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ORIGINAL RESEARCH ARTICLE

Investigating the effective indicators on the realization of good governance in border cities: A case study of Paveh, Iran

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ABSTRACT

Border cities face significant challenges due to political, environmental, and social issues. Strong urban governance can help resolve many of these problems, but it requires identifying practical factors specific to each city's location. This study aimed to assess the state of urban governance in Paveh, a border city with a population of 25,771 people. The research used both primary data collection (through a questionnaire) and secondary data sources (local and national databases and documents). The study randomly selected 379 households from Paveh's population and determined a reliability value of 0.913 using the Cochrane procedure. To assess Paveh's urban governance, eight criteria were used: participatory, rule-of-law compliance, transparency, responsiveness, consensus-oriented, equitable and inclusive, effective and efficient, and accountability. The findings revealed that Paveh's urban governance, particularly in the dimensions of transparency and participation, is in an unfavorable situation.

Keywords: good governance; effective indicators; optimal governance index; border city; Paveh

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1. Introduction

Urbanization, characterized by the growth of cities and their populations, is a hallmark of the modern era. This phenomenon dominates the landscape of developing countries, as highlighted by Barari et al.[1] and Kamran et al.[2]. However, this rapid urban growth has ushered in a slew of challenges for policymakers and city administrators worldwide, as noted by Abdi et al.[3]. These issues encompass high population density, inadequate living conditions, a lack of basic infrastructure services, environmental pollution, unsanitary surroundings, and elevated rates of illiteracy, unemployment, crime, and mental health disorders. The unchecked expansion of cities, as discussed by Beckley[4] and Finewood et al.[5] underscores the urgency of implementing effective urban management strategies. In response to these pressing challenges, it is imperative to adopt new management systems aimed at mitigating the problems associated with urban growth. Indeed, evolving societal patterns necessitate innovative approaches to urban governance, as emphasized by Murphy et al.[6], De Guimarães et al.[7] and Paschoal and Wegrich[8]. Over the past few decades, diverse methodologies for urban

management have been proposed, with a strong focus on the concept of good urban governance, as advocated by scholars such as Horak[9], Ziervogel et al.[10] and Cento Bull and Jones[11]. This paradigm shift in governance principles challenges the traditional top-down approach, placing greater importance on local responses to urban governance to address the needs of urban populations. Korosteleva and Flockhart[12] highlight the significance of this transition in global governance dynamics.

The concept of urban governance has gained prominence in the pursuit of the United Nations' Sustainable Development Goals, which were adopted in September 2015, as articulated by Pieterse[13]. This evolution of governance is marked by a transition from the traditional and centralized model of government towards a more participatory and network-based approach, as discussed by Lyall and Tait[14]. At its core, urban governance can be distilled to the quality of the relationship between government and citizens, a fundamental idea echoed by Sheng[15], Koster[16] and Da Cruz et al.[17]. Recognizing the multitude of actors and their influence on urban spaces at various scales—local, national, and regional—it becomes evident that achieving convergence and alignment, often referred to as regional governance and democracy, is of paramount importance. Recent years have witnessed a notable shift in urban management strategies, with an increasing focus on urban governance, as noted by Ghalehteimouri et al.[18] and van der Heijden[19]. While traditional urban management predominantly emphasized the efficient allocation of resources for service delivery within municipal structures, administrative systems, planning processes, and policy implementation methods[20], urban governance takes a more holistic approach by integrating urban management and government at the local level (municipality or local government), as underscored by Ripp and Rodwell[21] and Pieterse et al.[22]. This approach, often referred to as optimal urban governance, has garnered widespread recognition as the most effective, cost-efficient, and sustainable method for urban management practices, as advocated by Cento Bull and Jones[11], Ghalehteimouri et al.[18], Washbourne et al.[23] and Ghalehteimouri and Kojouri.[24].

The concept of urban governance has gained significant attention, particularly in light of the United Nations' Sustainable Development Goals adopted in September 2015[13]. This shift in governance signifies a departure from the traditional centralized government model towards a more participatory and network-based approach, as discussed by Lyall and Tait[14]. At its core, urban governance revolves around the quality of relationships among various stakeholders, including government, the private sector, and civil society, with the aim of addressing urban challenges. This approach recognizes the multifaceted influences on urban spaces at local, national, and global levels, emphasizing the importance of aligning strategies with regional governance and democracy[25–27]. Border cities, in particular, have faced neglect and mismanagement within the urban planning system, resulting in instability not only in these urban centers but also in their rural surroundings[28]. For instance, Paveh, a border city, faces similar challenges, making the adoption of good urban governance practices increasingly vital due to structural weaknesses in border areas and, consequently, in urban centers (Paveh).

The emergence of new topics in urban studies, including good urban governance, is facilitated by developments in various fields, such as geospatial phenomena[1,29]. While governance has gained academic prominence[30], progress toward a comprehensive theory of urban governance has been gradual[31,32]. Governance, in this context, encompasses the structures and processes used for decision-making and power-sharing in societies, involving dynamic interactions among government, the market, civil society actors, and citizen[33–35]. The increasing recognition of urban governance's potential in influencing positive urban development outcomes, especially in developing countries, has led to a more focused analysis of organizational processes and their potential consequences[36,37]. This shift positions (urban) governance as a development paradigm that can address the unstable urban conditions prevalent in the developing world[38,39]. While various institutions, actors, and stakeholders may have differing perspectives on governance[18,40], they share a common goal of enhancing organizational and decision-making processes to achieve positive national and local development outcomes. This transition to urban governance as a development paradigm reflects the limitations

of both government-based and market-based/neoliberal urban management approaches in achieving sustainable, comprehensive, and successful urban development for all[41]. Good governance indicators play a crucial role in improving governance outcomes and effectiveness, transcending mere organizational analysis and incorporating geographical factors for a better understanding of performance and executive capacity[27,42,43].

Smith[44] emphasizes the pivotal role of good governance in fostering consensus among decision-makers and establishing effective decision-making institutions. According to Smith, policymaking should focus on shaping such institutions, particularly when reorganizing a city's governance framework to address social and political challenges, necessitating the creation of organizational mechanisms[45]. Consequently, a robust political and social system is essential for enhancing economic prosperity, and good governance stands as a fundamental source of funding[46]. The World Bank classifies good governance into two primary components: the quality of the political system and the generation of social and economic resources[36,47]. The former involves establishing mechanisms for legitimate power exercise and administrative enhancements at the grassroots level, while the latter encompasses resource allocation for human development. According to the United Nations Economic and Social Commission for Asia and the Pacific, good governance is characterized by its participatory nature, adherence to the rule of law, transparency, responsiveness, consensus-building, inclusivity, effectiveness, efficiency, and accountability[48]. The United Nations Development Programme (UNDP) has long advocated a set of quality standards for urban governance, which encompass citizen participation, strategic vision, rule of law, transparency, sensitivity, inclusiveness, consensus-building, equity, responsiveness, effectiveness, and efficiency[49,50]. Given the diverse perspectives on the components of good urban governance, **Table 1** provides a summary of the key indicators for reference.

In other words, because border cities are directly influenced by borders and are affected by both positive and negative border issues, the role and position of urban management in border cities are critical. As these cities are subject to dual administration both within and outside the country, their management is more sensitive, and their governance is more important and visible, and it should be doubled[51].

Table 1. Components of good governance in different sources.

Theories and dimensions	Axial consensus	Justice	Legitimacy	Responsibility	Transparency	Effectiveness	Responsiveness	Participation
United Nations Development Program	*	*	*	*	*	*	*	*
John Friedman		*					*	
World Bank		*			*	*	*	*
United Nations Center for Human Settlement		*			*	*	*	*
Deputy Chief of Operations		*	*				*	
Denish Mata				*			*	*
Sajiko and Darood		*			*	*	*	
Sun Feng Com		*			*			*
Douglas		*					*	*
United Nations Human Settlement Program		*		*			*	*
Kaufman, Cray, Paplosid, Lobton			*				*	
Taylor, Weiss, Moyes, Tisdale		*			*		*	*

2. Research methods

2.1. Profile of respondents

The descriptive findings of the study revealed that 94 of the 219 statistical population responses were male, while 125 were female. The following was the age distribution: there were 41 people over the age of 60, 79 between the ages of 30 and 45, and 99 under the age of 30. There were 116 bachelor's degrees, 39 diplomas and undergraduate degrees, 55 master's degrees, and 9 doctorate degrees. There were 147 self-employed people and 72 government employees in terms of employment. According to the theoretical foundations of the research, there is complete agreement on urban governance indicators among international institutions and experts. The World Bank and the United Nations Development Program identify eight key indicators of good governance: participatory, rule of law-compliant, transparent, responsive, consensus-oriented, equitable and inclusive, effective and efficient, and accountable. As a result, the same eight indicators were used in this study to assess and analyze effective urban governance in Paveh, a border city. The Smirnov-Kolmogorov test was used to investigate the scattering distribution of research data.

The Kolmogorov-Smirnov statistic is defined as follows, using the previously mentioned definition for the empirical distribution function.

$$dn = sup_x|\hat{}Fn(x) - F(x)|$$

Meaning of sup_x is to find the smallest upper bound for the distance between two empirical distributions and the true distribution over all values. It can be shown that if the observations from the distribution $F(x)$ be, amount dn. As the amount increases n tends to zero (**Figure 1**).

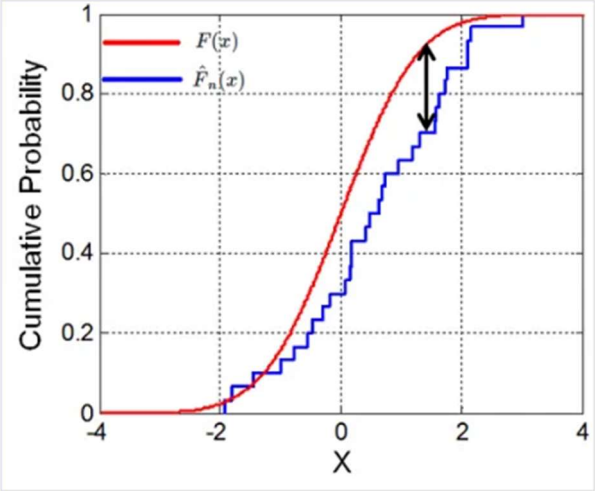

Figure 1. Cumulative probability.

In the Kolmogorov-Smirnov test, the null hypothesis and the opposite hypothesis are written as follows:

H0: The empirical distribution is the same as the original distribution.

H1: The empirical distribution is not the same as the original distribution.

In this way, to determine the critical area (Critical Area) of the quantile a. The upper limit of the Kolmogorov distribution (Ka) used and if the test statistic means $\sqrt{n}d_n$ bigger Ka. Therefore, we reject the null hypothesis (that is, the empirical distribution is the same as the true distribution).

$$\sqrt{n}d > Ka, ReJect\ Ho, Prof(KK) = 1 - a$$

In the Kolmogorov-Smirnov test, the null hypothesis (H0) posits that the empirical distribution is identical to the original distribution, while the alternative hypothesis (H1) suggests that the empirical distribution differs from the original distribution. To determine the critical region (Critical Area) for the quantile "a", the upper

limit of the Kolmogorov distribution (Ka) is utilized. If the test statistic, $\sqrt{n} \times dn$, surpasses Ka, the null hypothesis is rejected, indicating that the empirical distribution is not the same as the true distribution. It is important to note that the Kolmogorov-Smirnov test is not suitable for assessing normality in data distribution. Modified versions of this test, such as the Lilliefors test, are more effective in determining normality in data. Further exploration of this method will be conducted in subsequent sections. In the realm of inferential statistics, a fundamental distinction exists between parametric and non-parametric tests. The primary objective of inferential statistics is to estimate population parameters based on sample statistics. Although statisticians rely on sample characteristics to make inferences about populations, the variability of sample means poses a significant challenge. Nevertheless, this variability, being well-understood in its nature, can be estimated through statistical tests based on probabilities.

2.2. Scope of the study

Paveh, nestled in the Zagros Mountains at 1485 meters above sea level, is a charming city bordered by Marivan, Javanrood, Ravansar, and Iraq. Covering 1260 square kilometers, it features lush gardens and fertile agricultural land. Paveh boasts a population of 60,431, with 36,103 residents in the city and 24,328 in the surrounding rural areas. With its temperate mountainous climate, characterized by cold winters and cool summers, Paveh offers a delightful environment year-round[52] (**Figure 2**).

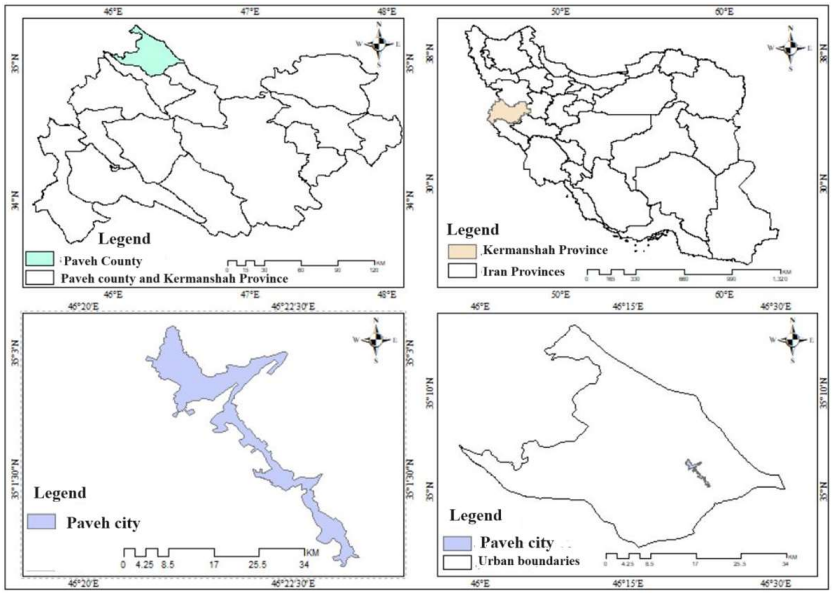

Figure 2. Regional location of the study area.

3. Results

In this section, the Smirnov test was employed to assess the parametric nature of the study's findings. The results, as displayed in **Table 2**, indicate that the distribution of research data conforms to a normal distribution and demonstrates a parametric statistical fit. Specifically, **Table 2** illustrates that the study's data distribution exhibits normality and aligns with parametric statistical criteria. The statistical significance of this test for the research data is reflected in a level of 0.205, with a corresponding significance level of 0.092.

Table 2. Kolmogorov-Smirnov test results.

Test	Sig	Result
0.205	0.09	Parametric

3.1. Measuring the impact of urban governance dimensions in the Border City of Paveh (One-Sample *T*-test)

The *T*-test in this study compares the sample average to (3), which is considered the average value. If the dimension has a less-than-normal effect on border control in the studied area, if each of the research indicators is less than three and differs from this significant difference. Paveh's municipal government was evaluated using eight criteria: participatory, rule of law-compliant, transparent, responsive, consensus-oriented, equitable and inclusive, effective and efficient, and accountable. **Table 3** displays the results of the One-Sample Test, which was used to examine the impact of each dimension on urban government.

As depicted in the table, the total index score obtained (2.58) signifies a challenging situation in the implementation of the requisite urban governance in Paveh, which has a benchmark value of 3. Among the dimensions assessed, "Participatory" yielded an average score of 3.22, "Transparent" received an average of 3.47, and "Effective and Efficient" garnered an average of 3.88. These dimensions demonstrated a favorable influence on urban governance in Paveh, as indicated by the *T*-test results. In contrast, "Consensus-Oriented" and "Responsive" dimensions, with averages of 2.35 and 2.2, respectively, received lower scores than the expected impact on urban governance in the study area. This is primarily due to their average scores falling below the established research threshold (**Table 3**).

Table 3. Results obtained from One-Sample *T*-Test.

Urban governance dimensions	Average	Test value	T	Significant level
Participatory	3.22		17.23	0.000
Equitable and inclusive	2.67		23.34	0.000
Rule of law-compliant	2.75		17.33	0.000
Transparent	3.47		20.69	0.000
Consensus-oriented	2.35	3	12.9	0.000
Accountable	2.3		17.87	0.000
Responsive	2.2		12.65	0.000
Effective and efficient	3.88		20.97	0.000
Total	2.58		30.32	0.000

3.2. Measuring the effect of indicators of different dimensions on optimal urban governance in the city of Paveh using the *T*-Test

Participatory indicator

Table 4 reveals that, based on the calculated averages and their corresponding levels of significance, four out of the five indicators examined within the participatory dimension for achieving optimal urban governance in Paveh surpass the established average. Leading the pack is the indicator "Citizens' awareness required for participation in decision-making", which boasts an impressive average score of 4.41. Following closely is the indicator "Engagement of city officials in decisions pertaining to urban matters with citizens", which secures a commendable average of 4.4. However, the indicator "Solicitation of citizen involvement by city administrators in municipal affairs" lags slightly behind with a score of 2.72, marginally falling short of the overall average in the fifth category. These findings shed light on Paveh citizens' perspectives, emphasizing the paramount importance of comprehensive awareness regarding the city's decision-making processes over time. It underscores the significance of citizens comprehending how decisions are formulated and the rationale behind them. In contrast, the exchange of opinions and feedback from Paveh citizens on urban matters by city officials assumes a somewhat lower priority in attaining the desired level of urban governance.

The term participatory refers to both the ability to influence decision-making and citizen participation in power. The active participation of urban groups in social and economic activities is referred to as urban participation[53]. In the current study, the following 5 indicators were used to assess this criterion:

Table 4. *T*-test results for participatory indicator.

Participatory indicator	Test value	Average	T	Sig
Exchange of views of city managers in decisions related to city issues with citizens		4.4	27.7	0.000
Appropriate knowledge of citizens to participate in decision-making		4.41	13.6	0.000
The effective role of implementing citizens' decisions in the preparation of urban plans	3	4.03	9.17	0.000
The impact of social networks on the participation of civil society organizations, cooperatives, and the private sector		3.22	2.02	0.04
City managers ask citizens to participate in affairs		2.72	−2.21	0.02

3.3. Equitable and inclusive

As per the findings presented in **Table 5**, within the dimension of equitable and inclusive factors contributing to good urban governance in Paveh, five out of the seven indicators surpass the established average, while two fall below this benchmark based on their calculated averages and degree of significance.

Leading the way is the indicator "Fair Distribution of Urban Facilities", commanding the top spot with an impressive average score of 4.7. Following closely is the indicator "Adherence to Fairness and Justice in Maintaining Urban Cleanliness", securing the second position with an average score of 4.3. Ranking third is the indicator "Promotion of Gender Equity", attaining a respectable score of 3.88. However, the indicator "Proactive Involvement of City Management in Physical Urban Development" lags significantly, ranking eighth with a score of 2.76, notably lower than the established norm. These findings underscore the critical importance that Paveh residents place on the equitable distribution of urban facilities in achieving their vision of urban governance that prioritizes fairness. Given Paveh's modest size and its unique border location, it becomes imperative to ensure the optimal utilization of facilities and services for all residents, especially in newly developed areas like "Dorisan, Nasmeh, Sarkran, and Chorgi", which align with the city's political divisions. Regardless of their scope, efficient service and facility allocation throughout the urban landscape have assumed pivotal significance. Furthermore, Paveh's status as a tourist destination in Kermanshah province, coupled with its mountainous terrain and border proximity to the Kurdish regions of the country to the west, amplifies the importance of maintaining the city's cleanliness and orderliness. This attribute consistently ranks as the second most vital indicator within the framework of equity and inclusion, as evidenced by various polls (**Table 5**).

Equitable and inclusive means providing appropriate opportunities for all citizens to improve their well-being, striving for equitable resource allocation, and allowing disadvantaged groups to express their opinions and make decisions. This criterion was evaluated using seven sub-indicators.

Table 5. *T*-test results for equitable and inclusive indicator.

Equitable and inclusive indicators	Test value	Average	T	Sig
Equal distribution of urban facilities		4.7	26.2	0.000
Observe fairness and justice in keeping the city clean		4.3	−4.54	0.021
Preference for public interests over personal	3	3.74	9.17	0.000
Establishing gender justice		3.88	2.02	0.034
The justice-centered approach of city managers to various issues of the city		2.89	−4.58	0.026

Table 5. (*Continued*).

Equitable and inclusive indicators	Test value	Average	T	Sig
The level of attention of city managers and authorities to the economic dimension of quality of life		3.01	0.373	0.710
Active action of city managers in the physical construction of the city		2.76	−2.27	0.000

3.4. Investigating the indicators affecting the dimension of efficiency and effectiveness in optimal urban governance

This criterion hinges on the effective allocation of available resources to cater to citizens' needs, deliver urban services, and ensure citizen satisfaction. To assess this criterion, four sub-indicators were employed. Based on the calculated averages and their respective levels of significance, two out of the four indicators, as part of the efficiency dimension for achieving optimal urban governance in Paveh, surpass the established average value, while two fall below this benchmark. Leading the way is the indicator "Utilization of Experts and Seasoned Personnel in Urban Management", securing the top position with a noteworthy average score of 4.3. Following closely is the indicator "Effectiveness of City Management Initiatives in Enhancing Citizens' Quality of Life", which ranks second with an average score of 3.92. However, the indicator "Availability of Skilled Workforce" lags behind with an average score of 2.64, falling short of the research standard value of 3. This indicator exhibits a relatively lesser impact on governance within the study area[54].

It's worth noting that the first option was ruled out due to the higher level of significance compared to the standard value of the obtained result. These findings shed light on the significance of leveraging expertise and experienced personnel in urban management and the effectiveness of city management endeavors in elevating citizens' quality of life as key determinants of efficient urban governance in Paveh (**Table 6**).

Table 6. Significant value for the indicators of efficiency dimension.

Efficiency indicators	Test value	Average	T	Sig
Using the appropriate ability of city capacities in urban development	3	2.77	−1.84	0.068
Skilled manpower availability		2.64	−3.49	0.001
The effectiveness of city managers' actions on the quality of life of citizens		3.92	12.41	0.000
Use of experts and well-experienced people in urban management		4.3	19.71	0.000

According to the findings, the use of competent and experienced employees in urban management is critical for residents in terms of efficiency. It is appropriate for educated people in the fields of geography and urban management, but because of the city's political importance in recent decades, it has always been one of the most important cities in the country, resulting in the emergence of experienced people in various fields. Successful urban governance has necessitated the creation of a favourable environment in which to utilise these people's experiences. The next critical issue in achieving good urban governance from the perspective of citizens is the effectiveness of measures implemented by city managers in the lives of citizens. The effectiveness of measures implemented by city managers in the lives of citizens is the next critical issue in achieving good urban governance from the perspective of citizens. Regardless of the implementation of various guiding projects, this problem persists and is one of the city's most prominent concerns in terms of noise and air pollution, and citizens have yet to see municipal managers' success in addressing this issue in their daily lives. As a result, one of the main concerns of Paveh residents in achieving the desired urban governance has been to solve the city's problems and difficulties in such a way that the citizens feel fully involved in their lives.

3.5. Rule of law-compliant

Based on the calculated averages and their respective levels of significance, it is observed that out of the

seven indicators examined within the dimension of Rule of Law Compliance for achieving optimal urban governance in Paveh, five indicators surpass the established average value, while one indicator falls below this benchmark, as indicated in **Table 7**. Notably, the sixth option is deemed insignificant due to its level of significance exceeding the standard value of the generated result. Leading the chart is the indicator "Neutrality and Equality Before the Law", securing the highest average score of 4.48. This is followed by the indicator "Utilization of Appropriate Measures and Solutions for Ensuring Rule of Law Compliance Among Urban Managers", which garners a respectable score of 3.92. Another indicator, "Adherence of Urban Managers to Legal Frameworks", also achieves an average score of 3.92. Further emphasizing the importance of legality in urban governance, the indicator "Non-Influence of Influential Figures in City Affairs" scores an average of 3.91, affirming its significance in the city's administration. However, the indicator "Degree of Commitment of City Managers to Intervening in the City's Physical Environment" falls short with an average score of 2.49, below the research standard value of 3, indicating its comparatively lesser impact on governance within the study area. These findings underscore that, within the context of legal compliance, the precedence of equality among residents of all social classes and groups is paramount. Paveh accommodates citizens from various urban and rural backgrounds who engage in administrative duties, and the municipal government diligently executes its responsibilities in accordance with the law, addressing the expectations of all Paveh residents. Another pivotal aspect contributing to good urban governance in Paveh is the unwavering commitment of city managers to legal adherence. Adherence to the law by city managers is considered essential, as it sets a vital example for ordinary citizens. It fosters a culture of lawfulness and non-partisanship, thereby fulfilling one of the fundamental requirements for good urban governance within the study area (**Table 7**).

The existence of effective laws, the fair application of legal frameworks in decision-making, and the exclusion of irresponsible individuals from decision-making are all requirements for rule of law compliance. Seven indicators were used to assess this criterion.

Table 7. *T*-test results for rule of law-compliant indicators.

rule of law-compliant dimensions	Test value	Average	T	Sig
Applying appropriate measures and solutions for the legitimacy of city managers		3.92	8.04	0.000
The degree of city managers' commitment to not favoring influential people in the city		3.91	10.3	0.000
Impartiality and equality before the law		4.48	15.3	0.000
City managers' efforts to aware citizens of urban environmental laws	3	3.66	5.03	0.000
Awareness and knowledge of urban management of urban environmental rights and laws		3.48	3.41	0.001
Influence of influential groups on the physical development of the city		3.16	1.22	0.224
The degree of commitment of city managers in intervening in the physical environment of the city		2.49	−5.28	0.000

3.6. Transparent

Table 8 provides insights into the dimension of transparency, a pivotal aspect for achieving optimal urban governance in Paveh. Among the indicators assessed, two surpass the established average value, while one falls below this benchmark. Additionally, the third option is considered insignificant, as its level of significance exceeds the standard value of the result. Leading the way is the indicator "Citizen Awareness Facilitated by Urban Management", securing the top position with an impressive average of 4.41. Closely following is the indicator "Promotion of Transparent Rules Without Ambiguity", ranking second with an average of 4.13. In contrast, the indicator "Public Perceptions of Physical and Economic Plans" records a score of 2.8, below the research standard value of three, indicating its relatively lower impact on governance within the study area.

From the citizens' perspective, transparency in disseminating information related to urban management emerges as a critical concern. Residents attach significant importance to comprehending urban management matters. While Paveh has been efficiently governed by city officials, the development of clear municipal regulations also plays a significant role in fostering good urban governance. Emphasizing transparency and eliminating legal complexities in implementing these regulations within the city underscores the importance of enhancing citizens' awareness and ensuring transparent, unambiguous laws. These two aspects—enhancing citizen awareness and promoting transparent, unambiguous laws—emerge as central demands from Paveh's residents regarding city management.

This criterion is based on the free flow of information and its ease of access, the clarity of actions, and citizens' ongoing awareness of existing trends. This criterion was evaluated using four sub-indicators.

Table 8. *T*-test results for dimension or transparent indicators.

Transparent indicators dimensions	Test value	Average	T	Sig
Codification of clear rules without ambiguity	3	4.13	15.61	0.000
The role of citizen awareness by the city administration		4.41	27.8	0.000
Provide clear information on technical and executive issues		3.12	1.31	0.192
Asking people about physical and economic plans		2.8	−2.01	0.048

3.7. Consensus-oriented

Table 9 sheds light on the consensus dimension, a critical element for achieving optimal urban governance in Paveh. Among the four indicators under scrutiny, two surpass the established average value, while one falls below it. Furthermore, the fourth option is considered insignificant, as its level of significance exceeds the standard value of the result. Taking the lead is the indicator "Coherence of Programs of Organizations Related to Urban Management", claiming the top position with an impressive average of 4.71. Following closely is the indicator "Interaction and Constructive Collaboration Between Public and Private Institutions", securing an average of 4.15. These two indicators play pivotal roles in achieving consensus among urban management components. Conversely, the indicator "Citizens' Participation in City Public and Religious Affairs" registers an average score of 2.68, below the research's standard value of three, indicating its comparatively lesser influence on governance within the study area.

Consensus-oriented management considers the public and collective opinions of citizens when developing policies. As a result, different points of view are incorporated, and all ideas are actively validated. At all stages of individual or societal formation, it is critical to orient the consensus. Individuals who play an active role in developing urban management strategies benefit the most[10]. Five sub-indicators were used to evaluate this criterion.

Table 9. *T*-test results for the consensus-oriented dimension of indicators.

Consensus-oriented dimension	Test value	Average	T	Sig
Citizens' participation in public and religious activities of the city	3	2.68	−1.98	0.01
Coordination of organizations' programs and plans related to urban management		4.71	36.8	0.000
Interaction and constructive interaction between public and private institutions		4.15	20.1	0.000
Look at group and group working		3.11	1.46	0.07

The findings underscore the significant positive impact of coordination among various urban management components, as perceived by citizens. Lack of coordination among entities such as the municipality, electricity,

water, sewage, housing, and urban development often leads to citizen confusion and disparate actions. These organizations frequently operate without synchronization, resulting in visible consequences like uncoordinated demolition and construction activities. For example, the absence of coordination between the city's gas and water departments and municipal institutions can lead to the destruction of asphalt or pavement during well construction, resulting in additional municipal costs and delays. Effective coordination among urban management components can mitigate such issues and prevent associated problems.

3.8. Investigating the indicators affecting the dimension of responsibility in optimal urban governance

Table 10 provides insights into the responsibility dimension, a crucial aspect for achieving optimal urban governance in Paveh. Among the four indicators under examination, three surpass the established average value, while the third option does not meet the standard value of the obtained result. Securing the top position is the indicator "Meritocracy in the Selection of Urban Managers", attaining an impressive average score of 4.12. Following closely is the indicator "Citizens' Degree of Responsibility in Various City Issues", with an average score of 3.74. These two indicators emerge as vital components of effective responsibility within the city and serve as driving forces for optimal urban governance. Additionally, the indicator "The Degree of Sense of Responsibility of Urban Managers" ranks third in terms of its impact on good urban governance in the study area, with an average score of 3.2.

This criterion is based on how managers and decision-makers are accountable to citizens, and four sub-indicators have been used to measure this criterion.

Table 10. *T*-test results for the dimension of responsibility indicators.

Dimension of responsibility indicators	Test value	Average	T	Sig
City manager's sense of responsibility degree	3	3.2	1.93	0.000
The level of responsibility of citizens in various issues of the city		3.74	6.66	0.000
Empowering citizens		2.83	−1.63	0.056
Meritocratic in selecting city planners		4.12	11.72	0.000

The findings underscore the importance of appointing city managers based on merit, emphasizing the selection of capable individuals for managerial positions rather than relying on political or governmental affiliations. This approach helps address issues associated with frequent managerial changes that often occur with presidential or parliamentary transitions, ensuring a more stable city management landscape. On the other hand, fostering citizens' sense of responsibility is equally critical. Citizens, regardless of their backgrounds, should consider themselves responsible and accountable to the city, actively engaging with and following the decisions made by city managers. This collective sense of responsibility contributes significantly to the overall success of urban governance.

3.9. Investigating the indicators affecting the accountability dimension in optimal urban governance

Accountability is a necessary component of good governance in order to provide political development, social status, an economic framework, and a governing body to design a region's future reform period[44]. In other words, it is critical for city officials to respond to citizens and obtain their perspectives on urban issues. Four sub-indicators were used in this section. Two of the four indicators examined in terms of accountability for optimal urban governance in Paveh are above the mean, while two options below the mean have less of an impact on urban governance. The indicator "Holding public meetings to explain public actions" ranks first with a score of 4.01, and the indicator "Accountability of managers and city officials to citizens" ranks second with a score of 3.2. Accountability has been effective in the city's good governance (**Table 11**).

Table 11. *T*-test results for the dimension of responsive indicators.

Dimension of responsive indicators	Test value	Average	T	Sig
Citizens' negative reaction to the lack of responsibility of city managers	3	2.89	4.09	0.000
The responsibility of city managers and authorities to citizens		3.2	1.98	0.000
City council responsibility and urban plans and projects explanation		2.79	3.11	0.000
Holding public meetings to explain public actions		4.01	8.90	0.000

The pivotal aspect of accountability, as indicated by the findings, revolves around city officials' responsibility to elucidate their actions, both past and forthcoming, during public meetings. This transparency serves to enhance citizens' comprehension, allowing them to align their perspectives with a deeper understanding of the actions already taken or those slated for the future. Furthermore, the responsiveness of city managers and officials to the concerns voiced by Paveh's residents regarding city management closely correlates with the foremost aspect of accountability. Addressing these concerns effectively fosters a sense of trust and collaboration between the city's administration and its inhabitants, further strengthening the foundation of accountability.

3.10. Determining the share of effective dimensions in optimal urban governance using multivariate regression

In the regression analysis, the coefficient "*R*" represents the multiple correlation coefficient, taking values between 0 and 1. A value closer to 1 signifies a stronger relationship between the independent and dependent variables. In this study, "*R*" is determined to be 0.987, a notably high value, as indicated in **Table 5**. The coefficient of determination, denoted as "*R*-squared", also ranges from 0 to 1, with values approaching 1 indicating that the independent variables effectively explain the variation in the dependent variable. With an *R*-squared value of 0.97, it can be inferred that approximately 97% of the observed changes in urban governance are accounted for by the independent indicators (**Table 12**).

Table 12. Summary of model fitting statistics.

Coefficient of determination	*R* Square	Correlation coefficient (*R*)
0.971	0.974	0.987

Table 6 shows how the Sig value of the variance column was analyzed (6). Because this value was less than 0.05, the obtained result indicates that the regression model used is significant and at the level of a good predictor for the research's dependent indicator, namely optimal urban governance as shown in **Table 13**.

Table 13. Tandardized regression coefficients of independent indicators on dependent.

Significant level	Correlation coefficient (Beta)	Dimensions of optimal urban governance	T-test	Variance analysis (ANOVA)	
				Sig	F
Participatory	0.003	0.153	3.08	0.000	328.79
Justice	0.000	0.232	5.29		
Legislative	0.001	0.133	3.42		
Transparency	0.000	0.219	5.98		
Sociability	0.034	0.106	2.16		
Responsibility	0.000	0.168	4.05		
Responsivity	0.000	0.171	6.84		
Efficiency	0.000	0.147	6.11		

In the context of regression analysis, where most independent indicator scales encompass multiple dimensions, the beta coefficient plays a crucial role in assessing the relative impact of each independent indicator on explaining variations in the dependent indicator while simultaneously considering the influence of other independent indicators. Within a regression test, a higher beta coefficient for an indicator signifies its greater importance in predicting alterations in the dependent variable. Except for the consensus dimension, the significance levels for the eight dimensions believed to influence desired urban governance exceeded the standard threshold, based on the significance of the beta coefficients derived from the research's independent indicators. These dimensions exhibited a positive impact. Notably, the equitable and inclusive governance dimension yielded a beta coefficient of 0.232, the transparency dimension recorded a score of 0.219, the accountability dimension obtained a score of 0.171, and the responsibility dimension achieved a score of 0.168, based on the coefficients generated from the individual indicators. The participation dimension featured a beta coefficient of 0.153, and the effectiveness dimension displayed a beta coefficient of 0.147. However, due to its high level of significance, the outcome from the consensus dimension could not be adequately assessed. Additionally, ANOVA analysis was employed to evaluate the model's accuracy in predicting changes in the dependent indicator.

4. Conclusion

In recent decades, Iran has experienced a significant shift in population policy, resulting in a substantial rise in demand for our unwavering attention. The unique nature of border cities further underscores the significance of effective city management. Within this context, our study delves into the dimensions of optimal urban governance, encompassing eight key facets, in the small town of Paveh, home to nearly 25 thousand residents. The findings, presented in **Tables 4–11**, shed light on various dimensions of optimal urban governance in Paveh. Notably, within the participatory dimension, the indicator "Citizens' awareness required for decision-making participation" stood out with an impressive average of 4.41. Similarly, in the equitable and inclusive dimension, the indicator "Fair distribution of urban facilities" excelled with an average of 4.7. Within the efficiency and effectiveness dimension, "Use of experienced and specialized personnel in urban management" garnered an average of 4.3. The legality dimension highlighted "Neutrality and equality before the law" as the leading indicator with an average of 4.48. The transparency dimension emphasized "Impartiality and equality before the law" with the same impressive average of 4.48. In the central consensus dimension, "Coordination of programs among organizations related to urban management" secured the top spot with an average of 4.71. Lastly, the responsibility dimension highlighted "Meritocracy in selecting city managers" with a remarkable average of 4.12, while the accountability dimension showcased "Holding public meetings to elucidate public actions" as the frontrunner with an average of 4.01. The regression test results underscored that those three dimensions—equitable and inclusive (with a beta coefficient of 0.232), transparency (with a beta coefficient of 0.219), and responsiveness (with a beta coefficient of 0.171)—exerted the most substantial influence on the formulation of optimal urban governance in Paveh. In summary, it is evident that the concept of urban governance does not seamlessly align with the existing framework of urban management in Iran, primarily due to its foreign origins. Given the closed and top-down structure of Iran's planning system and the multitude of influential stakeholders within Iranian cities, particularly sensitive border cities, the municipal institution, while deemed the most significant administrative body responsible for urban governance, often lacks effective executive authority. In the case of Paveh, the municipal institution has undergone transformations due to unique budgetary constraints imposed upon it, leading to changes in land use and the emergence of natural and urban green spaces. To truly achieve good urban governance in Paveh, a comprehensive reform of the planning system, coupled with enhanced legal status for urban management institutions such as the council and municipality, is imperative. This transformation must empower these institutions to effectively navigate and assert themselves amidst the myriad power actors within the city's urban population. As a result, urban management has become increasingly intricate and essential.

Author contributions

Conceptualization, KJG and MNM; methodology, RHZ; software, RHZ; validation, KJG and MNM, RHZ; formal analysis, RHZ; investigation, KJG and MNM; resources, KJG; data curation, RHZ; writing—original draft preparation, KJG; writing—review and editing, KJG; visualization, RHZ; supervision, MNM; project administration, MNM. All authors have read and agreed to the published version of the manuscript.

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Data availability declaration in the manuscript

Data are available on request.

Conflict of interest

The authors declare no conflict of interest.

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