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Public Trust and Urban Resilience: Evidence from Sustainable Cities

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Abstract
Public trust is a critical factor in building resilient and sustainable cities as urban areas face growing challenges from climate change, rapid urbanization, environmental risks, and social uncertainty. This study investigated the role of public trust and institutional factors in promoting urban resilience and sustainable city development using Structural Equation Modeling (SEM). A cross-sectional survey of 420 urban residents was analyzed using Confirmatory Factor Analysis (CFA), SEM, and mediation analysis. The proposed model examined the effects of public trust, institutional transparency, risk communication, and citizen participation on urban resilience, as well as the mediating role of urban resilience in sustainable city development. The measurement model demonstrated satisfactory reliability and validity, while the structural model showed good fit ($\chi^2/df = 2.31$, CFI = 0.95, TLI = 0.94, RMSEA = 0.052, SRMR = 0.041). Institutional transparency was the strongest predictor of urban resilience ($\beta = 0.64$), followed by public trust ($\beta = 0.61$), citizen participation ($\beta = 0.56$), and risk communication ($\beta = 0.49$) (all $p < 0.001$). Urban resilience significantly predicted sustainable city development ($\beta = 0.73$, $p < 0.001$), explaining 53.3% of its variance ($R^2 = 0.533$). Mediation analysis confirmed that urban resilience significantly mediated the relationships between all institutional and social determinants and sustainable city development. These findings underscore the importance of trust-based governance, transparent institutions, effective communication, and active citizen participation in fostering adaptive, inclusive, and sustainable urban systems.

Keywords: Public trust; Urban resilience; Sustainable city development; Institutional transparency; Structural equation modeling

Introduction

Cities around the world are increasingly exposed to complex and interconnected challenges arising from climate change, rapid urbanization, environmental uncertainty, public health crises, technological disruption, and socioeconomic inequalities (Orsetti, et al., 2022). These challenges have transformed the way urban systems are understood and managed, requiring cities not only to pursue sustainable development but also to develop the capacity to anticipate, absorb, adapt to, and recover from unexpected disturbances. Within this context, urban resilience has emerged as a central concept in contemporary urban planning, emphasizing the ability of cities to maintain essential functions while responding effectively to changing conditions (Das, et al., 2024; Monadi, 2025). Although physical infrastructure, technological innovation, and environmental strategies are important

components of resilience, growing evidence suggests that social and institutional factors are equally essential for creating adaptive and sustainable urban systems.

Among social and institutional determinants of urban resilience, public trust has received increasing scholarly attention. Public trust refers to citizens' confidence in government institutions, public authorities, and decision-making processes (Verhoest, et al., 2024). Trust influences how communities perceive risks, respond to policies, cooperate with authorities, and participate in collective actions. In resilient cities, citizens must rely on institutions during periods of uncertainty, including natural disasters, environmental emergencies, public health threats, and climate-related events (Ma, et al., 2024). Without sufficient trust, even technically effective policies may encounter resistance, limited participation, and reduced effectiveness. Therefore, understanding the role of public trust represents an important step toward explaining why some cities successfully manage crises while others experience prolonged disruptions (Shanka & Menebo, 2022).

Urban resilience has traditionally been examined through physical and environmental perspectives, including infrastructure robustness, ecosystem protection, and disaster preparedness. However, contemporary approaches increasingly recognize resilience as a multidimensional phenomenon involving governance capacity, social cohesion, institutional legitimacy, and citizen cooperation (Monadi, 2025). Cities are complex adaptive systems in which government agencies, communities, private organizations, and individuals interact continuously. Within such systems, public trust functions as a social resource that facilitates coordination, information exchange, and collective problem-solving (Rybski & González, 2022). High levels of trust can improve compliance with urban policies, increase willingness to participate in sustainability initiatives, and strengthen collaboration between citizens and institutions.

Institutional transparency represents one of the primary mechanisms through which public trust is developed and maintained (Monadi, et al., 2013). Transparent governments provide citizens with access to information, explain decision-making processes, and demonstrate accountability in resource allocation and policy implementation (Yun, et al., 2024). In the context of urban resilience, transparency is particularly important because crises often involve uncertainty, rapid decision-making, and competing priorities (Vian, 2020). When citizens perceive authorities as transparent and accountable, they are more likely to accept emergency measures, support adaptation strategies, and cooperate with resilience-building initiatives (Monadi, et al., 2014).

Another important factor associated with public trust and urban resilience is risk communication. Effective communication between authorities and communities enables citizens to understand potential hazards, prepare for emergencies, and participate in risk reduction activities (Das, et al., 2025). Poor communication, misinformation, or limited access to reliable information can weaken public confidence and reduce community preparedness (Ramsbottom, et al., 2018; Vandrevala, et al., 2024). Therefore, resilient cities require communication systems that are timely, accessible, inclusive, and capable of building shared understanding between institutions and residents.

Citizen participation also represents a critical dimension linking public trust with urban resilience. Participatory planning approaches recognize residents as active contributors rather than passive recipients of urban policies (Gil-Lespinard, et al., 2025). Through participation in decision-making, environmental programs, disaster preparedness activities, and neighborhood initiatives, citizens develop stronger connections with local institutions and greater ownership of urban development processes (Sixsmith, et al., 2023). Participation can simultaneously strengthen trust by demonstrating institutional responsiveness and enhance resilience by mobilizing local knowledge and community resources.

The relationship between public trust and urban resilience is particularly significant within the framework of sustainable city development. Sustainable cities require long-term cooperation among diverse stakeholders to address environmental challenges, manage resources efficiently, and promote social equity (Razia & Abu Bakar Ah, 2023). While technological solutions and infrastructure investments remain necessary, their effectiveness depends largely on public acceptance and collective action (Lim & Hwang, 2024). Climate adaptation strategies, renewable energy transitions, sustainable transportation systems, and environmental protection programs all require citizens to trust institutions and actively participate in implementation processes (Dsouza, et al., 2023).

Despite increasing recognition of social factors in resilience research, several research gaps remain. First, many previous studies have focused primarily on technical and physical dimensions of urban resilience, while the role of social legitimacy and institutional trust has received comparatively less empirical attention. Second, existing research often examines public trust, governance, or citizen participation separately, without considering their integrated influence within a comprehensive resilience framework. Third, although conceptual discussions emphasize the importance of trust, fewer empirical studies have examined the pathways through which trust-related factors contribute to measurable resilience outcomes using advanced statistical approaches.

Structural Equation Modeling (SEM) provides an appropriate methodological framework for addressing these gaps because it enables researchers to examine complex relationships among latent constructs while accounting for measurement errors. Through SEM, researchers can simultaneously evaluate how public trust, transparency, risk communication, and citizen participation influence urban resilience and how resilience

contributes to sustainable urban outcomes. This analytical approach allows for a deeper understanding of the mechanisms through which social and institutional factors shape resilient cities.

Furthermore, examining public trust within urban resilience research contributes to broader debates regarding adaptive governance and participatory urban planning. As cities face increasingly uncertain futures, resilience cannot be achieved solely through engineering solutions or administrative interventions. Instead, resilient urban systems require legitimate institutions, informed communities, and collaborative relationships between governments and citizens. Public trust serves as a foundation for these relationships by enabling cooperation, strengthening social cohesion, and supporting collective responses to urban challenges.

Given these considerations, this study aims to investigate the role of public trust and related institutional factors in strengthening urban resilience within sustainable cities. Specifically, the study examines how public trust, institutional transparency, risk communication, and citizen participation influence urban resilience and how urban resilience contributes to sustainable city development. By developing and empirically testing an integrated SEM framework, this research contributes to the growing literature on social dimensions of urban resilience and provides practical insights for policymakers, urban planners, and local governments seeking to build more adaptive, trusted, and sustainable urban systems.

Methodology

Research Design and Approach

This study adopted a quantitative, explanatory, and cross-sectional research design to investigate the role of public trust and institutional factors in strengthening urban resilience and promoting sustainable city development. A quantitative approach was considered appropriate because the research aimed to empirically examine relationships among multiple latent constructs and test theoretically developed hypotheses using statistical modeling techniques. Given the multidimensional nature of public trust, urban resilience, and sustainable city development, SEM was employed as the primary analytical approach. SEM enables researchers to simultaneously assess measurement properties and structural relationships among latent variables while controlling for measurement errors. In this study, Confirmatory Factor Analysis (CFA) was first conducted to evaluate the reliability and validity of the measurement model, followed by SEM to test the hypothesized direct relationships. Furthermore, mediation analysis was performed to examine whether urban resilience acts as an explanatory mechanism through which public trust and institutional factors influence sustainable city development. The proposed conceptual framework assumes that public trust, institutional transparency, risk communication, and citizen participation enhance urban resilience, while urban resilience subsequently contributes to sustainable city development.

Study Population and Sampling Procedure

The target population consisted of adult residents living in the selected urban area who had sufficient experience with local governance systems, municipal services, environmental conditions, and urban development processes. Residents were selected as the study population because they directly experience the outcomes of urban policies, emergency management systems, infrastructure quality, and sustainability initiatives. To ensure that respondents possessed adequate knowledge of local urban conditions, participants were required to have lived in the study area for a minimum of one year. A stratified random sampling technique was employed to improve the representativeness of the sample. The city was initially divided into administrative districts, after which respondents were selected proportionally from each district according to population distribution. This sampling strategy was adopted to minimize potential sampling bias and ensure that residents from different geographic and socioeconomic backgrounds were represented in the study.

Sample Size Determination

The minimum required sample size was estimated using G*Power version 3.1.9.7. Following Cohen's guidelines for multiple regression and SEM studies, the power analysis was conducted based on a medium effect size ($f^2 = 0.15$), significance level of $\alpha = 0.05$, and statistical power of 0.95. Considering four predictor variables influencing urban resilience, the G*Power analysis indicated that a minimum sample size of approximately 129 respondents was required to detect statistically significant effects. However, because SEM requires larger samples to ensure stable parameter estimation and reliable model fit assessment, the target sample size was increased. Accordingly, 450 questionnaires were distributed among urban residents. After data screening and removal of incomplete or invalid responses, 420 valid questionnaires were retained for final analysis. This sample size exceeds the recommended minimum threshold for covariance-based SEM and provides sufficient statistical power for CFA, structural modeling, and mediation analysis.

Inclusion and Exclusion Criteria

To ensure data quality and methodological consistency, specific inclusion and exclusion criteria were established. Participants were included if they were aged 18 years or older, had lived continuously in the selected urban area for at least one year, were able to understand and complete the questionnaire, and voluntarily agreed to participate in the research. Participants were excluded if they were temporary visitors or non-residents, had insufficient familiarity with local urban conditions, submitted questionnaires containing more than 10% missing responses, or demonstrated careless response patterns, such as identical answers across all items or extremely short completion times. These criteria ensured that the collected data represented meaningful perceptions regarding public trust, governance processes, urban resilience, and sustainable urban development.

Data Collection Procedure and Research Instrument

Data were collected using a structured questionnaire consisting of two main sections. The first section collected demographic information, including gender, age, education level, occupation, income status, and duration of residence. The second section measured the research constructs using previously validated scales adapted from the literature on governance, trust, resilience, and sustainable urban development. All items were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The measurement instruments included the following constructs:

- **Public Trust:** Public trust was measured using items assessing citizens' confidence in local authorities, perceptions of institutional reliability, belief in government competence, and willingness to cooperate with public organizations. The construct reflected the extent to which residents perceive urban institutions as trustworthy and capable of addressing community needs.
- **Institutional Transparency:** Institutional transparency was assessed through indicators measuring openness of decision-making processes, accessibility of public information, accountability of authorities, clarity of policies, and citizens' ability to understand governmental actions.
- **Risk Communication:** Risk communication was measured through items evaluating the effectiveness, accessibility, and reliability of information provided by authorities regarding environmental hazards, emergency situations, climate risks, and urban safety measures.
- **Citizen Participation:** Citizen participation was assessed through indicators related to residents' involvement in urban planning processes, participation in community programs, engagement in environmental initiatives, and willingness to contribute to local decision-making.
- **Urban Resilience:** Urban resilience was measured using indicators reflecting adaptive capacity, disaster preparedness, infrastructure robustness, institutional flexibility, recovery capability, and the ability of urban systems to maintain essential functions during disturbances.
- **Sustainable City Development:** Sustainable city development was assessed through indicators representing environmental protection, social inclusion, economic sustainability, efficient resource management, quality of urban life, and long-term development planning.

Validity and Reliability Assessment

Before conducting the main survey, the questionnaire was reviewed by experts in urban planning, environmental management, governance studies, and research methodology to establish content validity. Based on expert feedback, several items were modified to improve clarity, contextual relevance, and linguistic accuracy. A pilot study involving approximately 30 respondents was conducted to evaluate questionnaire comprehensibility, reliability, and completion time. The pilot results indicated satisfactory internal consistency, and minor wording adjustments were made before the final data collection phase. Construct reliability and validity were evaluated through CFA. Internal consistency reliability was assessed using Cronbach's alpha and Composite Reliability (CR), with values above 0.70 considered acceptable. Convergent validity was evaluated using standardized factor loadings and Average Variance Extracted (AVE). Factor loadings above 0.70 and AVE values greater than 0.50 were considered evidence of satisfactory convergent validity. Discriminant validity was examined using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio.

Data Analysis

Data analysis was conducted using IBM SPSS Statistics version 29 and AMOS version 29 through a series of sequential analytical procedures. First, descriptive statistics were calculated to summarize respondents' demographic characteristics and assess the distributional properties of the study variables. Data screening procedures were performed to examine missing values, outliers, normality, and multicollinearity. Normality was assessed using skewness and kurtosis statistics, with values within acceptable thresholds indicating that the data were appropriate for SEM analysis. Multicollinearity was evaluated using Variance Inflation Factor (VIF) values, with values below 5 indicating the absence of critical multicollinearity issues. Potential common method bias was examined using Harman's single-factor test and full collinearity assessment. Subsequently, Confirmatory Factor Analysis (CFA) was conducted to evaluate the measurement model, and model fit was

assessed using multiple goodness-of-fit indices, including Chi-square/degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). After establishing an acceptable measurement model, Structural Equation Modeling (SEM) using maximum likelihood estimation was employed to test the hypothesized relationships among the constructs. Standardized path coefficients (β), critical ratios (t-values), and significance levels were examined to determine hypothesis support, while the explanatory power of the model was evaluated through coefficients of determination (R^2) and effect sizes where applicable. Finally, mediation analysis was conducted using bootstrapping procedures with 5,000 resamples to examine the indirect effects of public trust, institutional transparency, risk communication, and citizen participation on sustainable city development through urban resilience. The significance of mediation effects was determined based on bias-corrected 95% confidence intervals, with mediation considered statistically significant when the confidence intervals did not include zero. This analytical framework provided a comprehensive assessment of how trust-based institutional relationships contribute to urban resilience and sustainable city development.

Results

Data Screening and Preliminary Analysis

A total of 450 questionnaires were distributed among urban residents. Following the data screening process, 420 valid questionnaires were retained for final analysis, representing a response rate of 93.3%. The final sample size exceeded the minimum requirement estimated through G*Power analysis and was considered adequate for conducting Confirmatory Factor Analysis (CFA), SEM, and mediation analysis. Before conducting the main analyses, the dataset was examined for missing values, outliers, normality, and multicollinearity. Cases with excessive missing responses were removed, while remaining missing values were handled using appropriate statistical procedures. Univariate outliers were assessed using standardized z-scores, and multivariate outliers were evaluated through Mahalanobis distance. No problematic cases were detected. The normality assessment showed that skewness values ranged from -0.76 to 0.69, while kurtosis values ranged from -0.84 to 1.12, indicating that all variables were within acceptable limits. Therefore, the assumption of normality was satisfied. Multicollinearity was assessed using Variance Inflation Factor (VIF) values. The obtained VIF values ranged between 1.28 and 2.36, indicating that multicollinearity was not a concern. Additionally, Harman's single-factor test was performed to examine common method bias. The first factor accounted for 29.8% of the total variance, which was below the recommended threshold of 50%, suggesting that common method bias was unlikely to significantly influence the findings.

Respondent Characteristics

Table 1 presents the demographic characteristics of the respondents. Among the 420 participants, 216 (51.4%) were male and 204 (48.6%) were female. The largest age group consisted of respondents aged 30–39 years (35.2%), followed by those aged 18–29 years (24.8%), 40–49 years (25.5%), and 50 years or older (14.5%). Regarding educational background, the majority of respondents held a bachelor's degree (43.1%), followed by master's degree holders (30.5%). In terms of occupation, private-sector employees represented the largest group (36.9%), followed by government employees (28.3%), self-employed individuals (19.5%), and students (15.3%).

Table 1. Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	216	51.4
	Female	204	48.6
	Total	420	100.0
Age	18–29	104	24.8
	30–39	148	35.2
	40–49	107	25.5
	≥50	61	14.5
	Total	420	100.0
Education	Diploma	82	19.5
	Bachelor's Degree	181	43.1
	Master's Degree	128	30.5
	PhD	29	6.9
	Total	420	100.0
Occupation	Government Employee	119	28.3

Variable	Category	Frequency (n)	Percentage (%)
	Private Sector Employee	155	36.9
	Self-employed	82	19.5
	Student	64	15.3
	Total	420	100.0

Descriptive Statistics

Table 2 presents the descriptive statistics for all study constructs. The mean values indicate moderately high levels of public trust, institutional transparency, risk communication, citizen participation, urban resilience, and sustainable city development among respondents. The skewness and kurtosis values for all constructs were within acceptable ranges, confirming that the data distribution was approximately normal and suitable for subsequent CFA and SEM analyses.

Table 2. Descriptive Statistics of Study Constructs

Construct	Mean	SD	Skewness	Kurtosis
Public Trust	3.61	0.74	-0.38	0.41
Institutional Transparency	3.68	0.72	-0.44	0.52
Risk Communication	3.55	0.77	-0.29	0.36
Citizen Participation	3.63	0.73	-0.41	0.45
Urban Resilience	3.72	0.70	-0.47	0.38
Sustainable City Development	3.76	0.68	-0.51	0.43

Measurement Model Assessment

Confirmatory Factor Analysis (CFA) was conducted to evaluate the adequacy of the measurement model. The CFA results indicated that all observed indicators loaded significantly on their intended constructs, with standardized factor loadings exceeding the recommended threshold of 0.70. The measurement model demonstrated satisfactory goodness-of-fit: $\chi^2/df = 2.18$, CFI = 0.96, TLI = 0.95, RMSEA = 0.050, SRMR = 0.038. These indices confirmed an acceptable fit between the hypothesized measurement model and the observed data. Reliability analysis demonstrated satisfactory internal consistency. Cronbach's alpha and Composite Reliability (CR) values for all constructs exceeded 0.70. Furthermore, Average Variance Extracted (AVE) values were above 0.50, confirming convergent validity. The square roots of AVE values (diagonal values) were greater than the correlations between constructs, confirming discriminant validity.

Table 3. Reliability and Convergent Validity Results

Construct	Items	Standardized Loadings	Cronbach's α	CR	AVE
Public Trust	5	0.76–0.89	0.90	0.92	0.69
Institutional Transparency	4	0.78–0.90	0.89	0.91	0.72
Risk Communication	4	0.74–0.87	0.86	0.89	0.67
Citizen Participation	5	0.75–0.88	0.90	0.91	0.68
Urban Resilience	5	0.79–0.91	0.92	0.93	0.73
Sustainable City Development	5	0.77–0.88	0.90	0.92	0.70

Table 4. Discriminant Validity (Fornell–Larcker Criterion)

Construct	PT	IT	RC	CP	UR	SCD
Public Trust	**0.831**					
Institutional Transparency	0.61	**0.849**				
Risk Communication	0.54	0.58	**0.818**			
Citizen Participation	0.57	0.60	0.52	**0.825**		
Urban Resilience	0.63	0.66	0.59	0.62	**0.854**	
Sustainable City Development	0.56	0.59	0.53	0.58	0.72	**0.837**

Structural Model and Hypothesis Testing

After confirming the reliability and validity of the measurement model, the structural model was evaluated to test the hypothesized relationships among the latent constructs. The structural model demonstrated an acceptable fit to the empirical data, indicating that the proposed theoretical framework adequately represented the observed relationships. The goodness-of-fit indices showed satisfactory model performance: $\chi^2/df = 2.31$, CFI = 0.95, TLI = 0.94, RMSEA = 0.052, and SRMR = 0.041. These values indicate that the structural model achieved an acceptable level of fit according to commonly recommended criteria. Figure 1 presents the standardized structural model with estimated path coefficients. The path analysis results revealed that all

hypothesized direct relationships were positive and statistically significant ($p < 0.001$). As presented in Table 5, institutional transparency emerged as the strongest predictor of urban resilience ($\beta = 0.64$, $t = 12.36$, $p < 0.001$), followed by public trust ($\beta = 0.61$, $t = 11.72$, $p < 0.001$), citizen participation ($\beta = 0.56$, $t = 10.18$, $p < 0.001$), and risk communication ($\beta = 0.49$, $t = 8.74$, $p < 0.001$). Furthermore, urban resilience demonstrated a strong positive influence on sustainable city development ($\beta = 0.73$, $t = 16.21$, $p < 0.001$), confirming that resilient urban systems represent an essential foundation for achieving long-term sustainability.

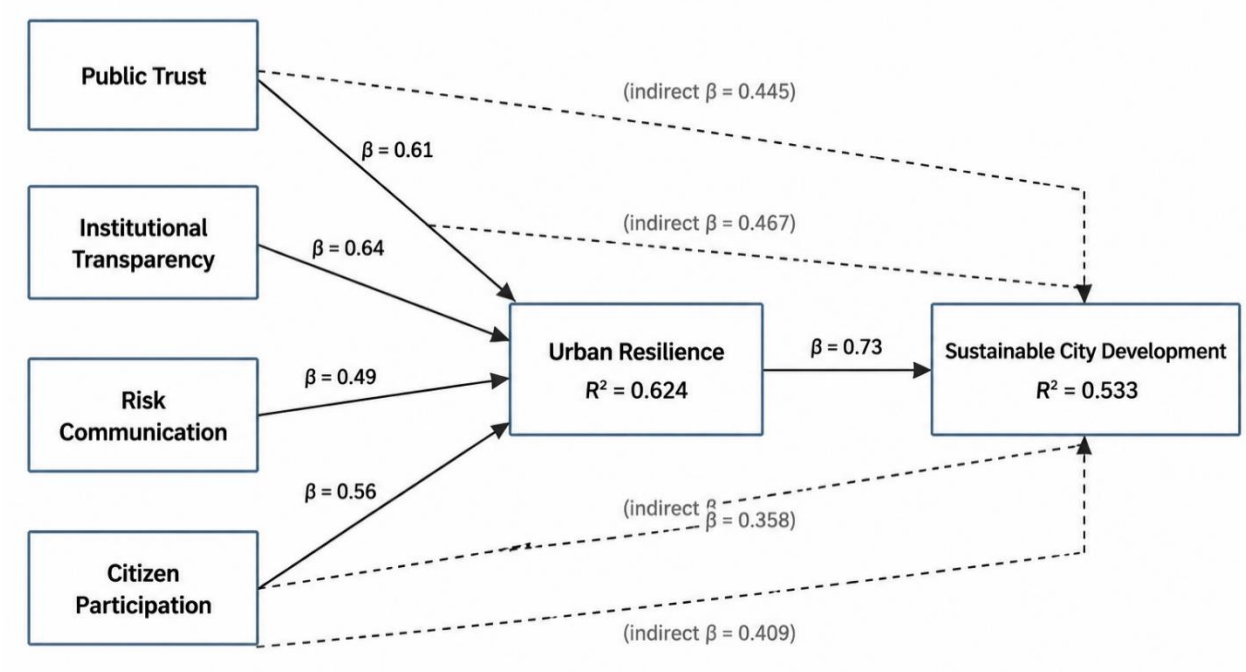

Figure 1. Standardized Structural Model

Table 5. Structural Path Coefficients and Hypothesis Testing

Hypothesis	Path	β	t-value	p-value	Decision
H1	Public Trust → Urban Resilience	0.61	11.72	<0.001	Supported
H2	Institutional Transparency → Urban Resilience	0.64	12.36	<0.001	Supported
H3	Risk Communication → Urban Resilience	0.49	8.74	<0.001	Supported
H4	Citizen Participation → Urban Resilience	0.56	10.18	<0.001	Supported
H5	Urban Resilience → Sustainable City Development	0.73	16.21	<0.001	Supported

The structural model demonstrated substantial explanatory power. Public trust, institutional transparency, risk communication, and citizen participation collectively explained 62.4% of the variance in urban resilience ($R^2 = 0.624$). Furthermore, urban resilience explained 53.3% of the variance in sustainable city development ($R^2 = 0.533$). These findings indicate that trust-based institutional relationships and participatory governance mechanisms play a critical role in strengthening urban resilience, which subsequently contributes to sustainable urban outcomes.

Mediation Analysis

To examine whether urban resilience mediates the relationship between trust-related institutional factors and sustainable city development, mediation analysis was performed using the bootstrapping method with 5,000 resamples. The significance of indirect effects was assessed through bias-corrected 95% confidence intervals. An indirect effect was considered statistically significant when the confidence interval did not include zero. The results demonstrated that urban resilience significantly mediated all hypothesized relationships between the antecedent variables and sustainable city development. Public trust showed a significant indirect effect on sustainable city development through urban resilience ($\beta = 0.445$, $p < 0.001$), indicating that citizens' confidence in institutions contributes to sustainability primarily by strengthening adaptive urban capacities. Institutional transparency demonstrated the strongest indirect effect ($\beta = 0.467$, $p < 0.001$), suggesting that transparent and accountable governance enhances resilience, which subsequently improves sustainable development outcomes. Risk communication also showed a significant indirect effect through urban resilience ($\beta = 0.358$, $p < 0.001$), demonstrating that effective communication systems improve preparedness and adaptive capacity. Similarly, citizen participation significantly influenced sustainable city development through enhanced urban resilience ($\beta = 0.409$, $p < 0.001$). The mediation findings confirm that urban resilience represents an important mechanism

linking social trust and institutional capacity with sustainable city development. Although public trust, transparency, communication, and participation directly enhance resilience, their contribution to sustainability is largely realized through the development of resilient urban systems capable of adapting to environmental and social uncertainties.

Table 6. Mediation Effects of Urban Resilience

Hypothesis	Indirect Path	β	BootSE	95% Confidence Interval	p-value	Decision
H6	Public Trust → UR → Sustainable City Development	0.445	0.048	0.354–0.546	<0.001	Supported
H7	Institutional Transparency → UR → Sustainable City Development	0.467	0.050	0.372–0.568	<0.001	Supported
H8	Risk Communication → UR → Sustainable City Development	0.358	0.044	0.276–0.449	<0.001	Supported
H9	Citizen Participation → UR → Sustainable City Development	0.409	0.046	0.322–0.501	<0.001	Supported

Discussion

The primary objective of this study was to investigate the role of public trust and institutional factors in strengthening urban resilience and promoting sustainable city development. By developing and empirically testing an integrated SEM framework, this research examined how public trust, institutional transparency, risk communication, and citizen participation contribute to urban resilience and how resilience subsequently influences sustainable urban outcomes. The findings provide strong evidence that social and institutional dimensions represent fundamental components of resilient and sustainable cities. All hypothesized relationships were statistically significant, demonstrating that public trust, transparent governance, effective risk communication, and citizen participation enhance urban resilience. Furthermore, urban resilience significantly contributed to sustainable city development and served as a mediating mechanism through which trust-based factors influenced sustainability outcomes. These findings extend previous approaches to urban resilience by emphasizing that resilience is not solely a function of physical infrastructure, technological capacity, or environmental management. Instead, resilient cities depend on the quality of relationships between institutions and communities. Infrastructure and technology may provide essential resources, but their effectiveness depends on citizens' willingness to cooperate, accept policies, share information, and participate in collective responses. Therefore, public trust should be recognized as a strategic asset within urban resilience planning.

Public trust was found to have a significant positive influence on urban resilience ($\beta = 0.61$, $p < 0.001$). This finding highlights the importance of citizens' confidence in governmental institutions and public authorities as a foundation for adaptive urban systems. Trust influences how communities respond to uncertainty, particularly during periods of crisis such as natural disasters, climate-related events, and public emergencies. When citizens trust institutions, they are more likely to follow emergency guidance, support resilience policies, participate in community programs, and collaborate with authorities (Bonfanti, et al., 2023). Conversely, low levels of trust may reduce policy acceptance, increase social resistance, and weaken collective responses. The mediation analysis further demonstrated that public trust contributes to sustainable city development through urban resilience (Nicholas, et al., 2026). This finding suggests that trust does not directly create sustainability outcomes by itself; rather, it strengthens the institutional and social capacities required for cities to adapt and maintain essential functions under changing conditions. From a policy perspective, urban governments should consider trust-building as an essential component of resilience strategies. Improving transparency, accountability, communication, and citizen involvement can enhance institutional legitimacy and strengthen urban adaptive capacity.

Among the examined predictors, institutional transparency demonstrated the strongest effect on urban resilience ($\beta = 0.64$, $p < 0.001$). This result emphasizes that open and accountable governance systems are critical for developing resilient cities. Transparency enables citizens to understand policy decisions, evaluate governmental performance, and participate more effectively in urban development processes. During crises, transparent communication and decision-making reduce uncertainty and improve public confidence (Ho, et al., 2024). Furthermore, transparent institutions are better positioned to coordinate resources, engage stakeholders, and implement long-term resilience strategies. The mediation findings revealed that institutional transparency indirectly enhanced sustainable city development through urban resilience (Lee & Li, 2021). This indicates that transparent governance contributes to sustainability by strengthening adaptive capacity and improving cooperation between institutions and communities. Therefore, policymakers should prioritize mechanisms such as open data systems, participatory budgeting, accessible planning information, and clear communication

regarding urban policies. Such practices can strengthen institutional credibility and improve the effectiveness of sustainability initiatives.

Risk communication was found to significantly influence urban resilience ($\beta = 0.49$, $p < 0.001$). This finding highlights the importance of information exchange between authorities and citizens in preparing cities for environmental and social uncertainties. Effective risk communication enables residents to understand potential hazards, adopt appropriate protective behaviors, and contribute to disaster preparedness efforts. Reliable information reduces uncertainty and allows communities to make informed decisions during emergencies (Mohsenzadeh, Y et al., 2025). The mediation results demonstrated that risk communication contributes to sustainable city development through enhanced resilience. This suggests that communication systems should not be viewed merely as emergency management tools but as long-term components of sustainable urban governance (Holroyd, et al., 2020). Urban authorities should therefore invest in accessible communication platforms, early warning systems, public education programs, and inclusive information strategies that reach diverse population groups. Effective communication can strengthen both public trust and collective resilience.

Citizen participation significantly contributed to urban resilience ($\beta = 0.56$, $p < 0.001$), confirming the importance of community involvement in resilient urban development. Residents possess valuable local knowledge regarding environmental conditions, social vulnerabilities, and community needs. When citizens are actively involved in planning and decision-making processes, urban policies become more responsive and effective (Llonto Caicedo, et al., 2025). Participation also strengthens social cohesion and encourages collective responsibility for sustainability goals. The mediation analysis confirmed that citizen participation improves sustainable city development through urban resilience (Özden 2023). This demonstrates that participation is not merely a democratic principle but also a practical mechanism for enhancing adaptive capacity. Urban planners should therefore move beyond traditional top-down approaches and develop collaborative planning frameworks that include residents, community organizations, and other stakeholders. Participatory workshops, digital engagement platforms, neighborhood resilience programs, and community-based environmental initiatives can strengthen citizen involvement.

One of the most important findings of this study was the strong positive relationship between urban resilience and sustainable city development ($\beta = 0.73$, $p < 0.001$). This finding confirms that resilience represents a fundamental pathway through which cities achieve long-term sustainability. Sustainable cities must be capable of maintaining essential services, protecting vulnerable populations, managing environmental risks, and adapting to changing conditions (Salvador Costa, et al., 2022). Urban resilience provides the adaptive capacity necessary to balance immediate challenges with long-term development objectives. The results support the perspective that sustainability and resilience are interconnected rather than independent concepts (Nunes, 2025). While sustainability focuses on maintaining ecological, social, and economic balance over time, resilience emphasizes the ability to respond and adapt when disruptions occur. Together, these concepts provide a comprehensive framework for addressing contemporary urban challenges.

This study contributes to urban sustainability and resilience literature in several ways. First, it expands existing resilience frameworks by highlighting the importance of public trust and institutional relationships as key determinants of adaptive capacity. Second, the study provides empirical evidence that social legitimacy and governance quality influence sustainability outcomes through urban resilience. Previous studies have often emphasized infrastructure and environmental dimensions, whereas this research demonstrates the importance of social and institutional foundations. Third, the mediation analysis advances theoretical understanding by showing that urban resilience functions as the mechanism through which trust-based factors contribute to sustainable city development. This finding provides a more comprehensive explanation of how social capital and governance processes translate into practical sustainability outcomes. Finally, the study demonstrates the value of SEM methodology for examining complex relationships among social, institutional, and environmental dimensions of urban development.

The findings provide several practical implications for urban policymakers and planners. First, local governments should prioritize trust-building strategies by improving transparency, accountability, and communication with citizens. Trust should be considered an essential component of urban resilience planning rather than an indirect social outcome. Second, municipalities should strengthen participatory governance mechanisms that allow residents to contribute to planning decisions and sustainability initiatives. Active citizen involvement can improve policy effectiveness and increase public acceptance. Third, urban authorities should develop comprehensive risk communication systems that provide timely, accurate, and accessible information during both routine planning processes and emergency situations. Finally, resilience strategies should integrate social and institutional dimensions with physical infrastructure investments. Building resilient cities requires coordinated efforts across governance, community engagement, environmental management, and technological innovation.

Despite its contributions, this study has several limitations. First, the cross-sectional research design limits the ability to establish long-term causal relationships. Future longitudinal studies could examine how public

trust and resilience evolve over time. Second, the study relied primarily on residents' perceptions rather than objective indicators of institutional performance or resilience capacity. Future research could integrate survey data with disaster records, infrastructure indicators, environmental monitoring systems, and governance performance measures. Third, the research was conducted within a specific urban context, which may limit generalizability. Comparative studies across different cities, countries, and governance systems would provide deeper insights into how cultural and institutional factors influence trust-based resilience. Future research could also examine additional variables such as social justice, digital governance, institutional trust dynamics, psychological resilience, and climate adaptation behavior.

In conclusion, this study demonstrates that public trust represents a fundamental foundation for building resilient and sustainable cities. The findings confirm that public trust, institutional transparency, risk communication, and citizen participation significantly strengthen urban resilience, which subsequently promotes sustainable city development. The central contribution of this research is the demonstration that resilience is not created only through physical infrastructure or technological innovation but also through strong relationships between institutions and communities. Trust enables cooperation, transparency supports legitimacy, communication improves preparedness, and participation mobilizes collective action. As cities face increasingly complex challenges associated with climate change, urban growth, and environmental uncertainty, developing resilient urban systems requires a shift toward collaborative and trust-based governance. Sustainable cities of the future will depend not only on what governments build but also on how effectively they engage, inform, and cooperate with their citizens. Therefore, strengthening public trust should be regarded as a strategic priority for urban planning, providing the social foundation necessary for cities to become more adaptive, inclusive, and sustainable.

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