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Research paper

Measurement and Spatial Analysis of Internal Development Zones in Isfahan Metropolitan Area 3

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Abstract

The lack of macro urban development strategies, the growth of worn out texture, dispersed and heterogeneous growth, marginalization, environmental problems, and physical development have created an inappropriate landscape for the metropolis of Isfahan. Accordingly, the aim of this study is to measure the spatial analysis of internal development zones in Isfahan metropolitan area 3. To determine the appropriate internal development zones of the ANP model and its cluster analysis, the nearest neighbor and the Getis-Ord model have been used. The results of the research show that, the areas with a high, low and very low priority for internal development are 97, 91 and 430 hectares, respectively. Hence, about 188 hectares of texture in the 3rd district of Isfahan is prone to internal development. Based on the average method of the nearest neighbor, the distribution pattern of the high priority areas has a z-scoer of 20.85 and p-value with a score of 0.000, which indicates a fully clustered pattern of distribution of these lands at a level of 99% It should be.The conclusion show that priority intervention areas are in the north and center and low priority clusters in the southern part of the region. Therefore, neighborhoods with values above the mean in the center and somewhat in the north and west of the city and neighborhoods have lower values than the mean in the south and east of Isfahan.

Keywords: *Worn texture, internal development, area 3*

1. Introduction

With urban population growth as well as increasing the number of urban areas in Iran, the urban development trend has led to instability in the past. The construction of landscapes of high quality agriculture, the elimination of natural landscapes with beautiful spectacles, the destruction of valuable historic textures, the social imbalance, the expansion of the informal market, various environmental pollution, urban disturbances, the need for attention.As Meshkini et al. (2012) mentioned, according to the provisions of Agenda 21, urban development should only be achieved within existing urban areas and areas, so the European Commission (2015) and the United Nations (2011) A new pattern of urbanization called urban anthropogenic development is emphasized for sustainable urban development. Urban Domestic Development is one of the three urban development policies that accompanies two integrated or continuous urban development policies (the creation of towns and cities within the formal boundaries of the city) and the developmental or unconstrained urban development policy the creation of cities The new approach is far from the mother city. This approach, as Mohammadi and Zwaribidgoli (2009) mentioned, has several comparative advantages over the other two policies, since internal development can meet many needs, such as urban population overflow settlements and promotion of per capita Urban services. In countries such as USA, UK, Canada, urban development plans are based on sustainability principles, including compact development, mixed use, full use of existing infrastructure, diversified transportation systems, revitalization and strengthening of cultural and artistic centers. Open space and the development of parks (Rafatyan et al. 2009).Unlike other urban development policies, urban development, in spite of the fact that it is located in the city, with the presence of residents, citizens and neighboring units, is a complex, multifaceted, interdisciplinary, and even flawless subject, which not only is a physical activity, Physical and urban, but also has a strong social, cultural, economic and environmental dimension. Inhabited and abandoned urban areas are being used, inappropriate and disproportionate uses of urban life such as prisons, military garrisons, factories and intruder industries in the city are being rectified. The level of passages and access networks, the level of green space and so on is closer to urban standards. In fact, the development of urban inland means refurbishing and rebuilding the tissues and rearranging the body of the city (Mohammadi and Zavareh Bidgoli, 2009). In general, it can be said that urban development, especially in comparison with the scattered growth of the suburbs, has many benefits, thus it can reduce urban sprawl, support urban open spaces, revitalize and revitalize urban centers and neighborhoods. One of the most important benefits of urban development is the development of public transportation and walking networks, housing improvements, and infrastructure costs reduction.in this regard, the aim of this study is to measure the spatial analysis of internal development zones in Isfahan metropolitan area 3.

2. Background Research

According to the above, urban development is of particular importance in most urban development approaches. In the Perspective of Iran 1404, the benefit of the Iranian society to the favorable environment and the general policies of the system in the area of urbanization, land and housing on the restoration of the renovation and improvement of historical, old and worn-out textures for the development of cities, preventing development Marginalization, etc. However, comparing the average population density per hectare of gross in large cities of Iran with the average cities of the world, there is a significant difference, and this indicator is very low in Iranian cities (Ayni and Ardestani, 2009).

In this regard, the 3rd district of Isfahan with a population of 10,9968 people is located on the eastern axis of Chaharbagh and north of Zayanderrood River. Historical, religious and commercial texts are the most important features of the third region of Isfahan. Imam Square and its four valuable elements, Chahar Bagh; The historical axis of the city and its magnificent school are only some of the historical heritage of Isfahan in the 3rd district, which depicts the image of old Isfahan in the eyes of tourists. There are 320 mosques in this area; in each region of the area, historic mosques can be seen, each of which plays an important role in attracting tourists. 27,000 shops operating in this region of Isfahan have a decisive role in the economy of Isfahan. The worn out texture is often referred to as another feature of area 3. 25% of the area is an endemic texture; in Isfahan region 3, there are 300 ha of eroded texture and 200 ha of non-approved worn texture, which totally covers 500 hectares of the area of 1,200 hectares. There are 110,000 citizens living in this area. The focus of the administrative centers, historical markets and commercial centers, tourist centers and historical buildings, tombs and Imam Zadehs, seminaries and religious scholars' offices and scientific centers of this region into a specific region with special characteristics Has changed. Indeed, District 3 covers a large part of the city's historical texture. The region has a lot of commercial centers, with around 20,000 square meters of commercial texture in Zone 3, according to which the population of the region is twice as large as the population of its inhabitants. In the cultural area, this area is one of the most important cultural centers in the city with its mosques and cultural centers. (Isfahan Urban Development and Architecture Department, 2015).

However, the three metropolitan areas of Isfahan, in spatial and functional areas, face challenges such as the vastness of historic fossils, low passageways, the lack of access and uneven distribution of urban services, maladaptive use and lack of use Complex, lack of proper drainage network and sewage system, which requires serious attention of urban managers and planners. Therefore, this study by examining different physical, economic, social and environmental indicators (Occupational variables) and endogenous development as a dependent variable, are after answering to the main question whether the inward development approach Urban can improve the spatial and cultural performance of the three metropolitan areas of Isfahan in order to improve the quality of life and achieve sustainable urban development? Various studies have been conducted on the internal development, which is followed by the most important foreign Research.

- Anderson (2005), in a study entitled "The Development of Challenges and Opportunities", explores the inner development of the city, and the obstacles and opportunities ahead in its realization. In this study, he looked at the development trend of Truckee Meadows in the period 1990-2001 and its impact on the natural environment around it, while outlining the development of the interior as the opposite of the horizontal development of the city; the various types of definitions provided by the inner development of the city; by Organizations and individuals (15 definitions).

- Wallis (2008) explores the internal development capacities in the study entitled "Evaluation of internal development as an antithesis against urban dispersion in metropolitan area Detroit". By studying the history and growth of the Detroit area from 1950 onwards, the author of this study, introducing the benefits, and challenges ahead, to the development of the inner city, introduces smart growth as a new perspective on US urban development policies. Is. In the context of this view, in order to cope with urban dispersal and urban suburban control, the city's inner development as one of the city's smart growth policies is emphasized. In this policy (internal development), with the direction of development towards eroded and degraded lands, while increasing urban densities, lush lands and natural capital around the city are also preserved.

- Zhou (2009), in a study entitled "Urban Development Based Smart City Development", compares the basics and strategies of sparse growth and smart city development. With the study of the city of Lanzhou in northeastern China and the study of the city's growth, especially since the 90's, the author evaluated the consequences and dispersed urban growth outcomes, such as: City development deviation from the map projected in the city's master plan; The use of land for urban construction, land use change and the reduction of green spaces in the countryside of cities and suburbs of cities and land grabs on land and agricultural levels in this part of the city. The author concludes that in the framework of smart growth, the solution can be solved by solving such problems by: 1) developing the city as a multicenter; 2) eliminating the horizontal development of the city by creating constraints Law 3) restrictions on the provision of services in these areas, and 4) the protection of natural open spaces and ecosystems around the city has addressed urban sprawl problems.

- Bethesney (2010), in a research entitled "Capacity for substitution (transfer) of land investment in housing, in the city of Gaborone, Botswana, is a necessity for smart growth policies and homes" Explores the scattered growth of the Gaborone city in Botswana, Africa. The author of this study, by expressing the rapid growth of the city of Gaborone in the last three decades of the 20th century with a growth rate of 37.3% per year, addresses the issue of urban sprawl and the collapse of the city's physical system, especially in housing provision. Is. In this regard, the author analyzes the growth of intelligent as the opposite of urban dispersal growth to study the power of smart growth in housing production for all segments of society and the reduction of urban land prices. At the end of the paper, the author classified his proposals into three main parts: (1) the removal of land and property transactions at the city level; (2) creating a context for increasing the density of the city; and (3) providing subsidies (Financial incentives) to high levels; believes that by relying on the concept of intelligent growth and internal development, it is possible to transfer capital in the land sector to the housing sector, while confronting scattered growth and stockpiles The earth has solved the problem of housing shortages and the cost of land.

- McConnell & Willie (2010), in an article entitled "Intermediate Development: Economic Perspectives and Planning", examined the role of intermediate growth in urban development. The results of the present study show that despite the high level of discussion with regard to intermediate growth, there is little information about the impact of policies on intermediate development and its impact on suburban communities. This article also presents different perspectives on measuring intermediate growth and evidence of the extent of the expansion of the incidence occurring in relation to other developments.

- Chris Scylledt (2011), in a research entitled "Strategies for sustainable internal housing", outlines the costs and benefits of internal housing. Due to the availability of infrastructure and public services in the inner reaches of the cities, new constructions have been encouraged in these areas. In this regard, he has been exploring the areas of San Jose city.

-Jake Wagman and Alison Mitro (2011), in a paper titled "Secondary Units and Urban Development: An Ancillary Study", generally outline intermediate development, and, in part, secondary units (Small-scale units built within the inner city).

- The Ministry of Infrastructure, Energy and Resources (2013), in a study called "Intermediate Development in Hubart the Bigger", outlined the necessity, importance, concept and benefits of intrinsic development and barriers and supply strategies (site identification, feasibility Development, planning and evaluation of development, infrastructure provision, financing development and construction costs) and demand (population growth, economic growth, population changes, price, comfort and life cycle, welfare, safety and design) Housing Internalized on Hubart.

- The Denver Central Council (2014), in a research paper titled "Development and Redeployment Challenges," states that intermediary development locations are somewhere.

3. The concept of internal development

The cost of a city associated with building more housing is doubling. First, initial construction costs or infrastructure upgrades to service new housing; this may include building new roads, upgrading water and wastewater capacity in the area, and building new welfare facilities. Second, cities pay more for most of the current public services in the region, including police, firefighters, parks and libraries. Also, these current costs include the operation and maintenance of roads, sewage and other infrastructures. Therefore, internal development can have many advantages for cities in terms of capacity in existing infrastructures and in terms of space efficiency to reduce initial and current costs (Schildt, 2011). An internal development means the development of new housing or other buildings on a piece of vacant land dispersed in the area. Open development means defining or replacing the use of existing structures or land that has lost its past prosperity, including conservation or rehabilitation of any structure (Listokin et al. 2007). According to Joseph et al. (2007), internal development will foster mixed income communities and help reduce poverty by promoting security and attracting new urban services to the neighborhood (Wegmann & Nemirow, 2011). Tony Biddle et al. (2006) described internal development as "urban consolidation, housing with moderate density, redevelopment, or high development." In other words, "more compact use of land for residential development in urban areas. Such development can be in the form of medium and high density apartments, urban houses (row houses) and villa units. In general, urban consolidation refers to the expansion of existing urban areas and the development of inner urban areas that are either empty or under exploitation "(Biddle et al, 2006: 2). An intermediate increase in development has many advantages that are compared with the development of the suburbs of "green lands": it can reduce dispersion, protect from open spaces, refurbish and recreate the central regions of cities and distressed and historic neighborhoods, create community-based, community-based transport, and improve the imbalance between the workplace and the local area, reduce infrastructure costs. And offers residents a wide variety of housing options. It is not surprising, however, that the main faces of internal development are intelligent growth experts, sustainable development, and neo-conservative agendas. However, implementation of internal development is very difficult due to the existence of various issues, such as neighborhood disputes, localization standards, parking regulations, financing requirements, the need to clean brownfield land and high production costs. (Wheeler, 2001).

4. Materials and Methods

The research objectives are the type of applied research-development and its method is descriptive-analytical and is in the field of library-field studies in terms of information access. The most important variables of research include life expectancy (10 to 1, 20 to 11, 30 to 21, 31 years and more), marginalization (less than 50 meters, between 150-50, 300-300, 500 meters up), The quality of the building (solid, under construction, repairable, demolished and ruinous), demolished and ruined lands (demolished and ruined lands, other lands), transportation centers (access to the main routes 20-0, 50-20, Residential, commercial, tourism, office, sports, recreation, green space, social services, educational, industrial, cultural, municipal facilities, office services, religious services, transportation, Therapeutic, ambulatory and unused). The network analysis model (ANP) has been used to identify the capacities in the 3rd district of Isfahan. It has many stages, including "problem definition, network hierarchy structure, the integration of the theories, the creation of pairwise matrix matrices (pairs of pairs) Compatibility test, calculation of super matrices and choice of optimal options. " The Getis-Ord statistic is based on spatial accumulation, so it can deepen analysis to detect spatial clusters around each region i without affecting the variable value in region i. The Getis-Ord statistic is calculated as follows (Mahdanezhad, 2015):

$$G_i^* = \frac{\sum_{j=1}^{n} w_{ij} x_j - \bar{X} \sum_{j=1}^{n} w_{ij}}{S \sqrt{\frac{\left[n \sum_{j=1}^{n} w_{ij}^2 - \left(\sum_{j=1}^{n} w_{ij} \right)^2 \right]}{n-1}}}$$

In which the Getis-Ord index for Polynomial, S is the standard deviation of the values for the studied regions and other parameters according to the Moran index. The positive value for this statistic indicates that clustering of high values and negative values indicates that clusters of low values (Mahdanezhad, 2015). The mean of the nearest neighbor is based on measuring the distance between single users and their closest neighbors, and it is useful in determining the convergence and divergence of different user types. The nearest neighbor is calculated based on the average distance from each user to the nearest neighbor. The closest neighbor's index is expressed as the ratio of the average observed distance to the expected distance. The expected gap in this method is obtained as a result of the Z-analysis. If there is between 1.96 and 1.96, there is no significant difference between the observed distribution and the random distribution, otherwise the distribution will be cumulative or even. This index is obtained from the following equation:

$$AAN = \frac{\overline{DO}}{\overline{DE}}$$

Where DO is the distance between each of the indicators to the nearest neighbor obtained from the following equation:

$$\overline{De} = \frac{0.5}{\sqrt{\frac{n}{a}}}$$

In the previous equation, DE is equal to the distance between the index I and its closest neighbor, n is equal to the total number of indices and a is equal to the total area studied (Mohammadi Hamidi et al. 2016).

5. Results

The 3rd metropolitan area of Isfahan (Figure 1) is one of the densely populated areas of Isfahan in terms of population density. According to the population of 2011, the average urban population density in the region is 9723 inhabitants per square kilometer, which shows a higher density of population in the region than the corresponding average in the city of Isfahan (5801 people per square kilometer). From the area of 3,133 hectares, the textured area of the area is 2892.7 hectares and 20.22 hectares of non-historical texture Isfahan urban planning and architecture department, 117:

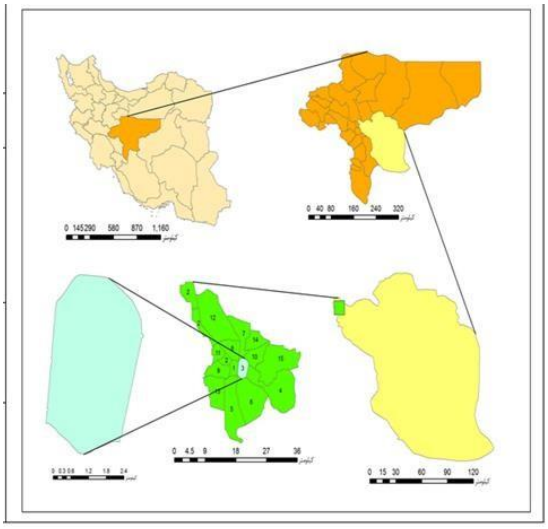

Figure (1): Position of study area (Behmanesh,2016)

6. Discussion

According to the provisions of Agenda 21, urban development should only be achieved within existing urban areas and areas, so the European Commission (2015) and the United Nations (2011) A new pattern of urbanization called urban anthropogenic development is emphasized for sustainable urban development. Urban Domestic Development is one of the three urban development policies that accompanies two integrated or continuous urban development policies (the creation of towns and cities within the formal boundaries of the city) and the developmental or unconstrained urban development policy the creation of cities The new approach is far from the mother city.Determine the appropriate zones for internal development in the region:

After identifying effective measures for locating and identifying their weight, these information layers should be combined with an appropriate method. The combination of maps is obtained from the overlapping of weighted maps. Combining and combining different layers of space from different sources together is the primary goal of GIS projects and its unique feature, in order to identify the interaction effects of description and analysis with the help of predictive models, and A solid foundation for decision-makers. In this research, each user of Area 3 was divided into 5 categories and based on the opinion of 30 elites and experts, and in order to calculate the final weights, the average of experts' opinion was used. Firstly, the level of influence and importance of each The layers of user inputs in the ANP dynastic process were prioritized according to the opinion of experts including university professors, elites, and municipal experts. Thus, each of the criteria was weighted with values from 1 to 9. After weighing, we must normalize the weights. Table (1) shows the calculated weights for each user. After obtaining the importance of each option with respect to single factors, it turns into the combination of the obtained weight and the determination of priorities. At this stage, relative weights of each of the factors were combined with the relative weights of each of the options obtained using the Raster Calculator function, and the mean of them was taken. The resulting number actually indicates what region has the highest priority for urban extension, in fact, the less the score is, the more priority it will be (Table 1 and Figure Number 2).

Table (1): Indicator weight using ANP model(Behmanesh,2016)

weight	Layer
25	User Neighborhood
21	The quality of the building
18	Building life
12	Mindfulness
15	Access to the way 15
9	Desert and Rural Areas 9

Figure (2): Land status for the development of urban enrichment in Isfahan region (Behmanesh,2016)

Spatial Analysis of Proper Developmental Areas in Region 3:

The results of the ANP model indicate that recyclable lands in Isfahan area 3 have significant potential for housing. In Isfahan, there is a significant level of deteriorated land. The Network Analysis (ANP) calculations have well captured the areas and priorities available for internal development (Figure 3). Based on this, a high priority area with an intervention area of about 97 hectares, equal to 35.11% of the total area of the area, has a high priority area with an area of about 91 hectares, equal to 27.57% of the total area of the area The low and very small intervention zones have an area of about 430 hectares, equal to 50.41% of the total area of the area. Based on the calculations, an area of about 188 hectares from the texture of the 3rd district of Isfahan is a high priority for restoration, renovation and intervention, which is about 23% of the area of this region. Considering the high percentage of users in the category of people in need and with high and high capacity for intervention, one can conclude that the 3rd district of Isfahan has the potential for population and development.

Figure (3): Intervention Priority Areas for Inner Development in District 3 of Isfahan(Behmanesh,2016)

Therefore, with the analysis and the results obtained from the network analysis models, 852 hectares of full text, about 188 hectares have priority for intervention and renovation in the direction of future settlement and population and regeneration in this area, which is in the opinion of Having a household size of 3.3 people, in households in Isfahan, can receive (74361) people who are considered to have high and very high intervention priorities (Figure 4). According to the construction regulations in the worn-out tissues approved by the Ministry of Road and Urban Development of Iran's Municipal Civil and Improvement Company, the dividing limit of residential units (in the medium density zone) is 200 square meters. According to these criteria, in units of 200 to 250 meters, and according to the characteristics of the study area, the number of floors is considered 3. Therefore, with the following calculations only in high and very high priority zones, we can at least obtain population residency in these tissues.
Land plots of 7511 = 250 m 2 and 188 hectares
Residential unit 22533 = 3 floors × 7511 pieces
Population 74361 = Residential unit 22533 × 3/3
Average household size By comparing above the existing population of the whole range and the capacities in the priority intervention zones, it can be concluded that the worn-out tissues of the third Isfahan region are not only a socio-economic and physical threat, Cities are not counted, but they can be converted from the potential to the actual state by adopting a supportive-extension approach.

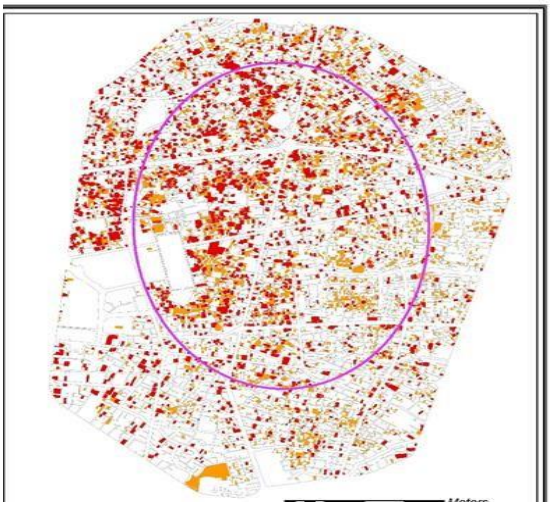

Figure (4): Zone status of the 3rd district of Isfahan in order to develop the intrinsic Behmanesh,2016)

Geographic objectivity test of vulnerable zones of high priority intervention and high intervention in the 3rd district of Isfahan have been used from the nearest neighbor's index. Based on the analysis of the nearest nearest neighbor method, the distribution pattern of the domains with the highest priority intervention and the highest intervention has a z-scoer score of 20.85 and p-value with a score of 0.000 indicating a fully clustered distribution model These lands are at a level of 99%. The results are shown in Figure 5.

Accordingly, in this section, the Getis-Ord model is used to identify areas of the third region that have the highest priority of intervention. The Hotspot analysis clearly shows the areas with priority of intervention at the level of Isfahan region 3, with the highest priority in the northern and central parts of the cluster. Also, low priority clusters are seen in the southern part of the region, which confirms the results of the average indicator of the nearest neighbor.

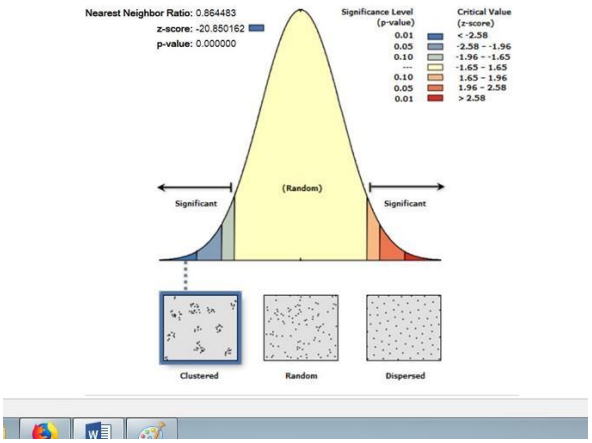

Figure (5): Distribution of Priority Areas in the City of Isfahan Behmanesh,2016))

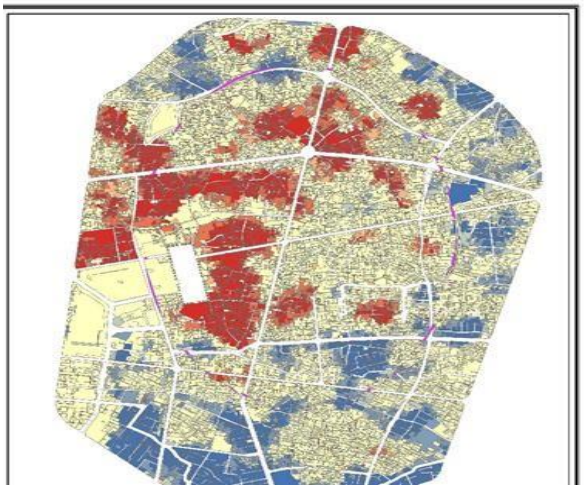

Figure (6): Desirable and desirable clusters according to the intervention in the truncated tissues of Isfahan region Behmanesh,2016)

7. Conclusion

6/313 hectares of textured area of area 3 belong to the worn texture, which is 2892.7 hectares of historical texture and 20.22 hectares of non-historic worn texture. 8% of the total area of 3 metropolises of Isfahan (about 2555 pieces) lacked access to the cockpit. 34% of the passage width is less than 6 meters. Meanwhile, the results of the ANP model indicate that the indicators of the life of the building, the quality of the building and the microhardness do not have a proper situation in the area of the 3rd district of Isfahan; large areas of Isfahan 3 area are devoted to Bayer and Chavriyeh lands. The northern and central parts of the region are in a good position in terms of neighborhoods of users. In general, certain parts of Zone 3 have internal development capability (20% of its total area). Hence, the implementation of intermediary development will flourish the deteriorated texture of Zone 3, as well as its exclusion from isolation. Also, the economic boom and the increase in municipality revenue is another consequence of this. Because in the present situation a set of factors such as severe exhaustion of texture in area 3, lack of proper and rapid access to the environment and environmental pollutants, cause investors to be reluctant to attract capital to the region. However, due to the development of intermediaries and the improvement of the transit network, removal of physical barriers and elimination of pollutants, the possibility of attracting private sector capital

increases. Moreover, due to lack of incentives for renovation, restoration, lack of adequate income and low level of general income in the region, the level of municipal revenues is very low. In the case of municipality development, you can earn a lot of revenue because there are a lot of business users in the region.

8. Suggestions

• Establishing facilitating offices to use appropriate incentive facilities for sustainable restoration of worn out homes and guidance and recreational guidance;
• Establish pocket parks and green spaces to provide leisure and recreational spaces in the 3rd metropolitan area of Isfahan;
• Enhance readability and achieve a range with aesthetic values of the Ledawa;
• Identification and potential of the region to attract investors;
• To grant technical and engineering assistance free of charge or to provide some of the cost to the government and the municipality;
• Ensuring adequate access to the inside of the cavalry and linking the passageways;
• Establishing a hierarchy of urban signs; order and continuity on the edges;
• Construction of automated and classical car parks in area 3;
• Holding workshops for the relative promotion of the expertise and skill of the inhabitants of the worn out tissue;
• Design and construction of a sewage disposal system at the level 3 of Isfahan metropolis;
• Strengthening the formal networks of familiarity and social capital through the expansion of cultural and public spaces.
• Creation of special tourist routes based on renovation of valuable buildings, wiring and flooring;
• Definition of a specific pedestrian crossing at Zone 3 level;
• Reopening impervious passages and building development projects;
• Creation of cultural resources such as culture, public libraries, cultural-artistic complexes, cinema, theater, exhibitions, etc.
• Determine the ownership of the property of the unclean al-Malik, the heirs, the endowments and ... and expedite the registration of the property.

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Persian

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