THE 'ELLINIKON' RENOVATION PROJECT: BALANCING ECONOMIC DEVELOPMENT AND SOCIAL EQUITY IN ATHENS

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Abstract
While the economic and environmental performance of construction projects has been extensively studied, their social performance—a critical dimension of sustainable development and project success—has received comparatively less attention. In Greece, the social dimension of urban development projects has historically been undervalued compared to their economic and environmental impacts. This study examines Athenian citizens' perceptions of the social impacts of the Ellinikon urban development project. Social Impact Assessment (SIA) is essential for enabling planners, project promoters, affected communities, and policymakers to anticipate and evaluate the social consequences of proposed developments. To ensure comprehensive data collection, a questionnaire comprising 49 items was distributed to approximately 2,500 residents across various municipalities in the Athens metropolitan area.

The findings highlight the crucial role of public perceptions of the social performance of construction projects in shaping public approval and project success. Participants expressed significant concerns regarding the social impact of the Ellinikon project, optimism about its potential economic benefits, and skepticism regarding the equitable distribution of its effects. Particular emphasis was placed on perceptions of fairness in the allocation of benefits and burdens among different community groups, disparities in access to project resources, and the extent of participatory community engagement in the planning process. Furthermore, the results contribute to broader research on urban "vulnerability" to crises, such as the COVID-19 pandemic, and the assessment of the social impacts of large-scale urban redevelopment projects. This study underscores the importance of sustainably managing open urban spaces and ensuring equitable access to these resources as fundamental components of providing resilient and inclusive urban development.

Keywords: *urban renovation projects; social sustainability; social impacts; impact assessment; Ellinikon urban project; Athens*

1. Introduction

Achieving sustainable urban development is a primary objective of European urban policy (Martinelli, 2024; Salama et al., 2024). The implementation of urban regeneration projects in degraded areas of urban centres' can significantly contribute to their sustainable renewal, as urban regeneration is inherently linked to development and progress. According to the International Union for Conservation (IUCN, 1991), sustainable development ensures the improvement of the quality of human life while fully respecting the carrying capacity of ecosystems. However, misinterpretations of this definition have led to the assumption that any development intervention in urban areas necessarily results in improved quality of life for urban populations. Consequently, the social dimension of sustainable development has received less attention compared to its environmental aspects (Anselmi et al., 2024; Sharifi et al., 2024).

To attain a more balanced approach to the various dimensions of development, European development strategies formulated since 2014 have adopted a more holistic and integrated approach to the concept of urban regeneration. As a result, physical regeneration measures are now combined with initiatives that promote education, economic development, social inclusion, and environmental protection. The successful implementation of these strategies requires strong partnerships involving residents, civil society, the local economy, and multiple levels of governance. Urban regeneration is no longer confined to the preservation and restoration of historic sites and infrastructure, architectural interventions in heritage buildings, or the introduction of new uses and functions. Instead, European policies now emphasize a holistic approach to addressing the economic, social, and environmental challenges facing degraded urban areas (European Commission, 2014; Shamaee et al., 2024).

Developing new methodological tools for assessing the sustainability of urban regeneration projects—particularly those that emphasize the social dimension of development—is imperative in contemporary urban planning. The social dimension of development is inherently multidimensional, encompassing subjective factors that make its measurement and assessment complex (Isgren et al., 2024). Specifically, it involves a range of social values influenced by multiple stakeholders, including investors, developers, public and private property owners, civil society, local communities, and public opinion. This complexity underscores the need for multidisciplinary approaches and assessment tools that integrate diverse perspectives and social values into decision-making processes.

This study aimed to:

A) Identify and assess the social impacts of the large-scale urban regeneration project at the former Ellinikon airport. The research records the perceptions of citizens living and working in Elliniko and neighbouring municipalities, as well as residents of other municipalities within the Attica region, regarding the potential social impacts of the redevelopment. Specifically, the study examines how this project may affect residents' health and social well-being, the quality of the residential environment, economic conditions, social welfare, and family and community dynamics.

B) Highlight the need for an appropriate framework for assessing the social impacts of major urban interventions and evaluating their social acceptance.

The paper is structured as follows: Section 2 explores the relationship between urban regeneration projects and social sustainability, while Section 3 examines their social impacts. Section 4 presents the Social Impact Assessment (SIA) methodology and summarizes its key characteristics. Section 5 introduces the case study, followed by Section 6, which outlines the

research methodology. Section 7 focuses on data analysis and interpretation, and finally, Section 8 provides concluding remarks and discusses future research directions.

2. Urban regeneration projects and social sustainability

Urban regeneration projects play a crucial role in advancing sustainability, with Sustainable Urban Development (SUD) remaining a key policy objective for many nations (Abbas, 2015). The construction sector, in particular, significantly influences the sustainability of development (Xiahou et al., 2018; Jaradat et al., 2024). Social sustainability, a fundamental aspect of urban regeneration, is shaped by interventions that address both physical and psychological human needs (Irfan et al., 2024). Physical needs can be met through the realization of "hard infrastructure", which ensures greater accessibility, adequate water resources, a high sense of safety and security, better education services and more employment opportunities. Conversely, psychological needs are supported by "soft infrastructure," which strengthens community engagement, preserves cultural heritage and identity —like heritage conservation programs and local museums—facilitates social interactions, and elevates social capital (Hollis et al., 2023; Komak et al., 2023; Baporikar, 2024).

For an urban regeneration project to contribute effectively to social sustainability, it must be designed with inclusivity in mind, ensuring accessibility for vulnerable groups such as people with disabilities, the elderly, and children. Careful planning is essential to create functional, well-maintained, and user-friendly spaces that accommodate all community members. Throughout the lifecycle of construction projects, economic, environmental, and social impacts profoundly affect local communities (Kustova et al., 2024). Compared to economic and environmental factors, social impacts are often less tangible and more challenging to quantify (Sha et al., 2024; Vijayakumar et al., 2024). Briefly, these impacts influence residents' lifestyles, employment conditions, social interactions, community relationships, and overall well-being (Wang et al., 2016; Hussain et al., 2024). Urban regeneration projects can lead to both positive and negative social outcomes—such as improved public spaces and economic growth or displacement and social inequality—depending on their scale, intensity, and level of community engagement (Rohman et al., 2024).

For instance, in some cases, urban development projects may trigger social conflicts, particularly if they are not managed effectively (Halder et al., 2024). In regions with lower economic development, investment in construction does not always translate into increased employment opportunities, skill development, or positive economic impacts. Instead, such projects may exacerbate social inequalities and intensify tensions within local communities (Iroha et al., 2024). Recent studies suggest that urban development initiatives lacking participatory planning and equitable benefit distribution are more likely to deepen social disparities and undermine long-term sustainability (Arar et al., 2024; Wang et al., 2024). Therefore, integrating social impact assessment and management into the planning and implementation of urban regeneration projects is essential to promoting inclusive and sustainable urban development.

3. Social impact of urban regeneration projects

Urban regeneration projects often generate significant social impacts, making Social Impact Assessment (SIA) a critical prerequisite for their implementation. The primary objective of SIA is to minimize potential negative consequences while maximizing positive outcomes for the affected communities. Positive social impacts may include poverty reduction, strengthened community relationships, the promotion of gender equality, improved health and well-being, and the adoption of environmentally sustainable practices (Bartoll-Roca et al.,

2024; Samolej et al., 2024; Shen et al., 2024). However, it is equally important to assess these impacts immediately after project completion and throughout its operational phase to ensure the continued relevance and benefits of the intervention.

Achieving meaningful social progress necessitates profound structural changes rather than superficial solutions (Isgren et al., 2024). In the context of urban regeneration, this requires innovative approaches that address fundamental societal challenges rather than merely alleviating surface-level symptoms. A well-planned redevelopment should prioritize meeting specific social needs, ensuring that projects serve as long-term solutions rather than temporary interventions (Orieno et al., 2024). To mitigate potential adverse social impacts, Social Impact Assessment (SIA) has been widely employed at various stages of the project life cycle (Maharana, 2024; Vijayakumar et al., 2024). The International Association for Impact Assessment (IAIA) defines SIA as a process of analyzing, monitoring, and managing both the anticipated and unanticipated social consequences—whether positive or negative—of planned interventions, including policies, programs, and development projects. Additionally, SIA examines the broader social changes induced by such interventions (IAIA, 2018). One of the key challenges in managing social impacts within construction projects is navigating the intersection of technical risks and social structures, as well as addressing the lack of public engagement in decision-making processes.

The social acceptance of urban design interventions—whether large-scale projects that significantly transform the urban environment or smaller-scale initiatives—is closely linked to their positive spatial, socio-economic, and environmental impacts, as well as to the way these transformations evolve over time. Equally crucial is the relationship between social acceptability and the degree of co-design in such interventions, particularly the involvement of local communities and civil society in the planning and implementation processes. Social acceptability plays a key role in the success of urban interventions, as it directly influences how redeveloped spaces are used and integrated into daily life.

Although social analysis has become an essential component of integrated urban regeneration planning, further methodological advancements are necessary to deepen this analysis, as Social Impact Assessment (SIA) is inherently complex. Unlike environmental impact assessments, which focus on quantifiable biophysical changes, SIA evaluates the broader societal implications of a project, encompassing a multitude of variables related to human lifestyles, social dynamics, and community well-being. The failure to anticipate and address potential risks—including social impacts—is a key driver of social conflict. Such challenges, however, can be mitigated through rigorous social impact assessments, which enable planners and policymakers to identify potential sources of discontent and incorporate strategies that promote community engagement, equity, and long-term social cohesion. The emergence of social conflict and unrest is often closely linked to the underestimation of societal challenges and the failure to address social concerns proactively. As noted by Larsen et al. (2015) and Leonardi (2024), the escalation of complex social issues frequently triggers public resistance and opposition to development interventions. If inclusive and participatory planning mechanisms are not established prior to the implementation of an urban regeneration project, the likelihood of intense conflicts among stakeholders increases (Halder et al., 2024).

In Greece, the social dimension of urban regeneration projects has historically been underestimated or even overlooked in official spatial planning, with greater emphasis placed on the economic and environmental aspects. The existing legal framework does not mandate social impact assessments before, during, or after the implementation of urban interventions. While participatory planning is theoretically included in the urban planning framework, it has not been effectively implemented in practice. The absence of a culture of governance and participation in urban planning processes has hindered the realization of provisions aimed at advancing participatory approaches (e.g., the Neighborhood Planning Committees under Law

1337/83). Despite the ongoing discourse on the necessity of coordinating urban interventions over recent decades, even the most recent spatial and urban planning reforms (Law 4269/2014) fail to incorporate participatory planning processes. The redevelopment projects in Elliniko area serve as a typical example, where issues such as the proposed construction of skyscrapers and casinos have sparked concerns and become subjects of debate—issues that this paper aims to explore. In such cases, social impact measurement tools could prove invaluable in assessing and addressing the potential implications of these projects on local communities.

4. Social impact assessment of urban regeneration projects

According to the International Association for Impact Assessment (IAIA), Social Impact Assessment (SIA) is defined as "the process of identifying the future consequences of a current or proposed action that affect individuals, institutions, organizations, and social macro-systems." SIA refers to the "processes of analysing, monitoring, and managing the intended and unintended social impacts, both positive and negative, of development projects" (Chan et al., 2016; Bachnik et al., 2024). Urban planners have adopted SIA to evaluate the socio-economic impacts of development projects on communities. This process helps capture the perceptions of all stakeholders and promotes social justice. Stakeholders can be categorized into two broad groups: the first group consists of active stakeholders, such as operators and producers, while the second group includes passive actors, such as consumers who use goods and services (Dell' Anna and Dell' Ovo, 2022).

Anticipating the social problems that may arise during the design phase of a project is often the most challenging aspect, as these issues frequently surface only after the work has been completed. Developing scenarios and alternative strategies is a key element of the strategic planning process to mitigate potential negative consequences. For example, it is important to note that continuous monitoring of statistical data and forecasts is essential throughout the project's duration. Corporate Social Responsibility (CSR) should not cease upon the completion of the project but must extend to account for the future impact, addressing any unpredictable factors that may arise later. A significant body of evidence suggests that urban regeneration projects have a limited chance of success if they disregard or contradict the local traditions, values, and social structures of the area in which they are implemented (Jokar et al., 2024). Similarly, projects that set overly ambitious goals or fail to address the everyday concerns and needs of citizens are likely to struggle (Amati et al., 2024; Janssen et al., 2024). While social analysis has become an integral part of urban regeneration planning, further development of appropriate techniques is essential, as SIA involves assessing a much broader range of variables, making it a highly dynamic and multidimensional task.

A particularly informative example of the use of Social Impact Assessment (SIA) is found in Nigeria through several studies conducted over the years (Akpofure and Ojile, 2002; Nzeadibe et al., 2015; Ukhurebo et al., 2023; Ogbu et al., 2024), which illustrate the process of reconciling the various parties involved. In the economically distressed Niger Delta region, two oil and gas extraction projects were planned in Bayelsa State, alongside a third case study focusing on the rehabilitation and strengthening of buildings in seismic zones. The project timeline coincided with a period of severe communal conflict, necessitating the presence of armed personnel to safeguard the projects and surrounding areas. The process of gathering socio-economic data proved challenging, as external researchers struggled to gain the trust of the local community, which ultimately favoured the construction companies. Rather than collecting information directly from residents, communication was channelled through local community delegations. These delegations received the data but were not provided with further explanations or opportunities for interactive presentations regarding the projects.

Consultants from the companies were advised to avoid direct contact with the communities and refrain from engaging in discussions with local residents, further limiting the effectiveness of the engagement process.

Awareness of the challenges posed by geographical characteristics, insufficient information, and the heightened sensitivity of local populations—stemming from feelings of neglect and abandonment—led to the development of strategies that used existing knowledge and experience to ease tensions and reach a compromise. Following the completion of the social impact assessments, project developers have recognized that a well-executed SIA process can serve as a powerful tool for preparing local populations for the impacts of development projects. The SIA process, as applied and documented in the case of the Niger Delta projects, includes the following steps:

- A team consisting of a company representative, site manager (CLO), the EIA team leader, and an SIA consultant conducts a comprehensive mapping of the project area.
- The various tribes or communities involved are identified, including elders, chiefs, youth, and women. These groups are then invited to scheduled meetings with stakeholders from all sides.
- In order to provide a positive atmosphere, local food is offered during the meeting, facilitating an environment of mutual respect and cultural understanding.
- At the meeting, community representatives are informed about the proposed project and the studies carried out, with all necessary legal support provided. The SIA consultant serves as the liaison between the community and stakeholders, while a community consultant is available to interpret and clarify any points raised.
- A cooperative and friendly atmosphere is emphasized throughout the meeting to ensure effective communication and collaboration.
- Intractable issues such as the number of employees to be hired, salaries, and other labor-related concerns are addressed. This stage is crucial for both sides to converge and reach agreements, with the use of videos and interactive materials for documentation and clarity.
- Once permission is granted by the community, the SIA process moves to the second stage, which involves gathering further data through interviews and questionnaires. Key informants—community members with significant knowledge of local affairs—are selected first.
- Questionnaire surveys are the final step, conducted in communities that are more accessible. However, in communities that are difficult to reach or where there is mistrust of staff, the process can be challenging. Low education levels in certain regions, such as Niger, further complicate the process. Despite these challenges, personal responses provide valuable insights into local attitudes and perspectives regarding the proposed projects, and these responses should be collected carefully.

Finally, the sequential findings underscore that effective socio-economic data collection and impact prediction can be accomplished through a combination of interactive and participatory activities. Examining the current framework for assessing environmental impacts in urban regeneration projects reveals that the outcomes could be significantly improved through the implementation of a comprehensive social analysis. This analysis should prioritize understanding the characteristics of the local population and ensure their active participation in the study process. In conclusion, the application of Social Impact Assessment (SIA) tools not only facilitates the resolution of discrepancies between stakeholders but also strengthens the environmental dimension of the project, thereby strengthening its unity and acceptance within society.

5. An empirical study

The redevelopment project of the former Ellinikon Airport stands as a landmark construction initiative in Greece, representing a significant urban regeneration effort aimed at transforming the Ellinikon seafront into a prominent hub for commercial and residential activities (The Ellinikon, 2022; Integrated Development Plan - Hellenikon, 2018; Approved Urban Planning Studies - Hellenikon, 2019).

For over six decades, the Ellinikon International Airport was the largest in Greece, located in the area of Ellinikon, to the south of Athens. Despite undergoing expansion work, it became increasingly evident by 1976 that the airport could no longer serve as the capital's primary airport. Following its replacement by the "Eleftherios Venizelos" Airport, Ellinikon International Airport ceased operations in 2001. Since then, various development proposals have been put forward, and, in the context of the 2004 Olympic Games, the site was repurposed as an Olympic Park (Hellinikon Olympic Complex), featuring numerous stadiums that supported the sporting events. Simultaneously, the site housed various services, including the National Meteorological Service (E.M.Y.), the tram depot, and civil aviation facilities. However, its post-Olympic use remained uncertain, and the redevelopment plans eventually envisioned a combination of a metropolitan park and a cutting-edge urban area. In 2014, the Hellenic Republic Asset Development Fund (HRADF) selected Lamda Development as the investor responsible for overseeing the comprehensive planning and development of the site. According to Lamda Development's official website, the project involves the creation of a Metropolitan Park of international significance, spanning a total area of 2,000,000 square meters.

The project aims to serve as a model for urban development, blending the region's natural beauty and distinctive features with landmark buildings of exceptional architectural design. The sustainable design approach to the project aims to provide world-class services and infrastructure, thereby improving the quality of life for the citizens of Attica. The investment includes extensive residential developments, hotels, commercial units, family-friendly areas, entertainment and cultural centres', museums, health and wellness facilities, sports complexes, and recreational spaces. It also envisions a state-of-the-art business park dedicated to education, research, and entrepreneurship. Additionally, the project plans to fully develop the existing marina and upgrade and promote the entire coastal front, which, alongside the metropolitan park, will form the project's primary attraction.

The available information regarding the social and environmental impact study is provided by the company itself. The Environmental and Social Study (ESDD) was conducted by the European Bank for Reconstruction and Development (EBRD) with the assistance of a consultant. The study included a site visit, discussions with the company, a review of the completed environmental and social questionnaire (ESDD Questionnaire), as well as the Social and Environmental Impact Assessment (SEIA) and Environmental Impact Assessment (EIA). The project in question was "Certified as Category B (No significant impact on the environment) based on the ESP 2014," and it was demonstrated that any environmental and social (E&S) impacts affect the project exclusively and/or are easily identified and addressed with effective mitigation measures. Also, an Environmental and Social Action Plan (ESAP) will be implemented for the project. Additionally, an Environmental Impact Assessment (EIA) study was developed, covering the demolition of existing buildings, site infrastructure, and parks, which was approved in the second quarter of 2019. These studies assessed the impacts and included mitigation measures related to human health, flora, fauna, biodiversity, soil, water, air, climate, and cultural heritage.

The potential for pollution associated with the former airport or the demolition of existing facilities was not assessed as a significant issue in the Social and Environmental

Impact Assessment (SEIA) or Environmental Impact Assessment (EIA). Any potential pollution will be considered on a project-by-project basis, with mitigation measures implemented to address any issues that may arise. Noise, dust, vibration, construction waste, hazardous substances, and traffic impacts related to construction will be addressed in the Environmental and Social Due Diligence (ESDD) of each individual project, as well as in any project-specific Environmental and Social Management System (ESMS). On-site monitoring of air, water, and noise during construction is anticipated as part of the project's Environmental and Social Action Plan (ESAP). No ecologically sensitive areas are present in the region, and impacts on biodiversity are expected to be limited. Three churches, an archaeological site, and several listed buildings are located within the development site boundaries, with their restoration and protection included in the general development plan. The Archaeological Authority of Greece will oversee construction on-site, and both the company and contractors will be required to develop a chance finds process as part of the project's ESAP. The Environmental and Social Action Plan (ESAP) focuses on conducting a thorough environmental and social assessment of individual projects, as well as developing and implementing appropriate policies, plans, systems, and capabilities to manage the environmental, health, safety, and social (EHSS) aspects of the project. The client will also be required to comply with the European Bank for Reconstruction and Development's (EBRD) Performance Requirements (PRs) and submit an Annual Environmental and Social Report. This information is extracted directly from the report prepared by the European Investment Bank and the European Bank for Reconstruction and Development (EBRD), as it is crucial for understanding every aspect of the project's environmental and social implications.

However, a notable limitation in the report is the imbalance in addressing environmental versus social concerns. While the environmental aspects are comprehensively covered, the social dimension is only briefly mentioned at the end of the report in reference to the annual Social Report following project completion. This oversight raises significant concerns, as the lack of a robust Corporate Social Responsibility (CSR) framework could lead to negative long-term effects once the construction phase is completed, especially in terms of the social implications for the local community.

From the outset, the implementation of the project has been met with enthusiasm by those who see the potential economic benefits it could bring. However, there has also been significant concern from residents of Attica regarding the availability, accessibility, and use of public open spaces, which is a critical issue for local communities. The proper integration of these spaces into the development is essential for ensuring that the benefits of the project are felt broadly across the population and that it does not exacerbate social inequalities or reduce the quality of life for local residents. According to Greek legislation, public spaces encompass various areas such as roads, parks, squares, wooded areas (or groves), and any other open spaces designated for communal use. These spaces are determined by the approved urban plan or have been allocated for common use through other legal means (Mitoula and Economou, 2020). In the urban region of Attica, particularly, free public spaces occupy a very limited area. Several factors contribute to this scarcity, including natural, historical, and social influences. However, the most significant reason is that many of the free public spaces that do exist arose inadvertently—often as surplus areas from urban reconstruction efforts rather than through deliberate urban planning or traffic management. The COVID-19 pandemic has highlighted the critical importance of quality outdoor public spaces in urban areas, particularly in Attica. According to Mitoula and Economou (2020), the pandemic underscored the value of free public spaces, as they provided a safe refuge for large segments of the population during times when access to natural environments within the city became essential for public health and well-being. These spaces serve as crucial areas for physical activity,

mental health, and social interaction, especially in urban environments with limited access to nature.

6. Methodology

The interaction between the built environment and its surrounding ecosystem—both physical and social—must be carefully considered when planning reuse activities. The influence of the building stock on the environment is reciprocal, with the surrounding environment exerting a portion of its prior impact on new constructions. A particularly complex case of built environment reuse involves the redevelopment of former airports. These large-scale redevelopment projects necessitate comprehensive environmental and social impact assessments, which require substantial resources for the collection of essential documentation and measured data.

This study presents a methodology for conducting social impact assessments (SIA) for the redevelopment projects at former Greek airports. While specifically developed and applied to the case of the former Ellinikon Airport in Athens, the methodology is adaptable for use in other large-area redevelopment projects. The goal of this approach is to ensure that both social and environmental considerations are integrated into the redevelopment process, promoting more sustainable and socially responsible urban regeneration. The primary aim of this paper is to estimate Athenian citizens' perception of the social impact of the Ellinikon urban development project. Social Impact Assessment (SIA) plays a crucial role in helping planners, project promoters, the impacted population, and decision-makers evaluate and predict the potential social effects—both positive and negative—on human populations and communities affected by proposed developments. Due to the multifaceted nature of social impacts, the scope of the inquiry extended to various municipalities in the Athens periphery, enabling a more detailed and comprehensive interpretation of the data collected.

A questionnaire, consisting of 49 items, was administered to approximately 2,500 citizens in these areas. The questionnaire focused on social aspects such as safety, health, social impacts, and social conflicts. It was based on SIA and EIA (Environmental Impact Assessment) studies, along with a revised list of indicative social impacts based on Frank Vanclay’s framework (2002) and other studies (Burdett, 2024), adapted to the specific national and local context. The redevelopment of the former Ellinikon airport is an emblematic construction project in Greece, aiming to transform the area into a significant urban hub (The Ellinikon, 2022; Integrated Development Plan - Hellenikon, 2018; Approved Urban Planning Studies – Hellenikon, 2019). Assessing the social impact of large-scale projects, such as those involving former airports, is a complex undertaking that requires a comprehensive methodological approach. This approach must facilitate a representative analysis of the current social conditions, identify prevailing social burdens, and examine mechanisms of social evolution. This process combines newly acquired data with existing information, ensuring that the methodology is both effective and accurate.

7. Data analysis

In order to analyse the social impact of the Ellinikon redevelopment project, we utilized a survey consisting of 56 questions, which we refer to as the "Social Universe." This questionnaire was designed based on Social Impact Assessment (SIA) and Environmental Impact Assessment (EIA) studies. Out of the 56 questions, 37 are directly related to social impact, while the remaining questions address economic and other dimensions. To facilitate analysis, we constructed a "Market Index," which is the equal-weighted summation of all questions. Additionally, we developed two key subindices: the first subindex includes only

the equal-weighted summation of the "social impact" questions, while the second subindex aggregates the rest of the questions. Our survey includes a complete set of qualitative variables, such as age, gender, educational level, occupation, and place of residence. Data was collected randomly across all major municipalities, with the assumption that individual responses are cross-sectionally uncorrelated—meaning that each individual's answers are independent of others' responses.

Based on the mean and standard deviation of responses to each question, we found that there was no significant difference in results when comparing responses from the neighbouring municipalities of Ellinikon to those from all municipalities combined. This suggests that the opinions of citizens from neighbouring municipalities have a strong influence on the overall results, and aggregating the opinions from the more distant municipalities does not significantly alter the outcome. As a result, we focused our analysis on the municipalities closest to Ellinikon, as their views provide a more accurate representation of the local social impact. We categorize the answers from 1 to 5 considering the 1 as the less satisfying answer and the 5 as the strongest satisfying answer. The scale may be different if we have a no/yes claims which is from 1 to 2.

In Figure 1, we present some descriptive results based on gender and educational level of each participant. To analyse the distribution of responses, we take the 30th and 70th percentiles for each question. We then categorize how many men and women fall below the 30th percentile and how many fall above the 70th percentile. The same process is applied for individuals with higher and lower educational levels. This method provides a descriptive view of the "extreme" responses, allowing us to observe the dispersion in how more and less educated people, as well as men and women, responded to the questions.

From the results, we observe that, on average, women and individuals with lower educational levels tend to provide the most extreme answers—both those below the 30th percentile and those above the 70th percentile. This indicates that these groups are more likely to express stronger opinions, either in favour or against the development. One notable finding is that the question concerning increasing residential prices has the highest mean response, suggesting that this is a particularly concerning or impactful issue for respondents. Conversely, the question with the largest standard deviation refers to ethics and religion changes in the Ellinikon area, indicating a wider divergence in opinions on this topic.

Figure 1 Cross-sectional Regression Analysis (means, betas, alphas, and t-statistics of alphas for each question).

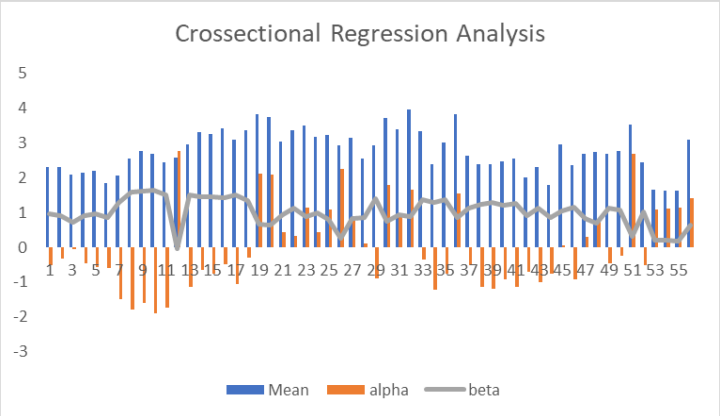

Figure 1 presents the means, betas, alphas, and the t-statistic of alphas across the different questions.

As the next step in our analysis, we conduct Ordinary Least Squares (OLS) regressions for each question and the Market Index, applying a market model approach. In these regressions, we compute two key values: alpha and beta.

Beta (β) represents the systemic changes in the responses to each individual question based on the changes in the Market Index. Essentially, the beta coefficient indicates how the response to each question correlates with the overall trends captured by the Market Index.

Alpha (α) represents the extra mean of each question after accounting for its systemic relationship with the Index. It reflects the additional effect of the question that is not explained by its exposure to the Market Index. A positive alpha would suggest that the question has a larger positive mean beyond the overall trends captured by the Market Index, while a negative alpha indicates that, after adjusting for exposure to the Index, the question's response has a negative mean. If a question has a zero alpha, this suggests that the question's response is entirely driven by its exposure to the Market Index. In this case, the question does not add any unique information beyond what is already explained by the general Market Index, meaning that it is fully aligned with the systemic trends observed in the Index.

Figure 2 Overview of key findings, including means, betas, and alphas for each question.

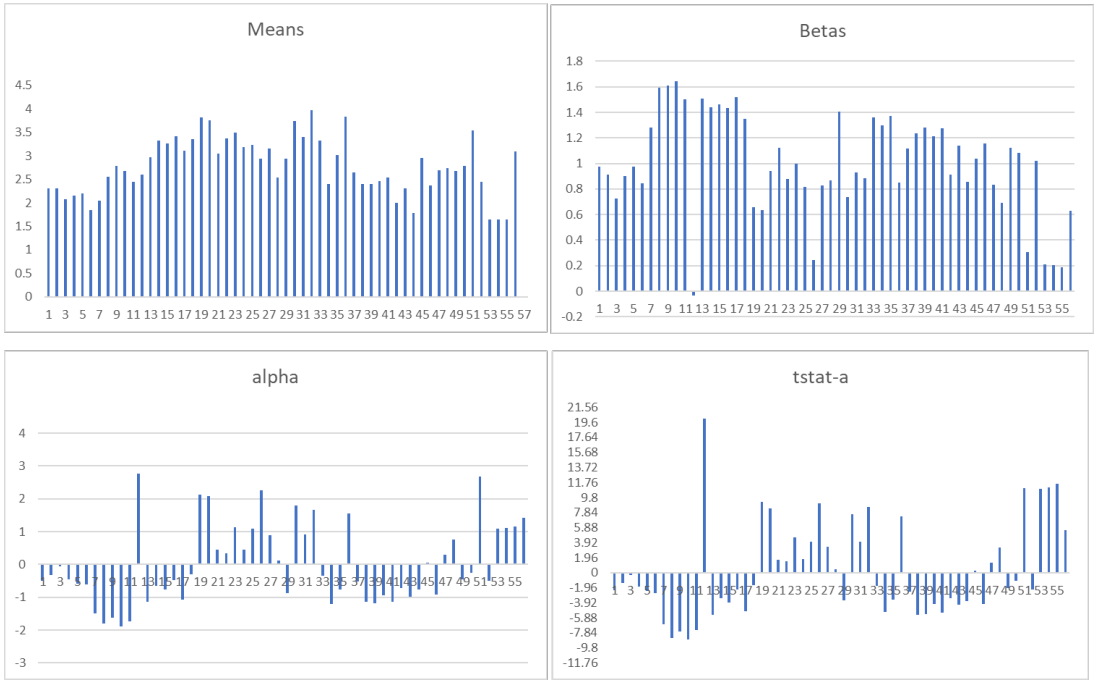

Figure 2 provides an overview of the key findings

In the figure presented, we observe the means, betas, and alphas for each question, providing insight into the social impact of the Ellinikon redevelopment project. As the mean of a question increases, it is typically accompanied by an increase in either beta or alpha. This indicates that questions with higher means tend to align with broader systemic trends (captured by beta) or provide additional unique insights (captured by alpha). In cases where the mean of a question increases without a corresponding increase in beta, the alpha of the question increases. This suggests that the impact of the question cannot be explained by the Market Index. In such cases, the alpha component captures the unique impact not accounted for by the broader trends of the Market Index. For example, the 12th question, which concerns the initial impression of the announcement about the regeneration of the Ellinikon area, cannot be explained by the Market Index, and its impact is captured in the alpha component,

reflecting insights unique to this question. Based on the t-statistics of each question, we conclude that 46 questions have statistically significant alpha values. Among these, 26 questions belong to the social universe, while 18 come from other categories, such as economic or environmental factors.

Furthermore, we conducted two regressions to examine the relationship between the two subindices and the Market Index. Our objective was to determine whether the social impact of the general project has a negative effect when adjusted for the Market Index. To do this, we equally weighted the questions related to social impact and created a "social" subindex. Similarly, we equally weighted all other questions, excluding those related to social impact, and formed a "rest" subindex. The results revealed that the "social" subindex exhibited statistically significant values for both alpha and beta. This indicates that social impact has a distinct and significant effect, which is both systemic (as captured by beta) and independent (as captured by alpha). In contrast, the "rest" subindex showed positive values for both alpha and beta, suggesting that non-social aspects of the project have a generally positive impact. Ultimately, these findings suggest that, when adjusting for the broader Market Index, the social impact of the Ellinikon redevelopment project is negative. This implies that, while other aspects of the project may be perceived positively, the social dimensions, when considered independently, may have a less favourable impact on the community.

8. Conclusions

Overall, our findings underscore the critical role of citizens' perceptions regarding the social performance—whether positive or negative—of construction projects, as these perceptions significantly influence public approval and the successful implementation of such developments. Notably, the results highlight profound concerns among participants regarding the social impact of the Ellinikon urban development project. These concerns varied depending on factors such as educational level, gender, and other demographic variables. While respondents expressed optimism about the anticipated positive economic effects of the project—not only for the neighboring municipalities but also for the broader Athens metropolitan area—they simultaneously exhibited considerable skepticism regarding the equitable distribution of these benefits. Specifically, participants raised concerns about fairness in the allocation of both positive and adverse impacts across different community groups and disparities in access to project-related resources. Moreover, respondents emphasized the perceived lack of participatory community engagement in the planning and decision-making processes of the Ellinikon redevelopment, highlighting the need for more inclusive and transparent governance mechanisms. Although the majority of participants initially express a positive outlook on the proposed regeneration project, their optimism becomes more measured when asked to evaluate specific aspects, such as job creation and the project's contribution to strengthening social structures.

More specifically, participants responded favourably to aspects of the project related to urban regeneration, the expansion of entertainment options, the development of high-quality residential infrastructure, the improvement of public safety, and the improvement of natural infrastructure. However, a notable discrepancy emerges in the economic expectations of the respondents. While 63% agree that the project will contribute to the economic revitalization of the area, only 27% anticipate an increase in family incomes as a direct outcome. Regarding potential demographic shifts in the area, opinions are evenly divided, with 50% of participants expressing concern over possible changes, while the remaining 50% consider such changes unlikely. Additionally, the majority of respondents do not foresee significant opposition or disruptions to the traditional structure of the Greek family as a result of the project. Gender plays a significant role in shaping attitudes toward the social impact of the project.

Specifically, men tend to express scepticism regarding most of the anticipated benefits, whereas women are more concerned with household financial implications and hold greater hope for potential economic improvements resulting from the intervention. Additionally, women place particular emphasis on preserving the cultural value of the area. Educational background also influences perceptions of the project. Individuals with postgraduate degrees generally evaluate the redevelopment positively, while those with lower educational attainment, such as a high school diploma, exhibit greater caution and scepticism.

Furthermore, age is a critical factor in shaping opinions. Older participants express concerns regarding accessibility, particularly the ease of movement for the elderly and their unrestricted access to public spaces. A significant issue emerging from the study is the widespread distrust among participants regarding the transparency of the project's planning and awarding processes. Concerns extend to the overall assessment of positive versus negative impacts and the fairness of their distribution among different social groups.

A considerable portion of respondents indicated a lack of clear and comprehensive information on key aspects of the project, often encountering conflicting reports about essential details such as the extent of the metropolitan park and public concessions. Additionally, contentious topics—including the presence and scale of skyscrapers, the inclusion of a casino, and the architectural style of the buildings—have sparked public debate and disagreement. This lack of sufficient consultation in the public sphere has hindered consensus-building, highlighting the need for greater transparency and communication. Conducting social impact assessments at each phase of development could significantly elevates the project’s social acceptance by addressing concerns in real-time and ensuring that public interests are taken into account. The state must play a decisive role by officially defining and institutionalizing the areas designated for public access, as well as clarifying the total area of the metropolitan park—issues that have recently drawn heightened interest and concern.

Furthermore, many respondents stressed the importance of using sustainable materials and ensuring accessibility for individuals with disabilities, areas where government oversight is essential. The role of the state is also crucial in determining the number of jobs generated by the project, which emerged as a key issue in the study’s findings. The promotion and communication of the overall impact of the Ellinikon redevelopment project emerged as a critical issue in this study. The majority of participants expressed the belief that there has been no significant effort by the responsible bodies to adequately highlight the project’s positive impacts or to thoroughly assess and address its potential negative consequences. To bridge this gap, the establishment of a monitoring and information forum is recommended. Such a platform would not only provide transparent updates on each stage of implementation but also facilitate direct communication with citizens, allowing them to submit questions, voice concerns, and receive official responses.

The Ellinikon redevelopment represents a significant opportunity for both the local area and Athens as a whole. Failure to meet expectations would not only be a missed opportunity for Athenian citizens but also a setback for the state, which has the chance to demonstrate its credibility in managing large-scale urban projects. To ensure the project's success and broad social acceptance, a multi-faceted approach is required. Exhaustive public dialogue, the systematic implementation of Social Impact Assessments, transparent and extensive information sharing, and ongoing investment monitoring are essential steps. Establishing a structured framework for assessing social impacts and ensuring social acceptance at each stage of urban development is crucial. Additionally, institutionalizing participatory processes for co-developing urban interventions can help maximize local community engagement and consensus. These elements serve as critical prerequisites for the successful completion of the

Ellinikon project, ensuring that it delivers sustainable and equitable benefits for all stakeholders.

The existing research gap in the systematic evaluation of social impacts highlights the need for further exploration and the development of standardized tools. The original questionnaire employed in this study serves as a model for future research, offering a standardized and weighted survey instrument that can be utilized by researchers worldwide to gather valuable insights into public perceptions of urban projects. Given the profound effect of social impact on citizens' quality of life, it is imperative to institutionalize a framework for its investigation and assessment. Such a framework will ensure that social acceptance is actively considered in urban regeneration efforts, ultimately leading to more inclusive and sustainable urban development.

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