



# The Impact of Urban Governance on Enhancing Resilience in Informal Settlements: A Case Study from Jafarabad, Kermanshah



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**Abstract:** Informal settlements, home to a significant segment of the global population, are often overlooked by policymakers and urban planners, resulting in inadequate infrastructure, limited access to essential services, and precarious living conditions. This research explores the capacity of urban governance to enhance the resilience of such settlements, with a focus on Jafarabad in Kermanshah. Data was collected through questionnaires and observations, and analyzed using both descriptive and inferential statistical methods. The latter included multivariate regression analysis, one-sample t-tests, and Spearman's rank correlation tests. The analysis revealed a positive and statistically significant correlation between effective urban governance and the resilience of informal settlements, as evidenced in Jafarabad. All governance-related variables showed significant correlations with resilience, except for those pertaining to the rule of law, justice, and fairness. The predictive accuracy of the selected governance variables was 83%, highlighting the critical role of effective governance in fostering resilience. These findings underscore the necessity of incorporating robust urban governance frameworks to bolster resilience in informal settlements, providing essential insights for policymakers, urban planners, and communities committed to enhancing sustainability and living conditions in these areas.

**Keywords:** Urban governance; Resilience; Informal settlements; Jafarabad, Multivariate regression; Spearman's rank correlation

## 1 Introduction

The modern urban landscape is characterized by its unpredictability, instability, and discontinuity, rendering traditional urban planning concepts and frameworks obsolete [1, 2]. With the rise of industry and technology, cities have become increasingly attractive to rural immigrants and small-town residents [3, 4]. This shift has led to the emergence of new organizational and spatial structures, driven by centralized production, improved communication networks between cities and their surroundings, and the desire for urban living [5, 6].

Urbanization has also resulted in the migration of rural poverty [7, 8]. During this process, immigrants often settle informally in inner-city and adjacent areas due to their limited resources and financial constraints [9, 10]. Consequently, rural immigrants tend to seek neighborhoods with lower living costs [11, 12]. Informal settlements

represent a distinct form of urban living with significant political, social, cultural, economic, physical, and legal distinctions from other types of housing [13].

One of the most significant challenges to global sustainable urban development is the presence of these informal settlements [14–16]. Various strategies have been employed to address informal settlements, including ignoring them, demolishing and clearing them, integrating them into the city, or pressuring residents to relocate [17]. However, none of these approaches have effectively strengthened these communities or helped them navigate crises. Therefore, it is crucial to enhance their resilience, as informal settlements are susceptible to various disasters [18].

Urban resilience, defined as a city or urban system's ability to withstand stressors and shocks, is a crucial aspect of urban development [19, 20]. The United Nations Center for Human Settlements emphasizes that the key strategy for effectively managing informal settlements lies in enhancing city resilience through the active involvement of its residents, leveraging their skills and competencies [21]. As urban management practices continually evolve [22, 23], it becomes evident that good urban governance stands out as the most efficient, cost-effective, and sustainable approach to operating a complex, multi-level city system, particularly when it comes to enhancing the resilience of cities, including informal settlements [24, 25]. The consensus among experts today underscores the need for essential upgrades and resilience-building efforts in such neighborhoods, grounded in the principles of effective urban administration [26]. Given their vulnerability and the imperative to make them more resilient to disasters, there is a growing need to develop urban management techniques and implement robust urban governance strategies for informal settlements [27].

Central to good urban governance is the principle of maximum citizen involvement in all relevant government decisions, effectively serving as a political process that functions as an urban management system [28, 29]. Kermanshah metropolis has witnessed a unique influx of immigration and informal residences, primarily due to its status as a political center and its concentration of commercial, industrial, and service activities, setting it apart from other cities [30]. According to the official 2016 census data, the urban complex of Kermanshah is home to nearly 300,000 people living in informal settlements. Within the urban divisions, Jafarabad emerges as one of the informal communities in Kermanshah's third district, housing approximately 28,000 residents. Over time, this neighborhood has transformed into a complex and challenging area in the heart of Kermanshah.

In 1994, in response to severe infrastructure deficiencies and public health concerns, the “Shahr Salem” headquarters concentrated its efforts in a specific section of the neighborhood. This initiative included the implementation of development projects such as road paving, the establishment of a park, and the commencement of work on a cultural center. It also aimed to elevate the standards of health and environmental quality within the community [31].

Furthermore, in 2002, the Jafar Abad neighborhood empowerment plan underwent significant amendments, drawing upon insights gained from similar marginalized neighborhoods in Zahedan. This revised plan was characterized by its comprehensive description of proposed services, the collaborative approach of the strategic committee within the civil engineering organization, a cross-departmental strategy for necessary activities, and capacity-building initiatives for provincial institutions. These efforts collectively aimed to foster economic, social, and physical improvements in the neighborhood. The primary objective of this study is to explore how effective urban governance influences the capacity for resilience within the Jafarabad neighborhood of Kermanshah's informal settlements. Therefore, the present study seeks to answer the following questions:

- 1 - What effect does good urban governance have on the resilience of informal settlements (Jafarabad)?
- 2 - What are the proposed solutions to improve the resilience of informal settlements (Jafarabad) based on the approach of good urban governance?

## 2 Theoretical Foundations

The interpretation of informal settlements has varied across different research papers [32], but there is a general consensus that defining informal settlements consistently across different time periods and geographical contexts poses a significant challenge. This challenge is further exacerbated by the rapid pace of urbanization, which has led to the emergence of informal communities [33].

The term “informal settlements” first gained prominence in the writings of notable thinkers such as Charles Abrams, John Turner, and Robert Azara Park, especially following the 1976 Vancouver Housing Conference [34]. These residential developments typically occur in areas that are not officially authorized for residential use, such as lagoons, hill slopes, retaining strips, and other interstitial spaces [35].

Informal settlements are characterized by their high housing density, and the construction of homes in these areas does not adhere to established urban plans or regulatory frameworks, resulting in subpar living conditions for their residents [36]. The social and cultural environment within these informal communities is intimately linked to the psychological well-being of their inhabitants [37, 38]. According to Robert Park, the term “marginalization” describes a condition or environment that socially and culturally isolates individuals, rendering them unable to effectively participate in society, particularly in the face of cultural differences. These urban neighborhoods with informal settlements typically arise on the outskirts of the formal land ownership registration system and expand in

the absence of comprehensive land use planning and restrictions. As the study of Azhar et al. [34] notes, informal settlements are commonly found in underutilized areas of developing countries (Table 1).

**Table 1.** Factors of informal settlements from the perspective of experts

Source	Expert	Factors of Informal Settlements
The Urban Question: A Marxist Approach; Cambridge; MIT Press.	Manuel Castell 1977 [39]	<ul style="list-style-type: none"> <li>• Lack of infrastructure facilities</li> <li>• Social and physical</li> <li>• Unusual settlements away from conventional trends</li> <li>• Urbanization and standards</li> </ul>
The Challenges of Slums: A Global Report on Human Settlements, United Nations Human Settlements Programme. First published in the UK and USA in 2003 by Earth Scan Publications Ltd	UN-HABITAT, 2003 [40]	<ul style="list-style-type: none"> <li>• Women and children on the margins are the biggest victims</li> <li>• Women from lower education and social status</li> <li>• Working hours. They are taller and less active than men</li> <li>• Women’s participation,</li> <li>• Women’s self-employment in the margins</li> </ul>
Marginalization of Immigrant Youth and Risk Factors in Their Everyday Lives: The European Experience, Journal of Child and Youth Care Forum, Vol. 27, pp. 153-169.	Eldering & Knorth, 1998 [41]	<ul style="list-style-type: none"> <li>• Migration from village</li> <li>• Conflict and inconsistency</li> <li>• Cultural</li> </ul>

The concept of “resilience” encompasses an understanding of how ecosystems manage dynamic and non-linear stresses while gauging their capacity to withstand disturbances without undergoing significant, fundamental structural changes [42, 43]. In the context of urban environments, urban resilience pertains to the ability of an urban system, along with its socio-ecological and socio-technical networks, to swiftly adapt its systems, enabling them to accommodate current or anticipated changes. It also involves the preservation or rapid restoration of essential functions in the face of disruptions [44, 45].

Prominent resilience researchers emphasize that in our ever-evolving world, characterized by transformational shifts, system resilience is essential for achieving stability [46]. It is a strategic response to various situations, threats, and challenges, encompassing the ability to withstand disturbances while maintaining stability [47]. Despite their chaotic nature, informal settlements are highly susceptible to a range of risks, including natural disasters, climate change impacts, energy crises, political instability, financial turmoil, food security issues, and even terrorist attacks [48, 49]. Enhancing the resilience of informal settlements requires the development of innovative strategies that hinge on citizen engagement, the active participation of residents in these neighborhoods, the responsibilities of local authorities, and adherence to legal frameworks [50, 51] (Table 2).

Since all facets of resilience are emphasized by excellent urban governance, it seems to be successful in fostering the resilience of informal settlements [67–69]. In the late nineteenth century, the phrase “good governance” initially appeared in response to corruption that benefited political and corporate institutions [68, 70]. It was developed by the World Bank in 1989 to recognise the dilemma of African sovereignty [71]. As one of the requirements for a sustainable city, excellent urban validity has been endorsed and emphasised by international and national organisations over the past three decades in opposition to government-centered urban management [72].

### 3 Study Area

Jafarabad, Kermanshah’s largest slum, is home to approximately 30,000 residents living in 6,600 houses. Despite its proximity to Kermanshah’s city center, this area faces a critical deficiency in essential social, medical, and educational services. The lack of urban infrastructure in Jafarabad is primarily attributed to unfavorable topographic conditions, including low altitudes, challenging terrain, and the limited financial resources of its inhabitants. Compounding these challenges, the initial master plan for Kermanshah designated these territories as beyond the boundaries of legal development. Consequently, subsequent projects were initiated without official authorization and often overlooked ethical considerations due to the financial constraints of the residents (Figure 1).

**Table 2.** Definitions of resilience from the perspectives of different theorists

<b>Expert</b>	<b>Definition</b>
Holling, 1973 [52]	Defines a scale to show the resistance of devices and their ability to absorb change.
Scott et al., 2020 [53]	The ability of communities, their physical, social, political, and economic systems, buildings, and settlements to withstand the dangers posed by tensions and pressures that can quickly turn around, accept, and face future threats.
Folk, 2006 [54]	Proposed the triple definition of resilience in socio-environmental systems; 1. The maximum disturbance that the system can deal with; 2. The extent to which the system can adapt or change itself; 3. The extent to which the system can accommodate the capacity specified in the paragraph.
Dekker et al., 2008 [55]	Resilience is the ability of a social system to respond to and recover from disasters and includes the inherent conditions that allow the system to absorb the effects and deal with a disaster and a post-disaster. Resilience is an adaptive process that facilitates the ability of social systems to reorganize, change, and learn in response to threats.
Cassottana et al., 2019 [56]	Resilience is a process that connects a set of adaptive capacities to the positive processes of post-disruption performance and adaptation.
Yu et al., 2020 [57]	Resilience is defined as the capacity to tolerate and recover from risk.
Estelaji et al., 2024 [58]	In general, the relative force of the disturbance, which is permanently required for the instability of the main system, indicates the degree of ecological resilience.
Ghasemzadeh et al., 2021 [59]	Community resilience is important to avoid economic and social damage and leads to an easier recovery of the city after natural disasters. In fact, it is the ability to neutralize the destructive effects of a crisis as quickly as possible.
Pourmoghim et al., 2022 [60]	Resilience is not always a system of going back to the past or equilibrium but will give the possibility of adaptation and change in the current situation as well as the possibility of survival and change in the future.
Javadpoor et al., 2021 [61]	The ability of society is not only to deal with catastrophes but also to gain strength as a result of them to recover from dangers.
Chalabi et al., 2022 [62]	Resilience should be seen as a goal, which arises from climate change and natural disasters within a community or city, and this goal is a process of adapting to critical situations and returning to normalcy. Evans showed that the best way to achieve resilience is through experience.
Ghalehtimouri et al., 2023 [63]	Resilience refers to the capacity of ecological systems to absorb disturbances as well as to maintain the necessary and inherent feedback, processes, and structures of the system.
Assarkhaniki et al., 2021 [48]	Resilience is the ability of a system, community, or community affected by hazards to deal with, absorb, adapt to, and rehabilitate in a timely manner against the effects of a hazard is defined as an effective way to protect and restore important functions and structures of society.
Bastaminia et al., 2017 [64]	Resilience is the ability to deal with the unexpected and tolerate the negative effects created by disturbing approaches.
Ramezani and Camarinha-Matos, 2020 [65]	Resilience is the ability of a system to absorb unpredictable and continuous changes that quietly maintain its vital functions.
Hosseini et al., 2016 [66]	Resilience originates from the Latin word Resiliere (flexibility), which means to return to the original state. The general use of the word resilience refers to the ability of an organism or system to return to normal after a catastrophic disaster.
Ostadtaghizadeh et al., 2016 [67]	Resilience of local communities to the effects of natural disasters involves a complex set of interdependencies of social, economic, and environmental characteristics. Community capacity reflects sudden disturbances caused by natural disasters that reflect specific characteristics of vulnerability. Major economic and social conditions in the community, before sudden disturbances, warn the ability of residents in the face of natural disasters to provide local decision makers with the necessary resources within the government and train managers to coordinate rapid and effective response.

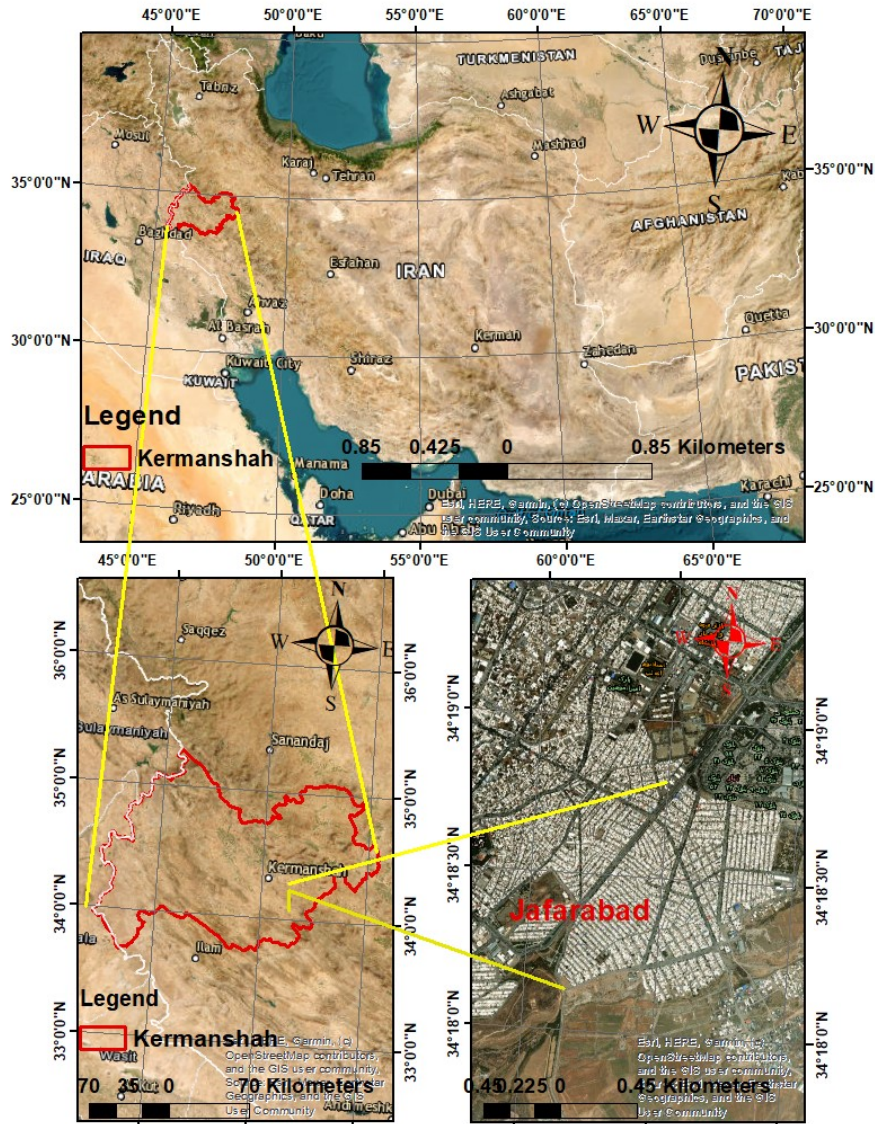


Figure 1. Geographical area of Jafarabad neighborhood of Kermanshah City

#### 4 Methods and Materials

This study employed a robust methodology involving various statistical analyses to explore the relationship between effective urban governance and the resilience of Jafarabad, an informal settlement. The methodology was conducted in multiple stages, ensuring a comprehensive examination of the research questions. Below, each stage of the methodology, along with data collection methods and statistical analyses, is outlined:

**1. Literature Review:** The research commenced with an extensive literature review to establish a strong foundation for the study. The review encompassed existing literature on urban governance, urban resilience, and their interconnectedness. It served as the basis for formulating research questions, hypotheses, and variables.

**2. Selection of Study Area:** Jafarabad, an informal neighborhood within the study area, was chosen as the focal point due to its relevance to the research objectives. The selection was made to ensure that the study remained aligned with its goals. A simple random sampling procedure was employed to ensure equitable representation of residents within Jafarabad.

**3. Sample Size Determination:** Initially, Cochran's formula was employed to determine the sample size. To enhance the study's reliability, the sample size was increased, ultimately comprising 380 individuals.

**4. Questionnaire Development:** To collect data related to desired urban governance and urban resilience, two types of closed-ended questionnaires were meticulously developed. Expert validation was conducted to ensure the reliability and effectiveness of these questionnaires in gathering data.

**5. Data Collection:** Data collection involved a comprehensive approach, utilizing observations and interviews with Jafarabad residents. These methods facilitated a holistic understanding of the study variables and their relationships [73].

**6. Data Analysis:** The collected data underwent a range of statistical analyses. Descriptive statistics, including frequency tables, central indices, and averages, were used to characterize the data. Inferential statistics played a significant role in the analysis, including the implementation of a multivariate regression model using the Enter method, a simple t-test, and the Spearman test. The multivariate regression model assessed the strength and direction of relationships between variables, while the Spearman test examined correlations among research variables [74].

Through this systematic approach, the study aimed to collect accurate and reliable data while providing valuable insights into the impact of effective urban governance on the resilience of informal settlements. This multifaceted methodology was designed to ensure a thorough investigation into the research questions, promote the generation of insightful findings, and contribute to the existing body of knowledge in the field.

## 5 Results and Discussion

### 5.1 Survey Participant Profile

The study encompassed a diverse group of 380 participants, with a significant male representation accounting for 64% of the respondents. Moreover, 42% of the participants were within the age range of 46 to 65 years, reflecting a broad demographic spectrum. Educational backgrounds among the respondents varied, with 36% having completed high school, 34% having attended middle school, and 8% being categorized as illiterate. This educational diversity underscores the heterogeneous nature of the participant group. Household income levels exhibited a wide range, as 50% of the surveyed households reported earning between 30 and 50 million Rials, shedding light on the economic diversity within the community. Additionally, half of the surveyed population reported being employed, providing insight into the employment status of a significant segment of Jafarabad’s residents.

### 5.2 Status of Resilience Indicators in the Informal Neighborhood

#### 5.2.1 Assessing resilience

The study employed a robust statistical analysis, utilizing a one-sample t-test, to examine and quantify various explanatory indicators related to resilience in the Jafarabad informal settlement. This analysis aimed to evaluate the community’s ability to withstand and recover from stressors effectively. The test’s hypotheses were structured as follows: the null hypothesis (H0) posited that the average resilience limit, when considering the stability equation with the third parameter, was maintained, while the alternative hypothesis (H1) suggested inequality in the average resilience limit. Importantly, the average resilience limit was set at three as a benchmark for assessment.

#### 5.2.2 Resilience indicator findings

The study yielded insightful results regarding different dimensions of resilience within the Jafarabad informal settlement. Notably, the social and economic indicators demonstrated robust performance, with average scores of 3.31 and 3.24, respectively. These above-average scores suggest a positive resilience status in these dimensions, highlighting the community’s strengths in social cohesion and economic adaptability. However, the institutional and physical resilience indices presented contrasting outcomes. Both indices recorded below-average averages, scoring 2.29 and 2.02, respectively. These findings indicate areas of concern, as they do not signal a favorable situation in terms of institutional support and physical infrastructure within the informal settlement. Therefore, this thorough analysis employed a multi-faceted approach, beginning with a diverse participant group and leveraging statistical methods to gauge resilience in the Jafarabad informal settlement. The results offer a nuanced view of the community’s strengths and challenges, with robust social and economic dimensions contrasted by concerns in institutional and physical aspects. This data-driven assessment provides valuable insights into the resilience dynamics of informal settlements, informing strategies for enhancing urban governance and bolstering community resilience (Table 3).

**Table 3.** Status of resilience indicators in the informal neighborhood of Jafarabad

Indicators	N	Mean	Std. Deviation	Std. Error Mean
<b>Resilience</b>	350	2.88	0.54	0.119
<b>Institutional</b>	350	2.29	0.25	0.18
<b>Physical</b>	350	2.02	0.42	0.243
<b>Economical</b>	350	3.24	0.03	0.025
<b>Social</b>	350	3.31	0.01	0.01

Source: Research Findings

The public perception of urban governance in Kermanshah’s Jafarabad neighborhood was evaluated, and the results reveal significant insights.

### 5.3 Status of Indicators of Good Urban Governance

#### 5.3.1 Overall governance score

The overall score for the governance index, as perceived by the public, stands at 2.86. This score was determined through a comparison of various governance indicators within the Jafarabad neighborhood. The Likert scale, which ranges from 1 to 5, was employed for scoring, with 3 serving as the median reference point for analysis. The findings indicate that the average score for Jafarabad’s urban governance index falls below the theoretical average, reflecting an unfavorable perception among its residents (Table 4).

**Table 4.** Status of indicators of good urban governance in Jafarabad neighborhood

Indicators	Mean	T	Sig.	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Good governance	3.91	5.64	0	0.911	0.58	1.23
Participation	3.52	10.7	0	0.942	0.34	0.01
Axis justice	2.12	-8.1	0	-0.492	-0.01	0.01
Axial consensus	2.42	-7.01	0	-0.339	-0.17	-0.4
Efficiency and effectiveness	3.09	1.5	0	0.857	-0.23	0.19
Legitimacy	2.95	-1.5	0	-0.474	-0.1	0.14
Transparency	2.87	-4.1	0	-0.129	-0.19	-0.67
Responsibility	3.41	10.4	0	0.413	0.33	-0.49

Source: Research Findings

#### 5.3.2 Indicator analysis

Figure 1 visually represents the scores for all urban governance indicators. Notably, the average score for all these indicators falls below 2, pointing to a highly unsatisfactory state of urban governance as perceived by the community. However, there are exceptions, as indicators related to involvement, responsibility, efficiency, and effectiveness receive scores above 3, indicating that residents have a more positive view of these aspects. On the contrary, most other indicators score below three, underscoring concerns in various dimensions of urban governance.

#### 5.3.3 Variability in citizen scores

Table 4 provides a detailed breakdown of the scores for each governance indicator and the overall governance score. It becomes evident that there are notable variations in citizens’ scores for each indicator, highlighting the diversity of opinions within the community regarding different aspects of urban governance.

These findings underscore the complexity of urban governance perceptions in Jafarabad and the need for tailored strategies to address specific governance dimensions based on citizen feedback.

### 5.4 Relationship Between Optimal Urban Governance and Resilience

The study investigated the correlation between various aspects of urban governance and the resilience of the Jafarabad informal settlement. The results, as presented in (Table 5), reveal several noteworthy relationships.

**Table 5.** Spearman correlation coefficient to determine the relationship between optimal urban governance and resilience in Jafarabad informal settlement

Independent Variable	Dependent Variable	r	p	Level of Correlation
Participation	Resilience of Jafarabad informal settlement	0.83	0	Strong
Axis justice		0.81	0	Strong
Axial consensus		0.72	0	Strong
Efficiency and effectiveness		0.67	0.007	Relatively strong
Legislation		0.21	0.089	Weak
Transparency		0.77	0	Strong
Responsibility		0.65	0.008	Relatively strong
Responsiveness		0.13	0.11	Weak

Source: Research Findings

#### 5.4.1 Strong positive correlations

Several key indicators of urban governance demonstrated strong positive correlations with the resilience variables of informal settlements in Jafarabad. These indicators include citizen participation, axis justice, axial consensus, transparency, efficiency and effectiveness, and responsibility. The strong correlations, with correlation coefficients ranging from 0.67 to 0.83, indicate a robust and favorable connection between these governance aspects and the resilience of the informal settlement. This suggests that when these governance components are well-established, the informal settlement exhibits higher levels of economic, social, physical, and institutional resilience.

#### 5.4.2 Moderate correlations

The study identified moderate correlations between transparency and consensus-building ( $r = 0.769$ ,  $r = 0.723$ ) and resilience variables. These relationships, while slightly less robust than the strong correlations, still point to a meaningful connection between these governance elements and resilience.

#### 5.4.3 Weak correlations

In contrast, the variables of legislation and responsiveness displayed weak correlations with Jafarabad’s informal housing resilience variables. These indicators exhibited limited influence on the resilience of the informal settlement.

#### 5.4.4 Non-Significant correlations

Lastly, the study found that the legislation and responsiveness characteristics did not significantly link with the resilience variables of Jafarabad’s informal housing. This lack of correlation suggests that these specific governance components may not have a pronounced impact on the settlement’s resilience (Table 5).

These findings illuminate the critical role that specific aspects of urban governance play in bolstering the resilience of informal settlements. By strengthening these governance dimensions, policymakers and urban planners can potentially enhance the adaptive capacity and resilience of communities like Jafarabad.

### 5.5 Relationship Between Good Governance and Resilience and Informal Settlement

A multivariate regression analysis was conducted to elucidate the relationship between good urban governance and the resilience of Jafarabad’s informal settlement. The study identified several predictor variables that significantly contribute to the variance in the dependent variable, resilience enhancement.

#### 5.5.1 Key predictor variables

The analysis revealed that the following predictor variables had the most substantial impact on the change in the dependent variable (resilience enhancement), listed in descending order of influence: citizen participation, central justice, central consensus, efficiency and effectiveness, transparency, and accountability. These variables played a significant role in explaining the relationship between good urban governance and resilience in informal settlements.

#### 5.5.2 Significant predictive power

Except for the two variables of regularity and accountability, all other predictor variables exhibited a significant relationship with the resilience of Jafarabad’s informal residence. Therefore, these variables were retained in the final model to explain the relationship comprehensively.

#### 5.5.3 Variance explained

The combined predictive power of these selected variables was substantial, explaining 83% ( $r^2 = 0.83$ ) of the variance in the dependent variable, resilience enhancement. This high proportion of explained variance indicates that these urban governance indicators have a significant and comprehensive influence on the resilience of the informal settlement in Jafarabad (Table 6).

**Table 6.** Multi-stage regression coefficients to explain the relationship between good urban governance and resilience in Jafarabad informal settlement

Variable	r	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	p
Participation	0.523	0.49	0.41	149.3	0
Axis justice	0.569	0.553	0.46	142.1	0
Axial consensus	0.813	0.573	0.55	192	0
Efficiency and effectiveness	0.631	0.662	0.58	162.4	0
Transparency	0.675	0.625	0.6	132.8	0
Responsibility	0.531	0.415	0.43	162.3	0

Source: Research Findings



These findings underscore the substantial influence of specific urban governance factors on the resilience of informal settlements, emphasizing the importance of effective governance strategies in enhancing the adaptive capacity of communities like Jafarabad.

### 5.6 Final Regression of Relationship Between Optimal Urban Governance and Resilience

The results of the data analysis to explain the variables related to desired urban validity and their impact on the resilience of the Jafarabad neighborhood are presented in Table 7. This table outlines the coefficients associated with each predictor variable in the final regression equation. The standardized beta coefficient analysis reveals the relative contributions of different variables to explain the dependent variable, “Strengthening the resilience of Jafarabad neighborhood.” Among the predictor variables, “efficiency and effectiveness” have the highest standardized beta coefficient, signifying their predominant influence on explaining resilience. Following this variable, in descending order of influence, are accountability, involvement, consensus, justice, and transparency.

**Table 7.** Coefficients of variables entered in the final regression equation to explain the relationship between optimal urban governance and resilience in Jafarabad informal settlement

Predictive Variables	Unstandardized Coefficients B		Standardized Coefficients Beta	t	p
	Input coefficient	Std. Error			
Participation	5.25	0.563	0.311	2.76	0
Axis justice	3.91	0.283	0.223	5.43	0
Axial consensus	5.69	0.636	0.243	6.24	0
Efficiency and effectiveness	6.07	0.862	0.359	7.58	0
Transparency	6.32	0.791	0.194	7.62	0
Responsibility	3.42	0.414	0.314	3.62	0

Source: Research Findings

These coefficients provide valuable insights into the strength and direction of the relationship between each predictor variable and the resilience of Jafarabad’s informal settlement. The positive coefficients indicate that an increase in these governance factors positively impacts resilience, while the t-statistics and p-values affirm the statistical significance of these relationships. In essence, all predictor variables demonstrate statistically significant relationships with resilience, underscoring their critical roles in enhancing the adaptive capacity of the informal settlement. This analysis emphasizes the significance of efficient and effective urban governance, along with other key factors like accountability, participation, consensus building, justice, and transparency, in fortifying the resilience of Jafarabad’s informal neighborhood. These findings highlight the multifaceted nature of urban governance and its pivotal role in promoting the resilience of vulnerable communities. Therefore, the study underscores the importance of addressing various aspects of urban governance to bolster the resilience of informal settlements, offering valuable insights for policymakers and urban planners seeking to enhance the adaptive capacity of such communities (Table 7). These findings underscore the substantial influence of specific urban governance factors on the resilience of informal settlements, emphasizing the importance of effective governance strategies in enhancing the adaptive capacity of communities like Jafarabad.

## 6 Conclusion

The present state of resilience in the Jafarabad neighborhood is a matter of concern. The study has unveiled several weaknesses in the resilience of this informal settlement, stemming from various dimensions. These include a lack of crisis management institutions in the area, a deficit of trust between residents and institutions, limited public participation with city council and municipal bodies, and insufficient efforts by housing construction institutions. Additionally, a dearth of essential infrastructure for immigrants from Ardabil, Gonbad, and Afghan citizens has driven households with limited economic means to inhabit the area, imparting an economic dimension to the challenges faced by the residents. Notably, the economic resilience of Jafarabad’s residents is significantly affected by their precarious financial circumstances. Furthermore, the absence of implementation of the area’s improvement and restoration plan has significantly hampered its physical dimension, particularly in terms of infrastructure networks. The accessibility of crisis management institutions remains a notable challenge. However, there is a positive aspect to the social dimension, marked by social solidarity, trust, cooperation, and residents’ strong connection to the region, contributing to a relatively superior social resilience dimension.

The findings of this study underscore the significant and positive association between resilient informal settlements and good urban governance, as exemplified by Jafarabad. The Spearman correlation test demonstrated that all aspects of acceptable urban governance exhibited a positive and significant relationship with the resilience of informal

settlements, except for the variables of the rule of law, justice, and fairness. Notably, the variable “efficiency and effectiveness” emerged as the most influential in explaining the dependent variable, “strengthening the resilience of the Jafarabad neighborhood,” outperforming other variables according to beta coefficient analysis. Subsequently, factors such as accountability, participation, consensus-building, fairness, and transparency also played vital roles.

Considering these findings, the following recommendations are put forth to enhance the resilience of informal settlements:

**1. Establishment of a Local Elected Council:** In accordance with the national document’s proposal and Cabinet approval, the creation of a local elected council should be pursued. This body should oversee and develop a comprehensive mechanism related to the Islamic Council of cities with informal settlements.

**2. Establishment of Jafarabad Municipality:** Collaboratively with local communities, a Jafarabad Municipality should be established using a participatory management mechanism. This institution can play a pivotal role in addressing the unique challenges of the area.

**3. Specialized Training:** Offering specialized training programs for neighborhood managers and residents can significantly enhance their understanding of individual and social responsibilities, contributing to improved governance and resilience.

**4. Promoting Cultural and Social Conditions:** Fostering cultural and social conditions and raising residents’ awareness, particularly through institutions such as education, mosques, cultural centers, and non-governmental organizations, can build trust and strengthen empowerment initiatives, ultimately enhancing resilience. These recommendations, if implemented, can pave the way for improved urban governance and resilience in informal settlements, creating a more robust and adaptable living environment for the residents of Jafarabad and similar areas.

#### Data Available

The data used to support the research findings are available from the corresponding author upon request.

#### Conflicts of Interest

The authors declare that they have no conflicts of interest.

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