



Evaluating the Procedural Framework of Informal Settlement Upgrading Makkah City, Saudi Arabia: Challenges and Lessons for Sustainable Urban Renewal

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ABSTRACT

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This study investigates the procedural framework for upgrading informal settlements in Makkah, Saudi Arabia, using a mixed-methods approach that includes analysis of 25 policy documents, field observations in 10 informal areas, and expert interviews. The research identifies a four-stage process: classification, policy formulation, implementation, and monitoring. While the model enables localized, context-sensitive interventions, it faces challenges such as institutional fragmentation, delays, and limited community participation. Comparative international cases underscore the value of participatory planning, diversified funding, and adaptive governance. In response, the study proposes a hybrid strategy—comprehensive redevelopment in high-risk zones and incremental upgrading elsewhere—aligned with Saudi Vision 2030. The proposed model offers a practical framework for sustainable, culturally aware urban transformation in rapidly growing cities.

1. INTRODUCTION

Rapid urban growth and high population density are among the most pressing challenges faced by major cities, particularly in the Global South. This phenomenon is exacerbated by both internal and external migration in search of employment opportunities, often occurring in the absence of inclusive urban development planning that addresses both urban and rural settlements. As a result, there has been an increasing demand for housing, which many developing nations have struggled to meet, particularly for low-income groups and migrants [1]. This demand has driven populations to occupy both private and public lands, constructing housing based on their limited financial capacities. Consequently, informal settlements—also known as slums—have emerged on the outskirts or even within city boundaries, leading to urban challenges such as deterioration, environmental degradation, and economic hardship [2].

Researchers widely agree that informal settlements are areas that have developed outside formal planning frameworks or have been poorly planned [3]. Furthermore, weak land management and the lack of municipal oversight, particularly in past decades, have contributed to the expansion of these informal extensions on the fringes of major cities [4].

Informal settlements represent one of the most critical urban challenges for governments, especially in major cities and capitals of developing countries, as well as those experiencing rapid economic and urban growth [5]. Many cities in Saudi Arabia, particularly Makkah, face this issue, with significant numbers of informal settlements spread across various parts of

the city [6]. Rapid urban growth in Makkah—driven by internal migration and the influx of pilgrims and foreign workers from across the Islamic world—has further strained land use, regardless of population distribution or the availability of urban services, posing a continuous challenge for relevant authorities [1].

Makkah is one of the fastest-growing cities in terms of population, and its religious significance has fostered economic growth and created investment and employment opportunities [7]. This has led to increased migration to the city in search of a better life. Some neighborhoods have resorted to horizontal expansion in response to high land prices and limited availability, leading to the creation of ethnically distinct neighborhoods, such as Al-Hindawiya and Al-Shamiya [8]. Informal settlements are characterized by several traits, the most notable of which are the lack of sustainable planning, poor land use distribution, and the absence of essential public infrastructure such as road networks, water supply, sanitation, electricity, and green spaces. This results in urban decay, necessitating intervention to curb their spread and promote their redevelopment [9].

To address this issue, the Government of Saudi Arabia has been actively working to improve Makkah's urban environment in alignment with its religious stature, by executing developmental projects aimed at rehabilitating informal settlements and integrating them into the formal urban fabric [6].

This paper aims to analyze the procedural stages in upgrading informal settlements, with a focus on Makkah's rehabilitation project as a case study. It seeks to examine the

impact of these development processes on the reality of informal housing, while highlighting the positive contributions these areas make toward alleviating the housing crisis. The study emphasizes a procedural analysis of informal settlement development in alignment with sustainable development goals and efforts to enhance the stability of residents and integrate them into the city's urban fabric.

1.1 Previous studies

In recent decades, scholarly interest in informal settlements and their redevelopment strategies has significantly grown, particularly due to the rapid and often uncontrolled urban expansion in cities across the Global South. Previous studies have extensively explored urban, social, economic, and governance-related aspects of informal settlements [10]. However, there has been limited focus on the procedural stages involved in upgrading informal settlements, especially within the Saudi context.

Abdulrahman [11] analyzed the impact of displacement resulting from the redevelopment of informal settlements in Makkah. The study emphasized that one of the key challenges in informal settlement upgrading was the absence of a clear procedural framework for implementation. This lack of structure, combined with insufficient community involvement, contributed to the failure of several redevelopment projects. The study also highlighted the social and economic consequences of displacement but focused primarily on these aspects without exploring the procedural steps involved.

In a separate study, Abdulrahman [11] conducted a field-based case study on the role of public-private partnerships in the regeneration of unplanned settlements in Jeddah. The research underlined the importance of collaboration between various sectors for the success of urban regeneration projects. However, it was geographically limited to Jeddah and did not provide a broader scope that could be applied to other regions, including Makkah.

Kadhim [12] explored the impact of redevelopment projects on residents of informal settlements in both Makkah and Jeddah. The study concluded that successful implementation relied heavily on well-structured procedural stages—from data collection to negotiation processes with residents. While offering valuable insights into the social implications for residents, the study did not comprehensively examine the full procedural framework or implementation challenges involved in urban planning.

These studies reveal that most research on informal settlement development has focused on one-dimensional aspects such as planning, architecture, community participation, or legal frameworks. However, there remains a significant gap in integrated analyses of the procedural stages involved in upgrading informal settlements. This gap is addressed by the current study, which seeks to fill this void by analyzing the procedural framework in Makkah as a case study. The study aims to offer an actionable model for similar contexts that face comparable socio-cultural and urban challenges.

While previous studies on slum upgrading initiatives in Saudi Arabia have provided valuable insights, most tend to focus on isolated technical or economic aspects or offer descriptive overviews of policies. Few studies have adopted an integrated approach to analyze the procedural, institutional, and governance dynamics involved. Additionally, the

sequencing of interventions and the relationship between national policies and local implementation remain underexplored. This research addresses these gaps by developing a comprehensive framework that examines the stages, actors, and outcomes of informal settlements upgrading in Makkah while also aligning with sustainable urban development goals and national strategic visions.

1.2 Research significance

This study is significant due to the challenging economic conditions in Makkah, which are compounded by the prevalence of informal settlements, particularly in areas close to the Masjid al-Haram. The expansion of the Haram has led to increased housing demand in its vicinity, exacerbating the issue [13]. This research aims to analyze the procedural stages involved in upgrading informal settlements, using the Makkah Slum Rehabilitation Project as a case study. The goal is to provide valuable insights that can enhance effective planning and implementation, contribute to sustainable development, and foster active community participation.

1.3 Research problem

The research problem lies in the absence of clear and systematic documentation of the procedural stages involved in informal settlement upgrading projects. This gap has contributed to the exacerbation of this issue, especially in densely populated areas suffering from inadequate infrastructure, lack of essential services, and ineffective urban planning. These challenges pose significant barriers to achieving sustainable urban development and improving the quality of life in cities. Despite the efforts made by relevant authorities in Makkah to address this issue, initiatives still lack a comprehensive and documented procedural framework that organizes the various stages of development—ranging from assessment and classification to planning, implementation, and evaluation [14]. This shortcoming weakens the ability of executing bodies to assess the effectiveness of these programs, hindering the replication of successful experiences or the development of models applicable in other similar contexts.

This problem is reflected in the continued existence of urban, social, and economic imbalances in many areas, deepening urban inequality and negatively impacting quality of life indicators. It also limits the achievement of the goals outlined in Saudi Arabia's Vision 2030. Therefore, the research problem is centered on the need for a thorough analysis of the procedural stages applied in the Makkah Slum Rehabilitation Project and the evaluation of its effectiveness in achieving developmental goals. This is critical, particularly in the absence of a documented procedural model that could be replicated in other regions facing similar challenges within Saudi Arabia.

1.4 Research objectives

The primary objective of this study is to analyze the procedural stages involved in upgrading informal settlements, with a particular focus on the Makkah Slum Rehabilitation Project as a case study. The study aims to evaluate the project's impact on the local community, both economically and socially, while exploring the challenges and opportunities that arise within the context of urban development. Additionally, the research seeks to propose strategic solutions that enhance

the effectiveness of the upgrading process, contributing to the improvement of residents' quality of life and facilitating their integration into the city's sustainable urban design.

2. LITERATURE REVIEW

2.1 Concept of informal settlements

Informal settlements have been widely defined in the literature as urban areas that emerge outside formal planning mechanisms and legal frameworks, often characterized by overcrowding, inadequate infrastructure, and substandard environmental conditions [15, 16]. These settlements typically form on the peripheries of cities or within unregulated land zones and are marked by spontaneous growth, absence of building regulations, and limited access to services like water, sanitation, and green spaces [17, 18]. Beyond physical deficiencies, informal settlements also reflect deeper social and economic inequalities housing populations facing poverty, precarious employment, and marginalization [19].

2.2 Emergence and causes of informal settlements

The rapid proliferation of informal settlements globally, particularly in the Global South, stems from a combination of demographic, economic, and policy-related factors. Population growth—from 2.5 billion in 1950 to over 6 billion by 2000—was coupled with unprecedented rates of urbanization [20]. Cities in developing countries struggled to absorb this growth, leading to a housing crisis that encouraged informal development. Weak planning systems, forced displacement due to wars or disasters, limited affordable housing options, and speculative land markets were key contributors [21-23]. Cairo, for instance, has witnessed informal growth reaching 84% of its urban fabric [21], highlighting the scale of the issue in Middle Eastern contexts.

2.3 International models and comparative lessons in slum upgrading

Global experiences in informal settlements upgrading reveal three primary approaches:

- (1) Top-down redevelopment (Ankara, Turkey): This model focused on large-scale clearance and resettlement supported by public-private partnerships, offering financial compensation but with minimal community involvement.
- (2) Hybrid upgrading (São Paulo, Brazil): This approach combined in-situ improvements and partial relocation, using GIS-based tools and multi-stakeholder engagement to enhance service delivery and social equity.
- (3) Community-led upgrading (Baan Mankong, Thailand): Residents were directly involved in planning, financing, and construction, resulting in socially sustainable outcomes and stronger local ownership, though scalability remains a challenge.

Key lessons from these cases highlight the importance of:

- (1) Integrated planning across housing, infrastructure, and social services;
- (2) Community participation to foster inclusion and resilience;
- (3) Data-driven tools to guide targeted interventions;

- (4) Transitional support mechanisms to reduce relocation-related hardship.

Despite their strengths, these models often overlook religious, cultural, and spatial justice dimensions—critical elements in cities like Makkah. This underscores the need for a context-sensitive framework that integrates cultural identity and sustainable urban goals.

2.3.1 Comparative summary table

Table 1 synthesizes the key elements of the three case studies for cross-analysis:

Table 1. Comparative analysis of international slum upgrading approaches

Aspect	Ankara, Turkey	São Paulo, Brazil	Baan Mankong, Thailand
Approach	Top-down redevelopment	Hybrid upgrading & relocation	Community-led in-situ upgrading
Project Scope	18,000 units; 4 million m²	150,000 units; high-risk zone focus	91,000 households; multiple cities
Implementation	Government & TOKİ	Government + Cities Alliance	Community organizations + CODI
Community Role	Limited	Moderate (planning input)	High (full control over finance & execution)
Support During Development	Rental compensation or temporary housing	Self-relocation grants	Group loans, tenure security
Funding	Unit sales + government	Federal & municipal	Government + community + NGO
Sustainability & Outcome	High infrastructure, weak social roots	Balanced integration	Strong community cohesion & resilience

Source: Authors [24-26]

2.4 Identified research gaps and contribution of the current study

While the reviewed international models offer comprehensive insights into slum upgrading strategies, a notable gap exists in context-specific evaluation frameworks—particularly those adapted to cities with religious significance, cultural sensitivities, and environmental constraints, such as Makkah.

Moreover:

- (1) Few models offer structured procedural evaluation tools that link classification, policy development, implementation, and sustainability phases in a unified framework.
- (2) Spatial justice, religious identity, and local cultural preservation are often treated as secondary, despite their centrality in cities like Makkah.
- (3) Existing literature seldom incorporates multi-criteria evaluation systems that combine technical, social, religious, and economic indicators for continuous monitoring.

The current study addresses these gaps by developing a comprehensive procedural framework for slum upgrading in Makkah, integrating urban planning strategies with religious, environmental, and cultural considerations. It contributes a contextualized evaluative model to guide redevelopment efforts in similar heritage-rich and religiously sensitive urban settings.

3. RESEARCH METHODOLOGY

This study adopts a comprehensive and multi-layered methodological framework to investigate the procedural dynamics and outcomes of the Slum Rehabilitation Project in Makkah. The methodology integrates both qualitative and quantitative approaches to ensure a robust, evidence-based analysis of the urban development interventions and their impact on local communities.

3.1 Research design: A mixed-methods approach is employed

A mixed-methods approach is employed, combining descriptive and analytical techniques to examine the procedural phases of the slum upgrading process. This design allows for the exploration of spatial, social, economic, and environmental changes resulting from the project, as well as the evaluation of its effectiveness in improving quality of life and aligning with national development goals.

Primary data is obtained through field observations, structured surveys, semi-structured interviews, and focus group discussions:

- (1) Field visits document the urban and social transformation of selected neighborhoods before and after the intervention.
- (2) Surveys are administered to residents to assess satisfaction with the rehabilitated environment [10].
- (3) Interviews with urban planners, municipal officials, project managers, and community representatives provide insights into implementation mechanisms, stakeholder engagement, and encountered challenges [27, 28].
- (4) Focus groups are conducted to gather community perceptions and validate field findings [10].

Secondary sources include governmental reports, planning documents, urban development strategies, and academic studies related to informal settlements in Makkah. These provide historical and policy contexts for understanding the rationale and evolution of the project [4, 6, 13].

Collected qualitative data is analyzed using thematic coding techniques, identifying key themes such as procedural gaps, socio-economic impacts, and governance practices. Narratives from interviews and field notes are triangulated with documentary evidence to ensure credibility and depth.

Survey data is statistically analyzed using descriptive and inferential methods, such as frequency distribution, cross-tabulation, and correlation analysis, to assess residents' quality of life indicators, including housing conditions, access to services, and economic mobility [10, 29, 30].

3.2 Case study framework

The Makkah Slum Rehabilitation Project is employed as the central case study, offering a detailed analysis of its

implementation stages—from initial planning and community engagement to execution and post-project evaluation. Special attention is given to the project's scale, phasing strategy, socio-spatial outcomes, and institutional collaboration [6, 13, 16].

3.3 Field engagement strategy

Complementing the structured methodology, the research includes on-site documentation and direct engagement with affected communities. This component captures the lived experiences of residents and provides practical insights into the transformation dynamics, cultural considerations, and local acceptance of redevelopment efforts [14, 27, 28], as confirmed by Al-Ghamdi [28], a representative of the Holy Capital Municipality, during a personal interview conducted in 2025. These insights enrich the analytical findings and add an applied dimension to the evaluation.

3.4 Evaluation framework

A hybrid evaluation framework is developed to assess the project's procedural and developmental impact. Key performance indicators (KPIs) include:

- (1) Economic revitalization
- (2) Social integration and equity
- (3) Environmental sustainability
- (4) Institutional coordination and governance

The evaluation also benchmarks the project's outcomes against the goals of Saudi Vision 2030, particularly those concerning sustainable urban regeneration and inclusive development [1, 13].

Based on empirical findings, the study offers practical recommendations for enhancing slum upgrading initiatives in Makkah and similar urban contexts. These include:

- (1) Strengthening participatory planning mechanisms;
- (2) Enhancing transparency and procedural clarity;
- (3) Promoting integrated service delivery;
- (4) Ensuring long-term socio-economic inclusion.

3.5 Research tools and procedures

This section outlines the tools and operational procedures employed to collect and analyze data in support of the study's objectives. A mixed-methods approach necessitated the use of multiple tools to ensure the validity, reliability, and richness of findings.

3.5.1 Data collection instruments

To capture the multifaceted nature of slum upgrading in Makkah, the study utilized a range of data collection instruments. These included:

- (1) Structured observation checklists to document existing physical and infrastructural conditions in informal settlements.
- (2) Resident satisfaction surveys, designed with both closed- and open-ended questions, to measure changes in quality of life, service access, and housing conditions following redevelopment.
- (3) Semi-structured interview guides for experts and stakeholders, focusing on procedural stages, policy formulation, and implementation challenges.
- (4) Focus group protocols tailored to facilitate discussions with community members regarding perceptions of the

rehabilitation process, socio-cultural impacts, and levels of participation.

Each instrument was designed to align with the research framework and objectives, and was pre-tested to ensure clarity, contextual relevance, and feasibility in the field.

3.5.2 Data collection procedure

The implementation of data collection tools followed a phased, field-based protocol.

- (1) Field observations were conducted during preliminary visits to selected neighborhoods, where urban conditions, infrastructure, and housing typologies were recorded.
- (2) Surveys were administered face-to-face with a stratified

sample of residents, ensuring a representative distribution across different slum typologies.

- (3) Interviews and focus groups were coordinated with municipal officials, urban planners, and community representatives, and took place in neutral or governmental settings to promote open dialogue.
- (4) All data were collected over a six-week period, transcribed, anonymized where necessary, and prepared for both qualitative coding and quantitative statistical analysis.

This structured approach ensured that findings were grounded in direct field engagement and supported the development of an integrated evaluation framework (Figure 1).

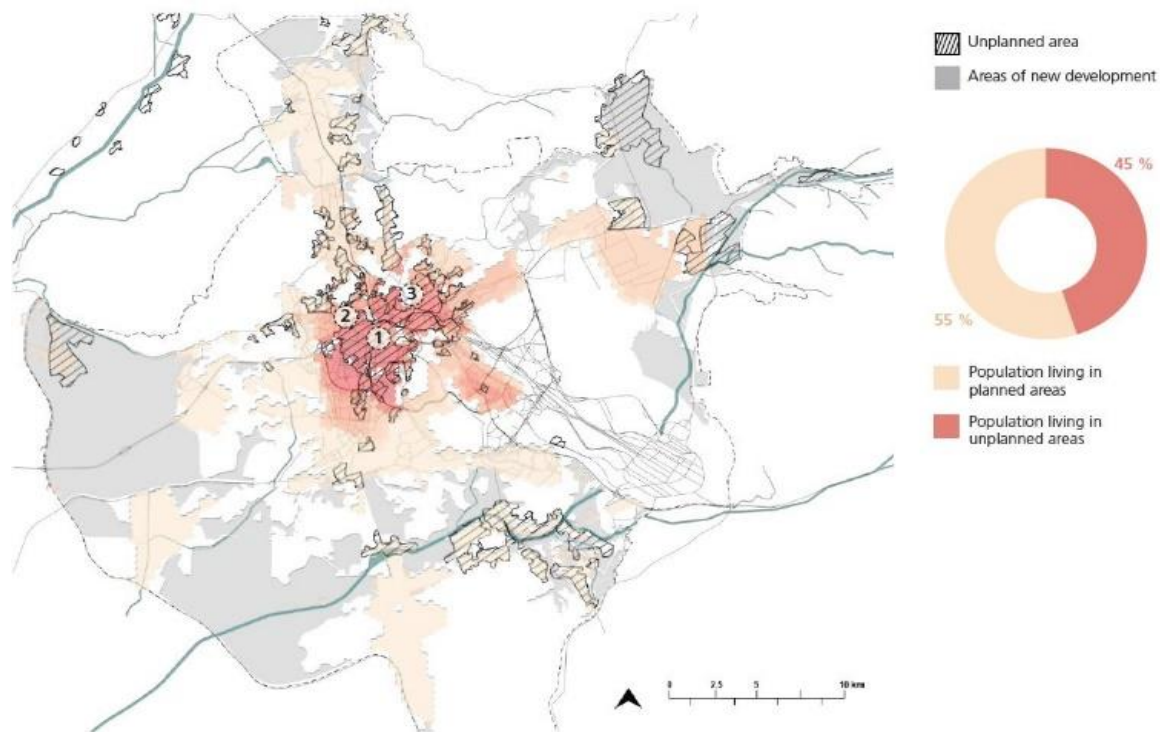


Figure 1. Distribution of informal settlements and population in Makkah [13]

3.6 Interview design

As part of the qualitative data collection process, a series of semi-structured interviews were conducted with key experts involved in the informal settlement development projects in Makkah. These interviews were designed to complement the broader research tools outlined above and to deepen the understanding of procedural dynamics and institutional practices.

The interview sample included:

- (1) Makkah Region Development Authority [27]
- (2) Representative of the Holy Capital Municipality (Balad Al-Ameen) [28]

The interview guide comprised a mix of open-ended and thematic questions, focusing on the balance between classification, planning, execution, evaluation, and monitoring. Additional themes included decision-making mechanisms, coordination between agencies, and obstacles encountered during project rollout.

The qualitative insights derived from these interviews were instrumental in validating field observations and informing the development of practical recommendations.

4. RESULTS

4.1 Classification of slum areas according to nature

The first step in addressing slum areas is to systematically identify and classify them based on several criteria, including urban planning, infrastructure, site conditions, legal status of buildings, and the historical significance of the neighborhood. The classification is based on the degree of organization within each neighborhood and the potential for improvement [16].

This classification helps in identifying the distinct characteristics of each type of informal area, allowing for targeted interventions that focus on the specific needs of the area. For example, unplanned slums may require complete urban re-planning, while semi-organized slums can be upgraded by adding necessary infrastructure such as sewage systems, roads, and utilities. Historical slums, on the other hand, necessitate a preservation approach to maintain their cultural and architectural heritage.

By using this classification, the authorities can prioritize efforts and focus on the most vulnerable and overcrowded areas first. This step is critical for understanding the severity

of the informal problem and developing effective urban development plans for each category (Table 2).

Table 2. The classification used for the slum areas in Makkah

Classification	Criteria	Description
Unplanned Slums	Poor Urban Planning	These are areas that have emerged without any prior urban planning and present significant challenges in terms of organization and infrastructure.
Semi-Organized Slums	Poor Infrastructure	These areas are characterized by partial infrastructure development and can be improved by providing basic services and upgrading facilities.
Historical Slums	Unclear Legal Status	These neighborhoods have historical significance and require preservation of their urban identity rather than demolition or complete redevelopment.

Source: By authors

4.2 Policy formulation and development plan

Once informal areas have been classified, specific policies and development plans are formulated according to the needs of each type. The priority is determined based on factors like the degree of hazard, the number of affected residents, and the geographical location.

For semi-organized areas, improvements can be made by providing essential infrastructure, while dangerous areas require complete removal, with residents being relocated to safer zones. A key part of the policy formulation phase includes securing funding and attracting private sector involvement through investment incentives.

It also involves establishing execution companies, such as the Balad Al-Ameen company, to accelerate the development process. Furthermore, community involvement in decision-making and surveys is crucial for ensuring the success of the plans, with specific emphasis on reassuring residents about compensation or relocation.

Successful policies rely on accurate data, clear priorities, and well-planned funding, alongside the active participation of all stakeholders to ensure sustainability.

4.3 Implementation of development plans and service provision

The implementation phase of Makkah's slum upgrading projects follows a structured sequence encompassing legal regularization, infrastructure development, housing rehabilitation or reconstruction, and the provision of essential services. This multi-stage process—outlined in Table 3—aims to minimize displacement while improving safety, living standards, and access to urban amenities. Social infrastructure such as schools, health centers, and markets is developed in parallel with construction activities, ensuring holistic transformation.

A dual strategy was adopted: full resettlement in high-risk zones and incremental upgrading in stable areas. This

approach reflects a balance between technical planning and socio-cultural sensitivity, aligning with the goals of Saudi Vision 2030. Public services like waste management, street lighting, and recreational facilities were prioritized to elevate livability and integrate formerly marginalized neighborhoods into the urban fabric (Table 3).

Table 3 illustrates the multi-stage process adopted in the implementation of slum upgrading projects in Makkah. Each stage addresses specific urban challenges, beginning with the legal resolution of land tenure issues and culminating in post-project monitoring and sustainability planning. The progression from legal regularization to infrastructure development and housing improvement reflects a structured and adaptive approach aimed at minimizing resident displacement and ensuring continuity of services.

Table 3. Stages of implementation for informal settlements upgrading projects

Stage	Description	Activities
Legal Framework Resolution	Resolve property ownership and legal issues related to slum areas.	Property registration, land acquisitions, and resolving disputes.
Infrastructure Development	Establish basic infrastructure to improve living conditions.	Construction of roads, water supply, sewage systems, electricity, and waste management.
Housing Rehabilitation and Demolition	Improve existing housing or demolish and rebuild unsafe structures.	Rehabilitation of houses, demolition of unsafe structures, and new construction.
Social Services and Community Facilities	Ensure the availability of essential public services for residents.	Building schools, healthcare centers, markets, and recreational spaces.
Monitoring and Adjustment	Ensure the continued success of the project and make adjustments as necessary.	Regular inspections, feedback collection, and policy revisions if needed.

Source: By authors

The inclusion of social infrastructure—such as schools, healthcare centers, and markets—demonstrates a holistic view of urban regeneration that goes beyond physical upgrades to incorporate social well-being and equity. Notably, the “Monitoring and Adjustment” stage reflects a feedback-responsive mechanism that allows for iterative improvements, ensuring that projects remain aligned with residents' needs and long-term development goals. In the case of Makkah, this framework has been implemented with particular sensitivity to the city's religious and cultural significance. For instance, in high-risk zones, complete resettlement was carried out through the provision of newly developed residential complexes on the city's outskirts. In contrast, incremental upgrading was used in less critical areas, allowing residents to remain in place while benefiting from phased improvements. This dual strategy—combining technical precision with socio-cultural awareness—represents a model for adaptive and inclusive urban redevelopment, aligned with the broader objectives of Saudi Vision 2030 [28].

4.4 Monitoring, evaluation, and sustainability

Once development projects are completed, the monitoring and evaluation phase begins to assess the success of the interventions and ensure that improvements are sustainable over the long term. This phase is essential to confirm that the efforts have achieved their objectives and to prevent neighborhoods from reverting to deteriorated conditions. Several aspects of monitoring and evaluation are considered:

- (1) Improvement of living standards and infrastructure: Key indicators are measured before and after development to assess the degree of change. These include the percentage of homes connected to reliable water and electricity networks, the presence of functional sewage systems covering the entire neighborhood, and reduced household density due to the provision of new housing.
- (2) Urban environment improvements: Assessed by the availability of paved roads throughout the neighborhood, clean public spaces, and green areas replacing former waste sites.
- (3) Social and economic indicators: These include increased school enrollment rates following the construction of new schools and improvements in household income due to job creation or local business growth. Resident satisfaction with their new living conditions—particularly their sense of safety and comfort—is also used as a qualitative success metric.
- (4) Security and safety: Informal settlements are often linked to high crime rates and safety concerns. A key success measure is improved neighborhood security, indicated by decreased crime rates and fewer safety-

related complaints, monitored in collaboration with police and security agencies. The structural safety of new buildings is also prioritized, with compliance to building codes ensuring resilience against fire and structural failure.

- (5) Dealing with challenges during and post-implementation: Development projects may face hurdles such as contractor delays, compensation disputes, or unexpected geological issues. Immediate intervention is required to maintain project timelines. Establishing a project follow-up committee is critical to ensuring smooth implementation. After completion, remaining issues (e.g., delayed school openings or inadequate transportation access) are resolved through coordinated efforts among stakeholders, safeguarding the quality of project outcomes.
- (6) Ensuring sustainability and preventing re-deterioration: Success is not merely the delivery of a project but its sustainability. This includes maintenance plans for infrastructure, prevention of illegal construction, and continuous monitoring to avoid the reappearance of informal settlements. Community engagement is encouraged through the formation of local committees that collaborate with official authorities to oversee neighborhood affairs. Urban indicators are employed to track improvements in the quality of life and reductions in previous problems. Any deficiencies identified inform adjustments in future stages, ensuring continuous improvement and supporting Makkah's vision of becoming free of informal settlements through sustainable urban development (Table 4).

Table 4. Summary of the results of the procedural stages for developing the slums in Makkah

Phase	Summary of Action
Slum Classification	Identification and classification of neighborhoods based on urban planning, infrastructure, legal status, and architectural nature to determine the required intervention type.
Plan and Policy Formulation	Development of policies tailored to each type of neighborhood, prioritization, securing funding, engaging the community, and attracting private sector investment.
Implementation on the Ground	Execution of legal and construction activities, such as demolition or rehabilitation of buildings, and gradual improvement of infrastructure to minimize disruption to residents.
Monitoring and Evaluation	Evaluation of the impact of development on living conditions, services, and infrastructure, while ensuring the sustainability of improvements and resident satisfaction.

Source: Prepared by the authors based on government reports and interviews with officials

5. DISCUSSION OF RESULTS

The analysis of Makkah's slum development process revealed a procedural framework encompassing four interconnected phases: classification, policy development, implementation, and evaluation. While this structure presents a coherent institutional approach, the field application demonstrated varying degrees of success. A summarized discussion, integrating prior reviewer feedback, is presented below.

5.1 Classification and preliminary analysis

This stage utilized criteria such as infrastructure condition, spatial organization, and legal status to prioritize intervention areas. It enabled differentiated planning (upgrade vs.

clearance), yet excluded some neighborhoods and lacked community input.

- (1) Strengths: Targeted high-priority areas; defined intervention types.
- (2) Weaknesses: Incomplete coverage; limited local engagement.

5.2 Policy development

Plans ranged from total clearance to in-situ upgrading and involved stakeholders like Baladna Company and private sector actors. While strategic in nature, this phase suffered from weak public involvement and slow execution.

- (1) Strengths: Balanced urban renewal with stability; built long-term vision.
- (2) Weaknesses: Delayed field translation; civil society

marginalization.

5.3 Implementation and service provision

The practical application included legal resolution, infrastructure development, housing interventions, and social services. A dual approach combined full relocation in high-risk zones with incremental upgrades elsewhere. Table 5 summarizes the stages.

5.4 Monitoring and evaluation

Evaluation efforts used access to basic services and resident satisfaction as benchmarks, supported by the Urban Observatory. However, mechanisms were neither systematic nor transparent.

- (1) Strengths: Employed quality of life indicators.
- (2) Weaknesses: Lack of structured follow-up; no consistent reporting.

The study found that the procedural phases still face some shortcomings, as the desired improvements have not yet been fully realized on the ground. Many informal neighborhoods in Makkah city continue to suffer from overcrowding, lack of roads, sewage systems, and other essential services. This is attributed to the limited effectiveness of the current execution

phases and poor coordination among the various authorities, which has led to continued hardship for residents despite the existence of development plans. The study concludes that the informal settlement issue is intertwined with housing and infrastructure crises, and while the steps taken so far are moving in the right direction, they need to be strengthened and expedited to fully achieve their objectives. The findings reveal that while the project made notable strides in some areas, its overall effectiveness was constrained by limited scope, weak coordination, and insufficient community involvement. Moving forward, a more inclusive, transparent, and systematic approach is needed to ensure the success and sustainability of future development initiatives in informal settlements.

Based on a comprehensive analysis of the collected data related to the development of informal settlements in Makkah, a holistic procedural framework has been developed, aimed at enhancing the urban environment and improving the quality of life within these areas. This framework incorporates a series of key themes—each with corresponding sub-elements—offering a comprehensive approach for evaluating the effectiveness of future interventions in these regions.

The criteria for measuring success have been clearly identified, along with appropriate tools for quantifying and documenting the outcomes in a precise and objective manner.

Table 5. Summary of the procedural stages for developing the slums of Makkah

Phase	Strengths	Weaknesses	Summary
1. Classification and Preliminary Analysis	<ul style="list-style-type: none"> - Guided efforts toward urgent areas. - Differentiated between neighborhoods for improvement or removal. 	<ul style="list-style-type: none"> - Limited scope, not all informal areas were included. - Lack of effective community engagement in assessing local conditions. 	<p>This phase directed efforts toward high-priority areas based on objective categorization but lacked full inclusion and community participation, limiting its comprehensive vision.</p>
2. Policy Development	<ul style="list-style-type: none"> - Awareness of balancing urban development and social stability. - Established long-term strategic foundations. 	<ul style="list-style-type: none"> - Slow translation of policies into field projects. - Limited civil society involvement in policy formulation. 	<p>Policy plans included strategies for comprehensive development, with some private sector involvement. However, the slow translation into tangible projects and weak community involvement affected their alignment with real needs.</p>
3. Field Implementation	<ul style="list-style-type: none"> - Visible changes in some areas, such as infrastructure and services improvements. 	<ul style="list-style-type: none"> - Poor coordination led to delays. - Limited scope of intervention and lack of local community involvement. 	<p>Some areas saw progress, including infrastructure and alternative housing. However, implementation was limited and coordination between executing bodies was weak, slowing down overall impact.</p>
4. Evaluation and Monitoring	<ul style="list-style-type: none"> - Inclusion of safety and quality of life indicators in evaluation. 	<ul style="list-style-type: none"> - Non-systematic and limited monitoring and evaluation efforts. 	<p>The use of basic indicators was promising but lacked systematic monitoring and community engagement, reducing the effectiveness of evaluation as a tool for improvement and sustainability.</p>

Source: Authors from analysis of results

6. CONCLUSION

This study developed a multidimensional framework (Table 6) to assess slum upgrading processes through five key dimensions: classification, planning, implementation, evaluation, and sustainability. Each sub-element is evaluated using precise criteria, success indicators, and verification tools—ensuring both operational clarity and adaptability. Cultural, religious, and spatial justice elements were intentionally embedded to align with Makkah’s urban identity, reinforcing the study’s context-sensitive approach.

The framework applies a scoring system to classify project proposals into performance bands, guiding iterative improvements through stakeholder feedback and expert reassessment. This cyclical process enhances the responsiveness of interventions and supports sustainable urban transformation.

While the procedural framework offers institutional value,

the research revealed implementation gaps, including delayed action, weak coordination, and limited community engagement. Addressing these challenges requires moving beyond infrastructure to integrated, inclusive planning that aligns with Vision 2030.

Drawing lessons from global case studies (Thailand, Turkey, Brazil), the study recommends a hybrid, participatory approach tailored to Makkah’s context. This includes:

- (1) Finalizing area classifications via transparent criteria.
- (2) Enhancing governance through a dedicated coordination body.
- (3) Expanding participatory planning mechanisms.

Institutionalizing monitoring via academic partnerships. Despite implementation constraints in Saudi Arabia’s administrative and financial structure, a phased, well-governed strategy offers a viable path toward resilient and inclusive redevelopment. This model is transferable to other religious and heritage cities facing similar urban challenges.

Table 6. Framework for evaluating the procedural phases of informal settlements development and transformation projects

	Sub-Element	Evaluation Criteria	Success Indicators	Measurement Tools	Challenges	Implementation Mechanisms	Verification Methods
(1) Classification and Initial Analysis	1.1 Data Collection	Gathering demographic, environmental, economic, and social data	Accurate data, social classification, distribution of services	Surveys, field studies, data analysis	Data accuracy, lack of community engagement	Comprehensive survey development, training field teams	Digital surveys, analysis reports, data review records
	1.2 Identifying Target Slum Areas	Identifying boundaries of slum areas and reasons for their existence	Well-defined slum areas, cause of slum formation	Maps, field studies, social surveys	Ambiguity in identifying areas, lack of local data	Collaboration with governmental agencies, community engagement	Updated maps, official reports, review records
	1.3 Prioritizing Areas	Classifying slum areas based on urgency criteria	Classification of areas based on priority criteria	Analysis of social and economic data	Local resistance, regulatory challenges	Prioritization of redevelopment areas based on field data	Priority reports, community workshops
(2) Planning and Execution	2.1 Infrastructure Upgrades	Developing water, sanitation, electricity, and communications networks	Number of upgrades, repair costs, execution speed	Simulation models, executive reports	Funding challenges, resistance to change, coordination between parties	Regular plan reviews, ongoing coordination with stakeholders	Implementation reports, work schedules, meeting records
	2.2 Cultural and Religious Considerations	Architectural designs that respect religious and cultural identities	Alignment of designs with cultural identity, respect for sacred places	Architectural designs, resident surveys	Community opposition, architectural constraints	Consultation with religious leaders, community involvement in design	Architectural images, design reports, meeting minutes
	2.3 Enhancing Community Services	Providing healthcare, education, social, and religious services	Improvement in basic services, community satisfaction	Surveys, service assessments, community inquiries	Community resistance to change, lack of funding	Partnerships with social institutions, funding small projects	Service reports, equitable service distribution records
(3) Monitoring & Evaluation	3.1 Environmental and Social Impact Assessment	Measuring the impacts of projects on the environment and local communities	Improved local environment, community satisfaction, sustainable development	Community surveys, environmental monitoring reports	Difficulty in measuring long-term environmental impacts	Establishing regular monitoring systems, community involvement in evaluation	Monitoring reports, interviews with residents, field research results
	3.2 Sustainability Evaluation	Reviewing environmental and social project sustainability	Sustainability reports, emission reductions, achieving environmental	Environmental data analysis tools, sustainability models	Differences in development levels between areas, economic challenges	Regular environmental and social sustainability assessments	Sustainability reports, environmental impact simulation models

		goals					
(4) Challenges & Opportunities	3.3 Social and Religious Performance Evaluation	Assessing the alignment of projects with social and religious values	Improved living standards, strengthened community ties	Resident surveys, interviews with religious leaders	Negative perceptions about projects, cultural challenges	Creating social and religious committees, community-driven standards	Reports on social and religious impact, interviews with residents and visitors
	4.1 Economic Challenges	Identifying economic barriers, cost, sustainable financing	Reduced costs, finding sustainable funding sources	Cost analysis, economic feasibility studies	High costs, difficulty in obtaining sustainable financing	Regular funding reviews, new public-private partnerships	Economic reports, funding meeting minutes
	4.2 Social Innovation Opportunities	Innovative financing models, enhancing community participation	Increased community participation, improved social satisfaction	Comparative studies, community surveys	Cultural challenges, difficulty reaching all social groups	Developing interactive platforms, organizing idea-sharing workshops	Workshop reports, survey records, community meeting results
	5.1 Environmental Sustainability	Implementing environmental strategies in slum development	Use of eco-friendly building materials, energy and water-saving systems	Environmental reports, impact studies	Resistance to traditional building methods	Promoting eco-friendly materials, periodic environmental reviews	Environmental reports, environmental impact assessment models
(5) Sustainable & Transformative Dimension	5.2 Spatial Justice	Ensuring equitable distribution of services and facilities	Equal access to services in different areas	Service distribution maps, spatial justice surveys	Resource disparities between areas, unequal distribution	Improving distribution methods, developing multiple projects for underserved areas	Service distribution maps, resource allocation reports
	5.3 Enhancing Cultural and Religious Identity	Preserving cultural and religious landmarks	Documenting local cultures, preserving sacred landmarks	Documentation studies, community meeting records	Cultural challenges, difficulty preserving local identity	Enhancing community awareness, developing documentation programs	Cultural reports, local meeting records
	5.4 Mixed-Use Development	Integrating residential, commercial, and religious uses	Balanced integration of different uses in a well-organized manner	Land use maps, economic feasibility studies	Community resistance to commercial use in residential areas	Collaborative urban planning, community design involvement	Land allocation reports, economic feasibility study results
	5.5 Supporting Social Welfare	Strengthening social welfare programs and charitable foundations	Strengthening the role of charity foundations in social projects	Charitable foundation reports, social documents	Lack of social awareness, coordination challenges between institutions	Strengthening partnerships with charities, directing financial support to social projects	Charitable foundation reports, community project reports

Source: By Authors

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