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Analysis of Urban Livability from the Socio-Cultural Perspective in the Neighborhoods of Bonab City with an Emphasis on the Spatial Duality of Livability in Urban Fabrics[1]

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Abstract
Background and Objective: Rapid urbanization and growing socio-economic inequalities in medium-sized Iranian cities like Bonab have led to spatial duality and reduced urban livability. This study aims to evaluate the factors affecting socio-cultural livability disparities in neighborhoods located within two distinct zones of Bonab: the worn-out texture–informal settlements (south and southeast) and the non-worn-out texture (central and northern) areas.
Methodology: This descriptive-analytical and exploratory study utilized data gathered through field questionnaires and documentary sources. The sample size was determined using Cochran's formula. Data normality was tested using the Kolmogorov-Smirnov test. Statistical analyses, including one-sample t-tests and one-way ANOVA, were conducted using SPSS software, while GIS was employed to map the spatial distribution of the data.
Findings and Results: TheThe results revealed that the average socio-cultural index in the non-worn-out texture zone (mean: 3/47) was significantly higher than that in the worn-out texture–informal settlements zone (mean: 2/98). Only a few worn-out neighborhoods exhibited relatively favorable conditions. Spatial analysis further demonstrated a declining trend in livability quality from central and northern areas toward the southern and southeastern neighborhoods. According to ANOVA, the most influential factors affecting livability were security (determination coefficient: 0/740), health quality (0/694), and education quality (0/682). Additionally, the uneven distribution of educational, cultural, and recreational centers within the worn-out zone has intensified livability inequalities.

Keywords: Urban Livability, Spatial Duality, Worn-out Fabric, Informal Settlements, Bonab City.

[1] This article is an extracted from a Ph.D Thesis titled " An analysis of the duality of livability in the city of Bonab with a focus on the dilapidated urban fabric (Case study :the neighborhoods of Bonab city)," first author, University of Mohaghegh Ardabili, Ardabil, Iran.

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Extended Abstract

Introduction:

Rapid urbanization today has led to increased pollution, traffic congestion, and waste generation, all of which negatively impact environmental quality and public health. Moreover, social and economic inequalities have considerably expanded in many urban areas, resulting in the erosion of social bases and marginalization of certain groups. Recently, the concept of urban livability has garnered significant attention from urban specialists, given the multifaceted environmental, social, and economic challenges facing cities. Urban livability aims to promote a balance among economic development, social equity, and environmental protection, ensuring resilient and sustainable urban life for present and future generations. Harhof (2016) defines urban livability as the degree of satisfaction residents subjectively and purposefully express regarding their living environment. Nonetheless, achieving urban livability remains complex, with numerous cities confronting considerable obstacles, including environmental degradation, socio-economic disparities, and urban decay.

These issues are vividly observed in many Iranian cities, such as Bonab, a mid-sized city in East Azerbaijan Province with a population exceeding 85,000. Bonab's unique economic and geographic conditions have made it a destination for migrants, predominantly low-skilled workers employed in construction, industry, and agriculture, placing them in lower income brackets. This situation, compounded by ethnic and cultural differences between migrants and indigenous residents, has fostered informal settlements and deteriorating urban fabrics adjacent to the main city, creating notable spatial and socio-cultural dualities.

Currently, Bonab's urban landscape can be divided into two distinct zones: the southern and southeastern neighborhoods characterized by informal settlements and deteriorated fabric, and the northern and central neighborhoods exhibiting more formal and structured development. The disparities in physical infrastructure, housing quality, accessibility, and socio-economic status between these zones highlight pronounced urban livability dualities. This study focuses on examining the socio-cultural dimension of urban livability duality in Bonab's neighborhoods by identifying the underlying factors, processes, and conditions. Furthermore, it aims to assess neighborhood priorities for urban livability planning and proposes appropriate strategies to enhance urban livability and spatial justice within the studied area..

Methodology:

Considering the research topic, "Analysis of Urban Livability from the Socio-Cultural Perspective in Neighborhoods of Bonab with Emphasis on the Duality of Livability Conditions in Urban Fabrics," the study employs a descriptive-analytical and exploratory research design. From the perspective of research objectives, this study is applied in nature. Data collection was conducted through both library-documentary methods (consulting websites, written sources, and documentary and statistical data from relevant urban organizations such as the Statistical Center, Ministry of Roads and Urban Development, and Municipality) and field methods (questionnaire surveys administered to residents of the selected neighborhoods in Bonab).

The statistical population comprises residents from two distinct urban zones in Bonab: the central and northern neighborhoods, and the southern and southeastern neighborhoods. The Cochran formula was used to estimate the sample size based on a total population of approximately 85,000 residents, resulting in a sample of 382 participants. Probability sampling was employed to ensure each individual had an equal chance of selection.

To determine the appropriate statistical tests, the normality of the questionnaire data distribution was assessed using the Kolmogorov-Smirnov test, which confirmed normal distribution, allowing the use of parametric tests. Consequently, one-sample t-tests and one-way ANOVA were performed for comparing means and group differences, respectively, using SPSS software to ensure analytical accuracy. Additionally, spatial analysis and thematic mapping of research findings were conducted

with ArcGIS, enabling detailed visualization and spatial pattern examination. This mixed-methods approach enhanced the comprehensiveness and reliability of the results.

Results and Discussion:

Analysis of the Structure and Function of the Social and Cultural Dimension of Livability in the Study Area

To analyze the research data, as outlined in the problem statement, the neighborhoods of Bonab city are divided into two distinct zones in terms of social-cultural liveability: the deteriorated fabric and informal settlements (southern and southeastern neighborhoods) and the relatively well-maintained fabric (central and northern neighborhoods). The social-cultural dimension of liveability considered in this study is categorized into quantitative and qualitative indicators. The quantitative dimension includes access to and distribution of educational, health, recreational, cultural, artistic, and public collective spaces within the studied zones. The qualitative dimension encompasses a sense of identity and place attachment, social cohesion and interactions, psychosocial security and public order, cultural diversity and ethnic coexistence, and civic participation. Quantitative social-cultural liveability indicators were analyzed using statistical data and Geographic Information System (GIS) spatial layers, while qualitative indicators were assessed via questionnaires and independent t-tests. Access to educational centers is one of the most critical indices for evaluating the social-cultural dimension of neighborhoods. According to available data, over 50 schools and higher education institutions exist across the two zones of Bonab city: about 30 schools and institutions are located in the newer and non-deteriorated fabric, whereas the deteriorated fabric and informal settlements host 20 and 10 schools respectively. This distribution reveals that the newer fabric zone enjoys better educational accessibility, indicating more balanced infrastructure development and improved opportunities for residents. Conversely, the deteriorated and informal zones face challenges due to fewer educational centers, reflecting an uneven spatial distribution. Cultural centers and public spaces play a fundamental role in enhancing urban liveability by fostering social interactions, strengthening collective identity, and promoting cultural participation. As depicted in Figure 7, out of 19 cultural facilities—including cinemas, theaters, museums, cultural monuments, libraries, and historic buildings—15 are concentrated in the non-deteriorated fabric (central and northern neighborhoods), approximately four times the number in deteriorated and informal zones, which only have four such venues. Recreational and sports facilities, crucial indicators of social vitality and connectivity, also display spatial disparities. Of 34 centers, including cafes, restaurants, parks, amusement parks, stadiums, halls, and swimming pools, 26 are located in the non-deteriorated zones, while only 4 centers each exist in the deteriorated and informal settlements. This uneven spatial distribution underscores a significant concentration of recreational amenities in the non-deteriorated area. Healthcare facilities, encompassing hospitals, clinics, health houses, and Red Crescent centers, further illustrate these social-cultural disparities. Of 13 healthcare centers, 6 are in the non-deteriorated zone and 7 in the deteriorated and informal zone, suggesting a relatively balanced quantitative distribution. Qualitative analysis utilized a Likert-scale questionnaire comprising 34 items to measure social-cultural liveability indicators related to security and public order, identity and place attachment, citizen participation, social cohesion, cultural diversity and ethnic coexistence, and access quality to educational, health, recreational, and cultural centers. Data collected from residents across the two zones were processed using SPSS, employing t-tests and ANOVA to scientifically dissect differences and influential factors. The t-test results revealed that the mean composite social-cultural indicators in the deteriorated and informal zone were below average (2.98 vs. 3), with only 3 out of 7 neighborhoods scoring above

average. The highest mean was found in Asgarabad-Aghajari (3.30), while Aghdash had the lowest (2.68), indicating spatial inequality and the necessity of targeted interventions. Conversely, all neighborhoods in the non-deteriorated zone scored above average, with those around Imam Hossein Square attaining the highest averages (3.62). These disparities manifest significant social and spatial inequalities requiring urban policy attention. Spatial analysis also showed a gradual decline in social-cultural quality from the central and northern neighborhoods towards southern and southeastern areas, with the eastern axis, except for the Municipality neighborhood, experiencing sharp declines. Neighborhoods like Imam Hossein Square and Imam Farhangian Town rank favorably, while Dizaj North and South, Akbarabad, and Aghdash are at the lowest, demanding urgent planning measures.

One-way ANOVA identified key indicators influencing the spatial social-cultural divide. In the non-deteriorated zone, seven out of eight indicators showed statistically significant effects ($p<0.05$) on liveability differences; only "cultural diversity and peaceful coexistence" was not significant ($p=0.120$). The most influential factor was "quality of health access" ($R^2=0.785$), followed by educational access quality (0.720), security and public order (0.653), and quality of recreational and cultural centers (0.601). Social capital factors, such as social cohesion (0.520) and civic participation (0.409), had notable impacts, while identity and place attachment had the least (0.354), reflecting its complex nature. In the deteriorated and informal zones, all social-cultural indicators were significant, with "security" ($R^2=0.740$) bearing the greatest influence, followed by health (0.694) and education quality (0.682). Overall, ANOVA results highlight the prominence of social-cultural factors — especially security, healthcare, and education — in shaping spatial liveability inequalities and improving quality of life. These findings emphasize the urgent need for urban policymakers and planners to focus on enhancing health, educational, and security infrastructures, particularly in disadvantaged neighborhoods, to reduce inequalities and boost social-cultural liveability in Bonab city.

Conclusion:

Social and cultural indicators of liveability are among the key components of urban quality of life, closely linked with place experience, collective identity, and citizen participation. They play a critical role in shaping spatial disparities in liveability. In Bonab city, the uneven distribution of cultural, educational, and social facilities has resulted in pronounced liveability inequalities between the non-deteriorated zones (central and northern neighborhoods) and the deteriorated and informal settlements (southern and southeastern neighborhoods). The majority of schools, higher education centers, and cultural and recreational amenities are concentrated in the non-deteriorated zone, while the deteriorated areas face serious deficiencies. T-test analysis reveals that the mean social-cultural liveability scores are significantly higher in the non-deteriorated zone, confirming spatial and social inequality. Spatial analysis further indicates a decline in these indicators from the central and northern areas toward the southern and southeastern neighborhoods, with areas such as Dizaj North and South, Akbarabad, and Aghdash exhibiting the lowest liveability levels. One-way ANOVA results emphasize the significant influence of health quality, education, and security on spatial liveability differences across both zones, underscoring the urgent need to prioritize improving these infrastructures to reduce disparities and enhance quality of life in deprived neighborhoods.

Declarations
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