CONTRIBUTION OF URBAN REGENERATION TO SUSTAINABLE DEVELOPMENT: THE CASE OF PIRAEUS

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Abstract
This study examines the pivotal role of urban regeneration in advancing sustainable development, focusing on the 2nd Municipal Community of Piraeus as a case study. Through a multidisciplinary approach—including bibliographic research, personal observation, statistical analysis, and a survey of 345 participants—the research highlights urban regeneration's ability to address environmental, socio-economic, and infrastructural challenges. Key findings reveal significant public support for initiatives promoting green spaces, pedestrian paths, renewable energy, and inclusive urban design. Statistical analyses emphasize broad agreement across demographic groups regarding the benefits of regeneration, with priorities centered on ecological sustainability, accessibility, and social cohesion. Drawing from exemplary international practices and public perceptions, the study demonstrates that urban regeneration can reduce pollution, enhance socio-economic resilience, and foster inclusivity in Piraeus. This research underscores urban regeneration as a vital contributor to transforming Piraeus into a sustainable, resilient, and inclusive urban environment, connecting local needs with global sustainability standards.

Keywords: *redevelopment; sustainability; urban environment; urban regeneration Piraeus*

Introduction

Exemplary cities worldwide offer transformative approaches to urban regeneration, providing valuable insights into sustainable urban development. Copenhagen, Denmark, is recognized as one of the most environmentally progressive cities, boasting 546 kilometers of cycling infrastructure and extensive investments in bicycle-friendly initiatives. In 2021, 35 percent of residents commuted daily by bicycle, supported by an annual infrastructure investment of 84

million Danish kroner. The city operates a fully electric public transport system, with electric buses and water taxis introduced in 2020. Copenhagen's former industrial harbor has undergone significant regeneration, transforming into a recreational area featuring ten designated swimming zones and an innovative rainwater storage system. Furthermore, 98 percent of households are connected to a district heating system that supplies thermal energy. Its vast green spaces cover 25 percent of the city, reducing summer temperatures by up to 2°C while reinforcing biodiversity protection through mandatory integration of green infrastructure into urban planning (Butler et all, 2024; Wonderful Copenhagen, "Sustainability in Copenhagen, 2024).

Barcelona, Spain, exemplifies a people-centered urban mobility model through its Superblocks initiative, which reshapes urban areas by prioritizing pedestrian-friendly spaces and restricting vehicular access. These interventions have significantly reduced noise pollution by up to 9 dB, enhanced air quality, and strengthened local economies through increased foot traffic. By 2024, Barcelona aims for 80 percent of transportation to rely on walking, cycling, or public transit, with plans to convert one in every three streets into green corridors by 2030 (European Commission, 2022).

Medellín, Colombia, presents another model of urban transformation, shifting from a city marked by social inequality and violence to an exemplary case of urban resilience. Through targeted regeneration initiatives such as cable car systems connecting marginalized neighborhoods to economic centers, enhanced public spaces, and innovative transportation infrastructure, Medellín has achieved socio-economic revitalization while fostering community engagement in redevelopment efforts (Esteves, 2012; Naef, 2020).

Singapore stands out as a densely populated yet efficiently designed urban environment, integrating vertical greening, advanced water management systems, and smart-city technologies to address sustainability challenges. By blending nature with urban density, Singapore has developed biophilic spaces, adaptive reuse policies, and water recycling initiatives that ensure resource efficiency while promoting a high quality of life (Webb, 2012).

Urban regeneration in Greece has evolved over several decades, from early reconstruction efforts following natural disasters in the 1970s to more comprehensive renewal projects influenced by European sustainability directives in the 1990s. Initial redevelopment strategies primarily focused on pedestrianization and aesthetic enhancements, while recent efforts aim to integrate resilience, accessibility, and green infrastructure more effectively. Major urban projects such as "The Ellinikon," which seeks to create a smart, inclusive, and sustainable urban hub along the Athenian Riviera, signal a shift toward more holistic urban regeneration models.

Aligned with global sustainability efforts, the research is structured within the framework of the Sustainable Development Goals (SDGs), particularly Goal 11: "Sustainable Cities and Communities." At the European level, strategies emphasize the need for resilient and innovative cities that prioritize inclusivity, economic development, and environmental protection. Nationally, urban regeneration policies aim to promote accessibility, green infrastructure, and socio-economic balance (United Nations, 2015; World Bank, 2018; European Commission,2023).

Piraeus, Greece, presents a complex urban landscape marked by environmental, socio-economic, and infrastructural challenges. The urban ecosystem suffers from limited green spaces, reduced biodiversity, and heightened levels of air, water, noise, and light pollution. Uncoordinated industrial activity, inadequate spatial planning, and inefficient traffic networks exacerbate urban congestion, narrow streets, and deteriorating infrastructure. Disorganized waste management further intensifies public health risks and environmental degradation. Vulnerable social groups—including migrants, the homeless, and individuals with disabilities—experience social exclusion, while economic instability and high unemployment

hinder socio-economic progress. These conditions, compounded by a densely built environment and the escalating climate crisis, necessitate a comprehensive and targeted urban regeneration strategy.

By synthesizing international, European, and national priorities, this study aspires to propose a robust and context-sensitive urban regeneration framework for Piraeus, addressing its distinctive challenges while envisioning its transformation into a resilient and sustainable urban hub.

Methodology

This research examines the critical role of urban regeneration in advancing sustainability, with a specific focus on the 2nd Municipal Community of Piraeus. The study aims to address the multifaceted challenges afflicting the area and develop a strategic framework for sustainable urban regeneration, aligned with international, European, and national directives.

The methodology employed in this research integrates a multifaceted approach, encompassing an extensive literature review, quantitative analysis through a structured 28-question survey administered to a randomized sample of N = 345 individuals, and qualitative assessment conducted through direct observation of the study area to formulate a comprehensive urban regeneration proposal. The survey sought to evaluate the public perception, social acceptance, and awareness of sustainability principles among Greek citizens who have either visited or reside in Piraeus. Given that the total population of Piraeus in 2021 was recorded at 168,151, the sample size represents a statistically valid proportion, ensuring the reliability and generalizability of findings. The selection of respondents, which includes both residents and visitors, accounts for diverse perspectives, reinforcing the robustness of the dataset and minimizing selection bias.

Survey data were electronically collected through Google Docs, and subsequent statistical analysis was conducted using Jamovi 2.3.28, ensuring methodological rigor in processing responses. The analytical framework incorporated descriptive statistics, where relative and absolute frequencies were computed, followed by a Chi-Square (χ^2) test to examine statistically significant associations among qualitative categorical variables. Independent demographic factors—including gender, age group, educational level, marital status, and residency in Piraeus—were analyzed to determine disparities in perspectives regarding urban regeneration.

The regeneration proposal was systematically developed based on an integrated assessment of environmental, social, and economic conditions, aligning with international and European sustainability directives. Factors influencing urban resilience, accessibility, and sustainable urban planning were derived from global and European urban sustainability objectives, a comprehensive literature review on emerging urban design technologies and exemplary international case studies, empirical data collected through survey responses, the strategic urban regeneration plan for Piraeus under the Programming Period 2021–2027, and a SWOT analysis, identifying Piraeus's strengths, weaknesses, future opportunities, and potential threats.

The incorporation of advanced statistical methodologies, paired with rigorous validation of the confidence interval, ensures the scientific reliability of this study's findings, reinforcing its applicability in informing sustainable urban regeneration policies for Piraeus.

Characteristics of the Region

Piraeus stands as a remarkable urban and maritime hub of Greece, playing a critical role as the nation's primary port and a central node in the Mediterranean. Its strategic location, historical

significance, and economic importance have driven its transformation into a focal point for maritime trade, cultural preservation, and socio-economic development. The municipality encompasses diverse neighborhoods, each reflecting unique socio-economic dynamics and land-use patterns. Its vibrant cultural and architectural heritage, exemplified by neoclassical structures, museums, and iconic landmarks like the Lion of Piraeus, is intricately tied to its historical evolution and serves as an asset for sustainable tourism and urban regeneration.

The region's physical and infrastructural characteristics further define its challenges and opportunities. Piraeus spans 10.9 square kilometers and features a dense urban fabric with limited green spaces, averaging 1.56 m² per capita, which is among the lowest in Greece (Municipality of Piraeus, 2024; Argyropoulos, 2020; Hellenic Statistical Authority, 2023). The city's-built environment includes 25,663 buildings, predominantly residential, alongside educational institutions, industrial facilities, and healthcare centers. The extensive road network of 430 kilometers is marked by narrow streets, limited bicycle lanes, and constrained pedestrian pathways, which exacerbate mobility issues and contribute to traffic congestion (Municipality of Piraeus (n.d.-e), 2024;Ministry of Environment and Energy, 2024). Despite the addition of metro stations, tramlines, and the Sustainable Urban Mobility Plan, gaps in public transport infrastructure persist, emphasizing the need for further integration and modernization (Piraeus Chamber of Commerce and Industry, 2014).

Environmental conditions also play a significant role in shaping urban challenges. Piraeus experiences a warm semi-arid steppe climate, with recent data indicating a 1°C rise in average temperatures between 2010 and 2023 due to climate change (Hellenic National Meteorological Service, 2016). The region struggles with high levels of air pollution, with concentrations of particulate matter (PM10) and nitrogen oxides (NOx) consistently exceeding European Union limits, largely attributed to industrial activity, maritime operations, and reliance on high-sulfur fuels (United Nations, 2015;Lialios, 2024; Hellenic Ornithological Society, 2024; meteo.gr). Biodiversity and vegetation have been significantly reduced, with urban flora dominated by Mediterranean trees and shrubs. Urban fauna is limited, primarily comprising companion animals and marine birds due to the city's coastal location (Environmental Association of Municipalities of Athens-Piraeus, 2024).

These characteristics reveal a complex interplay of strengths and vulnerabilities. On one hand, the city's cultural, economic, and geographic assets position it as a dynamic hub for innovation and sustainable growth. On the other hand, challenges such as environmental degradation, inadequate infrastructure, and socio-economic inequality underscore the urgent need for coordinated urban regeneration efforts.

Results of the Focus Group Survey

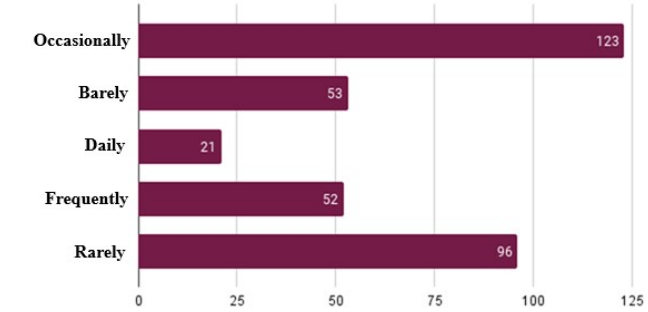
The survey was conducted within urban redevelopment areas and public spaces of Piraeus, involving both residents and visitors. The goal was to evaluate public perceptions of urban regeneration initiatives, their impacts on sustainability, inclusivity, and quality of life, as well as socio-economic factors affecting the city.

Participant Demographics

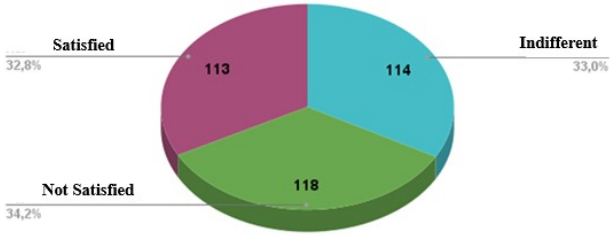
The first five questions referred to the demographics of the focus group, such as age, gender, marital status, educational status and whether the participants were residences of the area. The survey captured nearly equal gender representation, with 53.3% identifying as female, 46.1% as male, and 0.6% choosing not to disclose their gender. The majority of participants fell within the 26–65 age range, with lower participation from the 18–25 (9.9%) and over-65 (4.6%) age groups. Educational attainment levels were high: 31.6% were university graduates, 29.9% held a master's degree, 20% had secondary education, 13.3% completed vocational

programs, 4.1% held doctoral degrees, and 1.2% had primary education. Most respondents were married (51%), and only 16.8% resided in Piraeus.
Questions 6-22 focused on the urban regeneration and social acceptance:

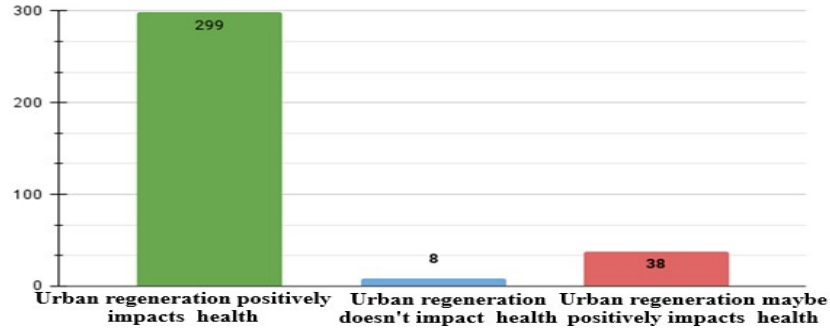
Question 6. How often do you visit urban redevelopment areas in Piraeus?
The frequency of visits to urban redevelopment areas displayed a range of behaviors. Occasional visits were the most common (35.7%), followed by rare visits (27.8%), while 15.1% reported frequent visits, and only 6.1% visited daily. Residency status significantly influenced visiting patterns, with permanent residents showing a higher likelihood of frequent visits ($p < 0.001$).



Question 7. Were you satisfied with the urban redevelopment areas you visited?
Respondents' satisfaction levels were distributed almost evenly, with 34.2% dissatisfied, 33% indifferent, and 32.8% satisfied. There were no significant differences between residents and non-residents ($p = 0.061$). These results highlight the need for improvements to ensure functionality and aesthetic appeal that meet the expectations of diverse users.

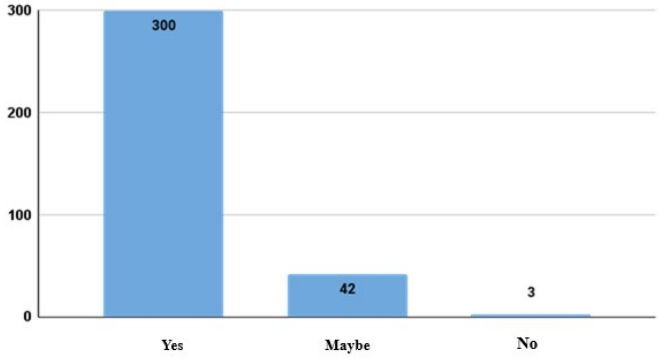


Question 8. Do you think urban redevelopments have benefits for mental health, immune health, brain and physical development, and the health of children and adolescents?
An overwhelming 86.7% of respondents acknowledged the positive impacts of urban redevelopment on mental health, immune health, physical and brain development, as well as benefits for children and adolescents, while only 2.3% disagreed. This reflects a strong consensus on the health-related advantages of sustainable urban planning.



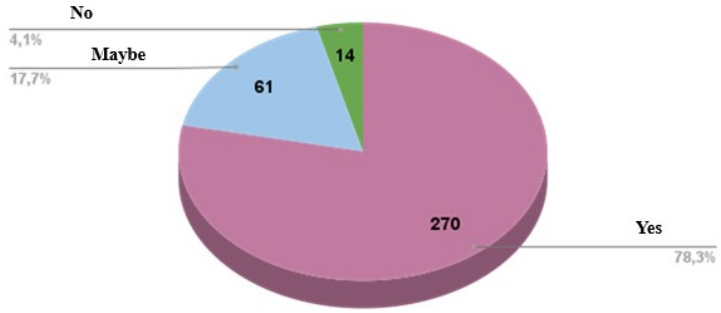
Question 9. Do you think urban redevelopments benefit social cohesion, economic growth, and investments?

The vast majority (87%) believed that urban regeneration fosters social cohesion, economic growth, and investments. Responses were consistent across demographic groups, with no significant variations observed (p = 0.684). This underscores the perceived economic and social benefits of urban regeneration.



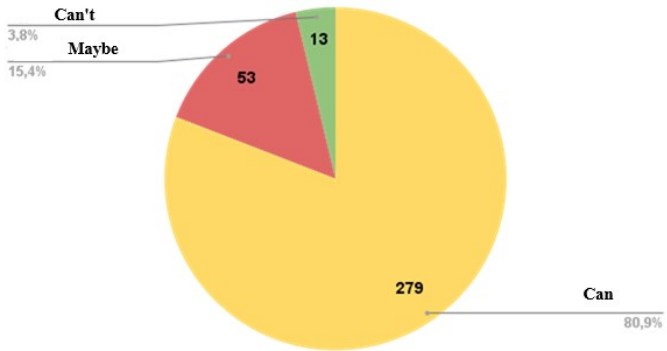
Question 10. Do urban redevelopments contribute to the increase of green spaces and biodiversity?

Most respondents (78.3%) affirmed that urban redevelopment contributes to the increase of greenery and biodiversity. This perception was consistent across all demographic categories (p = 0.393), reinforcing the environmental importance of redevelopment initiatives in Piraeus.



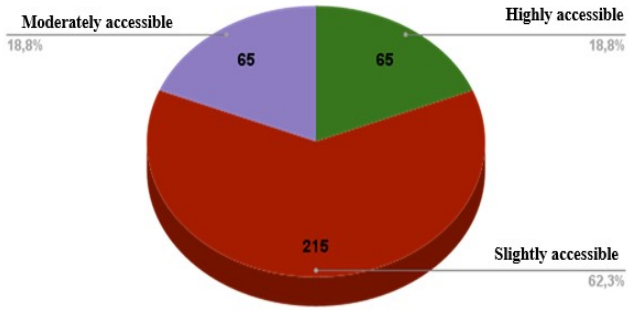
Question 11. Do you believe urban redevelopments improve air quality, help reduce city temperatures, and reduce noise pollution?

Approximately 80.9% of participants recognized the environmental benefits of urban redevelopment, particularly in improving air quality, mitigating urban heat, and reducing noise pollution. No significant differences were found across demographic groups (p = 0.990), indicating wide public recognition of these benefits.



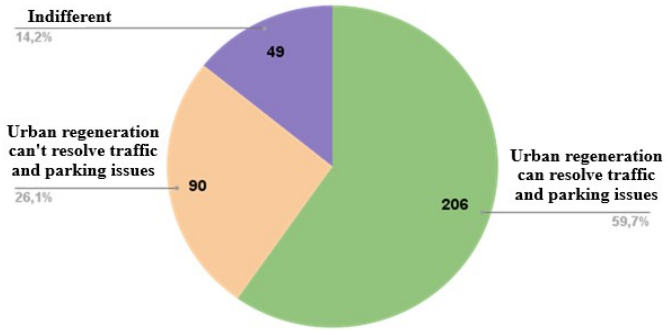
Question 12. How accessible are the redevelopment areas in Piraeus?

Accessibility to redevelopment areas was rated as moderate by 62.3% of respondents, while 18.8% considered them highly accessible, and another 18.8% viewed them as slightly accessible. There were no significant differences across demographic variables ($p = 0.475$). This suggests that although accessibility is generally perceived as adequate, further improvements are necessary to better accommodate vulnerable groups.

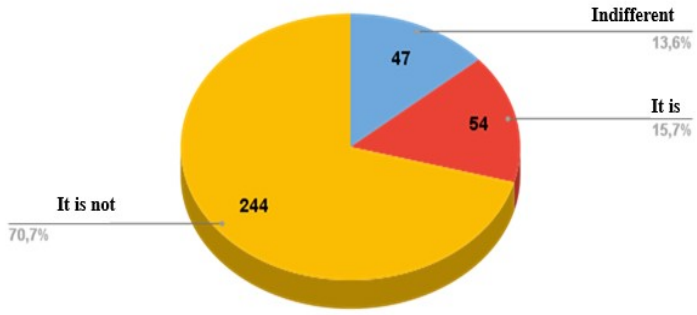


Question 13. Do you think urban redevelopments can provide solutions to traffic and parking problems in Piraeus?

A majority (59.7%) believed urban redevelopment could address traffic and parking challenges in Piraeus, while 26.1% disagreed. No significant differences were observed between residents and non-residents ($p = 0.268$). This reflects public optimism and demand for enhanced urban mobility through thoughtful planning.



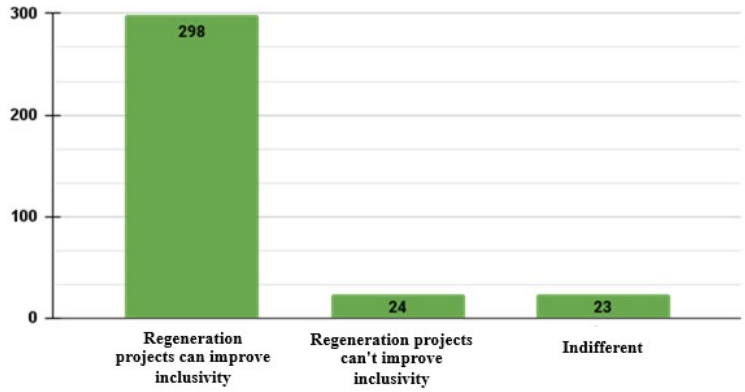
Question 14. Do you think Piraeus is inclusive, safe, and accessible for the most vulnerable social groups, such as people with disabilities, the elderly, women, children, foreigners, pedestrians?



A concerning 70.7% of respondents felt that Piraeus lacks inclusivity, safety, and accessibility for vulnerable groups.

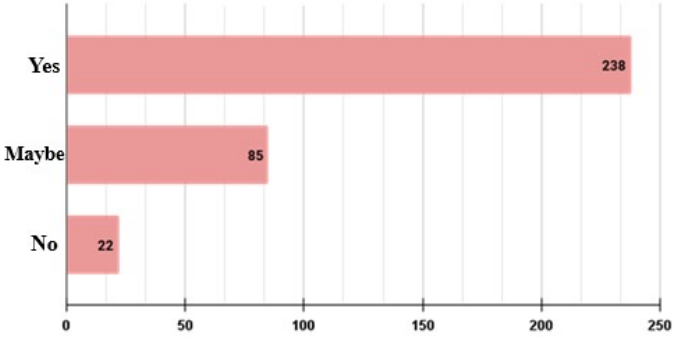
Question 15. Do you think urban redevelopments make a city more inclusive, safe, and accessible?

However, 86.4% believed that urban redevelopment projects have the potential to address these deficiencies. These findings highlight public expectations for regeneration efforts to prioritize inclusivity and accessibility.



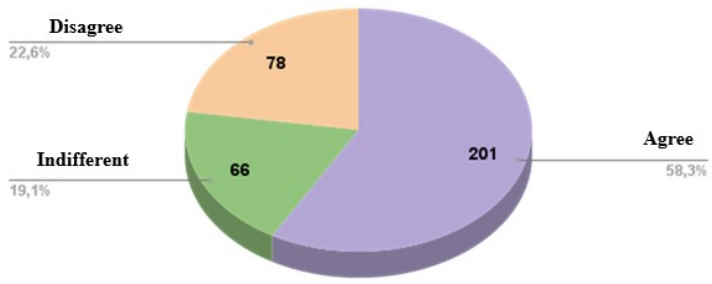
***Question* 16. Do you think urban redevelopments can help reduce and balance Piraeus' pollution footprint, turning it into a sustainable city?**

Approximately 69% of respondents believed that urban redevelopment projects could effectively reduce Piraeus's pollution footprint and transform it into a sustainable city. Positive views were consistent across all demographic groups ($p = 0.950$), emphasizing the critical role of regeneration in achieving environmental sustainability.



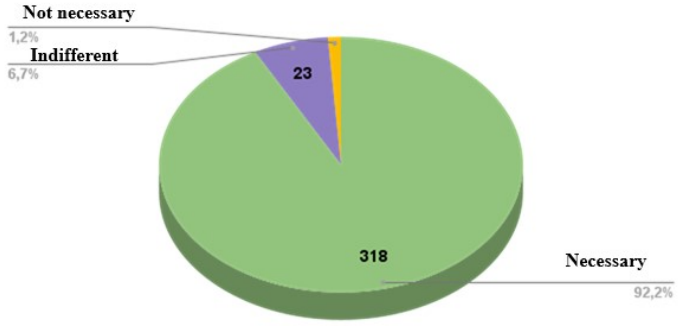
Question 17. Do you think urban redevelopments can make a city like Piraeus socioeconomically resilient, meaning it can anticipate and quickly respond to sudden disturbances and crises caused by economic and social challenges?

About 58.3% of respondents supported the view that urban regeneration can enhance socio-economic resilience. Gender differences in perceptions were statistically significant ($p < 0.05$), suggesting a need for gender-responsive planning strategies to address diverse concerns and priorities.



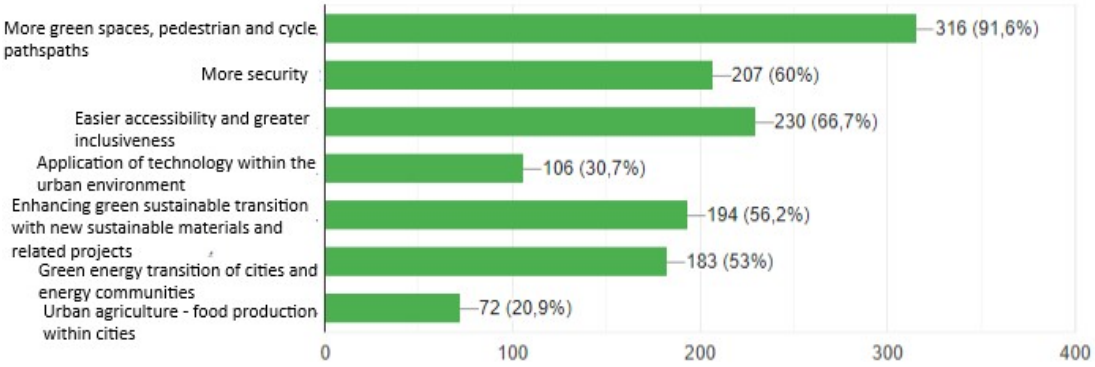
Question 18. Do you think urban redevelopments in Piraeus are necessary?

An overwhelming 92.2% of respondents affirmed the necessity of urban regeneration in Piraeus. Gender-based differences in opinions ($p < 0.05$) further highlight the importance of inclusive planning that considers diverse stakeholder perspectives.



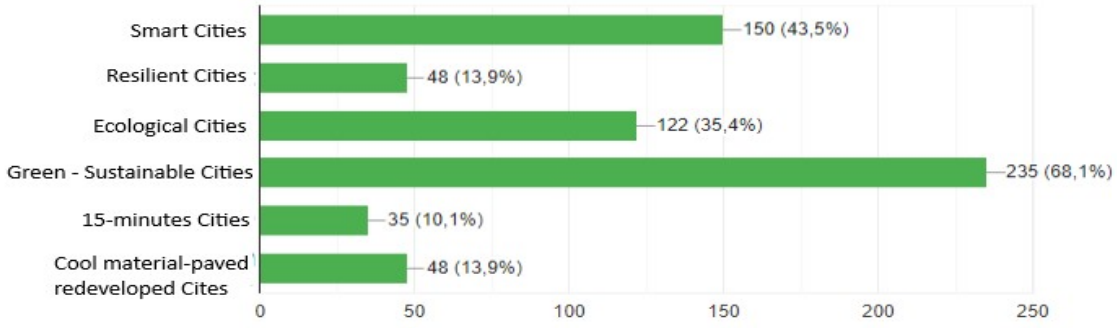
Question 19. What would you want from an urban redevelopment?

Respondents identified increased green spaces, pedestrian paths, and bike lanes as their top priorities (91.6%), followed by improved accessibility (66.7%), sustainable materials (56.2%), and green energy solutions (53%). These preferences demonstrate strong public demand for eco-friendly and inclusive urbandesign.



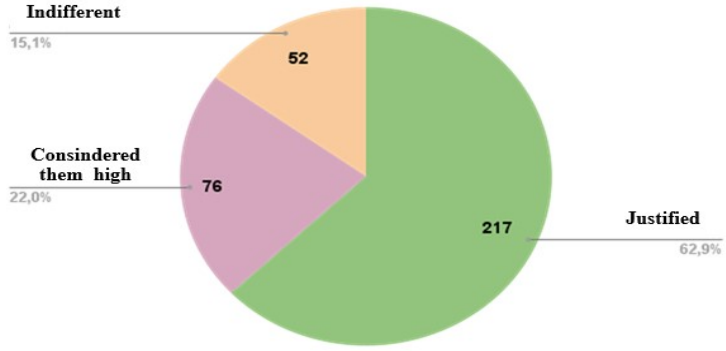
Question 20. What types of redevelopment areas/cities do you like?

Green-sustainable cities emerged as the most preferred model (68.1%), followed by smart cities (43.5%) and ecological cities (35.4%). These preferences reflect growing environmental awareness and a desire for sustainable urban development frameworks.



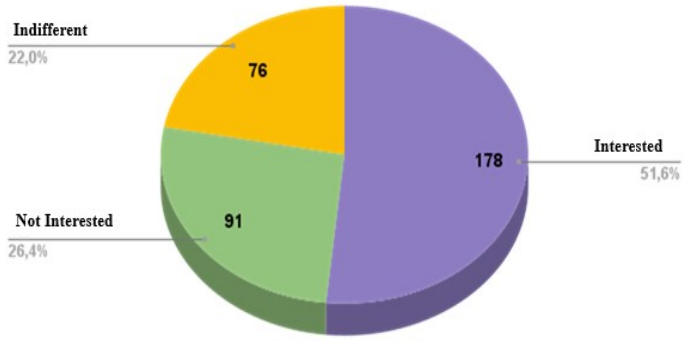
Question 21. Do you think the cost of redevelopments is too high compared to what they offer?

A majority (62.9%) considered the costs of urban redevelopment justified, while 22% perceived them as excessively high. Opinions varied significantly across age groups ($p < 0.05$), indicating generational differences in the perception of cost-effectiveness.



Question22. Would you like to participate in the design of redevelopments?

Approximately 51.6% expressed interest in participating in planning processes for urban redevelopment. No significant demographic differences were observed ($p > 0.05$). These results suggest the potential for increased public engagement, provided that targeted outreach and participatory mechanisms are implemented.



Statistical Observations

The majority of findings indicate no statistically significant differences across demographic variables ($p > 0.05$), suggesting a general consensus among respondents. However, five key variables demonstrated statistically significant differences ($p < 0.05$), reinforcing nuanced perspectives on urban regeneration in Piraeus:

1. Gender and Socioeconomic Resilience: Statistically significant differences ($p = 0.026$) suggest that gender influences perceptions of urban regeneration as a mechanism for socioeconomic resilience. Specifically, 80 male respondents and 120 female respondents expressed agreement that regeneration enhances the city's ability to withstand economic and social disruptions.
2. Gender and Necessity of Regeneration: Perceptions regarding the necessity of urban redevelopment varied significantly by gender ($p = 0.050$). Notably, 144 male respondents and 173 female respondents affirmed the need for regeneration projects, indicating a gender-based discrepancy in prioritization.
3. Age and Cost-Effectiveness of Regeneration: Respondents' assessments of whether urban redevelopment costs outweigh its benefits exhibited statistically significant variation across age groups ($p = 0.027$). Agreement rates varied as follows: 18–25 years:

15, 26–35 years: 13, 36–45 years: 15, 46–55 years: 18, 56–65 years: 14, 66+ years: 1, underscoring generational disparities in perceived fiscal feasibility.

4. Residency and Frequency of Redevelopment Space Utilization: The frequency with which residents and non-residents visited regenerated urban spaces differed markedly ($p < 0.001$). Daily visitation rates were substantially higher among residents (21 daily visitors) compared to non-residents (0 daily visitors), reinforcing the localized impact of redevelopment initiatives.
5. Residency and Perceptions of Inclusivity: Statistically significant differences emerged in respondents' evaluations of Piraeus as an inclusive, accessible, and safe city for vulnerable populations ($p = 0.032$). A higher proportion of non-residents (46 respondents) perceived the city as inclusive compared to residents (8 respondents), highlighting potential disparities in lived experience versus external observation.

Importantly, statistical analyses indicate that educational attainment levels did not yield significant differences in responses across any of the examined variables ($p > 0.05$). This suggests that perceptions of urban resilience, regeneration necessity, cost-effectiveness, redevelopment space utilization, and inclusivity are shaped more profoundly by factors such as gender, age, and residency status than by formal educational background. The findings underscore that sustainability and urban redevelopment are broadly recognized issues across all educational levels, reaffirming the universal relevance of these concerns.

S.W.O.T. Analysis

Category	Strengths	Weaknesses
Environmental	✓ Presence and operation of facilities in Psyttaleia conducting secondary water treatment and disinfection.	✓ Lack of green spaces and biodiversity. ✓ High pollution levels and poor air quality. ✓ Increased water and air pollution from industrial and maritime activities. ✓ Problems with the underground water system due to blocked drains and issues with rainwater absorption. ✓ Poor waste management with limited access to locked brown bins and overflowing green bins posing health risks.
Social	✓ Historical and cultural heritage that attracts tourism.	✓ Social issues like accessibility, social cohesion, and safety, with vulnerable groups facing prejudice. ✓ Low quality of the residential stock.
Economic	✓ Increased investments in the blue economy and improvement of tourist infrastructure. ✓ Strategic location of Piraeus as a major port. ✓ Social and economic activity hub.	✓ Economic issues like unemployment and economic adaptability.
Infrastructural	✓ Recycling initiatives with	✓ Traffic and spatial planning

	various recycling and waste bins.	issues, chaotic traffic network, lack of arterial roads, inadequate signage, and lack of organized parking spaces. ✓ Excessive urbanization with dense building and narrow streets. ✓ Degraded urban infrastructure.
Category	**Opportunities**	**Threats**
Environmental	✓ Implementation of green policies, promoting sustainable development and creating more green spaces. ✓ Investments in renewable energy sources and clean energy technologies. ✓ Awareness campaigns for environmental protection. ✓ Implementation of better waste management practices to reduce pollution.	✓ Climate crisis and worsening environmental conditions. ✓ Continuing pollution from industrial and maritime activities, increasing toxicity and heavy metal content in the aquatic environment. ✓ Further reduction of green spaces and biodiversity.
Social	✓ Awareness campaigns for waste management and reduction. ✓ Social inclusion programs to improve accessibility, social care, and support for vulnerable groups.	✓ Social inequalities and lack of social cohesion, leading to further social exclusion and unrest. ✓ Possible increase in crime due to social and economic problems.
Economic	✓ Development of sustainable tourism programs utilizing historical and cultural heritage to attract investments. ✓ Promotion and support of innovative economic activities to create new jobs. ✓ Implementation of smart city technologies for traffic management	✓ Ongoing economic instability, which may negatively affect development and investments in the area, along with high unemployment levels.
Infrastructural	✓ Improvement of infrastructure and waste collection mechanisms. ✓ Implementation of new sustainable urban planning projects. ✓ Development programs for upgrading the area, renovating and improving existing buildings.	✓ Increase in environmental impacts from vehicles, such as air and noise pollution. ✓ Environmental impacts from further construction. ✓ Continued increase in waste and further environmental impacts from poor management. ✓ Increase in the number of vehicles, exacerbating traffic and parking problems. ✓ Continuous population growth, worsening the lack of residential stock.

Table 1: The Strengths-Weaknesses-Opportunities-Threatens of Piraeus City.

This S.W.O.T. analysis conducted for Piraeus provides a comprehensive overview of its strengths, weaknesses, opportunities, and threats, offering valuable insights for sustainable urban regeneration planning. Piraeus's strategic location, its role as a hub of social and economic activity, and its historical and cultural heritage represent significant assets. Investments in the blue economy, tourism infrastructure, and recycling initiatives further bolster its development potential. However, the analysis reveals critical weaknesses, such as insufficient green spaces, high pollution levels, social and economic disparities, poor waste management, traffic congestion, and degraded urban infrastructure. These challenges, compounded by excessive urbanization, emphasize the need for targeted interventions. Opportunities identified include the implementation of green policies, sustainable tourism programs, renewable energy investments, and smart city technologies, which can foster economic growth, environmental sustainability, and social inclusivity. Nonetheless, threats such as the climate crisis, economic instability, pollution, and social inequalities pose significant risks to Piraeus's development. The analysis highlights the urgent need for coordinated efforts to capitalize on strengths and opportunities while mitigating weaknesses and threats, paving the way for an integrated approach to sustainable urban regeneration in line with global and European standards.

Conclusions

This study underscores the critical role of urban regeneration in addressing the environmental, socio-economic, and accessibility challenges faced by Piraeus, in line with global and European sustainability objectives. Key urban issues include pollution, a deficiency of green spaces, urban degradation, and accessibility deficits for vulnerable groups, exacerbated by urbanization and the climate crisis. Survey findings indicate public recognition of the benefits of regeneration for mental health, social cohesion, and air quality, though only about half of respondents expressed willingness to engage in planning processes. Statistical analyses revealed some significant differences in perceptions based on demographic variables such as gender, age, and socio-economic resilience. Despite its challenges, Piraeus benefits from strategic advantages like its historical and cultural heritage and investments in the blue economy, which present significant opportunities. The study confirms that urban regeneration can enhance sustainability in Piraeus, provided coordinated efforts address existing weaknesses and threats. Further research is recommended to refine and implement these strategies effectively.

The proposed urban regeneration strategies for Piraeus integrate targeted interventions aimed at improving environmental resilience, social inclusivity, and economic sustainability. Pedestrianization of key areas, such as Akti Koumoundourou, is essential for mitigating air and noise pollution while enhancing public safety and fostering neighborhood cohesion. Sustainable urban technologies, including solar-powered pergolas and integrated vegetation zones, contribute to ecological stability, biodiversity preservation, and efficient stormwater management. Accessibility measures, such as tactile pavement tiles and solar-powered parking facilities, address mobility challenges and improve inclusivity for vulnerable groups. Infrastructure upgrades focus on expanding bicycle networks, enhancing drainage systems, and optimizing adaptive reuse of urban spaces to support sustainable mobility and urban resilience. The study's findings demonstrate that well-planned urban regeneration serves as a key mechanism for transforming Piraeus into a more sustainable, livable, and economically dynamic city. By implementing strategic interventions informed by international best practices and emerging urban sustainability principles, Piraeus can establish itself as a model of resilience, fostering environmental integrity, social equity, and economic prosperity for residents and visitors alike.

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