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## Analyzing Livability in the Distressed Areas of Isfahan City with an Emphasis on City Development Strategy

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**Abstract:** Adoption of inefficient policies in the field of distressed areas and low quality of livability, there is the need for new approaches in preparing and implementing renovation and improvement plans; so, city development strategy can be an appropriate plan to replace current plans. The purpose of the study is to evaluate the livability of distressed areas in Isfahan city as one of the elements of urban development strategy to use the approach in renovation and improvement. Moreover, its innovation is in addressing livability situation of independent distressed areas of the city to provide urban development strategy plan. The research method is descriptive-analytical and regarding the purpose, the study is applied. The data were collected using questionnaires. They were distributed and filled out in August and September of 2015. In this research, SPSS, EXCEL and Arc Gis software were used. The study sample included 385 residents of distress areas who were selected by stratified random sampling. According to the results, the distressed area of Isfahan, with an average of 2.49 and t statistics, -38.07 is not livable and the residents have evaluated the index of urban development strategy and its status undesirable. Moreover, the other three dimensions of economic, social and environmental state are unfavorable and the social dimension has had a more critical situation. Livability state is not the same in all parts of the area. There is also a significant difference between the distressed areas regarding livability. In the meantime, the distressed area of district 9 rather than districts four and eleven and the distressed area of district 3 rather than district eleven had more livability.

**Keywords:** livability, distressed area, city development strategy, renovation and improvement, city of Isfahan

**JEL Classification:** R58, o47, N95, I25, L39

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## 1- Introduction

Today, with increasing growth of urbanization, urban problems, rather than any other time, plague cities in the country. The housing problem, urban transportation, environmental shortages and related pollution are specific examples of the problems. The problems with affect all aspects of urbanization, the logical relations of urban life have become distorted and the overall quality and livability of them greatly reduced and provided them with instability (Arabshahi, 2003).

One of the important aspects in cities that is both cause and result of many the problems is the exhausted tissue. The nature of the exhausted tissue invalidates any neglect of it in various ways, since it is culturally the origin of the modern city and a reminder of the culture and history of the past, and socially is a part of society and guarantor of human life whether in the event of abandonment or disproportionate use, and physically it has an outstanding architectural and urbanization value, despite all exhaustion (Pourahmad & Zarei, 1394).

Urban compact and worn out areas are affected by decisions of urban managers and an important part of their activities is to improve the conditions and appropriate solutions for increasing living conditions in these areas (Wang et al., 2007).

These tissues often suffer from low environmental quality and unsafe space, and sometimes there is pollution from surface water, sewage systems and garbage collection. Unauthorized residence, high rental rates, the prevalence of addiction and all types of behavioral abnormalities and delinquency and insecurity, especially for children and women, are the characteristics of urban tissue erosion (Izadi, 2011); therefore,

these disadvantages have caused them have lower quality of life than other urban areas, and reduce their viability.

The importance and necessity of this research can be discussed in two thematic and topical fields. Given the fact that livability represents the overall economic, social, and environmental characteristics of an area, it can be used as a powerful tool for monitoring social development planning, recognizing previous strategies and designing future policies. On the other hand, Isfahan is a historic city that lost the population living in its historic and worn out form due to the lack of facilities and services and the lack of proper access, which led to the erosion and abandonment of many buildings. On the other hand, with uncontrolled growth and expansion of the city, and with the conversion and change of the use of many gardens and lands, its natural ecosystem is shattered and endangered by the environmental crisis.

Adopting inefficient urban planning and management policies in the field of renovation and improvement of worn-out tissues gradually eroded and made ineffectiveness of a significant part of the tissues of the central and middle core of cities and created a sharp contradiction between urban constituents, especially new ones, which changed with the role of service functions, cities have been created, with worn-out tissues that cannot adapt to these changes (Sajjadi & Mohammadi, 2011).

The plans for the modernization and upgrading of worn out tissues can be spotted when it has a good prospect for urban development and has reached a strategy for development and sustainability of the city (Abdolalizadeh, 2010). Considering that urban development

strategy is the complete and advanced form of urban planning that can be used in a city or part of the city, it necessary is to implement urban development strategy for the modernization and upgrading of worn out tissues. If cities and towns want to enhance the welfare of their citizens and their residents, they must be sustainable and functional in four ways that are referred to as the four features, principles, or pillars of the CDS<sup>1</sup>: livability, competitiveness, bankability, and good urban governance (World Bank, 2000):

The urban development strategy pursues three main goals: economic growth, continuous reduction of poverty and improvement of urban management. In this strategy, after identifying the status quo and charting the desired situation, ways to get from the status quo to the optimal situation will be identified and designed. Therefore, one of the first steps required in the urban development strategy is to identify the status quo. On the other hand, the existing condition of the worn texture requires an assessment of the level of CDS components, which will also achieve the goals of the urban development strategy. Therefore, the purpose of this study was to analyze the current status of livability (as one of the components of the urban development strategy) in the worn out of Isfahan city and compare the worn-out texture of its fifteen districts in terms of the level of livability in order to use this approach to modernize and improve it. According to these goals, the research questions are as follows:

- What is the state of Isfahan worn out texture in terms of livability?

- Among the worn-out texture of fifteen districts of Isfahan, which is more livable than others?

## 2- Literature Review

### a) *Foreign Researches*

Rasoolimanseh et al., (2011) in a study comparing the definitions of the City Union and the World Bank in Malaysia, concluded that the term “sustainability” is used in several forms and definitions. In order to cope with the four decades of global economic, social and environmental problems, sustainable development should be approved by international organizations, national and local governments as a principle. On the other hand, new approaches to urban management should be used to achieve sustainable development. Although the urban development and sustainable development strategy are defined in many different areas, this paper describes two specific definitions of urban development strategies put forward by the Cities Union and the World Bank in order to achieve sustainable development.

Economist Intelligence Unit (2011) ranked 140 cities from different countries in 2011 based on their livability. This ranking has been conducted based on 30 quantitative and qualitative factors, which have been classified into five general categories: stability (social environment), health care, culture and environment, education and infrastructure. In this ranking, the city of Melbourne in Australia has been ranked as the most livable city, and city of Harare in Zimbabwe as the least livable city. The results of this study showed that higher rated cities, mostly middle-sized cities, have been relatively low in rich countries and population density.

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1- City Development Strategy

Song (2011) identified effective factors on livability level by using Structural Equation Modeling and introduced three variables of quality of environment, public facilities, and economic development as effective factors on livability, and extracted 24 qualitative variables from statistical yearbooks to measure these three variables. The sample used by the researcher included 284 cities from China. The results of this study indicate the direct impact of economic development on the livability and lack of impact of environmental quality and public facilities on the viability, which is due to the lack of influence of these two variables on the low quality of the variables used and the small size of the sample.

Kashef (2016) analyzed a variety of theoretical backgrounds that relate to the concept of the livable cities. The research ultimately tries to clarify the situation, conditions and processes that may increase the livability of different urban situations.

#### ***b) Iranian Researches***

Isaloo et al., (2014) did a research to identify the indicators of livable rural societies and to assess these conditions in the current situation of rural settlements of Kahak in the city of Qom. The research method was descriptive-analytical and the statistical population was all permanent residents of 9 villages in Kahak selected by stratified random sampling. The results showed that economic indicators had a significant role in determining the rate of livability in rural areas of this region. In addition, the results of the follow-up test for residences showed that although some villages have more facilities and services, their livability is lower than rural areas. Finally, the

elimination of economic problems and empowerment of villagers have been considered as the main factor of the livability of rural settlements.

Poorahmad et al., (2015) did a research to analyze the situation of Piranshahr based on City Development Strategy (CDS) indicators. The research method was descriptive-analytical, and data were collected by field study and using the questionnaire from three groups of citizens, officials and elites. For data analysis, SPSS and Lisrel software have been used. The results of this study showed that not all three groups evaluated the status of Piranshahr favorably in terms of CDS indicators. The difference in the view of the groups by using the Manova test indicates that there is a significant difference between the viewpoints of the urban groups, so that there is a significant difference between the viewpoints of the groups about all the CDS indexes other than the governance one.

Irandoost et al., (2015) did a research to identify the features of livable societies and evaluated livability of central part of Qom. The method of this research is descriptive-analytical, as well as documentary, surveying and field studies. The results of the study showed that there is a good status in terms of social, equality and equity index. Economically, the desirability of location (decent access) to the central housing sector has reduced the cost of moving but, in contrast to housing costs, has affected the real affordability of housing in this sector. From the environmental point of view, all three factors of air, water and sound are far from the criteria and standards specified.

Rashidi et al., (2015) did a research to understand the livability status of the metropolitan area of Tabriz. To achieve

this goal, using library-survey method and questionnaire tool, 384 residents of the area were evaluated by probabilistic sampling method. The results of this study showed that the livability of the metropolitan area of Tabriz with an average of 2.86 and 4.75 t was moderate. In addition, the livability conditions are not the same in all parts of it, and there is a significant difference between the metropolitan area of Tabriz in terms of livability, while in the economic index, the difference in livability in the study area is more than other indicators.

Shamaei et al., (2016) did a research to realize livability status in distressed area of Zanjan. In this research, descriptive-analytical and survey methods and questionnaire were used and the collected data were analyzed by using factor analysis, regression and path analysis in SPSS software. The results of the study showed that sub-indicators of management have a greater role in influencing the amount of livability of distressed area in Zanjan city. Moreover, the results of livability regression analysis showed that among the factors, the livability of distressed area of Zanjan has the highest correlation with social index. As the path analysis shows, the social index, among other factors, directly had the greatest effect on livability.

Studies on research background show that livability studies focus more on large cities and rural areas, and less attention has been paid to worn out areas. The urban development strategy has also been more prominent for cities. Therefore, theoretical and qualitative research in this field can increase the depth of thinking among the context of the worn out texture, the livability and the urban development strategy, and provide the basis for deep research in the area of

management and logistics of urban distressed areas.

### 3- Theoretical Background

#### *Worn-out Fabric*

The most formal theoretical definition of worn-out fabric is the one in the 2005 Supreme Council of Urban and Architecture: “worn-out fabric is a reduction in the efficiency and effectiveness of a tissue compared to the efficiency of other urban constructions. The exhaustion of the tissue and its internal elements is due to the lack of a program for the development and technical supervision of the formation of that texture. The outcome of exhaustion ultimately leads to the loss of its dignity in the minds of citizens, which can be detected in a variety of ways, including loss of or lack of livability, safety, and physical, social, economic and institutional disruptions.” Agedness in this definition is defined by old and unstable buildings, a low-profile property with low-income with socially dependent residents (Andalib, 2010). Due to problems such as: low quality of life, reduced security, traffic problems, defenseless spaces, fear, high crime, the worn out texture requires a fundamental strategy for basic changes in the physical, social, economic, and environmental dimensions. Changes that often take place in the long run with high costs to solve these problems by public institutions, emphasizing on three factors of training, implementation and engineering, and taking into account the needs of residents (Day et al., 2007); therefore, in order to prevent undesirable and sometimes irreparable consequences of this problem, proper intervention in urban distressed areas is necessary (Kakavand et al., 2013).

In terms of urban development and urban planning, various strategies and

interventions are proposed to improve urban centers or, more precisely, old and usually urbanized buildings. Types of intervention based on loyalty to the past include (Khaksari, 2004):

a: Improvement: To create a healthy environment and prepare a suitable place for healthy and productive livelihoods in the city and urbanization (Shieh, 1999).

b: Renovation: Renovations and urban spaces that through actions or processes, signs of exhaustion, destruction, superiors and stagnation are eliminated (Shamei & Poorahmad, 2006).

c: Reconstruction: Complete transformation of the background and the creation of new conditions in the context or its elements by dismantling the past works that leads to the construction of new developments (Habibi & Maqsoodi, 2007).

#### *City Development Strategy (CDS)*

The city development strategy approach has been applied since 1999, with the support of the World Bank and then with the cooperation of other international institutions such as the United Nations Center for Human Settlements (Habitat) and the establishment of Cities Alliance in different countries (Sadeghi, 2010). The City Development Strategy (CDS) is a tool for the development of urban poor areas. This approach is a participatory decision for cities that are facing the urban poverty crisis, increasing competition and putting pressure on environmental and economic sustainability, and provides a framework for economic growth, sustainability and equity through strategies (UMP, 2002).

In fact, CDS is a strategic plan that emphasizes the preparation and implementation of the document. The mentioned document is a tool in which participatory techniques

are being used and its main objective is to provide sustainable urban development through the creation of social capacity for participatory perspective and public action. On the other hand, this document is based on a common vision to improve the quality of city administration and management, to increase investment to enhance employment rates and sustainable poverty reduction, so that the growth of cities involves social justice through the cooperation and participation of people in the community to improve quality. The lives of all citizens are possible (Poorahmad, et al., 2015).

The principles of city development strategy are:

- Livability

- Competitiveness: One of the key components of CDS studies and analyzes is the analysis of the economic competitiveness of the city at international, national and regional levels. In other words, the formulation of a development strategy and, subsequently, the formulation of an executive plan, require the determination of the competitive advantage of cities. Therefore, analyzing the city's economic context in order to evaluate its strengths and weaknesses in comparison with other cities of the region and the country with the aim of identifying the corners in which the city has a competitive advantage and will be able to provide the market with its products and services (Golkar & Azadi, 2004).

- Good governance: According to the definition of the World Bank, good governance implies the inclusion and representation of all groups in the urban community, as it implies the accountability, integrity and transparency of the actions of the local government to define and pursue common goals; the rule of a city

can be seen in the indicators of structure and effectiveness of service, local government independence, in-government coordination and transparency of the local government (Noroozifard et al., 2014).

- Bankability: It refers to the financial health of the city in the administration of Revenue and Expense Revenue. A bankable city has a clear and consistently integrated local incomes and expenditures system, transparent and predictable intergovernmental transfers, prudent covenants for municipal borrowing, accepted financial accounting techniques, healthy asset management process, transparent procedures in procurement of goods and services, and a business approach (taking into account important social issues). A business approach is also a prerequisite for the participation of the private sector or the conditional privatization of urban services (World Bank, 2001).

#### ***Livability***

The origin of the concept of a livable city dates back to the ancient Greek era, followed by ideology and the concept of justice and fairness. The concept of livability, on the one hand, reflects the gravity and the strong urban impact, but, on the other hand, it will intensify the communication and impact of the city through the acquisition of investment, cultural and human resources (Hataminejad et al., 2014). Increasing livability of urban areas is a way to prevent pollution and protect natural resources in and around urban areas (Saitluanga, 2014).

Livability in its core concept is the achievement of livelihood and is in fact the achievement of good quality urban planning and sustainable location. In general, the definitions of livability and the livable community are a diverse set of issues that are expressed in guiding

principles such as access, equality and participation, in which the concepts of habitat are based on them. In many texts, livability and quality of life are expressed synonymously. The citizens' quality of life depends on their access to infrastructure (transportation, communications, water and sanitation), food, clean air, affordable housing, satisfying jobs, green spaces and parks. The livability of a settlement depends also on the extent to which residents have access to participate in the decision-making process in order to meet their needs (Timmer et al., 2005). A livable place should be secure, socially coherent, with educational facilities, diverse and affordable housing, open public spaces, local shopping centers, suitable health services, environmental sustainability, cultural and recreational facilities, proper and optimal transport, and suitable infrastructure for cycling and walking (Hankins & Power, 2009).

According to Evans (2002), the livability coin has two sides; the livelihood tool, and ecological sustainability. The livelihood tool means the jobs are close enough to affordable housing suitable for rent, and to access to services that provide a healthy habitat. Livelihood must also be sustainable. If the demand for jobs and housing is met by the destruction of the city's environment, the issue of livelihood is not resolved. Livelihood tool, through degradation and environmental degradation, is seeking to achieve quality of life; in fact, citizens who have to exchange green space and clean air at their wages. One city must have both sides of coin for survival, while protecting the quality of the environment, providing livelihoods for its citizens.

Livability divides into three dependent dimensions; economy, society, and the

environment. Economy provides jobs and income and it is vital for people's health (supplying food, clothes, and housing), and so does for providing higher-level needs like education, health, and recreation. Simultaneously, the use of economy of available resources in the environment should be in such a way that there should be assurance that there are enough resources for present and future generations. Environment is an infrastructure that is the provider of natural resources, waste disposal capacity and it is the relationship between humans and the natural environment, but social well-being depends on justice, social and spatial distribution of economic and environmental resources in a fair manner, as well as government systems that are considered by all citizens. Individual liberty and equal opportunity are important components of social welfare. If the functioning of each of these three is in disrepair, human settlements can quickly collapse, resulting in population decline, poverty, social conflict, and increasing health and environmental problems will be its consequences (Sasanpoor et al., 2015).

Beyond economic reasons, livability has been accepted for both residents and planners to create sustainable, functional and enjoyable spaces. Livable habitats create a greater sense of community and ownership and its immigration rates are lower. Nevertheless, this point should always be taken into consideration that a positive attitude towards a community cannot necessarily mean that the community has a proper position in terms of livability. The reason for this is that people who are satisfied with their condition can have a positive attitude about their community, because they do not have enough awareness of the real shortcomings that

exist in their community and the possibilities that can exist in the community (Khorasani et al., 2012).

#### 4- Research Method

The method of this research is applied in terms of purpose and it is a descriptive-analytic study in terms of entity and method. The required information was collected using library and field methods. The data collection tool was a researcher-made questionnaire. In order to prepare a questionnaire, indicators and livability were extracted using two-stage studies in Iran and in the world. In the first stage, using related studies, related indicators were extracted. According to the research emphasis on the CDS approach, the factors proposed by the World Bank as one of the founders and main sponsors of CDS were regarded more than other factors. In the second stage, some of the indicators and components were used in the final questionnaire after crossing the initial questionnaire designed for the pre-test phase. The indicators were summarized in three dimensions as follows:

- Economic dimension: Employment and income, housing, public transportation, facilities and services infrastructure
- Social dimension: public education, health, affiliation and location, security, recreation and leisure
- Environmental dimension: green space, pollution and landscape

In designing the questionnaire and measuring the indicators, 39 items with a positive direction and five-point Likert scale, including very few low to a very high extent were used. The validity of the questionnaire was evaluated by face-to-face and expert opinion, so the validity of the questionnaire was high. The reliability of the questionnaire was assessed through



pre-test and Cronbach's alpha. The Cronbach's alpha in this study was 0.89, indicating strong reliability.

The statistical population in this research is the inhabitants of Isfahan's worn out texture, which is 364426 people according to the statistics and maps in Isfahan's Renovation and Improvement Organization, who reside in all fifteen municipality districts. Sample size is determined according to the Cochran sampling formula (Equation 1).

$$n = \frac{Z^2 \frac{\alpha}{2} \sigma^2}{d^2}$$

$$n = \frac{(1.96)^2 (0.5)^2}{(0.05)^2} = 385$$

In this equation, n is the minimum sample size, Z is the value of the test statistic at the error level of  $\alpha$  percent,  $\sigma$  is the standard deviation of the statistical population and d is the permitted error. In this research, because of the lack of knowledge of the standard deviation of society ( $\sigma$ ), the standard deviation of

sample (S) is used as an estimate of standard deviation of society. The sample size was calculated at 95% confidence level and the permissible error level is 0.05, the maximum error is allowed and the sampling accuracy depends on it. 385 people were calculated.

After calculating the sample size for selecting samples from among the residents of distressed areas of Isfahan Municipality districts, stratified random sampling method was used. In this method, people according to their intra-group traits are divided into different classes, and random samples are selected from all classes (Hafeznia, 2005). Here, people's place of residence of the worn out tissue of the fifteen districts of the municipality was considered as their distinctive attribute and appropriate allocation was made (Table 1).

**Table1. Sample size**

Districts	People living in distressed area (person)	Population share (percentage)	Sample size (person)
District 1	20278	6	23
District 2	8486	2	8
District 3	23768	7	27
District 4	7956	2	8
District 5	10126	3	12
District 6	21068	6	23
District 7	28224	8	31
District 8	26187	7	27
District 9	40471	11	42
District 10	69378	19	73
District 11	24015	7	27
District 12	15716	4	15
District 13	19762	5	19
District 14	30528	8	31
District 15	18463	5	19
Total distressed area	364426	100	385

**Reference: (Renovation and Rehabilitation Organization of Isfahan)**

In this research, descriptive methods was used in order to generalize the results and inferential statistical tests including one-sample t, one-way ANOVA, Gabriel and Levene tests were used to answer and generalize the results. The application of the tests is as follows:

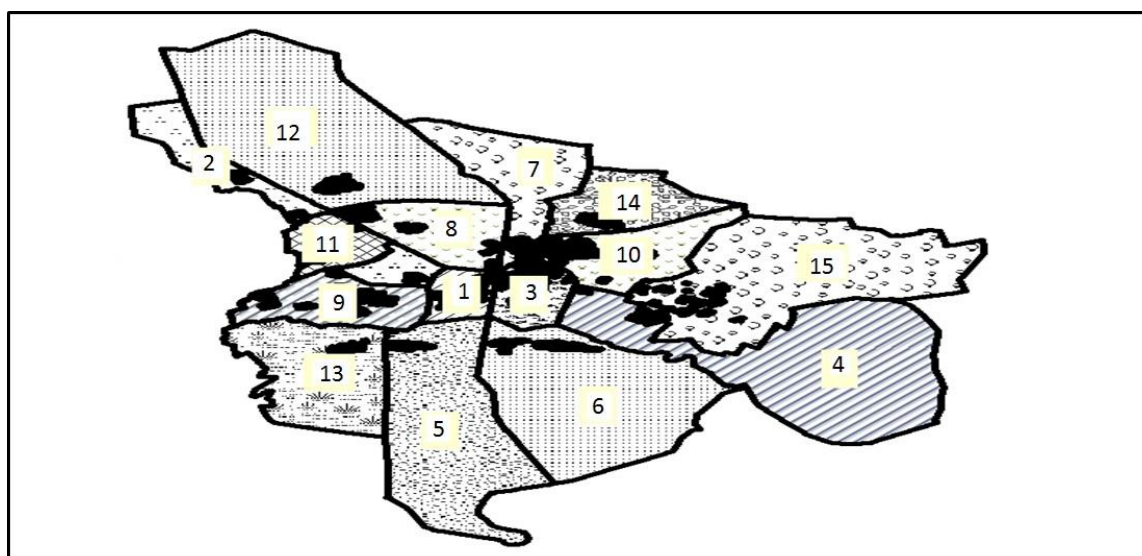
- One-sample t test: to study the level of livability, its dimensions and indicators
- Gabriel: Binary comparison of two distressed areas in terms of livability
- Levene: Equation analysis of variance of livability variable among areas of worn texture

#### *Spatial and Temporal Realm of Research*

Isfahan is the third largest city in Iran, with a population of 1908968 people, accounting for 2.54% of the total population of the country. The city has an area of 550-km<sup>2</sup> equivalent to 0.03% of total area of the country. Currently, it has fifteen

municipality districts by adding Khorasegan. It has 2280 distressed areas (Statistics of Isfahan, 2015).

The entire distressed area of Isfahan is not of the old texture type. Districts 1, 3, and 15 of the city of Isfahan, which are sometimes combined with historical texture, have become eroded over the years due to the large number of buildings, changes in the principles and methods of urbanization, the type of materials used, and so on. These areas are constructed with modern methods and modes of their time, and access to them is appropriate at that time, but they are ineffective at this time (Akbari Ziart, 2010). Figure 1 shows the city's fifteen districts. This research has been done in the spatial area of the worn texture of Isfahan city and in the period from September to October 2013.



**Fig1. Distressed area of fifteen districts of Isfahan city**

## **5- Results**

### *Analysis of Demographic Variables of Sample*

The demographic variables of sample were adjusted based on 9 general questions including gender, age, marital status, household size, educational level, employment

status, type of ownership and type of housing, the results of which are presented in Table 2. According to the results of the table, most of the residents were of high age, low-income families and low educational levels, who often lived in non-parish homes and were owners.

**Table2. Demographic features of sample size**

Variable		Frequency	percentage	Variable		Frequency	Percentage
Gender	Male	223	57.9	Marital status	Single	106	27.7
	Female	162	42.1		Married	277	72.3
Age	18 -20	22	5.7		Unknown	2	0.5
	21 -30	126	32.7	Educated	Illiterate	36	9.4
	31 -40	114	29.6		Lower than diploma and diploma	258	67.4
	41 -50	74	19.2		A.A. and Bachelor	77	20.1
	More than 50	47	12.2		Master and higher	12	3.1
	Unknown	2	0.5		Unknown	2	0.5
Type of ownership	Owner	267	70.4	Type of housing	Apartment	78	20.3
	Renter	112	29.6		Non-apartment	301	79.4
	Unknown	6	1.5		Unknown	5	1.8
Employment status	Unemployed	27	7	Household size	Fewer than 2 persons	48	12.5
	Student	42	10.9		3-4 persons	227	59
	Employed	183	47.5		5-6 persons	83	21.6
	housewife	30	7.8		More than 7 persons	15	3.9
	Retired	101	26.2		Unknown	12	3.1
	Unknown	2	0.5				

***Descriptive Findings***

Livability is evaluated through three economic, social and environmental aspects. Therefore, to assess the livability, first, by obtaining averages from the indicator of each dimension, a specific index is created to determine the rate of livability in each dimension, then, by calculating the average of all three dimensions, the overall level of livability was estimated. The indexes of each dimension are presented in Table 3.

Among the economic dimension indicators, the highest amount was for public transportation with an average of 2.85 and the lowest value for housing with an average of 2.56. In relation to social dimension indicators, the highest amount is related to continuity and place belonging with an average of 2.64 and the lowest amount for leisure time with an average of 2.22. In environmental dimension indicators, the highest amount is related to green space with a mean of 2.45 and the lowest value for the landscape with an average of 1.89. In general, it can be said that the average of all indices constituting

the three dimensions of livability is lower than the average of Likert scale (number 3) and among all the indicators, the landscape has the lowest average.

In addition, in Table 3, the level of each dimension and overall livability is presented. The results of this table show that the average economic dimension is 2.66, the social dimension is 2.50, the environmental dimension is 2.31, and ultimately the overall livability is 2.49 and less than the average of Likert. The level of livability of the worn out tissue of each area is also presented in Table 4. The results of this table indicate that the livability of the worn out texture of all areas is in the range of 2.5-2.55 and not have a desirable level (higher than 3.5).

***Inferential Findings***

The descriptive results obtained from the sample only can be generalized to the community when tested by inferential statistics methods. One-sample t-test was used to answer the first question and to evaluate its livability, and its dimensions in Isfahan distressed area. In this test, the value of the numerical value (critical

value) is set to 3.5. The choice of 3.5 was due to the fact that the score is 3 times with the same average. The raise of the number 3 cannot be attributed to livability. In other words, the score between 3 and 4, which is in fact between medium and

good, can be considered as critical, and more than 4 is considered good and livable. The Economist's report also confirms that it is a livable city with a score of over 70.

**Table3. Average indices of the three dimensions of livability**

Dimension	Indicators	Average	SD	Skewness
Economic	Employment and income	2.57	0.80	0.07
	Housing	2.56	0.79	0.22
	Public transport	2.85	1.03	-0.08
	Facilities and Services Infrastructure	2.67	0.63	0.24
	Economic livability	2.66	0.53	0.07
Social	Public education	2.63	0.91	0.13
	Health	2.57	1.00	0.22
	Attachment and spatial belonging	2.64	0.65	0.05
	Security	2.45	1.14	0.20
	Recreation and leisure	2.22	0.82	0.56
	Social livability	2.50	0.60	0.37
Environmental	Green space	2.54	1.07	0.29
	Pollution	2.50	0.73	0.36
	Landscape	1.89	1.02	1.00
	Environmental livability	2.31	0.72	0.77
Total livability		2.49	0.51	0.48

**Table4. Average livability of the worn texture of each district**

District	Average livability	District	Average livability
1	2.64	9	2.75
2	2.46	10	2.54
3	2.70	11	2.19
4	2.10	12	2.36
5	2.57	13	2.42
6	2.45	14	2.40
7	2.48	15	2.33
8	2.49	Total	2.49

The results of t test are presented in Table 5. Economic dimensional indicators have a significant difference with numerical value ( $p < 0.05$ ) and are lower than them. Among the economic dimension indicators, the public transportation index is closer to the average and the indicator of infrastructure facilities and services is more critical than the rest of the indicators. This shows the non-economic livability of Isfahan's distressed area.

Other social dimension indicators are also numerically significant ( $p < 0.05$ ) and

less. In general, the score obtained for the social dimension indicates that non-socially livability of distressed area.

The results of the environmental analysis show that although all of the indicators in this dimension are also lower than the numerical value, the green space (with  $t=17.43$ ) is better than the rest of the indicators. The social dimension of the results shows that the index of continuity and spatial belonging and the index of recreation and leisure have a more critical situation than the other indicators.

The landscape indicator is also more critical. In general, the results indicate the

non-environmental livability of the distressed area.

**Table5. T test to determine the level of livability indicators**

Dimensions	Indicators	Degree of freedom	T value	Significance value (p)	Low level	High level
Economic	Employment and income	384	-22.39	0.00	-1.00	-0.83
	Housing	384	-23.09	0.00	-1.01	-0.85
	Public transport	384	-12.21	0.00	-0.74	-0.54
	Facilities and Services Infrastructure	384	-25.76	0.00	-0.89	-0.76
Social	Public education	384	-18.51	0.00	-0.95	-0.76
	Health	384	-17.94	0.00	-1.02	-0.82
	Attachment and spatial belonging	384	-25.61	0.00	-0.91	-0.78
	Security	384	-17.97	0.00	-1.16	-0.93
	Recreation and leisure	384	-30.15	0.00	-1.35	-1.18
Environmental	Green space	384	-17.34	0.00	-1.05	-0.84
	Pollution	384	-26.76	0.00	-1.07	-0.92
	Landscape	384	-30.89	0.00	-1.71	-1.50

The results of Table 6, which are based on the t single sample, show that each of the dimensions of livability and ultimately overall livability, have a significant difference with the numerical value (3.5) and are less than it. Based on t observed, it can only be claimed that the

distressed area of Isfahan is closer to the desirable, on terms of economic aspect ( $t = -30.45$ ), and in terms of social dimension ( $t = -38.38$ ) is more critical. Therefore, it can be said with 95% confidence that the distressed area of Isfahan is not livable.

**Table6. T test to determine the level of livability and its dimensions**

Dimensions	Degree of freedom	T value	Significance value (p)	Low level	High level
Economic	384	-30.45	0.00	-0.88	-0.88
Social	384	-32.38	0.00	-0.93	-1.05
Environmental	384	-32.19	0.00	-1.11	-1.25
Total livability	384	-38.07	0.00	-0.95	-1.05

To answer the second question of the research that “among the distressed area of the fifteen districts of Isfahan, which one is more livable than others?”, one-way ANOVA can be used in the case of equality of variances or Kruskal-Wallis

test can be used in the case of inequality of variances.

First, Levene test was used to check the equality or non-equality of variances (Table 7). The results of the Levene test did not exclude the equality of variances, so one-way ANOVA was used (Table 8).

**Table7. Levene test to investigate the equation of variance of livability between fifteen districts of distressed areas**

Variable	Degree of freedom (1)	Degree of freedom (2)	Levene	P
Livability	14	370	0.62	0.84

**Table8. F Test to compare distressed areas in terms of livability**

	Sum of squares	Degree of freedom	Average squares	F	p
Intragroup	9.631	14	0.688	2.737	0.001
Intergroup	92.990	370	0.251		
Total	102.621	384			

The results of one-way ANOVA showed that the observed F ( $F = 2.737$ ) was significant at the alpha level of 0.05; in other words, there were significant differences among the scores obtained from the distressed areas of the fifteen areas. To determine how this difference, Gabriel's multiple comparison test was used. The results of this test were presented only for areas where their mean differences were significant ( $p < 0.05$ ). Regarding P

values, it can be said that the mean difference is only significant between the distressed areas of the pair of districts (11, 3), (11, 9) and (4 and 9). The old fabric of other areas did not have significant differences in terms of livability. The sign of the difference in mean between these pairs of regions also shows that the old fabric of districts 3 was 11 and the old fabric of district 9 compared to 11 and 4, respectively.

**Table9. Gabriel test for the paired comparison of old fabric districts in terms of livability**

p	standard error	Average difference (i-j)	Compared distressed area (j)	Base area worn texture (i)
0.02	0.136	0.513	11	3
0.033	0.193	0.653	4	9
0.001	0.123	0.566	11	9

## 6- Conclusion and Discussion

Today, in cities of the country, due to the lack of adaptation and reconciliation of the old fabric of cities with the new urbanization model, the existence of numerous and parallel organizations in the context of the management of worn out texture, the lack of implementation of many renovation and rehabilitation projects, on the one hand, and investment opportunity, and development on the margins of cities due to cheap land prices on the other hand, have led to the abandonment of these areas from the urban development process; while such areas, due to their low livability, if not properly programmed,

will gradually face the migration of the original and old residents and increase the problems for optimal planning. Urban development strategy can be a good model for replacing programs for renovation and rehabilitation of old fabric; however, before implementing urban development strategy plans, it is necessary to improve its indicators and parameters. Therefore, the purpose of this study was to evaluate the old fabric of Isfahan based on the principle of livability with the participation of residents in order to determine the status of Isfahan's distressed area and its dimensions as one of the principles of city development strategy.

The results of this study showed that Isfahan's old fabric is not livable with the mean of 2.49 and  $t$  2.37. In terms of having this indicator, the urban development strategy is not desirable.

In addition, the results showed that considering the numerical value of 3.5, the statistical value of  $t$  for economic and social dimensions of dimensions livability was significant and there was an undesirable situation for all three dimensions. In the meantime, the economic dimension is closer to the desired level and the social dimension is more critical. Thus, solving social problems can be considered as the most important factor for improving the livability of Isfahan's old fabric.

Research findings in relation to the average indicators of each dimension of research based on the one-sample  $t$ -test also showed that all of the livability indicators with a  $t$  score of between -12.21 and -30.89 are in an unfavorable situation. In the economic dimension, the most livable indicator is public transportation and the least is related to infrastructure services and facilities. In the social dimension, the highest livability is related to health and the least is related to continuity and place belonging. In the environmental dimension, the most environmentally livability is the green space and the least livability is related to the landscape.

Overall, the residents' view showed that there was a significant difference between the livability of old fabric areas, so that the distressed area of district 9 is more livable than districts 11 and 4, and so does 3 than district 11.

The City Development Strategy is based on the participatory process with the focus of urban management and the participation of urban stakeholders. To

improve livability as one of the principles of the city development strategy and the implementation of the City Development Strategy plan for Isfahan's worn out texture, it has been advisable to move towards a participatory perspective and increase the rate of livability indicators in these areas to a favorable and appropriate level in order that the immigration of its inhabitants will be reduced.

What distinguishes the present research from previous studies is the introduction of city development strategy as a new approach in the management process of renovation and rehabilitation of worn out tissues, livability analysis and all its dimensions and indicators in Isfahan's worn out texture and comparison of old fabric of fifteen districts of the city in terms of livability situation. In fact, the innovation of this research can be considered in addressing the livability of worn out texture independently of the city's condition for the development of city development strategy. The worn out tissues are sensitive and vulnerable areas that require a different look because of their specific situation.

According to the results of the research, the following suggestions have been made to improve the level of livability according to the indicators presented and in terms of dimensions.

#### *a. Economic Dimension*

Facilities to handle road coverings (asphalt, paving, etc.) and extending them by the municipality and related organizations should be prepared. Extending the passage not only reduces the traffic of the neighborhood, but also provides assistance to these neighborhoods in critical situations.

- Further monitoring by the municipality and related organizations on the quality and price of goods offered in stores and

shopping centers located in these neighborhoods.

#### **b. Social Dimension**

- Establishment of kiosks for police in the neighborhood and its proximity to induce a sense of security for the residents of the neighborhood and prevent drug addicts in the neighborhood

- Deciding upon abandoned buildings by landowners in worn-out places by sending a warning by the competent authorities, the complete destruction of these buildings and the proper fencing in the property, and preventing the accumulation of addicts in these buildings

- Attention to the construction and establishment of cultural and social centers such as public libraries, cultural centers, cinemas, museums and cultural exhibitions

#### **c. Environmental Dimension**

- Increasing the per capita of green space through the possession of arid lands in the worn out neighborhoods by the municipality and assigning these lands to the construction of a neighborhood park in order to increase livability among residents

- Improvement of neighborhood perspective index by the municipality by organizing urban landscape and utilizing the principles of Iranian architecture and urbanism and providing various and appropriate housing design models

- Equipping the existing parks with recreational facilities to increase their efficiency and benefit the inhabitants of the most desirable green space

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