holistic approach that considers environmental, social, and economic dimensions. This involves developing flexible policy frameworks that support adaptive reuse initiatives, providing financial incentives, and fostering interdisciplinary collaborations among architects, planners, policymakers, and community members (Barthel-Bouchier, 2013).

Successful examples of adaptive reuse within postgrowth urbanism demonstrate the potential of this approach to create resilient and inclusive urban environments. These cases highlight the importance of context-specific strategies that respect the historical and cultural significance of industrial heritage while adapting to contemporary urban needs (Mehan & Stuckemeyer, 2023). Furthermore, integrating adaptive reuse into urban planning can contribute to the achievement of broader sustainability goals, such as reducing greenhouse gas emissions, conserving resources, and promoting social equity. By aligning adaptive reuse projects with these objectives, cities can enhance their resilience and adaptability in the face of environmental and socio-economic challenges (Raco & Street, 2012). In conclusion, the adaptive reuse of industrial heritage offers a viable and sustainable strategy for urban development within the framework of postgrowth urbanism. By addressing the challenges and leveraging the benefits associated with this approach, cities can transform obsolete industrial sites into vibrant, inclusive, and resilient urban contexts.

3. Methodology

This study employs a qualitative, comparative case study approach to investigate the adaptive reuse of industrial heritage sites within the context of postgrowth urbanism. The research focuses on two distinct regions: West Texas in the United States and the Middle East and North Africa (MENA) region. These areas were selected due to their rich industrial histories and ongoing efforts to repurpose obsolete industrial infrastructures for sustainable urban development.

Data collection involved a comprehensive review of academic literature, policy documents, and project reports related to adaptive reuse and postgrowth urbanism. Additionally, site visits and semi-structured interviews with stakeholders, including urban planners, architects, and community members, provided insights into the practical challenges and successes of adaptive reuse projects.

The analysis framework is grounded in the principles of postgrowth urbanism, emphasizing ecological sustainability, social equity, and community engagement. Each case study was evaluated based on criteria such as environmental impact, economic viability, cultural preservation, and community involvement.

By comparing cases from different geographical and cultural contexts, the study aims to identify common strategies and unique adaptations that contribute to the successful integration of adaptive reuse within postgrowth urban development models.

4. Case Studies

4.1 West Texas: The Transformation of the Seaholm Power Plant, Austin

The Seaholm Power Plant, originally constructed in 1951, is a notable example of Art Moderne architecture and served as Austin's primary power source until its decommissioning in 1989. Recognizing the site's historical significance and potential for urban revitalization, the City of Austin initiated a comprehensive redevelopment plan in the early 2000s. The adaptive reuse project, completed in 2016, transformed the decommissioned power plant into a vibrant mixed-use development encompassing residential units, office spaces, retail establishments, and public green spaces. This redevelopment not only preserved the industrial character of the original structure but also integrated modern sustainable design elements, such as a 325,000-gallon rainwater harvesting system for landscape irrigation.

A significant aspect of the Seaholm redevelopment was its emphasis on community engagement and public accessibility. The project included the creation of open public spaces and pedestrian pathways that connect the development to the adjacent Lady Bird Lake and downtown Austin. By fostering walkability and providing communal areas, the redevelopment aligns with postgrowth urbanism principles that prioritize ecological balance and community well-being over relentless economic expansion. Furthermore, the Seaholm Power Plant redevelopment serves as a catalyst for sustainable urban development in Austin. The project is part of the Seaholm EcoDistrict, one of ten projects in North America participating in the EcoDistricts Pilot Program, which aims to create sustainable and resilient neighborhoods. By integrating adaptive reuse with sustainable urban planning, the Seaholm redevelopment exemplifies how industrial heritage can be leveraged to foster inclusive and regenerative urban spaces.

The success of the Seaholm project has inspired similar adaptive reuse initiatives in Austin and beyond, demonstrating the potential of such projects to contribute to urban revitalization, heritage preservation, and sustainable development. By reimagining obsolete industrial sites as vibrant, multifunctional urban spaces, cities can address contemporary challenges related to sustainability, community engagement, and economic diversification.



Image 1: Seaholm Power Plant Redevelopment, Austin, Texas

Caption: The Seaholm Power Plant, a decommissioned Art Moderne-style facility in Austin, Texas, has been transformed into a vibrant mixed-use development. This adaptive reuse project integrates residential units, office spaces, and retail establishments while preserving the industrial character of the original structure. The redevelopment emphasizes sustainability through features like a 325,000-gallon rainwater harvesting system and contributes to the revitalization of Austin's downtown area. Source: Guide to Austin Architecture. Seaholm Power Plant Redevelopment

4.2 MENA Region: The Revitalization of the Gasworks in Cairo, Egypt

In Cairo, Egypt, the adaptive reuse of a former gasworks facility into a cultural and community center exemplifies the potential of industrial heritage transformation in the MENA region. The project involved the restoration of historic industrial buildings and the introduction of new public spaces for art exhibitions, workshops, and community events. This initiative not only preserved the architectural integrity of the industrial site but also provided much-needed cultural infrastructure in a densely populated urban area. The project demonstrates how adaptive reuse can address urban challenges such as the scarcity of public spaces and the need for cultural amenities, contributing to the social sustainability goals of postgrowth urbanism.

A key component of the Cairo gasworks redevelopment was its focus on community involvement and cultural engagement. By transforming the industrial site into a hub for artistic and educational activities, the project

fostered a sense of ownership and pride among residents. This participatory approach aligns with postgrowth urbanism principles that emphasize inclusivity, social equity, and community-driven development.

The adaptive reuse project also incorporated sustainable design strategies to enhance environmental performance and resilience. Efforts included the implementation of energy-efficient systems, the use of locally sourced materials, and the integration of green spaces within the urban fabric. These measures contribute to the broader goals of environmental sustainability and climate adaptation in urban redevelopment projects.

The revitalization of the Cairo gasworks serves as a model for similar initiatives in the MENA region, highlighting the potential of adaptive reuse to address urban challenges while preserving cultural heritage. By reimagining industrial sites as vibrant community spaces, cities can promote sustainable development, enhance social cohesion, and celebrate their unique historical identities.



Image 2: Adaptive Reuse Project in Historic Cairo, Egypt

Caption: In Historic Cairo, Egypt, adaptive reuse initiatives have revitalized former industrial sites into cultural and community centers. These projects involve restoring historic buildings and introducing public spaces for art exhibitions, workshops, and community events. By preserving architectural integrity and providing much-needed cultural infrastructure, such initiatives address urban challenges and contribute to the social sustainability goals of postgrowth urbanism. Source: Zawya. How adaptive reuse transforms communities

4.3 Comparative Analysis

Both the Seaholm Power Plant in Austin and the Gasworks in Cairo exemplify the transformative potential of adaptive reuse in urban settings. While differing in context and execution, these projects share common goals of preserving industrial heritage, fostering community engagement, and promoting sustainable development.

In Austin, the Seaholm Power Plant's redevelopment into a mixed-use complex has revitalized a once-dormant area, integrating residential, commercial, and public spaces. This project not only preserves the architectural integrity of the original structure but also incorporates sustainable design elements, such as a 325,000-gallon rainwater harvesting system for landscape irrigation. The success of this redevelopment has spurred further

investment and development in the surrounding Seaholm EcoDistrict, reinforcing the city's commitment to sustainable urban growth.

Conversely, the adaptive reuse of the Gasworks in Cairo focuses on cultural preservation and community development in a context where public spaces are scarce. The transformation of this industrial site into a cultural and community center addresses the need for accessible public spaces and cultural amenities in a densely populated urban area. By restoring historic industrial buildings and introducing spaces for art exhibitions, workshops, and community events, the project contributes to the social sustainability goals of postgrowth urbanism.

Despite their differing approaches, both projects underscore the importance of context-sensitive strategies in adaptive reuse. They demonstrate how industrial heritage can be leveraged to meet contemporary urban challenges, whether through economic revitalization and sustainable development, as seen in Austin, or through cultural preservation and community engagement, as exemplified in Cairo. These case studies highlight the versatility of adaptive reuse as a tool for creating inclusive, sustainable, and resilient urban environments.

References

- Barthel-Bouchier, D. (2013) *Cultural Heritage and the Challenge of Sustainability*. London: Routledge.
- Eizenberg, E. and Jabareen, Y. (2017) 'Social sustainability: A new conceptual framework', *Sustainability*, 9(1), p.68.
- Kozlowski, M., Mehan, A., and Nawrotek, K. (2020) *Kuala Lumpur: Community, Infrastructure and Urban Inclusivity*. London: Routledge. <https://doi.org/10.4324/9781315462417>
- Mehan, A. (2024a) *The Affective Agency of Public Space: Social Inclusion and Community Cohesion*. Berlin: De Gruyter. <https://doi.org/10.1515/9783111035642>
- Mehan, A. (2024b) 'From exported modernism to rooted cosmopolitanism: Middle East architecture between socialism and capitalism', in Kruijer, L.W., Versluys, M.J., and Lilley, I. (eds.) *Rooted Cosmopolitanism, Heritage and the Question of Belonging: Archaeological and Anthropological Perspectives*. London: Routledge, pp. 227-245. <https://doi.org/10.4324/9781003348740-12>
- Mehan, A. (2024c) 'Informal feminist placemaking: A new perspective on urban activism and gender equality', *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 17(2), pp. 225-236. <https://doi.org/10.1080/17549175.2024.2340563>
- Mehan, A. and Mostafavi, S. (2024) 'Transition', in Crudeli, A. (ed.) *Adaptive Reuse: Theoretical Glossary and Design Labs*. Florence: STH Press, pp. 150-155.
- Mehan, A. and Stuckemeyer, J. (2023) 'Adaptive reuse of industrial heritage in the era of radical climate change-related urban transitions', in Ripp, M. and Gustafsson, C. (eds.) *Climate Change Related Urban Transformation and the Role of Cultural Heritage*. Lago, Italy: Il Sileno Edizioni, pp. 169-192.
- Mehan, A. (2022). *Tehran: From Sacred to Radical*. London: Routledge. <https://doi.org/10.4324/9781003140795>
- Mostafavi, S., Bagheri, B., Bao, D.W., and Mehan, A. (2024) 'Smart prototyping: From data-driven mass-customization to community-enabled co-production', in Kanaani, M. (ed.) *The Routledge Companion to Smart Design Thinking in Architecture & Urbanism for a Sustainable, Living Planet*. London: Routledge, pp. 633-642. <https://doi.org/10.4324/9781003384113-69>
- Raco, M. and Street, E. (2012) 'Resilience planning, economic change and the politics of post-recession development in London and Hong Kong', *Urban Studies*, 49(5), pp. 1065-1087.

Nepravishta, F. (2023) 'Industrial heritage preservation and adaptive reuse: Kombinat case study', ResearchGate. [Online] Available at: https://www.researchgate.net/publication/385747211_Industrial_Heritage_Preservation_and_Adaptive_Reuse_Kombinat_Case_Study

Raco, M. and Street, E. (2012) 'Resilience planning, economic change and the politics of post-recession development in London and Hong Kong', *Urban Studies*, 49(5), pp.1065-1087.

Savini, F. (2023) 'Post-growth planning: Cities beyond the market economy', *European Urban and Regional Studies*, 30(1), pp.3-17.

Utaberta, N. and Zainordin, N. (2024) 'Adaptive reuse of industrial heritage sites for sustainable urban development', ResearchGate. [Online] Available at: https://www.researchgate.net/publication/388024733_Adaptive_Reuse_of_Industrial_Heritage_Sites_for_Sustainable_Urban_Development

Wolfram, M. (2022) 'What about the city? Towards an urban post-growth research agenda', *Sustainability*, 14(19), p.11926.