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Research Article

Revitalizing Historic Trade Hub: Urban Renewal Strategies for Khatunganj Market, Bangladesh

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Abstract

Khatunganj, a historic commercial hub in Chattogram, Bangladesh, dated back to the 2nd century, serves as one of the largest wholesale markets in the region. Strategically located along the Karnaphuli River and adjacent to the Chaktai Canal, it facilitates vital local, national, and international trade networks. Despite its historical and economic significance, Khatunganj market faces challenges such as deteriorating infrastructure, traffic congestion, waterlogging, and the deterioration of heritage buildings, all of which threaten its sustainability as a trading center. The study evaluates Khatunganj's historical evolution, trading environment, market typologies, and infrastructure to identify its strengths and weaknesses. This study employs a mixed-methods approach—consisting of field surveys, interviews, mapping, and data analysis—to assess Khatunganj's current condition. A total of 150 respondents were surveyed, with over 130 stakeholders interviewed, including traders, architects, planners, and local officials. Quantitative analysis used percentages and scoring matrices, while qualitative insights and validation were obtained through thematic coding and feedback from experts and users. The key strengths identified includes 24-hour trade activity, pedestrian-friendly verandas, historical facades, and robust connectivity by land and water. However, significant weakness observed in infrastructure, mobility, and environmental resilience, with narrow roads, insufficient drainage, and the deterioration of heritage buildings being critical concerns. The Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis highlighted Khatunganj's strong commercial culture and strategic location but pointed out threats like poor governance, seasonal flooding, and the encroachment of modern commercial areas. The study's evaluation matrix revealed moderate performance by scoring 88-point, surpassing the 84-point threshold, highlighted the need for improved infrastructure and waste management. This paper proposes evidence-based urban renewal strategies (scoring 66 points, below the threshold of 76) focusing on enhancing mobility, preserving heritage, and upgrading infrastructure, providing a framework for revitalizing historic trade hubs. The SWOT analysis informed the proposed interventions, ensuring Khatunganj's economic viability, enhance its cultural preservation, and mitigate its environmental risks for future generations.

Keywords

Khatunganj, Historical Trade Hub, Infrastructure Decay, Chattogram, Wholesale Market, Urban Revitalization, Heritage Preservation, Mixed-methods, Stakeholder Analysis

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1. Introduction

Chattogram is the second populous city of Bangladesh and served an important role in economy as this city hosts the largest seaport of the country, located in Bay of Bengal. For centuries, it has figures as part of the trading hub due to its strategic position between the Karnaphuli River and the Chittagong Hill Tracts. Chattogram's important existence can be traced historically with archaeological evidence suggesting its presence on early Greek and Roman maps, including Ptolemy's world map [8]. The Greater Chattogram Area was home to more than 5.2 million people in 2022 and was undoubtedly a business hub with a trading history that begun in the 9th centuries when Abbasid Caliphate merchants set up a trading center in the region.

Embedded in this historical and commercial context, Khatunganj is one of the oldest and most historical trade centers in Bangladesh (Figure 1). It has a long-standing presence and continues to position a central role in the country's economic and trading culture [1]. Located on the bank of Karnaphuli River accompanied to Chattogram port Khatunganj has served as a key point in regional and international sea trade, evolving over time into a generalized wholesale market. Traditionally, Khatunganj is serving the local as well as international markets and greatly influenced the commercialization and economic development of Bangladesh.

Nonetheless, over the years, Khatunganj has encountered numerous challenges that threaten its functionality and sustainability. Traders are faced with problems of dilapidated infrastructure in the market- for instance, poorly constructed roads and inadequate drainage systems that contributing to persistent traffic congestion and water logging respectively. Furthermore, for decades, there are gradual decline of economic activities due to the development of other business areas hence the market is less active [11]. These compounded issues have increasingly deteriorating the market's ability to function efficiently, therefore require urgent attention and revitalization.

The primary motivation behind this research is to address the urgent need to preserve and revitalize Khatunganj. Thus, the objective is to study the historical developments and the current state of Khatunganj, as well as consider the specific advantages and opportunities that would be useful in response to the challenges of the present day. This study evaluates Khatunganj's historical evolution, trading environment, market typologies, and infrastructure using a mixed-methods approach. A key contribution of this paper is the adaptation of a decision-making matrix, originally proposed by Mehanna [9], to evaluate Khatunganj's potential for urban renewal (Appendix I). This modified matrix considers local conditions such as street characteristics, traffic, commercial structure, and community participation, providing a comprehensive framework for assessing the market's readiness for pedestrianization and revitalization. By integrating this methodology, the study offers a structured approach to balancing modernization with heritage preservation.

Additionally, the study uses a SWOT analysis to guide the proposed interventions. It identifies Khatunganj's strengths, such as its vibrant trade culture and strategic location, alongside weaknesses like infrastructure deficiencies and environmental risks. The findings highlight the need for infrastructure improvements, heritage preservation, and better community engagement to ensure Khatunganj's sustainability as a historical trade hub.

This paper provides evidence-based recommendations for urban renewal strategies, offering a framework for revitalizing historic markets while ensuring their economic vitality and cultural preservation.

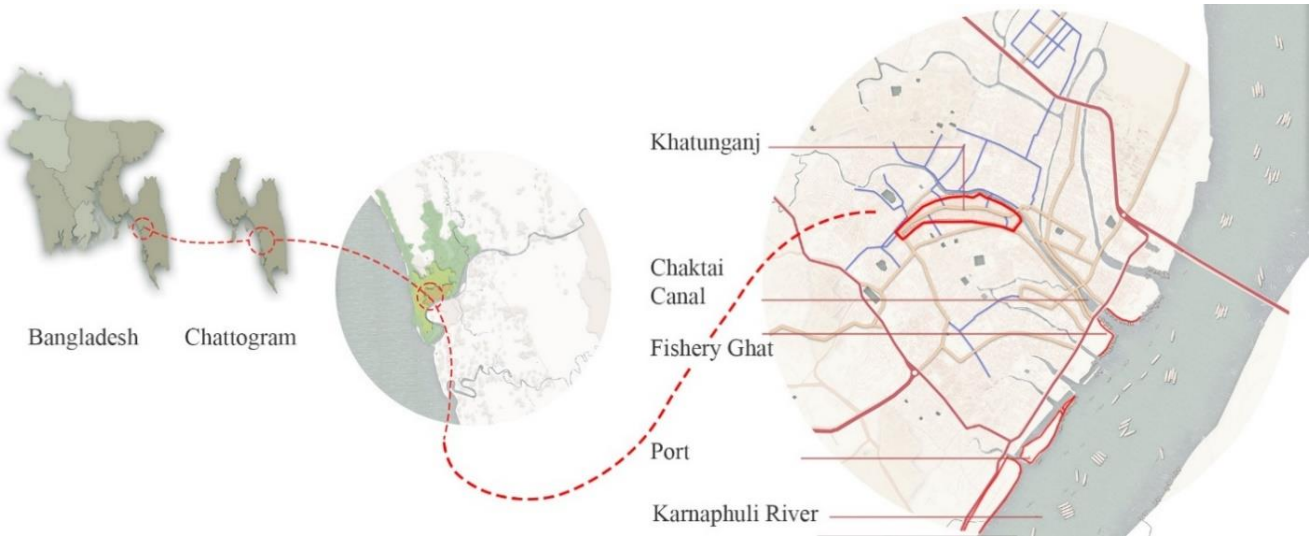

Figure 1. *Location of Khatunganj trade hub in Chattogram district. (source: Author).*

2. The Evolution of South Asian Trade Hubs and Their Urban Transformation

The South Asian trade centers have been at the cebter of the region's economic, cultural, and urban development over centuries. These trade centers developed along major ancient trade routes – overland and maritime and were linked with networks of early foreign trade like the Asian overland route, the Silk Road or the Indian Ocean maritime route. According to [4], Chittagong, Calicut and Surat were South Asia's main ports through which these trade networks connected Chinese, Persian, Arabian and many other merchants. The geographic positioning of these cities offered both economic and political advantages that allowed them to flourish as regional commercial capitals [4, 8, 11, 15] has pointed out that many pre-modern coastal settlements of South Asia witnessed phenomenal growth as a result of trade, administrative centers and new social groupings.

Khatunganj in Chattogram city is an example of such post-colonial shift in trade activities. Located on the banks of the Karnaphuli River and near the Bay of Bengal, Khatunganj became an important trading center as early as in the second century A. D. Due to its location, it had an opportunity to establish itself and grow, as it connected to both maritime and inland trade (Figure 2). According to [2] it was not the geographical advantages of sites like Khatunganj but local political stability, legal systems conducive to trade and market rights and property laws which encouraged growth of such cities. These trade centers were very important in the process of linking South Asia into the global markets especially in the pre-colonial and colonial period when the region was exporting goods such as textile, spices and raw materials [11, 12].

Figure 2. *Growth of Chittagong city beside chaktai khal and karnaphuli river 1960 (Source: https://en.wikipedia.org/wiki/Chittagong).*

However, it should be noted that the success of these trade hubs was not permanent and rather at decline due to various factors [6] stated that the decline in the urban areas, especially the historical market places is a common feature that is precipitated by changes in the economic status of cities, poor infrastructural development and urban sprawl. As industrialization and modern commercial processes progressed, older trade centers are usually displaced. For instance, a number of industries such as export processing zones emerged and as new modern commercial areas were established, and therefore, traditional commercial zones for instance Khatunganj were left

with outdated facilities, lack of investment and attention. As global trade patterns shifted, many historical trade centers such bazaars as Cairo's Khan el-Khalili, became less relevant to contemporary commerce, leading to their decline [14, 16]. This transition from vibrant market spaces to neglected urban quarters has been a common theme in the evolution of South Asian trade hubs. The decay of infrastructure, competition from modern commercial areas, and the erosion of cultural heritage are key issues that these cities have grappled with [6, 11].

The evolution of South Asian trade hubs, particularly in urban transformation, is underexplored in existing literature. Most research focuses on the historical significance of these hubs within colonial trade networks and their role in shaping urban economies [4, 8]. However, there is limited exploration of the contemporary challenges these markets face in balancing economic revitalization with cultural heritage preservation. Additionally, studies often focus on individual case studies without providing comparative frameworks to address common regional challenges. Few studies integrate community participation and heritage conservation into urban renewal strategies [12].

This study addresses these gaps by adapting a decision-making matrix for the urban renewal of South Asian trade hubs. Based on global urban renewal frameworks [9], the matrix is tailored to assess the specific needs of historic markets like Khatunganj. By incorporating recent studies on urban renewal and heritage conservation [11, 15, 16], the study proposes a framework that integrates modern urban planning with traditional architectural conservation. This approach provides a holistic perspective on balancing economic revitalization with cultural preservation. The theoretical contribution lies in offering a comparative framework for assessing the urban renewal potential of historic trade hubs across South Asia.

Existing studies on South Asian historic markets tend to focus on either physical conservation or socio-economic participation, while structured multi-criteria evaluation frameworks remain limited. Likewise, broader urban decision-making models are rarely operationalized in heritage-based commercial districts. This separation reveals a clear methodological gap in integrating conservation, stakeholder validation, and renewal prioritization.

3. Methodology

This study adopts a three-phase mixed-methods approach, combining both quantitative and qualitative techniques to assess the historical role, present challenges, and future regeneration prospects of Khatunganj.

3.1. Phase 1: Context and Data Collection

First phase established the contextual foundation of the study through a comprehensive literature review, historical trade records, and prior research on South Asian heritage markets. Site analyses included physical surveys of streets, buildings, and the Chaktai Canal, supported by comparative case studies. Field observations documented daily trade activities and movement patterns. Data collection integrated quantitative indicators (infrastructure condition, traffic counts, economic activity) with qualitative insights from semi-structured interviews with traders, residents, planners, and officials. Mapping and architectural documentation captured land use, heritage assets, and infrastructure evolution.

A stratified sampling approach was used to ensure a representative selection of key stakeholders, including traders, warehouse owners, transport workers, architects, planners, government officials, and residents. A total of 150 respondents were surveyed, in line with guidelines by [5, 13] (Appendix II), which suggest that 100-150 participants is an adequate sample size for similar studies. This diverse sample provided a comprehensive understanding of the strengths and weaknesses of Khatunganj, capturing both qualitative insights and quantitative data on infrastructure conditions, traffic, and economic activity.

3.2. Phase 2: Analytical Framework

Phase two deals with developing an evaluative framework (Figure 3). A pre-existing urban renewal decision-making matrix [9] was modified with site-specific criteria to examine the scope for urban renewal and pedestrianization of Khatunganj. Analytical tools included Land-use mapping for identification of ownership pattern, vulnerabilities, and statistical analysis of quantitative data. Besides, thematic analysis of interview transcripts for identifying repetitive issues was another analytical tool used.

The study adopted [9] framework because its core criteria—context, street characteristics, traffic conditions, commercial structure, environmental factors, and community participation—closely align with the conditions observed in Khatunganj. This adaptation enabled the development of a context-sensitive scoring matrix to guide pedestrianization and street management strategies. The matrices assigned scores based on observed conditions, providing a systematic evaluation of components such as road quality, drainage systems, and traffic performance. Consistent with Mehanna's recommendation that such frameworks support the renewal and classification of traditional commercial streets, the adapted matrix was validated through consultations with local planners, architects, and key stakeholders.

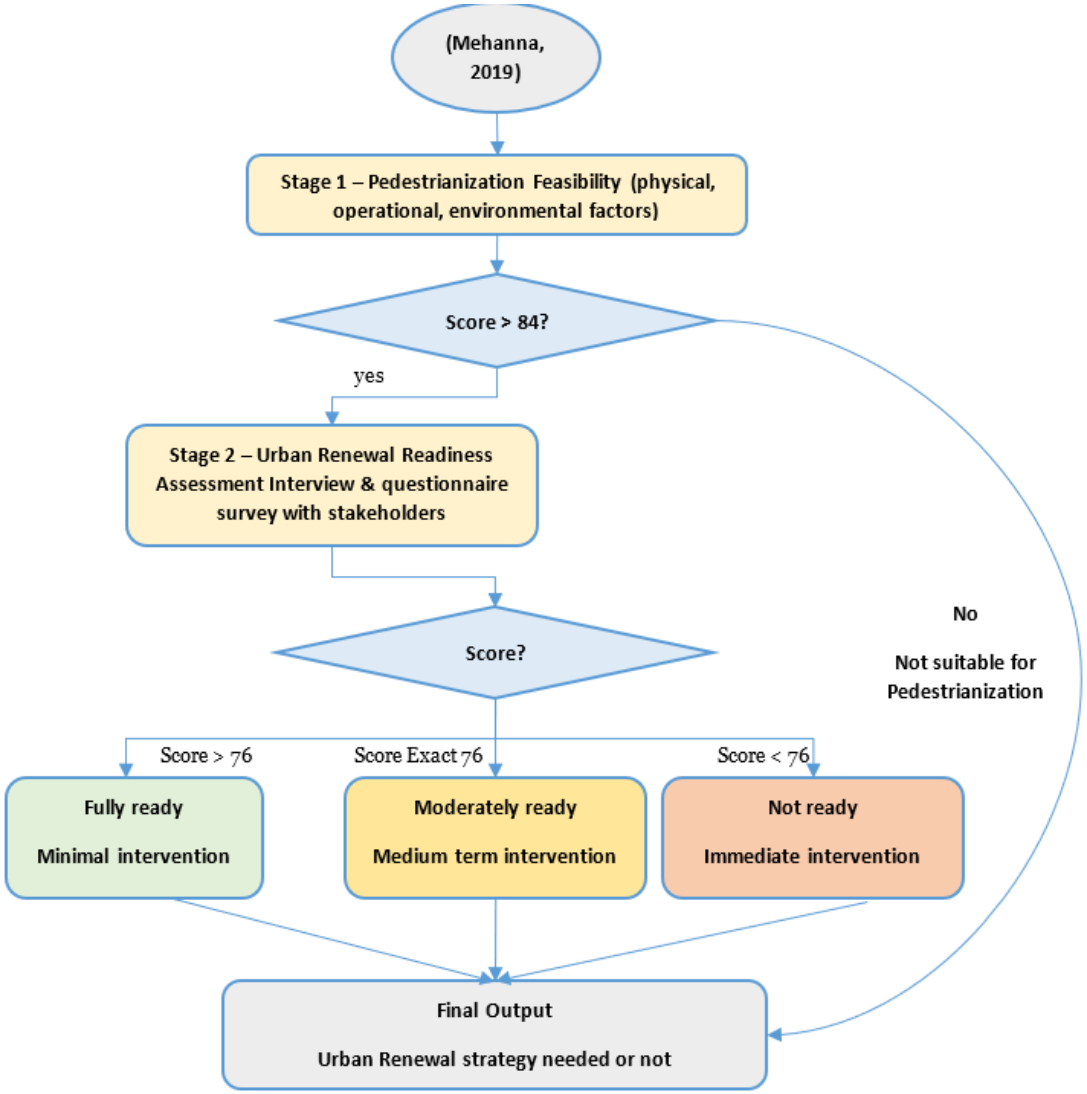

Figure 3. *Developed evaluative framework based on decision-making matrix for urban renewal stablished by Mehanna (2019).*

3.3. Phase 3: Synthesis and Recommendations

With SWOT analysis, the final phase consolidated quantitative and qualitative information to conclude the findings. From the analysis, Khatunganj's strengths and weaknesses and opportunities and threats to its sustainable development were established. The validity of the findings was cross-checked with expert feedback and stakeholder opinions to ensure consistency and accuracy. The expert validation process helped refine the analysis and confirm that the results were relevant and applicable to the proposed urban renewal strategies.

The study ultimately aimed to develop evidence-based, context-specific urban renewal solutions that promote economic development while safeguarding the area's cultural heritage. These steps provided a comprehensive and multi-dimensional strategy for Khatunganj's revitalization and long-term sustainability.

4. Results

4.1. Phase 1 Results: Historical and Built Environment Context

In Phase 1 of the study, focus was laid on the history, structure, and infrastructure of Khatunganj. The research shows that Khatunganj has been a trade center and a blend of commerce, culture, and trade for centuries.

4.1.1. Historical Evolution and Trade Significance

Khatunganj's origins as a trade center can be traced back to the 200s CE, as the Karnaphuli River and Chaktai Canal provided both sea and inland trade access. According to historical accounts, legendary merchant Chand Sawdagar is believed to have established trade operations in Khatunganj, facilitating

both domestic and foreign trade [1, 3]. This allowed Khatunganj to grow in prominence as a node between Bengal and the rest of Asia and the Middle East.

For the next several centuries, Khatunganj served as a place of commerce for Arab, Persian, and later Portuguese, French, and British traders, integrating Khatunganj into the global maritime trade (Figure 5) [4, 8]. The term Ganj for a marketplace or trade hub in Bangla came into use in the mid-19th century, after official businesses were set up by Hamidullah Khan on the land owned by Khatun Bibi [7]. With the addition of foreign merchants, Khatunganj became not just a center for the domestic distribution of goods, but also a regional and international trade hub.

The merchant communities of Khatunganj consisted of two dominant groups: the local traders of the region who are identified as Chatgaoniya and non-local traders that comprised of the Gujarati and Bombay merchants. The non-local traders monopolized the trade because of better capital, licenses, and maritime connections. However, the Chatgaoniya traders were later able to access better networks through import permits and reinvestment which balanced the commercial environment [7].

Over the years, starting with the separation of Bangladesh in 1971, Khatunganj emerged as the primary wholesale market, dominating the supply of key goods for the country and modern trucking systems, and improved port infrastructure. The 1980s containerized trade through Chattogram Port also improved Khatunganj's warehousing capacity. Moreover, the introduction of the Delivery Order (DO) system promoted a trust based trading environment which further improved Khatunganj's reputation as a commercial and financial center.

Beyond its own boundaries, Khatunganj has also shaped the development of neighboring specialized markets such as Teribazar for textiles, Korbaniganj for dried fish, and others focusing on cosmetics and traditional goods. This network effect demonstrates its catalytic role in shaping Chattogram's urban commercial landscape [6].

Despite its achievements, Khatunganj now faces mounting challenges. Infrastructure limitations, frequent waterlogging, and congestion undermine its efficiency. Traders frequently cite inadequate governmental support in providing utilities, road maintenance, and drainage improvements. Even so, the resilience of Khatunganj's business culture, coupled with its deep historical roots, continues to sustain its identity as the commercial heart of Bangladesh.

4.1.2. Chaktai Canal and Environmental Role

The Chaktai Canal has historically been integral to the functioning of Khatunganj. Serving as a vital link to the Karnaphuli River, it enabled the transportation of goods by connecting seagoing vessels to the inland market. In its earlier form, the canal was 90–120 feet wide, large enough to accommodate trading vessels near the river's mouth. From there, goods were transferred to smaller boats (lighters) that navigated the canal to Khatunganj, making it an indispensable artery of commerce (Figure 4).

Over time, however, unplanned urban expansion, encroachment, and sedimentation narrowed the canal to just 30–60 feet. This constriction significantly reduced its utility as a transport channel and diminished its effectiveness as a drainage system for Chattogram. Once capable of handling heavy flows during the monsoon, the canal now struggles to discharge stormwater, causing frequent waterlogging that disrupts trading activities and daily life in the surrounding community.

Figure 4. *The pictures of artist Shohag Parvez showing the earlier wider Chaktai canal used for the trading and drainage purpose Source: [10].*

The canal thus embodies a dual role: historically as a trade route and contemporarily as an essential drainage outlet. Its declining capacity underscores the urgency of revitalization. Without timely intervention, continued narrowing and pollution will undermine Khatunganj's economic sustainability and weaken its environmental resilience, threatening its position as one of Bangladesh's most important historic trading hubs.

4.1.3. Trading Culture and Economic Practices

Khatunganj sustains a vibrant trade culture anchored in a comprehensive business network comprising 276 warehouses, 84 wholesale shops, 192 business firms, and 21 banks. Essential goods, such as rice, chili, ginger, potatoes, onions, lentils, spices, and palm oil, are imported, exported, and distributed from this center to various markets in and out of Bangladesh. The volume and variety of trade activities in Khatunganj make it important to the shifting supply and demand of goods within the country and the globe.

Business activity in Khatunganj typically operates through three primary models (Figure 5):

1) Delivery Order (DO) Trading: Transactions are conducted on paper, often influencing domestic commodity prices through auctions and import–export clearances.
2) Warehouse Business: Commodities imported through Chattogram Port or transported from other regions are stored in extensive warehouse facilities.

3) Wholesale Shop Business: Goods are purchased in bulk directly from producers or processors and distributed nationwide.

This system of trade operates within the framework of critical infrastructure provided by the brokers, banks, trade associations, labor unions, and transport companies, which facilitates the smooth operation of the marketplace. Goods that are brought in from outside the country are transferred to Fishery Ghat by large and small ships and then from there, transported to Khatunganj by truck, van, or rickshaw. Throughout this entire process, the need for delivery orders showcases the integrated structure of the supply chain.

a. D.O. Trading b. Warehouse business c. Wholesale shop business

Figure 5. *Trading culture in Khatunganj (source: Author).*

4.1.4. Market Typologies and Architectural Heritage

Khatunganj's built environment reflects a compact, multifunctional urban form that integrates commerce, storage, finance, and housing. Shops are typically long and narrow—about 5 feet by 80 feet—with small street-facing storefronts and deep storage areas, while upper floors often serve as dormitories for workers. Wholesale shops are arranged in aisles supported by warehouses and offices at the rear, complemented by specialized buildings for DO trading, banking, and transport services (Figure 6). This organization creates a tightly interlinked system where residential, commercial, and financial functions coexist, reinforcing Khatunganj's position as both a trading hub and a financial center.

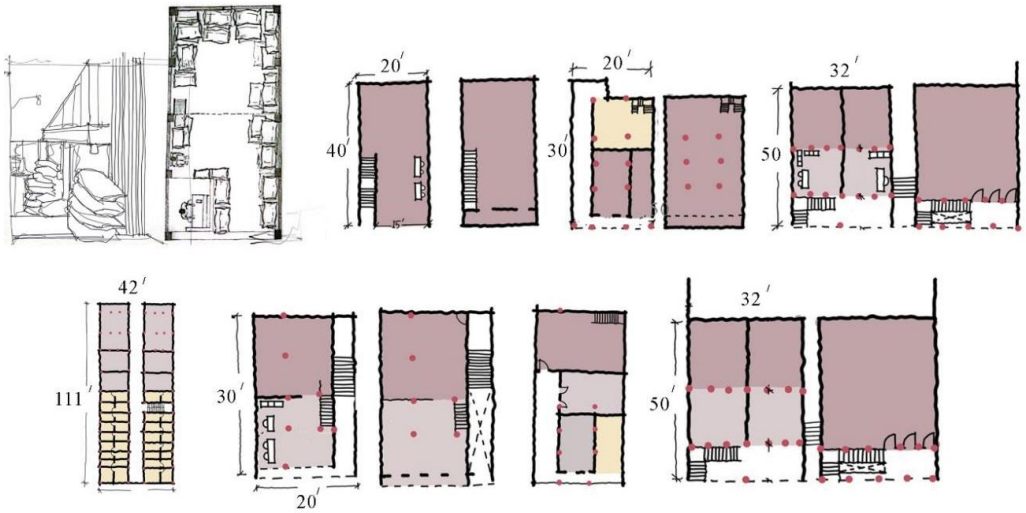

Figure 6. *Business plans for various types of shops of the market (source: Author).*

Architecturally, Khatunganj carries layers of history. Late colonial buildings (from the late 1700s through 1947) were designed with ground-floor commercial spaces and upper-level residences for merchants (Figure 7). Many structures featured European influences such as Corinthian columns, arched windows, and ornate cornices. During the Pakistani period (1948–1970), Islamic motifs including crescents, stars, and geometric patterns were incorporated alongside steel railings (Figure 8). Though much of this heritage is now decayed, adaptive reuse has allowed many buildings to function as shops and offices, preserving traces of Khatunganj's architectural identity. Together, the typologies and heritage elements illustrate how economic necessity and cultural history shaped a uniquely compact urban marketplace.

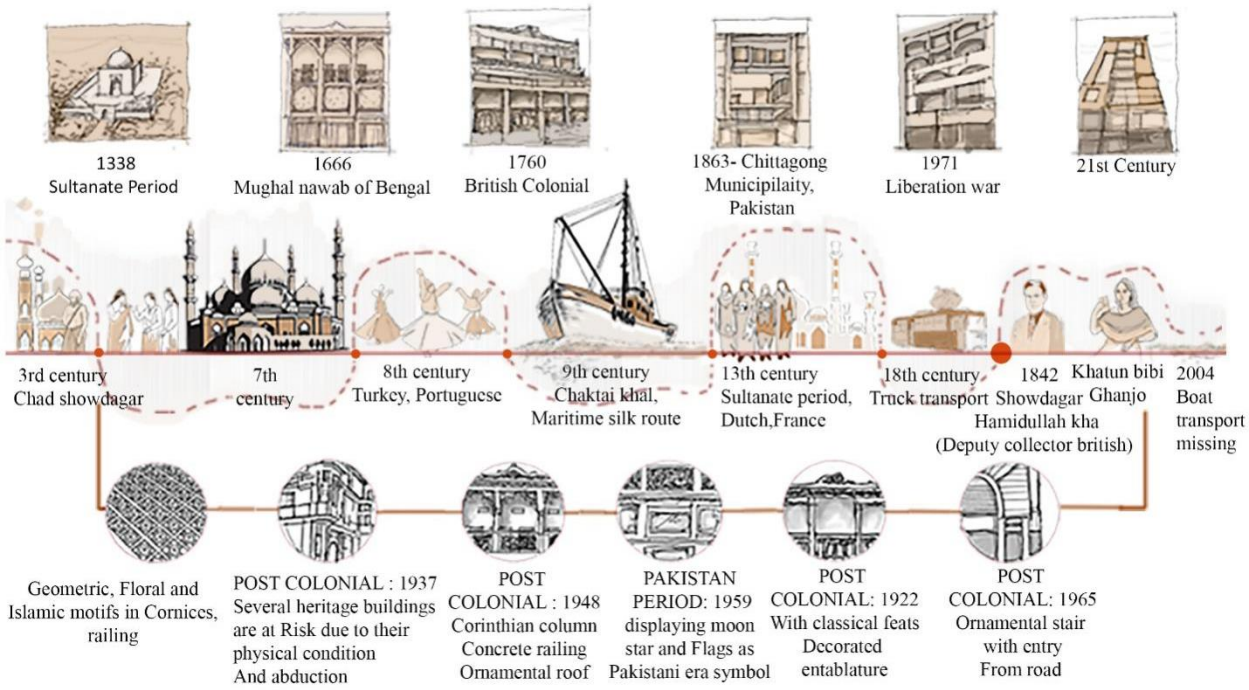

Figure 7. *Significant architectural features of the market for centuries (source: Author).*

Buildings in Khatunganj follow a traditional mixed-use shop-house typology, with wholesale functions at the ground level and upper floors used for storage or worker accommodation. They typically feature narrow entrances, elongated layouts, and rooms arranged along a continuous front veranda, accessed by narrow staircases. Constructed from red brick, mud, timber, and terracotta, the buildings display ornamental brickwork, arched openings, exposed columns, wooden windows, and decorative façade elements (Figure 8). Verandas with overhanging cornices and extended slabs reflect Bengal-Colonial influences and climatic adaptation through high ceilings, large openings, deep verandas, and cross-ventilation. Oriented toward the Chaktai Canal, these structures historically enabled direct unloading of goods into warehouses.

Figure 8. *Various aspects of building and constructions of the historical buildings (source: Author).*

4.1.5. Land Use, Urban Integration, and Infrastructure

Land use in Khatunganj is primarily commercial and warehousing, with limited residential presence. This compact arrangement facilitates intensive trading but also generates congestion and bottlenecks. The Chattogram region is underserved by the lack of open space, as well as narrow streets, which further complicates circulation and unloading activities. The need for infrastructure advancement, along with the preservation of the region's heritage, poses a challenge as it highlights the need for balance.

The commercial and storage functions dominate as illustrated in the provided functional zoning map in Figure 9. Although this density ensures efficiency in goods distribution, it restricts opportunities for expansion or improvement of transport systems and service facilities.

Figure 9. *Land use map showing various types of functional zoning of Khatunganj (source: Author).*

Infrastructure conditions further intensify these constraints. Roads are often damaged and too narrow for heavy trucks. They also lack dedicated unloading bays. Utilities like electricity, water, and gas are unreliable. Waste management and drainage systems are inadequate. Seasonal waterlogging disrupts business operations, damages stored goods, and decreases overall market competitiveness. Traders themselves often stress the urgent necessity of infrastructure improvements, including wider roads, better drainage and waste systems, and reliable utility services. These improvements are vital to enabling Khatunganj to remain Bangladesh's largest wholesale market and to render it viable in the long run both as a business center and as a historical site. The issues observed during analysis and field observation.

1) Land Use: Khatunganj is predominantly commercial and warehousing, with limited residential integration, causing congestion.
2) Interventions: such as balanced zoning and provision of open spaces are needed.
3) Roads & Circulation: Narrow, often damaged streets without unloading bays create traffic congestion and poor truck access.
4) Interventions: include road widening and dedicated loading/unloading zones.
5) Utilities: Electricity, water, and gas supply are unreliable, frequently disrupting trade, highlighting the need for modernized and uninterrupted utility networks.
6) Waste & Drainage: Inadequate waste disposal and poor drainage lead to seasonal waterlogging and sanitation hazards; improvements require systematic waste management and enhanced drainage infrastructure.
7) Urban Integration: The compact, dense market core creates tension between heritage preservation and modernization, which can be addressed through master planning that integrates heritage with infrastructure renewal.

This review illustrates the ways in which land use patterns, infrastructure conditions, and urban integration in Khatunganj are interconnected. The issues need to be tackled in a holistic way to ensure that it retains its economic dominance and cultural identity.

4.1.6. Summary of Phase 1 Findings

The first phase establishes that Khatunganj lies at the heart of Bangladesh’s economy but faces structural weaknesses. Its historical significance, vibrant commercial culture, and architectural heritage provide a strong foundation for heritage led revitalization. Environmental degradation and infrastructural fragility necessitate immediate interventions to safeguard both commercial activity and cultural heritage. Today, many buildings are deteriorating due to waterlogging, poor maintenance, aging infrastructure, and low plinth heights, making them unsafe and unsuitable for modern business use, highlighting the need for adaptive reuse and conservation.

4.2. Phase 2 Analysis: Basis for Urban Renewal Assessment

4.2.1. Evaluation Through a Recognized Framework

Phase 2 of this study entailed an evaluation of Khatunganj's potential for renewal and pedestrianization from established evaluation paradigms (Appendix I). Through reference to Mehanna's [9] work on historic commercial streets, the analysis provides a comparative approach to locating Khatunganj within broader urban typologies (Table 1). Characteristics of these studies indicate correlation along trunk roads, high historical and architectural value, and ongoing commercial occupation. The model pinpoints how business variety, traffic situation, market structure, environmental performance, and community engagement relate to gauge the potential of historic urban areas for revitalization. Implementing such concepts into Khatunganj links theoretical knowledge with ground realities so that recommendations for the future are grounded in relevance and evidence.

Table 1. *Comparative Alignment of Mehanna's Framework with Khatunganj.*

Key Findings from Mehanna (2019)	Correspondence in Khatunganj
Linear markets grow along main traffic corridors, forming continuous streets	Khatunganj is located on a primary traffic corridor with a strong linear market form
Pedestrian streets vary from full malls to semi-/transit malls depending on pedestrian–vehicular interactions	Market reflects pedestrian–vehicular interaction patterns consistent with linear typologies
Ramified markets develop around cultural or religious focal points; aggregated markets cluster around public spaces	Though primarily linear, Khatunganj integrates community and cultural spaces linked to its trading activity
Historic markets typically exhibit architectural diversity and cultural continuity	Khatunganj contains historically significant buildings, unique architectural features, and cultural memory

This alignment confirms that Mehanna's [9] model is well suited for evaluating renewal strategies in Khatunganj. It integrates urban form, mobility, economic activity, environmental quality, and community input—factors that closely match the area's corridor-based market and shared streets—while its flexible pedestrianization typologies and stakeholder validation ensure the matrix reflects local realities. To compare its readiness for pedestrianization in an orderly way, the research made use of a points-based decision-making matrix. The matrix considers five broad categories: street characteristics, traffic situation, commercial composition, environmental conditions, and people's involvement. These categories are further divided into specific criteria graded on a scale of 6 (high), 4 (medium), or 2 (low). The overall score indicates the suitability of a street for pedestrianization. Under this methodology, streets with more than 84 points are fit for full pedestrianization. Streets with 84 points can be considered for modification with caution, and streets with scores below 84 points are not suitable for change. The Overview of Khatunganj's Evaluation is mentioned in Table 2.

Table 2. *Urban Renewal Assessment Matrix (Summary of Khatunganj Evaluation).*

Criteria	Observations in Khatunganj	Score (6/4/2)	Total Score
Street Characteristics	Historic center location; width < 10m; length < 1.5 km; human scale; average accessibility	Mostly 6–4	88
Traffic Conditions	High pedestrian density; low vehicle ratio; parking absent; service access conflicted	Mixed 6/4/2	
Commercial Structure	More than 10 activities; diverse wholesale and retail functions	6	
Environmental Factors	Favorable street orientation; partial shading/ventilation; flat land, limited comfort	4–2	
Community Participation	>60% approval from both users and shop owners	6	

This adherence justifies Mehanna's [9] points-based decision-making matrix as a means of examining renewal strategies in Khatunganj. The application of the matrix to the site earned the area an 88-point mark above the mark of 84 points, qualifying the street for pedestrianization. This finding further justifies pedestrianization as the pressing intervention towards revitalizing Khatunganj's heritage commercial environment.

But pedestrianization alone will not guarantee effective market operation, given persistent problems with circulation, loading and unloading operations, and transactions on a day-to-day basis. To compensate for these factors, the matrix was complemented with new indicators from stakeholder questionnaires and expert interviews. These allowed for a more detailed evaluation of post-pedestrianization needs, segregating these into those in need of immediate remedy, those which can be tweaked with minor adjustments, and those needing long-term strategies.

4.2.2. Stakeholder Insights and Questionnaire Findings

Further interviews reinforced the initial findings, highlighting areas where community members expressed satisfaction and areas where dissatisfaction persisted. This provided deeper insights into operational, infrastructural, and social priorities, strengthening the evidence base for renewal strategies.

To assess Khatunganj, surveys and interviews were conducted with traders, residents, officials, and other stakeholders. Data were analyzed quantitatively (percentages, diagrams) and qualitatively (thematic coding) to identify key issues and opportunities.

Survey Focus Areas:

Economic Aspects: Market condition, loading/unloading efficiency, traffic management, business prospects, worker facilities, institutional support, and potential of canal-based transport.

Environmental Concerns: Walkability, drainage, waste management, sanitation, air quality, and canal restoration.

Cultural & Social Aspects: Heritage preservation, community interaction, tourism potential, and contextual sensitivity.

The summary of the questionnaire findings and their quantitative analysis are shown in Table 3 and Figure 10.

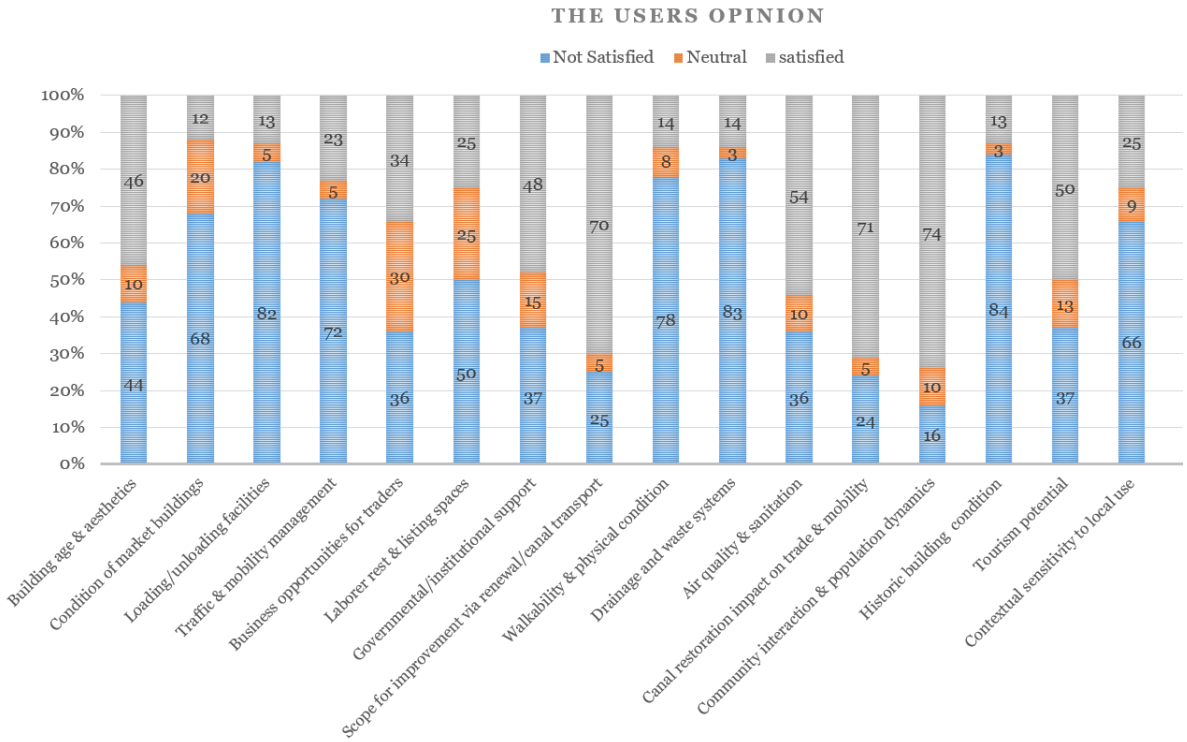

Figure 10. *Stakeholder's feedback over the questionnaire issues (source: Author).*

Table 3. *Stakeholder Insights and Questionnaire Findings (Key Themes).*

Domain	Issues Identified	Stakeholder Feedback Summary
Economy	Market condition, loading/unloading, traffic, labor facilities	Goods damaged during waterlogging; lack of unloading bays; inadequate facilities for workers.

Domain	Issues Identified	Stakeholder Feedback Summary
Environment	Drainage, waste management, air quality	Seasonal waterlogging; poor sanitation; environmental hazards due to canal stagnation.
Culture	Heritage, social interaction, tourism	Strong support for adaptive reuse of historic buildings; demand for heritage tourism opportunities.
Governance	Management, decision-making, policy support	Poor hygiene and waste management; governance gaps; political and institutional obstacles.
Future Planning	Circulation, parking, master plan, modernization	Strong demand for circulation re-planning, parking zones, and integrated master plan.

This community perception analysis served as a valuable tool to uncover real-world challenges and opportunities, ultimately informing a more responsive and sustainable development strategy for the area. Two central objectives guided this process: first, to assess whether the existing built environment adequately supports business growth and user needs; and second, to identify the extent to which updated urban policies, planning strategies, and design-based solutions are required. The categorization of responses streamlined the analysis and highlighted priority areas for strategic intervention. The categorization of responses streamlined the analysis and highlighted priority areas for strategic intervention. The expanded assessment ensured that renewal strategies were prioritized, their importance clearly defined, and their scale of implementation understood. All results were reviewed and validated by a jury board of planners and architects, confirming that the recommendations are evidence-based and supported by both experts and stakeholders.

4.2.3. Urban Renewal Needs Assessment Matrix

The third stage of analysis applied a locally developed Urban Renewal Needs Assessment Matrix, designed on the basis of interviews, questionnaire surveys, and expert jury evaluation (Appendix III). The purpose of this stage was to determine whether Khatunganj, once pedestrianized, could operate efficiently without additional interventions, or whether broader urban renewal measures would be required.

The scoring methodology applied a structured points-based system: 6 points represented full readiness, 4 indicated partial readiness requiring medium-term improvement, and 2 signified non-readiness requiring immediate intervention. Based on cumulative results, sites scoring above 76 were considered fully ready, 76 indicated moderate readiness, and scores below 76 reflected insufficient readiness for pedestrianization. The assessment summary is presented in Table 4.

Table 4. *Summary of Urban Renewal Needs Assessment (Derived from Stakeholder Inputs).*

Category	Strengths / Positive Aspects	Weaknesses / Deficiencies
Market System Functionality	Strong trading culture and adaptability	No unloading bays, poor scheduling, storage congestion
Infrastructure Readiness	Strategic central location	Waterlogging, unreliable utilities, lack of amenities
Social Infrastructure	Dense urban fabric and accessibility potential	Weak public transport linkages, congestion, poor emergency access
Economic & Cultural Viability	Heritage identity, tourism potential	Declining resilience, underused heritage, economic loss risks
Safety & Comfort	Large user base, vibrant daily activity	Overcrowding, poor shading/ventilation, weak security
Governance & Maintenance	Existing market associations	Inactive management body, inadequate budgets, lack of policy alignment

Khatunganj received a total score of 66 points (Appendix III), placing it below the readiness threshold. While pedestrianization remains technically feasible, the findings indicate that comprehensive urban renewal—particularly in infrastructure, governance, and social amenities—is required to ensure effective implementation.

The findings underscore that pedestrianization alone cannot

secure the future of Khatunganj. Without structural improvements in infrastructure, governance, and environmental resilience, the benefits of pedestrianization will be short-lived. A phased urban renewal strategy is therefore essential to safeguard both its commercial viability and cultural heritage.

4.3. Phase 3: SWOT Analysis – Final Outcomes

The third and final phase of the methodology involved a SWOT analysis to synthesize insights from historical review, stakeholder surveys, and evaluation matrices. This integrative step supported evidence-based decision-making for Khatunganj's urban renewal.

SWOT Analysis for Urban Renewal Decision-Making in Khatunganj Trade Hub

1) Strengths: Situated beside the Karnaphuli River and the Chaktai Canal, the area has historically functioned as a strategic gateway for water-based trade and goods movement, shaping its evolution into a major commercial hub. Over time, this advantageous location fostered a vibrant trading culture and a highly dense network of wholesalers, warehouses, and distribution systems that serve regional and national markets. The presence of numerous banks, financial institutions, and brokerage houses has further strengthened its role as a financial and commercial nucleus. At the same time, a rich collection of heritage buildings and long-standing business establishments reflects the area's cultural memory and architectural character, reinforcing its identity as both an economic powerhouse and a historically significant marketplace.
2) Weaknesses: The area experiences intense traffic congestion and inefficient circulation, largely due to the absence of designated loading and unloading facilities that disrupt everyday trade activities. Narrow, deteriorated streets further restrict movement and accessibility for both vehicles and pedestrians. Persistent waterlogging and a lack of basic amenities create challenging working conditions for traders and workers. These issues are compounded by weak governance and fragmented management, which limit coordinated decision-making and slow the implementation of effective improvements.
3) Opportunities: The area offers significant opportunities for revitalization through strategic interventions. Restoring the canals and reintroducing water-based transport can improve circulation, ease traffic congestion, and reconnect the market with its historic waterways. Heritage buildings and long-standing commercial structures present possibilities for adaptive reuse, preserving cultural identity while supporting modern functions. Developing heritage- and trade-based tourism can create new economic opportunities and showcase the area's unique history. Upgrading utilities and urban services would enhance daily operations, environmental resilience, and the overall quality of life for workers and visitors. All these measures can be effectively coordinated through an integrated master plan, ensuring that renewal is systematic, sustainable, and sensitive to both cultural and commercial values.
4) Threats: The area is confronted with multiple interrelated challenges that hinder both its functionality and preservation. Persistent encroachment on canals and waterways not only disrupts circulation but also erodes the historic character of the market. Institutional and political obstacles, including fragmented management and slow decision-making, limit the implementation of coordinated renewal strategies. Seasonal flooding and broader climate risks further exacerbate infrastructure weaknesses, affecting accessibility and trade operations. At the same time, competition from modern wholesale markets draws business away from traditional vendors, placing economic pressure on the historic trading system. Coupled with ongoing neglect and insufficient conservation efforts, these factors put heritage buildings and culturally significant sites at serious risk of irreversible loss.

The SWOT analysis confirms that Khatunganj's renewal strategy must integrate infrastructural improvements with heritage preservation and governance reforms. Pedestrianization is possible, but only within a broader urban renewal framework that addresses weaknesses and threats while leveraging the area's historic strengths and emerging opportunities. This ensures that recommendations are both context-sensitive and forward-looking, safeguarding Khatunganj's role as Bangladesh's largest wholesale hub and a living heritage site.

5. Conclusion and Recommendations

The findings of this study validate that Khatunganj has been a contributing area in Chattogram's urban and economic development due to its century-old trading culture, central location, and distinctive architectural heritage. These characteristics highlight the market's immense potential for renewal and sustainable growth.

The key findings also emphasize that Khatunganj has always remained an integral part of the city development due to its historical and commercial importance. With its thick and diversified trade culture, great central location, and peculiar architectural features, Khatunganj has tremendous potential for growth. Yet, the market is at a crossroads now, plagued by acute traffic problems, inadequate transport infrastructure, environmental stress, and neglect of old as well as newer historic building complexes. These issues can threaten its image as a vibrant trade center unless proper remedies are implemented in time.

To safeguard its future, this study recommends an overall strategy of interventions:

1) Rehabilitate the Chaktai Canal as a transport route and working drainage system.
2) Retain and rehabilitative old buildings, maintaining their architectural and cultural values.

3) Upgrade infrastructure and waste disposal, with specific focus on utilities, road networks, and public amenities.
4) Modernize the trading environment by having improved circulation, loading and parking areas, and computerization of trading systems.
5) Strengthen governance and community participation through a coordinated master plan with local market associations, government offices, and local stakeholders.

A central contribution of this study is the methodological adaptation of Mehanna's [9] urban renewal decision-making matrix to the socio-spatial context of Khatunganj. The framework was operationalized into a context-specific scoring matrix evaluating streets, traffic, commercial structure, environmental conditions, and community participation. Supported by stratified stakeholder surveys, quantitative scoring, thematic analysis, and expert validation, the approach ensured analytical rigor and contextual relevance.

The matrix results identified key strengths—strategic location, dense trade networks, strong commercial culture, and heritage assets—alongside critical weaknesses, including congestion, waterlogging, infrastructural deterioration, and weak governance. Through SWOT synthesis, these findings were translated into targeted strategies such as canal rehabilitation, adaptive reuse of historic buildings, infrastructure upgrading, circulation improvements, and coordinated governance mechanisms.

By integrating empirical analysis with a validated decision-support tool, the study provides a replicable and evidence-based framework for revitalizing historic trade districts. The adapted matrix offers a practical method for balancing economic modernization with cultural preservation and urban resilience, positioning Khatunganj as a model for context-sensitive renewal in similar South Asian markets.

Abbreviations

SWOT	Strengths, Weaknesses, Opportunities and Threats
DO	Delivery Order
CDA	Chattogram Development Authority

Author Contributions

Md. Sadman Chowdhury Apurba: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Resources, Software, Validation, Visualization, Writing – original draft

Ayasha Siddiqua: Conceptualization, Data curation, Investigation, Methodology, Project administration, Supervision, Validation, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

Appendix

Appendix I: Decision-Making Matrix

Table A1. *Decision-Making Matrix for Urban Renewal and Commercial Street Pedestrianization.*

Urban Renewal Assessment Matrix: A Multi-Criteria Evaluation Framework for Revitalizing Historic Commercial Areas based on Mehanna (2019).

Criteria	Issues	Number of points per item		
		6	4	2
Street Characteristics	Location	Historical Center	City center	Outskirts of the city
	Street width	< 10m	Between 10m to 15m	>15m
	Street length	< 1.5km	Between 1.5 km to 3 km	> 3km
	Street scale	Friendly	Human scale	Monumental scale
	Accessibility	High	Average	Low
	Functional continuity	Good	Acceptable	Low
Traffic Conditions	Intensity of vehicle	Low ratio	Average ratio	High ratio

Urban Renewal Assessment Matrix: A Multi-Criteria Evaluation Framework for Revitalizing Historic Commercial Areas based on Mehanna (2019).

Criteria	Issues	Number of points per item		
		6	4	2
	Intensity of pedestrians	High ratio (more than 3 persons/m²)	Average ratio (3 persons/m²)	Low ratio (less than 3 persons/m²)
	Parking	About 800m away	About 1000m away No specific servicing but with certain times of Service specified	More than 1000m away
	Serving	Side streets	Accessible	No scope for servicing except car entry
	Easy access	Easy	Average	Hard
	The relationship between vehicles and pedestrians	Conflicted	Balanced	No Conflict
	Absorption of parallel streets for car movement	High ratio	Average ratio	Low ratio
Commercial structure	Types of shop	Suitable for pedestrian streets	Corresponds to some pedestrian requirements	Compatible only with mixed traffic streets
	Diversity of activities	High (More than 10 activities)	Average (between 4 and 10 activities)	Low (Fewer than 4 activities)
	Street orientation	Good (parallel or tilted 20 °–30 °on N-S axis)	Average (tilted >30 °)	Bad (Perpendicular to favorable wind)
Environmental factors	Street Shading	Available	Can be improved	Not available
	Street ventilation	Good	Average	Bad
	Land topography	Different levels	Low slope	Flat
Community participation	The opinion of users about Turning the street into a Pedestrianized street	An approval rate of 60: 100%	An approval rate of 50 - 59%	Less than a 50% approval rate
	The opinion of shop-owners about turning the street into a pedestrianized street	An approval rate of 60: 100%	An approval rate of 50 - 59%	Less than a 50% approval rate
Total point		More than 84 points	84 points	Less than 84 points

Appendix II: Interview Question and Comments

Table A2. How does waterlogging impact trade operations in Khatunganj? (RQ1).

Questions / Issue	Stakeholder	Key Feedback / comments	Thematic code
How does waterlogging affect daily loading/unloading?	Local Traders	Goods often get damaged; trucks can't enter for 3–4 hours.	Operational Disruption
How do you manage deliveries during waterlogging?	Traders & Transport Workers	Delay shipments or use smaller boats; costly and risky.	Adaptive Strategy

Questions / Issue	Stakeholder	Key Feedback / comments	Thematic code
What are the economic impacts of waterlogging?	Local Traders	Delays cause financial loss; clients complain; perishable goods wasted.	Economic Loss
Biggest operational challenge in recent years?	Market Organization Secretary	Trade volume decreased; canal transport no longer functional; transport cost higher; fraud increasing; Chattogram Development Authority CDA hasn't provided solution.	Operational Disruption, Waterlogging Impact, Economic Loss
How does waterlogging affect warehouse operations?	Warehouse Managers	Ground floor stocks moved to higher levels; extra labor cost.	Adaptive Strategy
What are the per-truck & labor costs?	Local Traders, Truck Drivers, Brokers	Per truck 150 mon goods; labour 4 tk/mon; broker 100–150 tk/truck; warehouse rent 25,000+ tk; manager 20,000 tk/month; labour 13,000 tk; per package loading/unloading 20 tk.	Cost Structure Insight
Transport rates via ghats and alternative channels?	Boat / Push Cart Operators	Fishery ghat: 600 tk; Chaktai khal: 25–30 tk; outside Chattogram 20,000–250,000 tk per delivery in truck; Good price vary subject to tax, transport cost, dollar rate, international market fluctuations.	Transport Cost Insight, International Trade Impact
Are there facilities for rest or toilet during work?	Day Laborers	No rest area, no toilets; difficult working conditions during waterlogging.	Poor Amenities
How does waterlogging impact the local environment?	Local Traders & Residents	Water stagnation damages canals and drains; creates health hazards.	Environmental Issue

Thematic Summary (RQ1): Operational disruption, adaptive strategies, economic loss, cost & transport structure insights, poor amenities, waterlogging impact, environmental issues.

Table A3. *How does traffic and infrastructure influence logistics in Khatunganj? (RQ2).*

Questions / Issue	Stakeholder	Key Feedback / comments	Thematic code
How does traffic congestion affect unloading?	Transport Workers	Often wait a day; clients complain.	Supply Chain Delay
Are there seasonal variations in congestion?	Transport Workers	Before Eid, congestion doubles; no traffic plan.	Seasonal Variation
Is unloading infrastructure sufficient?	Traders & Warehouse Managers	Need dedicated unloading bay; waste disposal poor.	Infrastructure Constraint
How does pedestrian infrastructure affect movement?	Clients	No dedicated pedestrian, causing safety and movement problems.	Pedestrian Infrastructure Gap
How do narrow lanes & small vehicle traffic affect operations?	Local Traders	Narrow lanes blocked by vans/rickshaws; unloading slower.	Last-Mile Blockage
Is parking available for trucks?	Truck Drivers	No designated parking; forced to unload on main road.	Parking Constraint
What is the impact of damaged roads?	Transport Workers	Damaged surfaces slow movement and increase accident risk.	Road Condition Issue
How does poor infrastructure affect cultural heritage areas?	Planners / Architects	Old building facades and heritage streets are at risk; poor traffic circulation increases damage.	Heritage Conservation
Are environmental concerns considered in planning traffic?	Planners & CDA Officials	Stagnant water and blocked canals worsen environmental conditions.	Environmental Issue

Thematic Summary (RQ2): Delays, seasonal congestion peaks, poor infrastructure, pedestrian safety gaps, last-mile blockage, parking constraints, road condition issues, heritage conservation, environmental concerns.

Table A4. *How is market management perceived by stakeholders? (RQ3).*

Questions / Issue	Stakeholder	Key Feedback / comments	Thematic code
How is market cleanliness and hygiene?	Local Traders & Warehouse Managers	Waste disposal is poor; affects customer satisfaction.	Hygiene Issue
Are management practices effective?	Traders & Transport Workers	Market lacks proper management and coordination.	Management Gap
How do stakeholders suggest improvements?	All Stakeholders	Better drainage, traffic plan, organized unloading bays; revive canals; heritage/tourism potential; circulation plan; parking/loading areas.	Improvement Suggestions, Urban Renewal, Tourism Potential
Are traders involved in decision-making?	Local Traders	Most decisions taken by a few leaders; others uninformed.	Governance Gap
How are disputes resolved?	Association Members	Informal negotiation; no formal complaint system.	Dispute Resolution Issue
What are constraints in implementing solutions?	CDA Officials	Political influence, land encroachment, private ownership, natural lowland conditions delay canal revival projects.	Governance Challenge
How do economic and international factors affect trade?	Importers / Exporters	Dollar rate fluctuations, tax, transport costs affect order volumes and pricing.	Economic Issue, International Trade Impact
How does market management affect cultural activities?	Local Traders & Residents	Lack of organized heritage/cultural spaces reduces tourism and cultural participation.	Cultural Issue, Heritage Conservation

Thematic Summary (RQ3): Hygiene issues, management gaps, governance gaps, suggested improvements, dispute resolution needs, urban renewal potential, tourism potential, economic issues, cultural and heritage conservation concerns.

Table A5. *Stakeholder Opinion on Urban Renewal / Future Planning. (RQ4).*

Questions / Issue	Stakeholder	Key Feedback / comments	Thematic code
Do stakeholders want circulation replanned for traffic & trucks?	Local Traders, Truck Drivers	"Yes, proper circulation and alternative routes needed for smooth loading/unloading."	Circulation Planning
Do stakeholders want new parking facilities?	Traders, Transport Workers, Clients	"Dedicated parking for trucks and carts is essential to reduce congestion."	Parking Improvement
Do stakeholders want new load/unload zones?	Traders, Warehouse Managers	"Organized loading/unloading bays to reduce time and risk."	Loading/Unloading Planning
Do stakeholders support a new master plan for Khatunganj?	All Stakeholders	"Yes, integrated master plan including circulation, heritage, tourism, and market improvement."	Master Plan Support
Should heritage buildings be adaptively reused?	Planners, Architects, Traders	"Yes, old shop-houses and buildings should be revitalized for heritage and commercial use."	Heritage Re-adaptive Use
Do stakeholders want tourism introduced?	Traders, Residents	"Yes, controlled heritage & cultural tourism can boost economy and market visibility."	Tourism Potential
Should economy & culture be strengthened via market development?	Local Traders, Exporters	"Yes, preserving trade culture while improving modern facilities is desired."	Economic & Cultural Development
Do stakeholders want modernization with traditional context maintained?	All Stakeholders	"Yes, modern facilities (utilities, internet, shops) while maintaining market character."	Modernization with Context
Are social infrastructure improvements needed?	Residents, Day Laborers	"Roads, public toilets, stalls, rest areas, safety measures required."	Social Infrastructure

Questions / Issue	Stakeholder	Key Feedback / comments	Thematic code
Are recreational & religious facilities needed?	Residents, Traders	"Yes, community spaces and small recreational/religious areas will improve environment."	Recreational & Religious Spaces
Do stakeholders want planners, architects, and government support for policy/zoning?	Traders, Planners, CDA Officials	"Yes, guidance for zoning, circulation, heritage protection, and urban renewal is required."	Policy & Planning Support

Thematic Summary (RQ4):

Circulation planning, parking & loading/unloading organization, master plan support, heritage conservation & adaptive reuse, tourism potential, economic & cultural development, modernization with context, social infrastructure, recreational & religious facilities, policy & planning support.

Appendix III: Urban Renewal Assessment Matrix (Organized Summary and Scoring)

Table A6. *Urban Renewal Assessment Matrix – Summary and Scoring.*

Criteria	6 Points (Fully Ready)	Points (Partially Ready)	2 Points (Not Ready)	Observations in Khatunganj (from thematic codes)
Market System Functionality	Adequate unloading bays; smooth scheduling; nearby warehouses reduce congestion	Limited unloading facilities; some conflicts in scheduling; partial storage solutions	No proper facilities; frequent obstruction; constant conflicts; no off-site storage	Poor facilities, operational disruptions, last-mile blockages, and congestion
Infrastructure Readiness	Efficient drainage; reliable utilities; adequate street furniture and amenities	Minor flooding in extreme events; some utility disruptions; some amenities missing	Frequent waterlogging; utilities inaccessible; minimal amenities	Severe drainage issues; poor amenities; environmental risks
Social Infrastructure	Strong transport connectivity; full emergency access; efficient parallel street absorption	Limited access within 500m; moderate delays in circulation	Poor connectivity; difficult emergency access; severe congestion	Pedestrian infrastructure gaps; circulation planning deficiencies
Economic & Cultural Viability	Businesses resilient; stable/growing sales; strong tourism potential; heritage well-maintained	Moderate adaptability; stable but no growth; moderate tourism; partial heritage use	High resistance to changes; declining sales; heritage neglected/demolished	Economic losses; weak resilience; underused heritage
Safety & Comfort	Effective crowd management; good microclimate; strong security	Occasional overcrowding; partial comfort measures; partial coverage	Frequent overcrowding; poor shading/ventilation; weak security	Overcrowding; poor amenities; weak surveillance
Governance & Maintenance	Active management body; dedicated budget; full policy alignment	Inactive body; partial budget; partial policy support	No management body; no budget; no policy support	Governance gaps; weak policy & institutional support
Total Points	More than 76 points	76 points	Less than 76 points	

Scoring and Decision:

1) 76 points: Fully Ready – No major urban renewal needed; maintain & enhance.
2) = 76 points: Moderately Ready – Requires targeted urban renewal interventions.
3) < 76 points: Not Ready – Urban renewal strategy essential before/during pedestrianization.

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