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Post-conflict Aleppo as a Crisis Context: How Micro-Scale Construction Firms Sustain Housing Production Under Extreme Uncertainty?

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Abstract

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Post-conflict contexts pose severe challenges for urban economies, particularly for micro-scale construction firms that play a critical role in housing provision. Aleppo, as a city undergoing post-war reconstruction, represents an extreme crisis environment characterised by economic instability, institutional fragility, and limited resources. This study investigates how micro-scale construction firms in Aleppo develop economic resilience and sustain housing production under post-conflict conditions. Adopting a qualitative research approach, the study is based on semi-structured interviews with six micro-scale architecture, engineering, and construction firms, supported by contextual document analysis of post-war reconstruction reports. The findings reveal that micro-scale firms rely heavily on informal networks, adaptive financing mechanisms, flexible labour and material procurement practices, and trust-based relations to maintain operational continuity. The study contributes to post-conflict reconstruction and construction management literature by highlighting micro-scale firms' project-level governance practices and underlining their significance for housing recovery and urban resilience in post-war cities.

Keywords: Post-conflict reconstruction; Economic resilience; Micro-scale construction firms; Housing production; Urban economic recovery.

1. Introduction

Armed conflict and prolonged political instability have left deep and lasting impacts on cities, particularly through widespread housing destruction, disrupted construction supply chains, and the erosion of institutional governance structures (Kousa et al., 2021; Ibrahim et al., 2022). In post-conflict urban contexts, housing reconstruction is frequently discussed through large-scale recovery programmes, international aid frameworks, and state-led redevelopment strategies. However, in many cities where formal reconstruction remains fragmented or delayed, housing production continues through the incremental and often informal activities of micro-scale construction actors. Despite their central role in everyday urban recovery, these actors remain largely underexplored in both architectural and construction management literature.

Aleppo constitutes a critical case for examining these dynamics (Zeido, 2023; Kousa et al., 2023). Following years of intense conflict and large-scale physical destruction, the city has entered a prolonged post-war condition characterised by economic sanctions, material shortages, labour outmigration, and regulatory uncertainty (Munawar & Symonds, 2022). In the absence of a comprehensive and stable reconstruction framework, micro-scale architecture, engineering, and construction firms have emerged as key agents sustaining housing production through small-scale repairs, adaptive reuse, and incremental new construction. These practices do not merely respond to physical damage but also reflect broader strategies for operating under extreme uncertainty.

Existing studies on post-conflict reconstruction tend to focus on macro-level policies, donor-led programmes, or large infrastructure projects, often overlooking how housing is produced and maintained in practice during prolonged recovery phases (Bilau et al., 2018; Rezk et al., 2025). Similarly, research on construction firm resilience has largely examined organisational responses to economic crises in relatively stable institutional contexts. There remains a significant gap in understanding how micro-scale firms translate survival strategies into project-level decision-making routines when operating under compounded conditions of conflict legacy, economic instability, and institutional fragility (Alshahrani & Salam, 2022).

Addressing this gap, this paper investigates how micro-scale construction firms in post-conflict Aleppo sustain housing production by embedding adaptive decision-making practices into their everyday project operations. Rather than conceptualising resilience as a static organisational attribute, the study adopts a process-oriented perspective, examining

how financial arrangements, labour practices, material procurement strategies, and client relationships are continuously adjusted at the project level. By doing so, the paper shifts attention from abstract notions of resilience toward the concrete mechanisms through which housing production persists in crisis contexts.

Empirically, the study draws on qualitative data derived from in-depth interviews conducted with six micro-scale architecture, engineering, and construction firms operating in Aleppo. Analytically, the findings are structured around thematic categories that capture key dimensions of adaptive project governance, including financial risk management, labour flexibility, material sourcing, service diversification, and trust-based relational networks. Through this approach, the paper contributes to contemporary debates in post-conflict urbanism and construction management by foregrounding the role of micro-scale actors as critical, yet often invisible, contributors to urban recovery.

The remainder of the paper is organised as follows. Section 2 outlines the research methodology and analytical framework. Section 3 presents the empirical findings, structured around the identified resilience strategies. Section 4 discusses these findings in relation to existing literature on post-conflict reconstruction and organisational resilience. The paper concludes by reflecting on the implications of micro-scale adaptive practices for more inclusive and context-sensitive post-conflict housing strategies.

2. Materials and Methods

This study employs a qualitative research design to examine how micro-scale architecture, engineering, and construction (AEC) firms sustain housing production in post-conflict Aleppo under conditions of extreme uncertainty (Bengtsson, 2016). Methodologically, the study builds on an established qualitative protocol developed within a prior national research initiative (TÜBİTAK Project No. 125K269) and extends its scope to the Aleppo context. The protocol guided the development of the data collection tool, the identification of the target group, and the structuring of interview questions, ensuring both systematic coverage across participants and flexibility to capture context-specific dynamics. Primary data were collected through semi-structured, in-depth telephone interviews. This method enabled the research team to follow a consistent question sequence across participants while allowing probing questions to be introduced in response to the natural flow of the conversation and emerging themes. Such flexibility is particularly valuable in crisis and post-conflict settings, where experiential accounts and contextual nuances constitute a major source of analytical insight.

A non-probability purposive sampling strategy was adopted to identify information-rich cases aligned with the study's focus on firm survival and continuity practices. Two main inclusion criteria were applied:

1. firms had to be geographically located and operating within the boundaries of Aleppo; and
2. firms had to meet the definition of micro-scale enterprises.

To ensure that responses reflected strategic decision-making and crisis governance practices, interviews were conducted primarily with firm owners or top-level managers. The sample was intentionally limited to firms that were still active at the time of data collection, as the study specifically investigates practices associated with sustaining operations and maintaining housing-related production despite severe economic constraints and institutional volatility. Firms that had ceased operations or gone bankrupt were excluded from the sampling frame.

In line with qualitative research conventions, sample size was determined not through a priori numerical thresholds but through the depth and adequacy of the collected material. Data collection was concluded after the sixth interview, as responses began to show thematic convergence for the study's core analytical categories. The final sample therefore consisted of six micro-scale AEC firms, anonymised as F1–F6.

The semi-structured interview form consisted of three main parts. The first part captured participant and firm background information (e.g., education level, professional seniority, year of graduation, firm establishment year, number of employees, partnership structure, and service scope). This section was designed to contextualise strategic decision-making capacity and organisational flexibility. The second part focused on crisis-related operational challenges and survival strategies, with questions addressing financing sources, cashflow continuity, procurement and material supply constraints, labour payment practices, customer payment risks, cost estimation practices, and the perceived effectiveness of strategies implemented since the conflict period. The third part explored post-conflict market demand and the types of housing-related projects requested by clients, alongside the firms' ability to respond to these demands under constrained conditions.

The interview questions were informed by prior related studies and adapted to the Aleppo context using insights derived from post-conflict reports, media-based accounts, and existing sectoral assessments. This approach ensured comparability with earlier crisis-focused research while maintaining contextual relevance to Aleppo's post-war reconstruction environment.

The interview transcripts were analysed using qualitative content analysis with an inductive thematic coding approach (Bengtsson, 2016). First, the raw textual data were subjected to close reading to identify meaningful units (ranging from phrases to paragraphs). These units were labelled with initial codes that captured the essence of expressed experiences, practices, constraints, and decision logics. In a second step, codes were iteratively consolidated into broader categories and higher-order themes, enabling an analytically coherent structure to emerge from the data.

Following theme development, a cross-case comparative analysis was conducted across the six firms (F1–F6) to identify patterns of convergence and divergence in survival strategies, operational adaptations, and crisis governance routines. This comparative layer supported the identification of recurring mechanisms and context-specific variations, strengthening the analytical transferability of the findings.

The study included six micro-scale firms operating in Aleppo (Table 1). They represent a range of service profiles across architecture, interior architecture, engineering, construction, restoration, visualisation, furniture, and related activities.

Table 1: Profile of Interviewed Micro-scale Firms (Aleppo).

Firm	Service Scope	Establishment Year	Number of Employees
F1	Architecture, Interior Architecture, Engineering	2025	4
F2	Architecture, Interior Architecture, Visualisation	2024	3
F3	Architecture, Interior Architecture	2017	6
F4	Architecture, Interior Architecture, Construction, Restoration	2016	12
F5	Architecture, Interior Architecture, Construction	2023	6
F6	Architecture, Interior Architecture, Furniture	2025	2

3. Results

Findings from the six interviews (F1–F6) indicate that housing production continuity in post-conflict Aleppo is sustained through a set of interrelated, practice-based resilience mechanisms. Across cases, firms operate within a context defined by severe price volatility, constrained liquidity, skilled-labour depletion, and institutional and market fragilities. Rather than pursuing growth-oriented strategies, micro-scale firms prioritise operational continuity, risk containment, and adaptive reconfiguration of service portfolios and project governance routines. The analysis yielded eight thematic strategy clusters (CODE 1 – CODE 8), which are reported below.

3.1. Financial Resilience and Cashflow Governance (CODE 1)

Financial strategies emerged as a universal theme across all six firms. Two dominant cashflow regimes were observed:

(i) Instalment-based payment systems were adopted as a market-adaptive response to clients' declining purchasing capacity (notably F1, F4, F6). In these cases, firms used staged payments and, critically, developed internal "buffer" practices such as risk funds, temporary work stoppage clauses, and project-plan revisions to manage delays without collapsing the project cycle.

(ii) Upfront and milestone-based payment regimes were used to minimise default risk and secure liquidity (F2, F3, F5, and also F4 for larger projects). In these cases, firms explicitly linked project progress to payment clearance, limiting exposure to receivables risk.

A shared micro-level governance tactic was the incorporation of contingency margins into cost estimates to absorb exchange-rate and inflation shocks (reported by F1, F4, F6). Overall, financial resilience in Aleppo appears less dependent on external capital and more reliant on transactional safeguards, payment sequencing, and risk-adjusted estimation (Table 2).

Table 2: Financial Resilience Strategies (CODE 1).

CODE 1	Financial Measures	Instalment-based cash payment plans	Due to the weakened financial capacity of clients under war conditions, firms offer instalment payment plans. To manage possible delays, they allocate a risk fund and keep options such as temporary work stoppage or revising the project plan.
		Cash and upfront payment models	A large portion of the payment is collected at the beginning of the project, and the remaining amount is collected upon delivery. This model typically requires a down payment equivalent to one-third or one-half of the total value, with the balance paid in instalments in parallel with the property transfer process.
		Contingency margins embedded in profit rates	Due to price instability, budgeting includes an approximate 10–15% fluctuation allowance. A small contingency buffer is added to budgets to cover financial risks arising from changes in material prices.

3.2. Material Procurement and Supply Chain Adaptation (CODE 2)

Material availability was not reported as a strict physical scarcity in most cases; however, price instability and the quality gap between local and imported materials were consistently emphasized (Table 3). Firms tended to adopt one or more of the following tactics:

- Client-driven material selection between low-cost/low-quality local products and high-cost/high-quality imported options (especially visible in firms emphasising design and finishing decisions).
- Collective purchasing and storage as an anti-volatility hedge (notably F4 and F5). In these cases, stockpiling functioned as a strategic financial instrument rather than a mere logistical practice, converting market uncertainty into managed inventory risk.
- Supplier diversification to reduce dependency and mitigate disruptions (clearly stated by F4 and F6), combined with fallback strategies such as secondary-market procurement or engineering-compatible substitutions.

These practices collectively indicate that the critical supply chain challenge is not access per se, but the capacity to stabilise input costs and maintain technical adequacy under volatile conditions.

Table 3: Material Procurement and Supply Chain Strategies (CODE 2).

CODE 2	Material-Related Measures	Local (low-cost/low-quality) vs. imported (high-cost/high-quality) materials; choice left to the client	Because high-quality materials largely depend on imports and local alternatives are insufficient, material costs become disproportionate relative to the final price paid by clients. Significant price fluctuations—especially for key materials such as steel and cement—and low market liquidity make it difficult to access high-quality local supplies.
		Joint bulk purchasing and storage with other firms	To optimise costs, firms collaborate with other companies for bulk purchasing and apply stock/inventory management practices.

Supplier diversification

Procurement is primarily based on direct agreements with trusted suppliers in Aleppo; in the event of disruptions, sourcing shifts to secondary markets or to alternative materials that remain within engineering standards. Diversifying suppliers is used as an effective strategy to reduce dependency on a single source and mitigate supply risks.

3.3. Labour Constraints and Workforce Configuration (CODE 3)

Labour-related constraints—particularly the depletion of skilled workers due to migration and sectoral shifts—were among the most severe and widely shared challenges (F1, F2, F4, F5, F6). Firms responded through contrasting workforce configurations (Table 4):

- Flexible employment via temporary labour (F1, F2, F4, F6 and partially F5) to reduce fixed costs and adjust capacity to project cycles. Daily or task-based payments were common where temporary labour dominated.
- Selective investment in competent permanent staff (notably F3), where the firm considered stable expertise essential for quality assurance and client satisfaction, even if it increased fixed costs.

Across cases, labour resilience was strongly tied to quality control and project delivery reliability: firms reported that inexperienced labour could undermine performance, requiring either stricter supervision, narrower project scopes, or strategic avoidance of high-risk work packages.

Table 4: Labour Management Strategies (CODE 3).

CODE 3	Labour-Related Measures	Economic preference for temporary labour	In newly established companies, a temporary contract-based model is widely adopted instead of permanent employment. Due to skilled labour shortages, firms often have to rely on temporary staff.
		Skill development of the workforce	Access to qualified labour is one of the main challenges; war-driven youth migration has created a severe scarcity. The current workforce has limited experience and lacks the advanced technical skills available in neighbouring countries.

3.4. Business Model Flexibility: Portfolio and Spatial Risk Distribution (CODE 4)

Firms displayed adaptive shifts in their business models along two axes:

(i) Service portfolio diversification. Many firms maintained continuity by moving between project types—restoration, small-to-medium repairs, finishing works, limited new builds, and design services—depending on market demand and risk exposure (F1, F4, F6; also F2 through project-type selection). This flexibility enabled firms to remain active even when full-scale new construction was financially or institutionally constrained.

(ii) Spatial strategy. Some firms diversified geographically to distribute risk (F2, F6), while others constrained construction operations to safer, accessible areas near the office for security and monitoring purposes, while keeping design services geographically unconstrained (F3). This suggests that “extreme uncertainty” is managed through practical boundary-setting—deciding where physical production can be controlled and where work can be virtualised (Table 5).

Table 5: Business Model Adaptation Strategies (CODE 4).

CODE 4	Business Model Measures	Taking projects from different locations	Diversifying project locations is a key strategy to reduce regional dependency risk.
		Alternative business model approaches	Construction project locations are restricted to safe areas and places close to the office, considering security requirements and operational accessibility.
		Diversification of service scope	As a survival strategy, firms diversify engineering-related services and adopt flexible, pragmatic approaches such as focusing on the restoration of damaged buildings and small-to-medium-scale projects. Portfolios are managed flexibly, shifting between restoration projects and finishing works depending on market demand.

3.5. Sectoral Relations and Strategic Cooperation (CODE 5)

Two distinct cooperation pathways were observed:

- External market extension through partnerships beyond Syria and through online freelancing, enabling access to alternative revenue streams and clients (F1).
- Operational coordination with other firms and subcontractors to expand capacity, manage workloads, or complete delivery packages (F5).

However, the evidence also indicates that cooperation is a double-edged strategy: overly fragmented contracting and unreliable partners were associated with coordination failure and losses (highlighted as a negative experience in multiple narratives). Therefore, collaboration contributes to resilience only when it is governed through trust screening, clear role allocation, and transactional safeguards (Table 6).

Table 6: Collaboration and External Network Strategies (CODE 5).

CODE 5	Sectoral Relationship Measures	Building cooperation and partnerships	To expand workload and market reach, collaborations are established with engineering firms in Gulf countries, and international online design services are provided on a freelance basis. Coordination and collaboration with contractors from other companies are also used to increase project capacity.
		Benefiting from international support	Firms work as contractors/implementers with international and humanitarian organisations on projects such as the rehabilitation of schools and health centres and housing support for displaced populations (temporary and permanent solutions).

3.6. Proactive Adaptation and Continuous Monitoring (CODE 6)

A more formalised adaptive practice was explicitly articulated by F5, involving routine internal review meetings, continuous monitoring of market signals and material trends, and the systematic development of alternatives for clients. This suggests that some micro firms institutionalise resilience through regular strategic reflection, approximating a lightweight governance routine that reduces surprise exposure in unstable markets (Table 7).

Table 7: Adaptive Management Strategies (CODE 6).

CODE 6	Adaptation to the New Environment	Finding alternative solutions to overcome challenges	One strategy is holding regular review meetings to assess completed and ongoing work. These meetings allow firms to discuss challenges and develop proposals and solutions. As a result, they maintain up-to-date information on market forecasts and raw material trends, and they continuously try to offer alternative proposals and options.
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3.7. Local Reputation and Trust Capital (CODE 7)

Trust and reputation were not peripheral but central to business continuity. In Aleppo's relationship-based market structure, several firms reported that repeat business and referrals depend heavily on credibility, transparent pricing, and consistent quality (particularly explicit in F4, F5, F6). Reputation thus operates as a form of relational capital that substitutes for weak formal enforcement and mitigates uncertainty in transactions (Table 8).

Table 8: Reputation-Based Resilience Strategies (CODE 7).

CODE 7	Local Reputation Measures	Gaining new work through customer satisfaction and local reputation	Since trust and loyalty constitute the basis of market activity in Aleppo, firms prioritise building and maintaining strong personal ties with clients and suppliers beyond formal institutional relationships. A long-established and solid reputation is regarded as the most important competitive advantage for expanding and sustaining the customer portfolio.
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3.8. Customer-Centred Delivery: Fast, Affordable, and "Repair-First" Solutions (CODE 8)

A strong convergence emerged regarding client preferences and the dominant "repair-first" logic in housing production. Firms consistently reported demand for solutions that maximise space utility, minimise cost, and enable rapid occupancy. Consequently, repair and rehabilitation often outweighed full demolition and reconstruction, except in cases of total structural failure or irreparable damage (Table 9).

Table 9: Customer-Oriented Housing Strategies (CODE 8).

CODE 8	Meeting Customer Needs	Providing fast and cost-effective solutions	The core business strategy is to deliver affordable and functional buildings aligned with customer needs. This includes small apartments with simple, efficient designs that optimise space use, as well as renovating damaged but repairable buildings for customers who have limited access to new housing. The primary focus is to prioritise liveability over luxury and to build or repair at the lowest possible cost. Operationally, the approach has evolved from rapid low-cost repairs to adding floors to existing housing and establishing specialised restoration workshops for older buildings in working-class neighbourhoods.
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This aligns with the observed market shift: early post-conflict demand concentrated on urgent repairs (walls, ceilings, openings), later evolving toward economically modern finishing works, incremental extensions (including adding floors), and small-scale residential units. Notably, some firms positioned themselves exclusively in new-build production with bundled service packages, while others explicitly leveraged repair and rehabilitation as the more stable continuity pathway.

Across F1–F6, resilience is enacted through a coherent set of micro-governance routines rather than through formal institutional support. The most widely shared strategies were cashflow protection (CODE 1) and labour configuration (CODE 3), indicating that survival hinges on stabilising liquidity and maintaining delivery capacity. Supply chain strategies (CODE 2) and business model flexibility (CODE 4) functioned as the second core layer, allowing firms to remain operational despite volatility. Finally, relational and reputational mechanisms (CODE 7) and customer-centred delivery logics (CODE 8) anchored continuity in a trust-dependent market with constrained formal regulation.

Taken together, the findings suggest that micro-scale firms sustain housing production by combining:

- risk-managed financing and payment sequencing,
- adaptive procurement and inventory tactics,
- flexible labour and project staffing,
- portfolio switching between repair, finishing, and limited new-build work, and

- trust-based market positioning as a substitute for institutional stability.

4. Discussion

This study examined how micro-scale construction and architecture firms in post-conflict Aleppo sustain housing production under conditions of extreme uncertainty. Building on qualitative evidence derived from six firms, the findings reveal that survival is not driven by growth-oriented strategies or formal institutional support, but rather by adaptive, project-level governance routines embedded in everyday practices. In this sense, the findings contribute to the literature on post-conflict reconstruction and crisis management by shifting attention from macro-level recovery frameworks to micro-scale, practice-based resilience mechanisms. In this study, economic resilience is understood not as firm growth but as project-level operational continuity under extreme uncertainty.

4.1 Resilience as Operational Continuity Rather Than Growth

One of the central insights emerging from the findings is that resilience in post-conflict Aleppo is defined primarily as the ability to maintain operational continuity, rather than expansion (Mohamed Senin et al., 2024; Ojong & Simba, 2026), accumulation, or innovation-driven growth. Unlike conventional construction management models that emphasise scaling, formalisation, and capital accumulation, the firms studied deliberately avoid aggressive growth trajectories (Li et al., 2024; Bilau et al., 2018). Instead, they prioritise liquidity protection, manageable project sizes, and the reduction of irreversible commitments.

This aligns with crisis management literature suggesting that, under prolonged uncertainty, organisations tend to favour defensive and adaptive strategies over proactive expansion. In the Aleppo context, resilience manifests through cautious decision-making, flexible reconfiguration of resources, and the preservation of minimum operational capacity. Such findings challenge dominant post-war reconstruction narratives that implicitly assume rapid formalisation and market normalisation.

4.2 Project-Level Financial Governance as a Core Resilience Mechanism

Financial strategies emerged as the most universally adopted resilience mechanism across all cases. Rather than relying on external financing—which remains largely inaccessible due to sanctions and institutional constraints—firms develop transactional safeguards at the project level, including staged payments, upfront deposits, and contingency margins (Alshahrani & Salam, 2022).

These practices can be interpreted as forms of informal financial governance, compensating for the absence of stable banking systems and enforceable contracts. The widespread inclusion of contingency buffers (typically 10–15%) indicates that firms internalise macroeconomic volatility—such as inflation and exchange-rate instability—into micro-level pricing and budgeting decisions. This supports previous research highlighting how firms in crisis-prone environments embed uncertainty directly into operational routines rather than treating it as an external shock (Lasut et al., 2026).

4.3 Repair-Oriented Housing Production and Incremental Reconstruction

A notable pattern across firms is the dominance of repair, rehabilitation, and incremental upgrading over full demolition and new construction (Kousa et al., 2021; Munawar & Symonds, 2022). This repair-first logic reflects both supply-side constraints (material costs, labour shortages, capital scarcity) and demand-side realities (reduced purchasing power and urgent housing needs).

From an urban resilience perspective, this finding reinforces arguments that post-conflict reconstruction often proceeds through incremental and informal pathways, rather than comprehensive master-planned redevelopment. Housing production in Aleppo is thus shaped by pragmatism, speed, and affordability, privileging liveability over architectural or symbolic renewal. This challenges conventional post-conflict planning models that prioritise large-scale redevelopment while underestimating the role of micro-scale actors in stabilising everyday life (Isakhan & Meskell, 2024).

4.4 Labour Flexibility, Skill Loss, and Quality Trade-offs

Labour-related strategies further illustrate the tension between flexibility and quality. The reliance on temporary and rotating labour reflects an attempt to minimise fixed costs under uncertain demand conditions. However, the findings also reveal a clear awareness among firms that excessive dependence on inexperienced labour undermines quality, delivery time, and client trust (Li et al., 2024; Wedawatta et al., 2010; Wilkinson et al., 2016).

This duality highlights a critical constraint in post-conflict construction environments: labour flexibility enhances short-term survival but threatens long-term capacity building. The loss of skilled labour through migration represents a structural challenge that cannot be resolved solely at the firm level. Consequently, firms oscillate between pragmatic acceptance of labour limitations and selective investment in trusted, skilled workers when feasible.

4.5 Business Model Adaptability and Portfolio Switching

Another key contribution of the study lies in demonstrating how micro-scale firms deploy business model adaptability as a resilience strategy. Portfolio switching between restoration, finishing works, small-scale new builds, and design services allows firms to respond dynamically to fluctuating demand and risk levels. This adaptability is further reinforced by spatial strategies that balance risk distribution with security considerations (Alshahrani & Salam, 2022). Such findings resonate with literature on organisational resilience that emphasises flexibility, modularity, and reversibility as critical capabilities under uncertainty (Shojaei et al., 2025; Madhavika et al., 2025). In Aleppo,

adaptability is not an abstract managerial concept but a situated response shaped by security risks, infrastructure damage, and fragmented markets.

4.6 Trust, Reputation, and Relational Capital

In the absence of robust legal enforcement and institutional guarantees, trust-based relationships and local reputation emerge as indispensable assets. Firms rely heavily on repeat clients, referrals, and long-standing personal networks to secure work and manage risk. Reputation functions as a form of relational capital that substitutes for formal contracts and mitigates opportunistic behaviour (Munawar & Symonds, 2022).

This finding reinforces broader insights from informal economy and post-conflict studies, which underline the centrality of social capital in sustaining economic activity where formal systems are weakened. In Aleppo's construction sector, trust is not merely a social value but a strategic resource directly linked to survival.

4.7 Implications for Post-Conflict Reconstruction Research and Practice

Taken together, the findings suggest that micro-scale construction firms play a critical yet under-recognised role in post-conflict housing recovery. Their practices demonstrate that resilience is enacted through everyday project decisions, not through top-down reconstruction programmes. For policymakers and international actors, this implies that supporting post-conflict recovery requires engaging with and enabling these micro-level governance practices rather than imposing rigid formalisation frameworks (Bilau et al., 2018; Petrukha et al., 2025).

From a research perspective, the study highlights the need to conceptualise post-conflict reconstruction not only as a physical rebuilding process but as an adaptive socio-economic practice, shaped by uncertainty, informality, and relational governance.

5. Conclusions

This study explored how micro-scale architecture, engineering, and construction firms in post-conflict Aleppo sustain housing production under conditions of prolonged uncertainty. Drawing on qualitative evidence from six firms, the research demonstrates that survival in such extreme contexts is not primarily enabled by formal institutional support or growth-oriented strategies, but by adaptive, project-based governance practices embedded in everyday operations. The findings reveal that resilience is enacted through a combination of financial caution, flexible labour arrangements, incremental construction practices, and trust-based relational networks. Firms prioritise operational continuity over expansion, embed uncertainty directly into pricing and contracting routines, and favour repair-oriented and small-scale housing solutions that respond to urgent social needs and limited household resources. In the absence of stable financial systems and regulatory enforcement, informal mechanisms—such as staged payments, reputation-based client selection, and relational trust—function as critical substitutes for formal governance structures.

By foregrounding micro-scale actors and their situated decision-making practices, this study contributes to post-conflict reconstruction literature by shifting the analytical focus from macro-level recovery frameworks to micro-level resilience in practice. It highlights the central role of small firms as everyday agents of housing recovery, capable of stabilising urban life despite severe structural constraints. These insights suggest that post-conflict reconstruction policies should recognise and support the adaptive capacities of micro-scale firms, rather than imposing rigid formalisation or large-scale redevelopment models that may be misaligned with local realities.

The study is limited by its qualitative scope and geographically bounded sample; nevertheless, it offers a grounded analytical framework that can inform future comparative research across different post-conflict cities. Further studies could examine how similar adaptive governance practices evolve over time, interact with international reconstruction programmes, or transition into more formalised systems as institutional conditions stabilise. Understanding these dynamics is essential for designing more inclusive, realistic, and resilient post-conflict housing strategies.

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Conflicts of Interest

The authors report no conflicts of interest.

Data Availability Statement

The qualitative data supporting the findings of this study are derived from in-depth interviews conducted as part of an academic master's thesis. Due to ethical considerations, participant confidentiality, and the sensitivity of the post-conflict context, the data are not publicly available. Access to anonymised excerpts may be considered by the corresponding author upon reasonable request.

Institutional Review Board Statement

This study received ethical approval from the Scientific Research and Publication Ethics Committee on 19 February 2026 (Decision No: 2026-55/25). The data were collected within the scope of an academic research project and in accordance with institutional research ethics guidelines. All participants provided informed consent, and the study adhered to the principles of the Declaration of Helsinki.

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