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Research Paper

Evaluation of Urban Neighborhood Regeneration based on Urban Liveability Criteria Case Study: Kolapa Neighborhood, Hamedan City

Aliakbar Salaripour [1*], Mehrdad Mehrjou [1], Samaneh Jalilisadrabad [2]

[1] *Department of Urban Planning and Design, University of Guilan, Rasht, Iran*
[2] *Department of Urban Planning and Design, University of Science and Technology, Tehran, Iran*

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Abstract
Livability plays a vital role in the growth and development of cities and citizens' quality of life. Identifying and understanding the needs of citizens and making these settlements viable improves the quality of life in urban areas. The purpose of the present study is to evaluate residents' satisfaction with urban regeneration projects and the relationship with making these neighbourhoods viable. The goals formulated in the regeneration plan of the Kolapa neighbourhood of Hamadan have been extracted and used as criteria for evaluating the satisfaction of the project implementation. Livability criteria have also been divided according to the study of research background into four main classes: physical, environmental, socio-cultural, economic, and health criteria. This study has used descriptive-analytical methods and conducted a field survey through a questionnaire. Cronbach's alpha, with a coefficient of 0.863, confirmed the reliability of the questions. The statistical population was the whole population of the Kolapa neighbourhood, and the statistical sample size was 352, which was calculated by the Cochran formula, with a 5% error and 95% confidence level. We used stochastic sampling in this research. The compiled data were analyzed statistically using correlation, path analysis, and regression analysis in Spss and Amos24 environment. The research question was: To what extent has the regeneration project brought the Kalpa neighborhood of Hamadan closer to the indicators of a livable city? According to the findings, among the satisfaction criteria for the project, sense of place, safety and security, participation, and access to facilities and services have the highest level, respectively. According to the research findings, it is possible to benefit from people's participation in various stages of the implementation of the regeneration plan and turn neighborhoods into livable neighborhoods with better quality of life. The residents of the neighborhoods have gained a full understanding (such as strengths and weaknesses) of these types of places because they have lived in them for a long time. Therefore, the neighborhood can be regenerated based on the resident's knowledge and participation. Based on the results of path analysis, it was found that regeneration projects mainly consider the physical dimension, and therefore other criteria (especially economic, health, and socio-cultural criteria) are less considered.

Keywords: *Urban regeneration, Neighborhood, Livability, Kolapa neighborhood, Hamedan city.*

1. INTRODUCTION

Urban regeneration means the revival and revitalization of a living area that has been subject to destruction (Curtis et al., 2002). Consequently, urban regeneration is a process that leads to the creation of new urban spaces while preserving the original spatial features (Azimi Amoli & Jamdar, 2017). Urban regeneration, with a comprehensive and integrated approach and a set of measures that solve urban problems, results in a permanent improvement in the economic, physical, social, and environmental conditions of declining urban contexts (Tapsuwan et al., 2018). The decay of urban tissues occurs either

* *Corresponding author: salaripour@guilan.ac.ir*

because of age or of lack of planning and monitoring on the formation process of that tissue (Hankins & Powers, 2009; Shieh et al., 2011). Wear out of urban areas can manifest itself as problems such as poverty, environmental poverty of socially abnormal groups, unequal distribution of resources, class differences, and recession (Sajjadzadeh & Zolfigol, 2015). The inhabitants of these areas are socially isolated and economically disadvantaged, so they have a lower quality of life than people in other neighbourhoods (Van Kamp et al., 2003). Population density and physical-spatial growth in cities shape neighbourhoods with different economic and social conditions, making living conditions difficult in parts of these cities (Sandholz, 2016). Given these conditions, various approaches such as sustainability, quality of life, smart growth, new urbanism, and liveability have been put forward and applied in cities around the world (Balsas, 2004). Although these approaches overlap in addressing people's satisfaction, residents' assessments of the environment, security, health, quality of place, public popularity, and policymaking; the livability approach, as one comprehensive approach in an urban system, the social, economic, physical, and mental health of all residents are addressed (Badland et al., 2014; Mirzakhani et al., 2021). Livability is a multidimensional concept that sometimes overlaps with concepts such as quality of life, well-being, and satisfaction from living conditions and encompasses a wide range of aspects of physical and non-physical urban issues (Mouratidis, 2020). Livability is a generic concept for various meanings that depend both on the purpose of the measurement and on the viewpoint of the individuals who make the measurements (García-Lamarca et al., 2022). In a specific urban planning terminology, livability means the ability of the city or the metropolitan area for maintaining and improving the capacity of life and vitality (Furlan et al., 2019). The city is a living, human-centred, and dynamic entity, so there is a need to have long-term plans for making a livable city (Sandholz, 2016; Trudeau, 2013). Urban regeneration is one of the primary approaches to improving urban neighbourhoods' situation and increasing the livability of such textures. Different cities in Iran have considered urban regeneration since the 2010s, one of which is Hamedan city, a historical city with valuable historical textures. One of the neighbourhoods for which a regeneration plan has been provided in recent years is the Kolapa neighbourhood, located in the central part of Hamadan. One of the responsibilities of city managers and planners is empowering citizens to achieve a livable neighbourhood, which has characteristics such as a healthy environment, quality of life, a green environment, open spaces for social cohesion, and interactions and investment absorption capacity. This research investigates the extent of satisfaction from the urban regeneration plan by considering the criteria of urban viability. The research questions are: To what extent has the regeneration project made Hamedan's Kolapa neighbourhood closer to the indicators of a liveable neighborhood? What is the relationship between neighbourhood livability and residents' satisfaction from the regeneration project? Are the citizens satisfied with the implemented project in the Kolapa neighbourhood?

2. LITERATURE AND RESEARCH BACKGROUND

The Concept of Residents' Satisfaction

Cities do not have the necessary dynamism, efficiency, and capability to meet the needs of citizens and establish welfare, comfort, security, etc. due to rapid urbanization. Cities have become beautiful and glorious cages in which the psyche, feeling, emotion, moral, and enduring human values are threatened without proper alternatives, and the sharp decline of the quality of residence in cities has attracted the attention of planners in a worrying way (Liao et al., 2015). Today, the practice of evaluating the public thoughts has a special position in most of the world's political and administrative systems, and through this practice, local governments and administrations are informed of the needs, wants, and desires of citizens and their thoughts and positions on various issues. Awareness of public thoughts is one of the contributing factors in overcoming the problems and is the first step in planning to satisfy citizens. Assessing the level of residents' satisfaction with urban environments should be considered as a new approach, which tries to promote the desirability and livability of living environment through awareness of residents' wants, needs, and expectations (Bello et al., 2018). Creating vitality in urban spaces requires paying attention to the demands of citizens.

The role of the people in all affairs of the society becomes more sensitive day by day and the awareness of the demands of the citizens is to share them in the achievements of development. Local people have complete information about local issues and resources and more knowledge about priorities, so the current state of a neighborhood can not be identified without the presence of the people themselves (Fu et al., 2019). Although the residents' satisfaction is a multidimensional and complex concept and is affected

by objective and subjective variables and has different meanings for different individuals and groups with different temporal-spatial, social, economic, cultural, and physical conditions, available services in urban environments and at the local scale play a major role in improving the level of satisfaction or dissatisfaction and the way residents judge (Bernhard et al., 2018). The concept of satisfaction is a multidimensional, complex, and relative concept, influenced by time, place, and individual and social values. Satisfaction is a kind of pleasant feeling combined with rational evaluation. This concept was introduced in the world in the 1930s, and initially, it focused on the economic aspect (more emphasis on objective indicators), but since the 1970s, subjective indicators were also used by researchers to measure satisfaction and assess the quality of life and urban services (Liao et al., 2015).

Reducing the role of governments and paying attention to the civil society along with the wider social sciences moderated the objective approach and led to individual satisfaction (Mouratidis, 2020). Campbell et al. first paid attention to mental and psychological indicators in their work in 1976 (Rao, 2017). People make decisions based on objective evaluations. Therefore, the evaluation of each person from the place of residence and the quality of services depends on the perception, characteristics of the place of residence, comparison with the standard model, individual needs, expectations, enthusiasm, etc. People value the environment and its facilities as they would like them to be. This assessment is influenced by their initial experiences, level of adaptation, and cultural values (Mouratidis & Yiannakou, 2021). Thus, residents' satisfaction arises from the outcome of the factors that the individual perceives of housing, residential environment, and neighborhood. This perception can be very different because it passes through a person's filter. This means that, for example, a noisy neighborhood may be an acceptable environment for young people and unimaginable for the elderly.

Individuals' indicators of satisfaction vary. Factors such as aspirations, desirability, history, demographic characteristics, and job position affect this perception and satisfaction. In fact, satisfaction is a dynamic process that is related to the individual's relationship with the environment (García-Lamarca et al., 2022; Masiya et al., 2019). Lansing and Marans (1969) argue that social characteristics, including close relationships between individuals, increase residents' satisfaction with the neighborhood and services, and to justify this statement, they indicate that although the modern city's sanitation system (sewage, garbage collection, infrastructures) and services (police, fire station, and health) are better than old and less developed cities, residents have less sense of belonging to the neighborhood and community. They conclude that satisfaction goes beyond facilities, and residents' feeling about the environment is more important, while Sirgy and Cornwell (2002) identified physical characteristics as the most important factor in increasing satisfaction and quality of life. According to experts, satisfaction is more focused on physical characteristics, but from the perspective of residents, social factors are more important (Faiz et al., 2012; Holbert et al., 2021).

The Concept of Vitality and Viability

The origin of the concept of livability is related to the ancient Greece era when someone sought to achieve the ideology and concept of justice and equality. The concept of 'livability' has been propounded after these concepts: 'quality of place' and sustainability (Soga et al., 2017). "Quality of place" is one of the well-known practical objectives in the field of urban planning, combining "economic development", "environmental protection", and "social equality" aspects (Güzey, 2009; Spaans, 2004). In its general sense, livability is the achievement of life capability, and it is the achievement of good urban planning quality and sustainable location (Andrews, 2001). Generally, the definitions of livability and livable community encompass different themes expressed by the guiding principles such as accessibility, equality, and partnership. In many texts, livability and quality of life have been synonymous (Azimi Amoli & Jamdar, 2017). Citizens' quality of life depends on their access to infrastructure (transport, communications, water, and sanitation), food, clean air, decent housing, satisfying jobs, green space, and parks (Badland et al., 2014; Yassin, 2019). Livability and sustainable development are concepts and approaches that help cities prevent various environmental, economic, and social problems (Badland et al., 2014; Tapsuwan et al., 2018). A livable place must be safe, attractive, and encompass social cohesion, educational facilities, diverse and affordable housing, open public spaces, local shopping malls, decent health services, environmental sustainability, cultural and recreational facilities, Suitable and efficient public transport, and walking and cycling infrastructure (Balsas, 2004; Furlan et al., 2019). Therefore, livability consists of many human needs, from food and security to beauty, cultural symbols, and a sense of belonging to a community or place (Kashef, 2016; Rabbiosi, 2015).

The liveliness and livability of urban space, on the other hand, is boringly a reflection of the number and especially the type of activities and events that take

place in space. Therefore, to identify vitality and viability, one must first examine the activities. Activities are divided into three categories in terms of being being mandatory or optional: 1) essential (mandatory) activities such as going to school or work, waiting at the bus stop and shopping, 2) selected (recreational) activities such as going to the park, and 3) social activities such as watching others, talking, and paying attention. There are various equations for the concept of vitality in the West, such as vitality, viability, livability, liveliness. Of course, except for "vitality", other words are closer to the concept of livability and viability (Leach et al., 2017). In the Dictionary of Urbanism (2006), vitality and viability come together to mean: "viability and vitality" is the hallmark of successful cities and towns; the vitality of the city is a reflection of its busy level at different times of the day and in different parts; "while viability is a measure of its capacity to attract capital for survival, improvement, and adaptation to changing needs" (Powers, 2006).

Since the selection and classification of the most livable cities in the world are based on the quality of life indicators of Mercer and The Economist institutes, it seems necessary to identify these indicators. From Mercer's point of view, the term quality of life is different from the term quality of life. Quality of life is about the basic state of a person and personal life. A person may live in a city with the highest quality of life but have a low quality of life in terms of individual circumstances (Mouratidis, 2020). Mercer Institute conducts a study on the quality of life in more than 380 cities around the world based on evaluations of 10 main categories and 38 criteria and indicators listed in table 1.

The Mercer Institute published a complete list of components of viability in 2006, the main categories are as follows: political and social environment, economic environment, socio-cultural environment, medical, health and health considerations, schools and education, recreation and entertainment, consumer goods, housing, public services and the transportation system, and natural environment (Liao et al., 2015). According to the definitions of vitality and liveliness, a livable urban space is a place where many people from various social backgrounds (in terms of age and gender) are present most of the day, and their activities are mainly selective or social. According to the definitions and indicators introduced in the research literature, the indicators used in the present study are as follows: health, economic, socio-cultural, and physical-environmental, which have been selected according to the definition and introduction of Mercer Institute. The criteria of livability and residents' satisfaction have been selected for investigation in the present study. However, in this study, the criterion of livability is the main criterion and examines whether the Kalpa neighborhood has become a livable neighborhood in recent years, despite the regeneration program.

Table 1. Mercer's Quality of Living indicators

Indicators	Main classification	Indicators	Main classification
Variety of restaurants Exercise and leisure	Recreation and entertainment	Relations with other countries Internal stability Crime Law enforcement Ease of entrance and exit	Political and social environment
Daily consumer goods Vehicles	Consumer goods	Currency conversion rules Banking services	Economic environment
Housing Household appliances and furniture Reparation and maintenance of equipment	Housing	Individual restrictions and freedoms Media and censorship	Socio-cultural environment
Electricity Access to water Post Public transportation Traffic congestion	Public services and transportation	Hospital services Medical services Infectious diseases Drinking water Wastewater Air pollution	Medical and health considerations
Climate The rate of natural disasters	Natural environment	Schools	Schools and education

2.1. The Concept of Neighbourhood

Urban neighbourhoods have been the most important places for social interaction throughout the history of Iranian cities (Salaripour et al., 2019). *The dictionary of Dehkhoda* defined the neighbourhood as Barzan, Koi, and a sub-division of the city (Soga et al., 2017). neighbourhood is a relatively large part of the city which has both geographically and socially homogeneous environment and contains similar features so that the observer can practically distinguish them (Pourahamd et al., 2017; Salaripour & Fouladi 2021). Moreover, according to geographical definitions, neighborhoods are geographical units whose limits are determined not only by geographical and natural features but also by the capability to provide utilities (Soga et al., 2017). The perspective of urban geographers about the nature of the neighbourhood is that it provides an opportunity for residents to meet and participate in everyday life and overcome each other's problems (Powers, 2006). One of the most fundamental physical divisions of a city is the neighbourhood, one of the oldest urban heritages that has significant functions in the physical-spatial structure of cities (Cao et al., 2021; Van Kamp et al., 2003). Therefore, as physical-spatial units, neighbourhoods have particular socio-economic features, including stability and coherence, key spatial elements such as residential lots, mosques, public squares, marketplace, passage, and alleys (Curtis et al., 2002; Leach et al., 2017; Stafford & Baldwin, 2018). Participation of residents in local affairs is essential to improve the quality of social interactions in neighborhood public spaces (Quan, 2017; Wang et al., 2011). The neighborhood center is a place for public meetings and shaping social bonds, and they are the hearts of the neighbourhoods (Curtis et al., 2002; Faiz et al., 2012). They are divided into two categories according to their physical structure. First, the main passageways in which stores, local businesses, and social places are located around them; second, as an open space, usually local squares, at the intersection of main roads (Fu et al., 2019; Rao, 2017; Saitluanga, 2014).

2.2. Urban Regeneration

Gradually, the term regeneration carried a positive sense compared to the negative consequences of urban renewal (Rabbiosi, 2015). A policy called regeneration formed in Western countries, and since the 1990s, it has been considered the "challenge of cities" (Liao et al., 2015). In the 1990s, urban restoration considered the regeneration approach and attitude. Urban regeneration is a kind of interventionist approach, looking at the past without manipulating the historical identities of different eras (Sajjadzadeh & Zolfigol 2015). Besides, it deals with creating new identities, which are commensurate with the living conditions of the people who live in the present era (Faiz et al., 2012; Wang et al., 2011). Regional and local governments criticized renovation plans because of their overwhelming demand for physical change (Sajjadzadeh & Zolfigol 2015). Therefore, local governments are urged to voluntarily submit proposals to the central government with the participation of the public and private sectors for conducting regeneration projects in their jurisdictions (Salimi et al., 2016). Regeneration means the revival of a living part of the city that is subject to destruction.

Furthermore, regeneration is enacted by improving the city's physical, economic, and social life and contains a range of activities that revitalize the old and worn-out urban areas (Curtis et al., 2002; Furlan et al., 2019). Consequently, the concept of regeneration depends on the country's level of development defined in different ways (Shamaei et al., 2016). Regeneration means the restoration of the social, economic, and environmental life of the city and the neighbourhood, which aims to "return to the city" in an economically developed area (Faiz et al., 2012; Furlan et al., 2019). This approach can transform places, enhance the social image and recreate vibrant and attractive places that encourage sustainable inward investment (Stafford & Baldwin, 2018). So, it is clear that regeneration has a comprehensive and integrated perspective and consists of actions that lead to solving urban problems (Furlan et al., 2019). Studies have been carried out in the field of urban regeneration and liveability, briefly presented in table 2.

According to the research background table, researchers have used economic, social, physical, and environmental dimensions as indicators of urban livability. Generally, this study extracted urban livability indices from this table.

Table 2. Research Background

Research title	Indicators	Method or Result	reference
Urban vitality: a new source of urban competition. Effective Criteria for Identifying a Sustainable City	density, diversity, accessibility, safety and security, identity and differentiation, creativity, communication and collaboration, organizational capacity and competition	Confirmatory factor analysis	(Wang et al., 2011)
Livability Analysis of Urban Decay Textures (Case Study: Decayed Textures in Zanjan City)	Environmental, Directorial, Physical, Economic and Social	Factor Analysis, Regression and Path Analysis	(Shamaei et al., 2016)
Determining the livability of suburban villages with quality of life approach, Case study: Varamin city	Economic, social, environmental	Socio-economic dimensions are at mid-level and environmental ones are at the low level	(Khorasani, 2018)
Regeneration of Worn-out Urban Textures with Emphasis on Good Governance Pattern (Case Study: Deh-Wank Neighborhood, District 3, Tehran)	Transparency, Legibility, Participation, Justice and Equality, Accountability, Efficiency and Effectiveness	ONE-SAMPLE T Values, U Mann-Whitney, Structural Equations Analysis... ,	(Azimi Amoli & Jamdar, 2017)
Sustainable Regeneration of Inefficient Urban Textures. Case Study (District 10 of Tehran)	Social, economic, physical and environmental	QSPM_SWOT technique	(Pourahamd et al., 2017)
Urban Regeneration Approach in Worn-out Textures: Six windmills in Yazd	Urban governance, socio-economic, physical	Internal and External Factors Evaluation Matrix, SWOT	(Zangi Abadi & Moaedfar, 2011)

3. THE KOLAPA NEIGHBOURHOOD

The Kolapa neighbourhood, located in the center of Hamadan, has been bounded by 15th Farvardin Street from the north, Bou Ali Street from the south, Ayatollah Madani Boulevard from the west, and Taleghani Avenue from the east. The Kolapa neighbourhood has valuable historical texture, which has undergone many changes in the past. The surrounding streets indicate the sphere of influence of this neighbourhood. This neighbourhood has unique features that make it distinctive in the city of Hamedan. Commercial districts, both new residential textures and historical textures, exist in the neighbourhood. In the past decades, the physical growth of Hamadan has been towards the south of the city, so the center of gravity has changed over time. The population center of gravity shifted gradually from Imam Square toward the southern area and Tomb square. The neighbourhood has lost many of its traditional elements, which gave identity to it, and only three historic buildings, including two mosques and the Salehan School, have remained. Zandi Bath is another old neighbourhood building demolished and is currently being used as an informal parking lot. The Kolapa Mosque is related to the Qajar dynasty and is located in the center of the neighbourhood, east of Bou Ali Street. There are also some historic houses, located in the neighbourhood. The existence of a church at this location indicates that the Kolapa neighbourhood was one of the Christian settlements. It can also say that the Kolapa neighbourhood has a rich historical and social identity because the Gorban tower at the site shows ancient neighbourhood history. The neighbourhood has a unique geographical position in the city because it is approximate to the prosecutor's office, Ekbatan Hospital, University Square, Bou Ali street, and Aryan tower.

The residence of the city's influential people and former administrators in the neighbourhood have glorified its social status. Office buildings in the vicinity of this neighborhood have increased the traffic of strangers and busyness of the neighborhood, which finally resulted in the degradation of privacy and habitability in the neighborhood. The deployment of trans-local and sometimes trans-regional land uses cause that many visitors come to these offices and bring a large volume of traffic to the neighbourhood. Also the lack of parking space in the vicinity of the neighbourhood and the existence of wasteland at the neighbourhood level are other reasons for the rush of strangers' cars. Unregulated car traffic in the neighbourhoods has created safety problems, disturbances and noise pollution, and undermined neighbourhood quietness. The lack of a safe place for children to play and walk freely, besides chaos caused by cars' over-crowding, has undermined this neighbourhood's residential quality and identity.

Kolapa is one of the few neighbourhoods where people can remember the spirit and texture of the old city. The texture in which houses have large environments with wooden windows, adobe and mud walls, and narrow and dark alleys (Sajjadzadeh & Zolfigol, 2015). The regeneration plan was supposed to strengthen the identity of the historical neighborhood besides improving the quality of life of the residents. The achievement of these goals will be evaluated and discussed in the following sections.

4. RESEARCH METHOD

The purpose of this study was to determine the relationship between indicators of urban livability and citizens' satisfaction with the implementation of the traditional neighbourhood regeneration project in the Kolapa neighbourhood of Hamadan. The questionnaire has been reviewed by experts several times to improve the reliability of the indicators. This research has mainly applied a quantitative-descriptive approach, which is relied on statistical data analysis techniques. Cronbach's alpha coefficient, which assesses the reliability of the questionnaires, is 0.863 for these questionnaires. The study's statistical population is 4019 people, and the sample size, calculated by the Cochran formula, is 352. Participants' descriptive data indicate that in terms of gender, 59.5% of the respondents are men.

Moreover, most of the study population were college students (32.5%). Most of them had a high school diploma in education. Also, 30.5% of them had monthly income less than 400 thousand tomans, 22.5% between 1 and 2 million tomans, 22% more than 2 million tomans, 13% between 400 and 700 thousand tomans, and 12% between 700 and 1 million tomans.

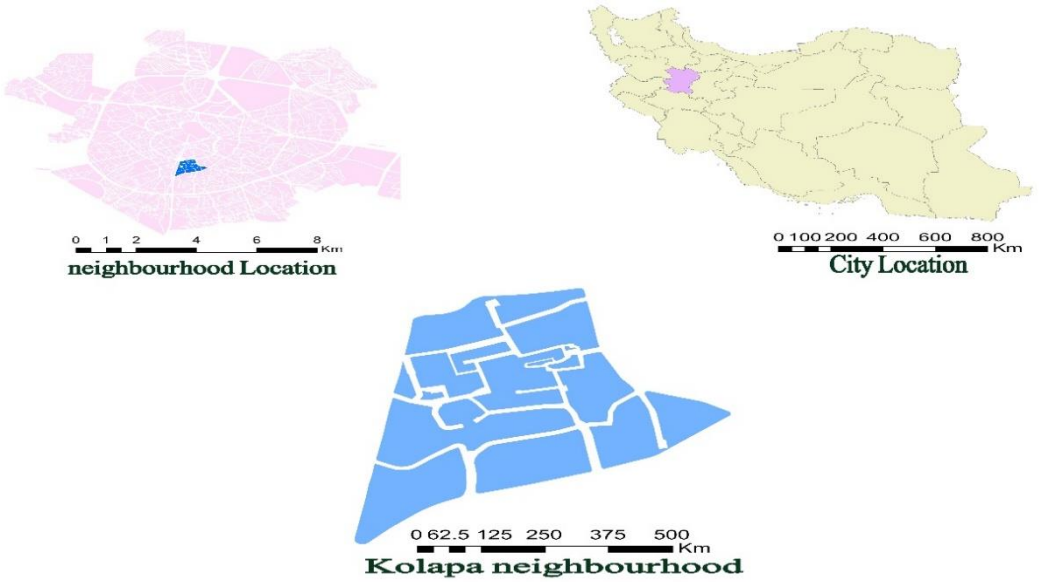

Fig 1. The Kolapa Neighbourhood Location

Table 3. Percentage and Frequency of Respondents' Specifications

Variable	Category	Frequency	Percentage
Gender	Male	119	5.59
	Female	81	5.40
	Total	200	100
Type of employment	Freelance job	40	20
	An employee of the Private sector	35	17
	Government employee	23	5.11
	University student	65	5.32
	Worker	37	19
	Total	200	100
Level of education	No high school diploma	8	4
	Diploma	69	5.34
	Associate	30	15
	Baccalaureate	64	32
	Masters and higher	29	5.14
	Total	200	100

The structural equation modeling (SEM) is used to evaluate the regeneration project based on urban livability indicators. The structural equation model is a comprehensive statistical approach to test the hypothetical relationship between observed and latent variables. Root mean square error of approximation (RMSEA) is applied to measure the model's fitness. In recent years it has become regarded as 'one of the most informative fit indices' due to its sensitivity to the number of estimated parameters in the model. In this study, the RMSEA index is 0.039, an acceptable level in this study. We used SPSS 25 and AMOS 24 software for data analysis. Figure 2 illustrates the Conceptual Model of the research.

4.1. Data Collection

This study was carried out in one of the historical neighbourhoods of Hamedan city, called Kolapa. Recently, an urban design team prepared the traditional neighbourhood regeneration plan for Kolapa and presented it to city managers. This study tries to determine whether the regeneration plan, from the inhabitant's point of view, has improved the livability in this neighborhood. For this purpose, a 5-point Likert scale questionnaire is used. Table 4 and 5 show the descriptive statistics.

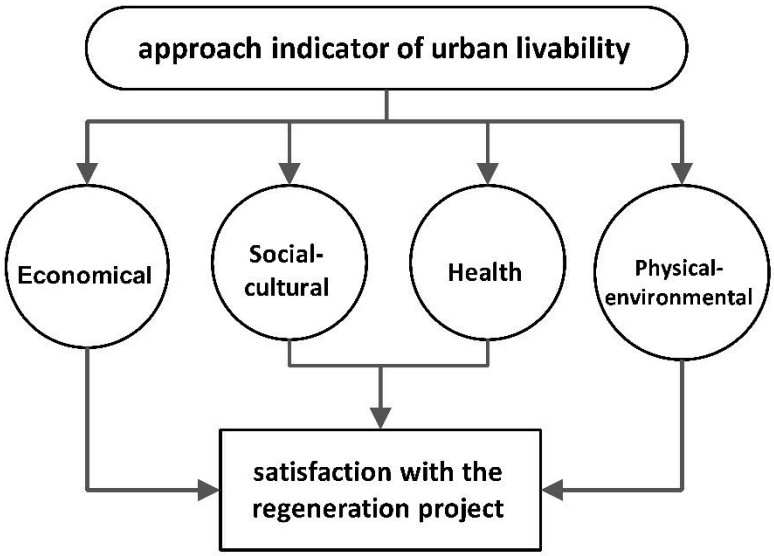

Fig 2. The Conceptual Model of the Research

Table 4. Validity, Standard Deviation, and Mean Used in the Project Satisfaction Questionnaire

Variables		M	Average	SD	α
Access to facilities and services	To what extent are you satisfied with access to utilities and services in the neighbourhood,	195.3	3.131	294.1	728.0
	How much use diversity is observed, in the project, on the local scale?	280.3		311.1	
	Are you satisfied with the establishment of the culture house in the neighbourhood project?	945.2		304.1	
	Has the permeability mentioned in the neighbourhood design (hierarchy of access paths) been realized?	085.3		226.1	
	Ease of movement by foot and doing activity in the neighborhood is realized?	245.3		285.1	
	Has the ease of access to the personal and collective amenities, mentioned in the plan, been realized after conducting the project?	105.3		285.1	
	Has the flooring of public spaces been conducted to prevent the accumulation of surface water?	065.3		299.1	
safety and security	How many active users have been added to increase the security of the project done on the site?	105.3	3.536	361.1	801.0
	How much the goal of establishing a multistory car park near the neighborhood entrances is attained?	105.3		281.1	
	Has the neighbourhood project improved the safety of citizens?	960.2		306.1	
	Is there public parking at a convenient distance from the neighbourhood square?	125.3		546.1	

Variables		M	Average	SD	α
	Are the access of local streets to the main city roads are blocked?	090.3		319.1	
	Have marginal and centralized parks been prevented in urban spaces?	015.3		339.1	
	Are there any factors to reduce the attractiveness of neighbourhoods for non-residents?	995.2		305.1	
	Is the passing traffic exchanged into destination-oriented traffic?	280.3		292.1	
	Has the proper distance between the neighbourhood and the main routes, considered in the plan, been realized?	825.2		277.1	
	To what extent has the hierarchy of roads in the neighbourhood observed?	570.2		233.1	
	Has the situation of regard to pedestrians and bicycles changed after conducting the project?	030.3		344.1	
	How much is the goal of safety improvement for cycling and walking achieved?	195.3		336.1	
participation	Has the car's speed changed in the neighbourhood after conducting the project?	020.3		314.1	
	To what extent has the project focused on strengthening social cohesion?	970.2		299.1	
	Implementation of the project has facilitated the organization of public cultural and religious ceremonies.	945.2		356.1	
	Have places been considered for public participation after the project completion?	970.2	2.608	333.1	710.0
	Are the public activities of different groups carried out in one space?	010.3		392.1	
	Are there shared spaces and facilities for various community groups living in the neighbourhood?	165.3		279.1	
	Is the safety of public areas provided with a vegetative cover?	200.3		310.1	
Sense of place	To what extent, people's opinions and ideas were used in changing the neighbourhood?	260.3		311.1	
	How many valuable buildings were allocated to public uses, primarily cultural, in the project?	960.2	3.113	283.1	708.0
	After conducting the project, new uses (such as crafts) are located in the neighbourhood.	125.3		243.1	
Comfort and convenience	Has the goal of avoiding strangers from entering the neighbourhood been fulfilled after conducting the project?	050.3		298.1	
	is the speed in the straight streets is limited by making them curved?	140.3		276.1	
	Have physical and non-physical boundaries been performed for the center of the neighbourhood?	130.3		233.1	
	Is the goal of domesticity and privacy in local neighborhood spaces attained?	130.3	2.626	524.1	835.0
	Are different nodes created to ease the wayfinding in the neighborhood?	085.3		290.1	
	Has any comfort been provided in the neighbourhood after completing the project?	300.3		299.1	

Table 5. Validity, Standard Deviation, and Mean used in the Livability Questionnaire

Variables		M	Average of all criteria	SD	α
Physical-environmental	Quality of public transport system efficiency	660.2		281.1	
	The quality of domestic and municipal sewage system	985.2		320.1	
	Quality of housing	135.3		305.1	
	Quality of communication ways	110.3		310.1	
	Improvement of tourism facilities and infrastructure	990.2		303.1	
	Quality of access to public transport facilities	855.2	3.03	300.1	789.0
	The satisfaction of access to public transport	985.2		368.1	
	The amount of satisfaction from the construction of sidewalks of roads	050.3		406.1	
	The amount of space available for walking	210.3		317.1	
	The amount of satisfaction of garbage collection in the neighbourhood	110.3		336.1	

Variables		M	Average of all criteria	SD	α
	The amount of security on the main routes	275.3		275.1	
	The amount of your satisfaction with your housing type	100.3		299.1	
	The satisfaction of residential neighbourhood	020.3		348.1	
	The amount of satisfaction of the parking situation in the neighbourhood	090.3		319.1	
Social-cultural	Social Partnerships in Urban Affairs	770.2		262.1	
	The quality of educational facilities such as the library	120.3		309.1	
	The quality of different schools and kindergartens in the neighbourhood	015.3		293.1	
	The quality of entertainment centres	975.2		339.1	
	The amount of the spirit of partnership	220.3		349.1	
	The amount of responsibility for doing city affairs	045.3	3.026	323.1	776.0
	The amount of satisfaction of access to training centres	070.3		297.1	
	The amount of satisfaction of social interactions	880.2		297.1	
	The standard level of paths' lighting in place	025.3		401.1	
	The level of relationships between neighbours	975.2		350.1	
	The amount of your satisfaction of elimination of wear in the neighbourhood	195.3		347.1	
Economical	Costs of providing fundamental necessities such as food and clothing	130.3		504.1	
	The existence of job opportunities	150.3		317.1	
	The amount of access to shopping malls	065.3		252.1	
	The amount of satisfaction of job opportunities	115.3	3.1	353.1	805.0
	Economic Level of Household	975.2		324.1	
	Investment possibility in the neighbourhood	995.2		343.1	
	The amount of your housing cost	275.3		322.1	
Health	Health quality of public places	120.3		316.1	
	Prediction of special space for trash drop-off locations.	860.2		276.1	
	Enhancing the quality of pristine natural landscapes	045.3		249.1	
	The satisfaction of access to health centres	070.3	3.065	293.1	701.0
	A sense of happiness and intimacy among residents	975.2		281.1	
	Quality of neighbourhood cleanliness and hygiene	190.3		297.1	
	The satisfaction of the quality of green space	205.3		229.1	

6. FINDINGS

6.1. Analytical Findings of the Study

After collecting the data, correlation analysis was used to establish the correlation between satisfaction of project performance and the indicators of urban livability. There is a moderate and significant correlation between some dimensions of both components. The degree of satisfaction in project implementation increases by increasing one value in the indicators of urban viability.

According to Table 6, there is no significant correlation between the physical-environmental dimension of livability and safety and security as a project satisfaction variable. Although increasing safety and security has been one of the most important goals of the neighborhood regeneration plan, little attention has been paid to the safety and security issues in implementing the regeneration plan. Given the meaningful relationship between safety and security and the economic dimension of livability, we can argue that improving the safety of Kolapa neighborhood is chiefly correlated with the economic condition of the neighborhood and its inhabitants. As a result, other environmental design procedures applied in the regeneration project have not had a noticeable impact on developing safety and security in the neighborhood. Among different dimensions of project satisfaction, access to facilities and services is more correlated with the livability variables. Here, the conclusion is that access to facilities and services has been more satisfactorily met than other regeneration project goals. Also, an increase in the level of facilities

and services is usually more tangible for residents than other social and cultural solutions.

The weak correlation between participation and the variables of livability shows the need for attention to this component in the comprehensive development of the neighborhood. Although participation is a key element of a regeneration plan from idea to implementation and monitoring, it seems that the current project has not been very successful in attracting the participation of residents and stakeholders. Even with the limited expectations of residents from participation, the regeneration plan failed to meet the primary expectations. According to them, they had only been informed in the early phases of providing the plan, and they were not engaged in the whole process of planning and implementation of the project. The residents perceive that the neighborhood has not changed regarding the sense of place. Also, the neighbourhood residents thought that the amount of comfort and convenience in the neighborhood had not changed much since the implementation of the regeneration plan. While the report of the plan has mentioned comfort and convenience as two main goals of the project, it seems that, in practice, it has failed on issues such as preventing strangers from entering the neighborhood. The health index of livability is correlated with the quality of green spaces in the neighbourhood. The increase of parks and green spaces through the regeneration plan has improved the beauty and tranquility of the environment. As a result, residents feel more satisfied with the health index. Finally, socio-cultural and economic dimensions of urban livability have a positive correlation ($P < 0.001$) with access to project facilities and services. However, some correlations ($P < 0.05$) are lower than the observed value, meaning most people and residents are not satisfied with the traditional neighbourhood regeneration plan developed and implemented in the Kolapa neighbourhood.

The result of the correlation test is used for developing and presenting the final structure model based on standardized regression coefficients. Regression analysis showed that the following paths between livability criteria and satisfaction variables were not significant in the beta matrix (i.e. physical-environmental→ satisfaction with safety and security; economic→ participation satisfaction; health→ satisfaction with safety and security; socio-cultural-satisfaction from comfort and convenience; health-satisfaction from comfort and convenience; socio-cultural→ satisfaction from safety and security). These paths were eliminated (Table 7). As shown in Table 7, all dimensions of urban livability significantly correlate with some aspects of project satisfaction. Physical-environmental dimension had a positive effect on satisfaction from access to facilities and services ($\beta = 0.256$, $T = 2.575$, $P < 0.001$), satisfaction of participation ($\beta = 0.305$, $T = 2.342$, $P < 0.001$), satisfaction from relaxation ($\beta = 0.419$, $T = 4.154$, $P < 0.001$), satisfaction from sense of place ($\beta = 0.348$, $T = 6.522$, $P < 0.001$). In the physical-environmental dimension, 37% of the variance was related to access to facilities and services, 45% to participation, 53% to a sense of place, and 58% to satisfaction from comfort. Therefore, the physical-environmental dimension strongly correlates with the comfort and convenience index.

Table 6. Correlation Coefficients between the Variables of Project Satisfaction and Urban Livability

indicators of urban viability / Project satisfaction variable	Physical-environmental	Social-cultural	Economical	Health
Access to facilities and services	0.180 Sig=0.011	0.300 Sig=0.000	0.301 Sig=0.000	0.164 Sig=0.020
safety and security	0.093 Sig=0.192	0.268 Sig=0.062	0.281 Sig=0.000	0.126 Sig=0.075
participation	0.164 Sig=0.020	0.190 Sig=0.007	0.113 Sig=0.111	0.157 Sig=0.026
Sense of place	0.151 Sig=0.032	0.145 Sig=0.040	0.148 Sig=0.036	0.144 Sig=0.042
Comfort and convenience	0.176 Sig=0.012	0.297 Sig=0.080	0.173 Sig=0.014	0.218 Sig=0.095

It was also observed that the socio-cultural dimension was less correlated with the satisfaction from project implementation. Socio-cultural index had a positive effect on satisfaction with access to facilities and services (β = 0.346, T = 4.427, P <0.001), participation (β = 0.0286, T = 2.717, P <.001), and sense of place (β = 0.327, T = 2.06, P <0.001). The socio-cultural index of urban livability explained 37% of the variance of satisfaction with access to facilities, 45% of participation satisfaction, and 53% of the variance of satisfaction with the sense of place. Accordingly, the socio-cultural dimension is highly correlated with the sense of place. The economic dimension of livability had a positive effect on satisfaction with access to facilities and services (β = 0.271, T = 4.436, P <0.001), satisfaction with security and safety (β = 0.166, T = 4. 126, P <0.001), satisfaction with sense of place (β = 0.261, T = 2.109, P <0.001), and satisfaction with comfort (β = 0.216, T = 2). 470, P <0.001). As a result, the economic dimension explained 37% of the variance in satisfaction with access to facilities, 48% in satisfaction with safety and security, 53% in satisfaction with mood and place, and 58% in satisfaction with comfort. Finally, the health dimension of urban livability has only a significant correlation with the indicators of satisfaction with access to facilities and services, participation, creativity, and sense of place. Health dimension had a positive effect on project satisfaction in providing access to facilities and services (β = 0.129, T = 2.245, P <0.05), participation satisfaction (β = 0.161, T = 2.209). P <0.05), and satisfaction with the sense of place (β = 0.202, T = 0.245, P <0.05). The health dimension accounted for 37% of the variance in satisfaction with access to facilities, 45% of participation satisfaction, and 53% of the variance in the sense of place.

AMOS 24 software was used to assess the model fit. This analysis has several indicators, all of which are listed below. The most important one is the Normative Fit Index (NFI), which should be between 0 and 1 for the proposed model. The closer this number is to 1, the more valid the proposed model will be. Also, the RMSEA index, used in most structural equation analyses, should be less than 0.05 to have a good model fit, and the values between 0.05 and 0.08 are considered moderate fit. As presented data in Table 8 shows, the RMSEA value in this model is less than 0.05. And the NFI index = 0.903. Thus, the model fitting is acceptable and good. Figure 3 shows the final structure based on standardized regression coefficients.

Table 7. Structural Model Analysis

direct effect	standardized coefficients β	t-test	sig	Adjust R^2
Physical-environmental → Access to facilities and services	0.256	2.575	***	0.375
Physical-environmental → participation	0.305	2.342	***	0.452
Physical-environmental → sense of place	0.348	4.154	***	0.536
Physical-environmental → comfort and convenience	0.419	6.522	***	0.589
Social-cultural → Access to facilities and services	0.346	4.427	***	0.375
Social-cultural → participation	0.286	2.717	***	0.452
Social-cultural → sense of place	0.327	2.067	***	0.536
Economic → Access to facilities and services	0.271	4.436	***	0.375
Economic → safety and security	0.166	4.126	***	0.481
Economic → sense of place	0.261	2.109	***	0.536
Economic → comfort and convenience	0.216	2.470	***	0.589
Health→ Access to facilities and services	0.129	2.345	*	0.375
Health → participation	0.161	2.239	*	0.452
Health → sense of place	0.220	2.045	*	0.536

Table 8. Indicators Accuracy of Data-model Suitability

Indicators data-model suitability	Expected value	value in model
Df	-	4
X2	-	4.11
X2/Df	≤4	1.02
GFI	≥0.90	0.984
AGFI	≥0.80	0.921
CFI	≥0.90	0.984
NFI	≥0.90	0.903
RMSEA	≤0.1	0.039

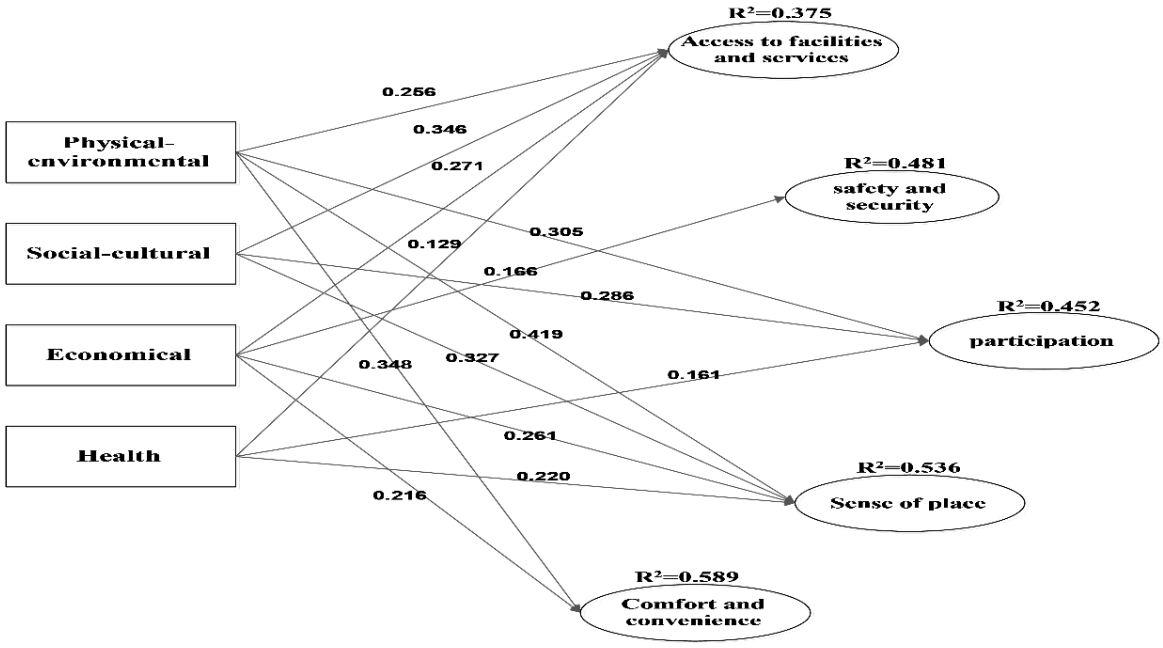

Fig 3. The Final Structural Model based on Standardized Regression Coefficients

7. DISCUSSION AND CONCLUSION

Mouratidis (2020) in his research entitled commute satisfaction, neighborhood satisfaction, and housing satisfaction as predictors of subjective well-being and indicators of urban livability, investigated the residents' satisfaction with the neighborhood and the residential environment. This study tested the relationship between the health index of livability criterion and the criterion of residents' satisfaction with neighborhood and the residential environment by correlation and regression tests. The correlation between health index (of neighborhood livability) and residents' satisfaction with the neighborhood had been estimated at 0.45%, which increased to 0.48% in the present study. Zhan et al. (2018)in his research entitled assessment and determinants of satisfaction with urban livability in China, has evaluated urban livability and its natural-physical, cultural-social, urban security, environmental health, and the economy. And it has been found that these factors have positive and significant effects on overall satisfaction with livability.

Worn-out urban contexts, especially in large city centers, with characteristics such as good urban location, access to services, and a social identity deeply rooted in the history of the community, have the potential to provide a significant part of the current and future residential needs of the city with the lowest cost. Economically, these are the most critical land reserves for habitation in the city. From a socio-cultural aspect, they guarantee human life, and they are the origins of modern cities and a reminder of the ancestors' culture and history. Despite all the physical and environmental problems in these urban contexts, they have many urban landscape elements with great historical and architectural values, which, if properly exploited, can provide the ground for sustainable development in these areas.

The findings of this study show that there are many shortages in educational, sports, health, and medical services in the Kolapa neighborhood, but there is a sufficient amount of commercial and religious centers in the neighborhood. This reflects the citizens' dissatisfaction with land-use diversity after the project implementation. Furthermore, the housing diversity in the neighborhood is shallow; hence the demands of different classes are not met justly.

Among the satisfaction factors with the project, participation has the lowest level, followed by comfort and convenience. The low satisfaction of the residents in these two areas shows that this project has failed to achieve its predetermined goals. Livability factors such as physical, environmental, socio-cultural, economic, and health play the most significant role in defining residents' satisfaction.

Paying attention to these indicators from the beginning could have increased the vitality in the neighborhood after the project implementation. Indeed, disregarding the demands and needs of the stakeholders from the idea generation phase to the implementation of this plan led to a decrease in its effectiveness.

To answer the second research question, the highest correlation coefficient is 0.301, between satisfaction with access to facilities and services and economic liveability. The results of the regression

analysis model showed that the satisfaction and comfort index had the most considerable effect on the liveability of the Kolapa neighborhood from the residents' point of view (R2 = 0.589). Results of the path analysis show that the physical-environmental index of liveability (β = 0.419) directly affected the satisfaction with convenience and comfort. Surveys conducted about the satisfaction of the regeneration project implementation revealed that neighbourhood liveability health index rated with significance, which was below 0.05. The economic factor of urban liveability has no significant relationship with the satisfaction of participating in the project. Therefore, it is possible to benefit from the people's participation in the various stages of the implementation of the regeneration plan and turn such neighbourhoods into liveable neighbourhoods with a better quality of life. Inhabitants of such neighbourhoods have gotten a complete knowledge of such places as strengths and weaknesses because they have been a long time in these places. Considering these recognitions, we can regenerate the neighbourhood as the residents imagine. Emphasis on participation is due to the extensive knowledge of the residents about the neighborhood and from the economic perspective. The participation of residents can considerably reduce the cost of the project. Improving social interactions among the residents through establishing socio-cultural centers can increase participation. However, this neighborhood has faced a shortage of these centers at present, and the goal defined in the regeneration plan for building a neighborhood house has not been achieved. The neighborhood regeneration program has identified these issues as the most critical problems of the neighborhood: urban mismanagement, unexpected change of city officials, inadequate access to facilities and services, lack of the role of experts in decision making, lack of participation of youth and citizens, lack of financial facilities, and low safety and security. These issues are assumed to be the basis for defining goals and plans in this plan.

Nevertheless, after assessing the citizens' satisfaction with the implementation of the plan, it became clear that the objectives were not operational and remained only on paper. The security of the neighbourhood during the day and night and safety of pedestrians haven't changed in residents' opinions. Most importantly, the lack of interaction between urban management and citizens is one of the most controversial urban - management challenges in worn-out contexts, especially in the Kolapa neighbourhood, which has affected the socio - cultural dimension of Kolapa's liveability. Regarding the economic effects of this plan, it can be said that the policy of increasing density and increasing the amount of construction, in general, has led to an increase in land prices in this area. However, other economic goals of the project, such as land-use diversity and the placement of new land uses, such as handicrafts shops in the main street, have not been implemented in the neighborhoud. The increase in construction and overcrowding, in the long run, will not lead to economic vibrancy and boost of employment in the neighborhood, and ultimately will only lead to the destruction of the identity of this historic neighborhood.

In answer to the third reseach question, analysis of citizens' satisfaction with the regeneration plan shows that their demands are more focused on socio - cultural participation, cooperation between officials and the people, promoting peace and comfort within the neighborhood, improving the security of residents, restricting non-local traffic, and increasing the health of the neighborhood by developing green spaces and parks. However, the plan focuses more on physical issues in the neighborhood. Therefore, the suggestion is to pay more attention to the socio-cultural dimensions in the future by emphasizing the participation of citizens, attracting investment, developing green spaces and various open spaces, and increasing collective open spaces to turn historic neighborhoods like Kolapa into livable neighborhoods with high quality of life.

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AUTHOR (S) BIOSKETCHES

A. A. Salaripour., *Department of Urban Planning and Design, University of Guilan, Rasht, Iran*
Email*: salaripour@guilan.ac.ir*

M. Mehrjou., *Department of Urban Planning and Design, University of Guilan, Rasht, Iran*
Email*: mehrjoumehrdad@gmail.com*

S. Jalilisadrabad., *Department of Urban Planning and Design, University of Science and Technology, Tehran, Iran*
Email*: s_jalili@iust.ac.ir*

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