The Modeling of Locating Method in Regenerating Urban Distressed Areas (Case Study: Zeynabiyeh Area in Isfahan)

Masoud Shafiei Dastjerdi
M.Sc. in Architecture, Instructor in the Department of Architecture, Dolat Abad Branch, Islamic Azad University, Isfahan, Iran
Peyman Moradiyan Borujeni*
M.Sc. in Urban Planning, Urbanization Department, Faculty of Art and Architecture, Tarbiyat Modarres University, Tehran, Iran

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Abstract: Urban regeneration is a comprehensive plan preparing the ground for sustainable improvement in economic, physical, social, and environmental condition in a city. Locating urban regeneration projects is one of the most important steps of the plan. The result of the negligence is failure in the implementation of projects or the imposition of financial, social, and cultural damages to cities. The current study intends to verify the hypothesis that following complex, multi-dimensions, and particularly presented models in this paper are considerably more effective on locating projects through presenting an exact locating model and measuring its accuracy in the case study. 13 criteria and 32 sub-criteria of economic, social, physical, environmental, and administrative information have been simultaneously used in locating process in the proposed model. Compatibility Coefficient for the importance of options in AHP model has been calculated and verified by utilizing GIS instrument. Data were collected from the case study by field method to locate the projects. The results show that there is a direct and significant relation between the place of projects and socio-economic variables in the environment.

Keywords: decay, regeneration, prioritization, AHP, Zeynabiyeh area in Isfahan
JEL Classification: N95, R10, C10, R00

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* Corresponding Author: Moradianp@gmail.com

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1- Introduction

Today, urban regeneration is a global issue and having an effective urban regeneration has widely changed into one of the most important strategies for all the cities in the world wanting to stop horizontal and wide development and create internal and condensed development (E.Leary & McCarthy, 2013). Considering remained areas from urban development, an important part of them is called distressed areas in our country, and solving underdevelopment problem is the most important problem facing all cities in the world and particularly developing countries and urban regeneration is considered as a part of solution to compensate the underdevelopment as well. Urban regeneration as a comprehensive and integrated interpretation of urban development and restoration is a flow that considers all aspects and restrictions of development in the center of the city and on the other hand it provides the opportunity to change into an instrument or solution for achieving to the development (Lotfi, 2007).

The modern framework of urban regeneration theory is the result of developments in the last century in the fields of internal development theories of cities, urban restoration, revival of historic places, the experiences of rehabilitation theories, reconstruction, renovation, redevelopment, and etc. It emphasizes on social, economic, cultural, and artistic considerations (Pourahmad et.al, 2010). The background of urban regeneration goes back to at least one hundred years ago. It was very popular especially in Modernism era and responding to the issues arisen from physical and functional decay and its consequences in cities, but they were a good example for failure of modernism thoughts (Habibi & Maqsudi, 2005). According to the studies about the evolution of opinions, the content of the actions and economic results of internal development and restoration of European and American cities plans have been done in the recent decades. Modern features consider urban regeneration plans as integration in solutions, comprehensive approach, emphasizing on public participation in projects, and utilizing supports and local and public institutions' movements (Roberts & Sykes, 2000). Therefore, preparing and implementing an urban regeneration plan needs a holistic and comprehensive approach and considering extensive and complex issues related to urban distressed areas.

On the other hand, the area of urban distressed context is to the extent that it is impossible to implement urban regeneration projects at the context level socially, economically, and administratively. According to the estimation in 2010, rehabilitation and renovation of all distressed areas in the country needs 6500 billion Rials credit and the government cannot provide it (Heshmati et.al, 2010). Therefore, areas with priority are always selected as the main arena of implementing projects in designing regeneration projects. Accuracy, functionality, and also the effectiveness of regeneration projects on the process of renovating the entire range depend on locating the projects greatly.

Although the definition and locating the projects helping regeneration in the urban regeneration theory needs a comprehensive and holistic approach, access to this approach in the analysis will not be possible but through the use of comprehensive analytical models. Generally, lack of using these models leads to a unilateralism (mostly by focusing on physical issues) in the definition of urban regeneration projects. Therefore, it is necessary to use an analytical model that can combine different information layers simultaneously on the basis of specific logic and consistent with the purposes of an urban regeneration plan and present a final out put (Roberts & Sykes, 2000). The purpose of this research is to present such analytical model.

Isfahan, as the third populated city in Iran, needs to regenerate many urban areas. The approved extent of urban distressed area is 2157 hectares. In the past years, the lowest rate of renovated buildings in urban distressed areas in this city devoted to Isfahan Municipality, district 14, Zeynabiyeh area in the case study. It has distressed area with the background of informal settlement facing severe shortage of urban basic services (the per capita of services is about 0.1 of the standard). There is a severe weakness in the access network and it has a residential density of more than 150 people in a hectare (Isfahan Municipality, 2013). Testing proposed model in such areas will be a desired solution for generalizing research findings to other less complicated models. It is difficult to select a place for implementing urban regeneration projects because of the complexity of socio-economic and physical condition in the case study and it creates a conflicting situation for designing the plan. Thus, the main question of this research is about the manner of forming comprehensive locating model for urban regeneration projects and the hypothesis is based on the formation of a hierarchy model from multilateral criteria. Analytic Hierarchy Process (AHP) is a strong tool for applying qualitative and quantitative criteria in urban development simultaneously. AHP has flexibility, simplicity for calculations, and possibility for final ranking (Zebardast, 2005). According to the access to the tools such as GIS which leads to facilitate the project and considerable decrease in cost and time in spatial analysis, and it also enables multi-variable place evaluation, the suggested analytical model is presented in a form of AHP.

The important result of this research is modeling the process of comprehensive multi-criteria locating for prioritizing and selecting urban distressed blocks in order to implement urban regeneration projects in GIS software. Generally, there were three to five main criteria of locating model and selecting blocks needing regeneration in previous researches which tended to one of the dimensions of decay issue such as economic or prioritization and participation, but 14 important criteria from 6 main dimensions of decay issue (economic, social, physical, environmental, historical, and administrative) were considered simultaneously in this research. Also, a combination of sub-criteria was used for discovering each criterion.

Accuracy in explaining sub-criteria and changing all of the criteria to space information are the features of this research.

2. Literature Review

Due to the very wide range of renovation and regeneration of urban distressed areas, the focus of this research is on examining those research projects in which the issue of locating and prioritization of urban renovation and regeneration has been accomplished. This is because first, suggested modeling method to be reviewed and then, applied variables to be identified again and the method of calculating their scores to be extracted. The shortcomings of previously suggested models were effective on completing theoretical model.

Table1. Previous researches about Modeling of Locating or prioritization of distressed areas

Researcher(s)	Subject	Indices	Results
Ahadnejad et.al. 2012	The study of social physical indices of housing in determining poor blocks (case study: Kermanshah)	The average of family's dimension, population density in residential unit, per capita of net residential and 6 other density indices	Choosing areas only based on physical/dimension criteria
Shams & Rashidi 2011	The assessment of sustainability indices in urban distressed area in Asadabad by using inharmonious coefficient Mauritius	Physical (building's floors, material, age, area) Economic (revenue, number of room(s0 for families, the type of property, the facilities of residential unit, activity status) Social (household density in residential unit, education, age, migration) Environmental (garbage disposal/ sewage disposal/ how to go to work)	Prioritization of areas based on Mauritius coefficient (rank compare ranges in each index) and ignoring important coefficient relative to another
Baqeriyan 2010	Recognition of renovation capabilities in distressed areas based on the qualities of the society and space (case study: Tehran, district 17, neighborhood19)	Social and spatial indices: social system, sub-culture, Tribal language combinations, social coherence, the value of the environment and residence, The homogeneity in the areas of housing and residence, Physical integrity	Choosing areas based on physical/ demographic criteria
Ziyari et.al 2012	Prioritizing immunization of distressed area in Karaj Metropolis using multi-criteria assessment model	Social, physical, environmental indices in the context of the hierarchical tree separated into 8 sub-indices	Prioritization of areas regardless of product, product process and its value (economic factor)
Sharifzadegan et.al. 2011	Determining the type of renovation priority with urban decline using factor analysis model and Boolean logic (case study: Tehran, district 15)	Physical variables (occupancy levels of building, net density of population, The percentage of total surface permeable pathways, small scale and renovation background) Social variables (the average of family's dimension, the average gender ratio) Economic variables (the internal rate of Return)	Prioritization of areas based on physical, demographic, and economic criteria
Ebrahimzadeh & Maleki 2012	An analysis on organizing urban distressed areas (case study: Khorram Abad)	Prioritization based on combination of indices, demands and context's problems: 15 indices, physical demand:10 indices, social problem and 10 economic problems	Prioritization of areas, ambiguity in the impact of measures and the manner of their assessment

Source: (Researcher's' studies)

3- Theoretical Principles

Urban Regeneration

Urban reconstruction can be divided into three main periods irrespective of numerous historical and theoretical details. These three ones are called reconstruction, renewal, and regeneration (Lotfi, 2007). Cities struggled mainly for renovating the destruction of World War II in 1950s; it was urban rehabilitation (Habibi and Maqsoudi, 2005). What is called urbanization in contrast to the urban renewal refers to governmental renovation policies in 1960s and 1970s which generally includes goals such as recognizing public (social) houses and promoting urban services in an area (Cowan, 2005), but new and replaced policies have been called urban regeneration since 1990s. Literally, regeneration means producing appropriate identification with modern living conditions (Habibi and Maqsudi, 2005), but conceptually, urban regeneration refers to a kind of renovation and rehabilitation of urban areas. It has gradual, quiet, but effective and physically positive changes as their goal; in addition they follow the revival processes in economic, social, and physical decline in an urban area that free market and its forces cannot revive it (Cowan, 2005). This view to reconstruction is a response against novel issues such as globalization, structural changes, and spatial imbalances arising from wide growth of cities. Regeneration emphasizes especially on local scale, cultural diversity, and interaction between human being and his place for life (Hajipour, 2007).

Therefore, urban regeneration includes a comprehensive, coherent plans and a set of influential measures in solving urban issues preparing the ground for sustainable improvement in economic, physical, social, and environmental condition of distressed area (Roberts & Sykes, 2000). The main instrument of this approach is involving in urban areas, regeneration and renovation in physical aspect (restoration and risk management), and in social aspect (empowering city community) (Ziyari et.al, 2012). This theory has presented a new form of urban regeneration emphasizing on concepts such as sustainability, public participation, and local government. The famous report of the Working Group specifies the quality of a good urban regeneration project in the following points: designing, economic power, social welfare, and good governance (Cowan, 2005).

It also seems that one of the theoretical principles in the issue of urban regeneration is based on the precise understanding of "urban decay" problem. The theory is to solve it. Basically, the need for urban renewal projects is proposed when a long period of urban decay governs on the neighborhoods of cities (Roberts & Sykes, 2000). In fact, urban decay, spatial focus of environmental, physical, economic, and social problems appear in high levels of poverty and pollution in the environment. However, each of urban experts present a different definition for urban decay according to their views and each of them explains one of the economic, social, environmental, or physical factors as an

important one in creating urban decay (Sharifzadegan et.al., 2011).

Urban Regeneration Policies

Main policies of regeneration project can be divided into two categories (Nasiri, 2013):

1- Categorization of policies according to the level, scale, and the context of intervention

2- Categorization of policies according to the problems of distressed area

Policies relevant to the problems of distressed areas in this study include:

1- Physical renewal policies: the main purpose of this policy is making distressed areas attractive for people who do not have another alternative. Improving physical quality, variations in the size and type of housing, surrounding barren and abandoned lands, facilitating retail, shopping and leisure, transferring incompatible land uses, and some others are the most important measures of physical regeneration (Rahnama, 2009).

2- Environmental regeneration policies: This approach emphasizes especially on the sustainability of environment resources. It is accomplished by creating sustainability in different dimensions of urban system. The method of achieving to the sustainability include: 1- Sustainable housing 2- The form of sustainable city 3- Sustainable transport 4- Sustainable economy (Rahnama, 2010).

3- Social regeneration policies: These policies try to involve residents in local affairs and stabilize the population. The goal of such policies is transforming some population features and new experiences in the area. Civic and professional training are one of the important aspects of social regeneration policies (Tallon, 2010).

4- Economic regeneration policies: Achieving to a sustainable economy is considered as undeniable necessity for exiting from decline cycle. Economic initiatives have an important role in stimulating economic development. Economic regeneration policies include: helping residents for access to work, changing residents' skills according to the markets' need, overcoming difficulties of job search such as self-confidence, transport problems, childcare, etc. (Tallon, 2010).

The purposes of urban regeneration

Following principles should be considered for defining an urban regeneration project: 1. it should be based on an exact analysis of area condition 2. It should be targeted for improving environmental, physical, social, and economic condition of areas simultaneously 3. Suggested plan should follow the principles of urban sustainability 4. It should have clear, fully applicable and economically feasible goals 5. It should take advantage of human, environment, and infrastructure resources 6. It should be based on ideas to attract the maximum participation of beneficiaries and influential people (Roberts & Sykes, 2000). Table two describes the goals of urban regeneration theory.

Table2. The goals of urban regeneration projects

Dimensions	Researchers		
	Duties	Tallon (2010)	Roberts & Sykes, (2000)
A) Economic	Public-private participation	Increasing competitive capability of places	Attracting investment
	Preserving jobs and enhance employment prospects	Retail Revival	Creating job opportunities
	Attracting organizational capital	Special areas of business promotion	Public-private participation
B) Social	Job skills training	Administration and Local Government	Improving social conditions
	Promoting local companies	Shared urban social network	Empowering local society
		Community involvement	Improving local participation
		Enriching areas	Improving residence capacity
		Urban cultural areas	
C) Physical	Integrated spatial Master Plan	Development of areas	Land structure reform
	Increasing public transport	Compact and dense city	Improving the quality of buildings
	Increasing local transport (walking and cycling)	Improving the quality of buildings	Improving urban infrastructures
	Creating local housing zones	Gated communities	Improving moving and transport system
D) Environmental	design-centered projects	Urban sustainability	Improving urban perspective
	Improving urban landscape	Increasing urban green spaces	Improving environment quality
E) Other Dimensions	Compliance Owners' conditions	The revival of urban centers	
	Twenty-five-year plans	Increasing urban tourism	

Source: (Urban Task Forces, 1999), (Roberts & Sykes, 2000), (Tallon, 2010).

4- Research Method

Library and field survey methods were used in order to collect required data. The main tool in this survey was questionnaire. On the other hand, indexes were identified and ranked by using the model of expert participatory planning (Delphi). Obtained results were included the framework of AHP and final analysis was presented by organizing in GES. The main used analytical method is AHP. It is one of the assessment methods which begin with identifying and prioritizing decision elements. These elements include goal, criteria or features, and probable options and as one of the known multipurpose decision-making models for complex condition which have multiple and conflicting measurement instrument. It is a flexible yet capable instrument (Qodsipour, 2002). This analytical process first was proposed by Thomas L. Saaty in 1980 and it was used greatly in urban development science in the place-selecting process (Zebardast, 2005). This model has four main steps: 1-making

hierarchy model of criteria 2- Determining the importance coefficient criteria and sub-criteria 3- Determining the importance coefficient of options 4- Determining prioritization; calculating Consistency Ratio (CR).

One of the merits of AHP is calculating the amounts easily and fast while using Extension software of AHP on GIS is ensuring the accuracy of specified importance coefficients in binary matrix indices.

Sampling Method

Ordered random sampling method was used in order to distribute the questionnaires (in 2013) and it was selected equal to the total number of buildings located in the areas. Sample size was estimated by using Cochran formula. P and q are available quality ratio of the population. Since the attributes are more than one and their ratio are not available, 0.5 can be considered that variance to be reached to their maximum.

$$n = \frac{t^2 pqN}{d^2(N-1)+t^2 pq} = 203$$

N = population = 986

n = sample volume = 203

Forming Hierarchy Model of Indices

According to the collected theoretical principles and reviewing previous studies of hierarchy model, the indices were formed and selected sub-criteria were specified in table 3 for explaining each criterion.

Table 3- Identified variables and sub-variables for determining the value of urban regeneration project

Dimensions	Variables		Sub-Variables
Economic	A1	Economic value of land and space	the price of land and house (+), current pattern of construction (+)
	A2	Economic ability of residents	properties and saving (+), assets' recognition(+)
	A3	Economic efficiency of renovation	renovation IRR (+)
Social	B1	Residents' social capital	social trust (+), belonging to place and neighborhood(+)
	B2	The possibility of residents' participation	willingness to engage residents(+), the rate of owners' residence(+)
	B3	The possibility of social improving and enriching	household dimension (-), household in residential unit (+)
physical	C1	The degree or level of decay	instability of buildings(+),impermeability of area(+), small scale in the area(+)
	C2	The impact on long-term revival of neighborhoods	being in the important bottlenecks of access to the area (+) / important perspective of the neighborhood (+)
	C3	The ability to increase density	density residential (-), the level of occupation (-), building density (-)
Environmental	D1	The rate of environment pollution	the accumulation of waste / construction waste (+)
	D2	Unpleasant environment	ugly face of buildings (+)
Administrative	E1	Formation Background	the initial core of rural backgrounds or auto residence (+)
	F1	The simplicity of implementation and ownership issues	inheritance issues of the property (-)

Source: (researchers' findings, 2013)

Determining Importance Coefficient of Criteria and Sub-Criteria

Any of the criteria, sub-criteria with each other, and matrices of importance coefficient were formed by using binary comparison. These matrices were sent to seven active experts in the field of urban distressed areas and their opinions were used to determine importance coefficients. Finally, suggested coefficients were modified and the weight of indices were calculated with the help of corrective methods and obtaining results consistency matrix of criteria. Tables4 and 5 show importance coefficients.

Table 4- Binary weights of variables in GIS Software

	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	E1	F1
A1	1	3	1	1	1	3	1	3	3	7	5	3	3
A2	0.33	1	3	3	3	1	3	1	1	0.33	0.33	1	1
A3	1	0.33	1	1	1	3	1	3	3	9	9	3	3
B1	1	0.33	1	1	1	0.33	1	0.33	0.33	0.11	0.11	0.33	0.33
B2	1	0.33	1	1	1	3	1	3	3	9	9	3	3
B3	0.33	1	0.33	3	0.33	1	3	1	1	0.33	0.33	1	1
C1	1	0.33	1	1	1	0.33	1	3	3	9	9	3	3
C2	0.33	1	0.33	3	0.33	1	0.33	1	1	0.33	0.33	1	1
C3	0.33	1	0.33	3	0.33	1	0.33	1	1	3	3	1	1
D1	0.143	3	0.11	9	0.11	3	0.11	3	0.33	1	1	3	3
D2	0.2	3	0.11	9	0.11	3	0.11	3	0.33	1	1	0.33	0.33
E1	0.33	1	0.33	3	0.33	1	0.33	1	1	0.33	3	1	3
F1	0.33	1	0.33	3	0.33	1	0.33	1	1	0.33	3	0.33	3

Source: researchers' studies (2013)

Table5. The importance of the main criteria based on weight of binary variables extracted from the process of calculation

	Value	Weight		Value	Weight		Value	Weight
A1	economic value of land and houses	0.1242	B3	The possibility of increasing value	0.0524	D2	Environmental homeliness	0/0579
A2	Residents' economic abilities	0.0901	C1	Level / degree of distressed area	0.1244	E1	Formation Background	0/0477
A3	Economic efficiency of renovation	0.1319	C2	The effect on long-term regeneration of neighborhoods	0.0346	F1	Ease of implementation	0/0415
B1	Residents' social capital	0.0359	C3	Ability to increase in density	0.0535			
B2	The possibility of residents' participation	0.1319	D1	The amount of environmental pollution	0.0721			

Source: researchers' studies (2013)

Weight and importance of each sub-variable of each main variable are listed in table 6. Variables of A3; economic efficiency, B2; the possibility of residents' participation, D1; the amount of environmental pollution, D2; environmental homeliness, E1; formation background, and F1; ease of implementation have been calculated directly without sub-variable.

Table 6- Binary importance and the results of calculating the weight of each sub-variable related to variables in study

weight	A-1-2	A-1-1	**A-2: residents' economic power**
0.33	0.5	1	A-2-1 assets and savings
0.67	1	2	A-2-2 the amount of property formality
weight	B-3-2	B-3-1	**B-3: possibility of enriching**
0.25	0.33	1	B-3-1household dimension
0.75	1	3	B-3-2household in residential unit
weight	C-2-2	C-2-1	**C-2: effectiveness in restoration of neighborhoods**
0.8	4	1	C-2-1being in important access
0.2	1	0.25	C-2-2 being in the important view
weight	C-3-2	C-3-1	**C-3: ability to increase density**
0.5	4	1	C-3-1 Building Density
0.5	1	0.25	C-3-2 Residential density

weight	A-1-2	A-1-1	**A-1: The economic value of land and space**
0.33	0.5	1	A-1-1 The price of land and housing
0.67	1	2	A-1-2 Construction patterns

weight	B-1-3	B-1-2	B-1-1	**B-1: residents' social capital**
0.63	5	3	1	B-1-1 willingness to residents' participation
0.12	0.2	1	0.33	B-1-2 belonging to place and neighborhood
0.25	1	5	0.2	B-1-3 rate of migration

weight		C-1-2	C-1-1	**C-1: rate/amount of decay**
0.5		1	1	C-1-1small units
0.5		1	1	C-1-2 building's instability

Source: (Researchers' studies, 2013)

5- Research Findings

Introducing the Studied Area

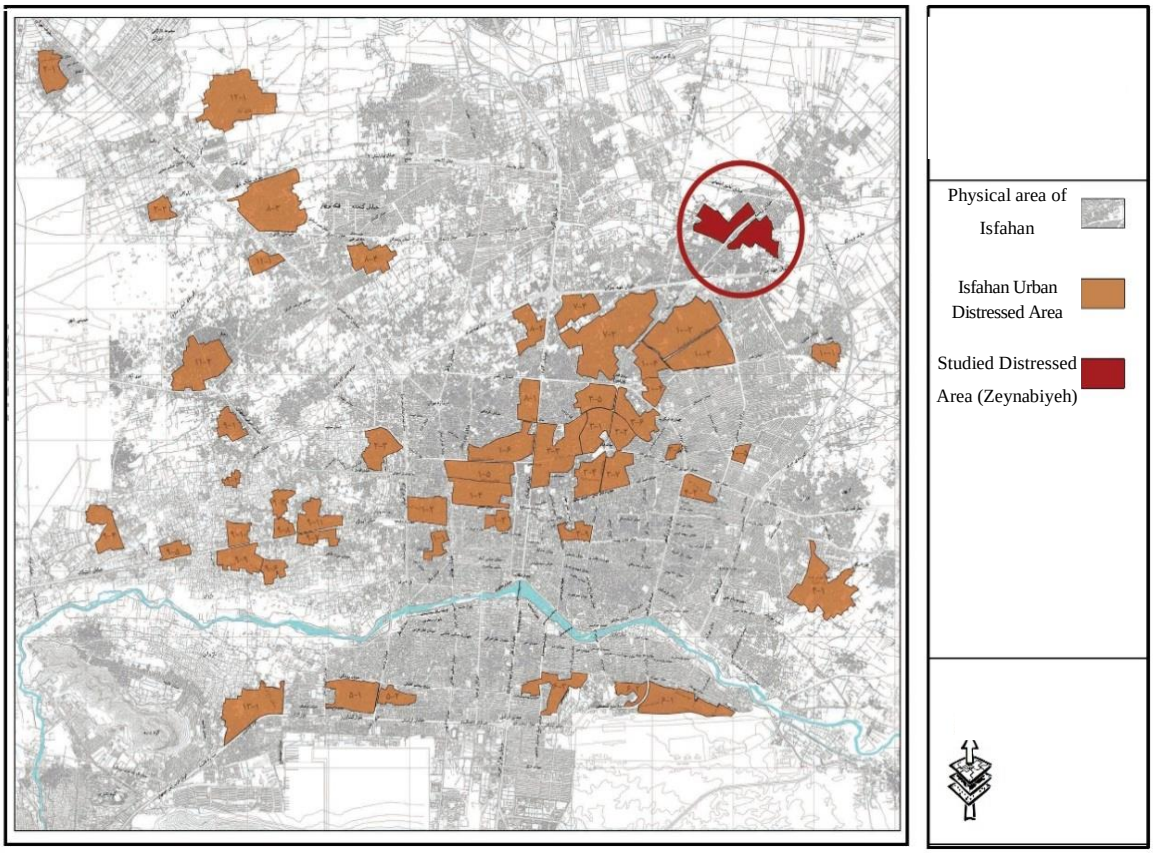
The distressed area of Zeynabiyeh neighborhood is located in a very especial situation in Isfahan. It is in the north-east of Isfahan and in district 14 (map1). It has very especial social context despite its large population. Distressed area reform index has been 0.9, 1.023, and 1.087 in 2009, 2010, and 2011 respectively in Isfahan while 17, 1, and 7 license were issued in Zeynabiyeh neighborhood during these years respectively. Only 0.54 percent of all issued licenses have been devoted to this area. The index of distressed area reform has been one-third of the average of whole the city.

Developments and the Emergence of Zeynabiyeh Area

Marginal small villages and old shrines are the primary residential core in the case study. According to the available information, it can be said that Zeynabiyeh area has been involved in massive construction and population growth because of migration to Isfahan especially during 1940s and 1980s (Design and architecture, 2009).

Extremely Old Blocks or Areas with Renovation Priority

Some areas are called "area with renovation priority" in organizing plan of distressed area in Zeynabiyeh neighborhood. These areas are the result of an analysis about the condition of the environment by advisor engineers of design and architecture in Zeynabiyeh neighborhood and they have been verified by working committee of Article 5 commission in Isfahan Province and afterwards, they would be fundamentals for planning and prioritizing. It should be noted that buildings need much more attention for renovating in these areas and they have a better socio-economic condition.



Map 1- The area of approved distressed contexts in Isfahan and the location of Zeynabiyeh
Source: (Isfahan Municipality, 2013)

Cognitive information are shown from different aspects of residential context in the field study in table 7 and functional situation in extremely distressed blocks has been shown in map 2.

Table 7- Cognitive information of different aspects of studied residential area

Housing	Traffic	Economic	Social	Demographic
The average of residential infrastructure of area equals 84.7 square meter	Only 18% of the area is streets and urban spaces	The price average of per square meter in residential building in the area is 460 thousand Tomans and near the main street is about 1 million Tomans	50 percent of people are willing to leave the area	Total population 26336 people
The number of existing housing units: 5457	46% without the possibility of marginal parking places		The migration rate in the range of 1996 to 2006 equals 19%	Gross population density, 288 people per hectare
The models of existing villa are 1 or one and half floor.	67% of the places have less than 6 km width		65% of households have lived 10 years and are more.	Gross density of people per hectare 488 people per hectare
The percentage of leased housing units: 22%	The penetration average is 24 percent (as defined by the index of permeability is at least 32%)	Monthly average of household's expenditure in 2012 is about 4660 thousand Rials	Immigrants: 56% of Isfahan, Chaharmahal Bakhtiari 13% Afghanistan 15%, other 16%	Population growth rate of 2.2 in 1996-2006
Percent of households willing to renovate their homes: 62%				
Families tend to participate in renovate projects: 33%		About 30 percent of properties has deeds		the rate of households in housing units equals 1.2

Source: (researchers' findings from design and architecture, 2013)

Map 2- the position of land use in extremely distressed blocks needing urban regeneration
Source: (Design and architecture, 2009)

Determining the Importance of Options

Based on the obtained data from collected questionnaires in the case study, the lowest, the highest, and the average of each sub-variable have been determined. According to the L. Saaty's theory, the necessity to provide the possibility of numerical calculations on sub-variables in the process of forming a hierarchy model is including sub-variables in equal rating forms. In this regard, it has been tried to categorize the data in five options so that the average number of each sub-variable places in the middle category and carried out classification covers greatly the information derived from the questionnaires. For example, the options were categorized in three groups with points from 1 to 3 according to the obtained average of the number official document presented in blocks (38 percent in average) in investigating sub-variable of the formality degree of ownership documents (A-2-2) in the area.

Score3 belongs to blocks with 50 percent and mostly with official deed, score2 to blocks with 25 to 50 percent rate, and score1 to the blocks with 0 to 25 percent rate of properties with deeds (table 8).

Table 8- Determining the importance of options related to each sub-variable

A-1-1 housing price (square meter)		A-1-2 construction pattern		A-2-1 assets and savings		A-2-2 the amount of property formality		A-3 Economic efficiency of renovation		B-1-1 willingness to residents' participation	
3: 1000 Tomans and more	46	3: apartment	18	3: 100 million Tomans and more	41	3: 50 percent and more	167	2: 50 percent and more	203	3: score 12 and more	147
2: 500 to 1000 Tomans	66	2: one or two residential units	181	2: 50 to 100 million Tomans	86	2: 25 to 50 percent	25	1: 0 to 50 percent	0	2: 6 to 12	56
1: to 500 Tomans	91	1: building poor buildings	4	1: to 50 million Tomans	76	1: to 25 percent	10			1: 0 to 6	0
B-1-2 belonging to the place		**B-1-3 the rate of migration**		**B- the possibility of residents' participation**		**B-3-1 household dimension**		**B-3-2 household in residential unit**		**C-1-1 small unit (square meter)**	
3:Interested more than 60 percent	20	3: 25 to 50 percent	198	3: high	81	4:0to 3	10	2: 1 to 1.2	152	4:0 to 25%more than 100	5
2:Interested 30 to 60 percent	147	2: 50 to 75 percent immigrants	5	2: average	81	3: 3 to 4	81	1: 1.2 to 1.4	51	3: 25 to 50% more than 100	0
1: interested to 30 percent	36	1: more than 75 percent	0	1: low	41	2: 4 to 5	107			2: 50 to 75 percent more than 100	30
						1: 5 and more	5			1: 75 to 100% more than 100	167
C-1-2 instability of the buildings (quality average of the building)		**C-2-1 being in important location of access**		**C-2-2 being in important view of the neighborhood**		**C-3-1 residential density (density average)**		**C-3-2 residential density**		**D-1 :The accumulation of waste**	
4: 0 to 1 stable	15	3: main and urban bottleneck	15	3: completely subject to be seen	102	3: to 60%	102	3: to 90%	87	2: without the problem of waste accumulation	188
3: 1 to 2 fairly stable	0	2: local bottleneck	157	2: fairly subject to be seen	102	2: 60% to 120%	76	2: 90 to 95%	98	1: with the problem of waste accumulation	15
2: 2 to 3 fairly instable	15	1: not being in the bottleneck	30	1: very slight to be seen	0	1: 120% and more	25	1: 95 to 100%	18		
1: 1 and more fully instable	173										
D-2: unattractive view of the building		**E-1: background and age of the building**		**F-1 : inheritance issues of the property**							
3: indifferent	15	3: more than 40 years	43	2: with	114						
2: unattractive	112	2: between 20 to 40 years	123	1: without heir	89						
1: very unattractive	76	1: less than 20 years	37								

Source: (Researches' findings)

Calculating Final Score of Each Block in GIS Software

1- Forming information layers for each project on the basis of subset of variables: first step is entering the information relevant to each project on the basis of specified sub variables based on the options of table4.

2- Forming the maps related to the information layers of each sub-criterion: each layer of sub-criteria changes into a Raster in this step. Raster shows the information related to each index based on their information inside the layers as a variety of ratings on the map.

3- Combining the indices of variables' sub-set and forming discrete

variables: Considering that each criterion is built of a number of sub-criterions, information about all sub-criterions is combined with each other. The software calculates the weight of the indexes and combines them together according to the assessment matrix of layers' combination entered to it. Map 3 shows a sample of formed information layers (residents' social capital) in GIS software.

Map 3- Information layer of social capital around the projects from the least to the most
Source: (Researches' findings)

4- Forming assessment matrix of final AHP: The final step is forming binary comparison matrix of all criteria. For this purpose, classification of all the main criteria in accordance with the above procedure was carried out. Accordingly, the final map of the scores of different blocks was obtained. Obtained scores in the final classification were divided into five priority areas. Map 4 shows the final ranking.

Looking at the results of the site selection model in the study area, we can say that there is a significant difference between obtained result and primary or experimental conclusions. For instance, the importance of connecting regeneration projects to lifelines and urban spaces in area is evident so that projects of P-5 to P7 indices which have been selected in place selection of regeneration projects are in the proximity of the most important

area (Zeinabiyeh Street), but there are a number of blocks with the condition of similar proximity with the most important area (Zeynabiyeh Street) which are away from main selected priority such as projects with P-11 and P-18 indices.

6- Conclusions and Suggestion

In this research, it has been tried to design a model of comprehensive place selection for choosing areas which require urban regeneration; therefore, three main steps have been done. The goals of the theory were extracted in the first step. They have been divided in a form of AHP into 13 criteria and 32 sub-criteria in five economic, social, physical, environmental, and administrative aspects. The Weight or the coefficient of mentioned criteria and sub-criteria were calculated and the CR of weights was determined by complementary AHP and GIS software in the second step. According to the calculations, CR equals 0.3113 and as a result the weights are verified based on L. Saaty's theory. According to the findings, the most influential sub-criteria include: the average of internal return on investment in the project weighting 0.1319, residents' participation weighing 0.1319, and the rate of physical decay of a block weighing 0.1244. In fact, obtained results of the survey from the experts were an important part of the process and verification of the initial hypothesis for weighting place indices of an urban regeneration project so that three important indices with high weights (economic and social indices, and an average of physical decay in a block) are indices that are not measurable based on prejudgment and obtaining an average from their situation in each block need exact statistical analysis; therefore, simplistic process of place selection will be different from this model.

In the third step, 42 distressed urban blocks were ranked by analyzing questionnaires and putting them on a hierarchy model and the best blocks were determined for urban regeneration. Blocks rankings were specified for urban regeneration in Zeynabiyeh area by using suggested place-selection model. The most important findings include: Choosing four blocks as main priorities which specified at the corner of Zeynabiyeh Street and the intersection of Batan and Shahpasand Streets with P-6 and P-8 indices. These blocks have always obtained scores more than average in terms of main social, economic, and physical criteria. Although they were not top priority, they have devoted the highest score and rank to themselves and they surpassed from other similar blocks in overall assessment process. Looking at the results of implementation of the model with case study and comparing to the simplistic process of place selecting, there are some evident contradictions. For instance, all blocks adjacent to the main artery of studied area have equal value for urban regeneration in simplistic method while the suggested model calculates a different priority for these blocks. Therefore, the main hypothesis of the research based on lack of efficiency of simplistic process common in place selection of projects and determining priorities is approved. In this regard, using complicated and more accurate

models particularly presented in this article will decrease possibility of mistake, its consequences, and financial, social, and environmental damages in the block recognition for urban renewal.

According to the theoretical findings of research, it is obvious that socio-economic goals have priority in urban regeneration theory. It means that the greatest benefit should be considered for beneficiaries, owners, residents, and users of space as a result of created development. These goals are evident in the results of this research and final selected places. For example, implementing urban regeneration project in adjacent blocks of the most important social and natural space, this is one of the old rivers in Isfahan, can create social goals such as promoting social interaction level in the area, satisfaction level from living in a place, and finally the identity of the residents more than other places. Undoubtedly, regenerating urban distressed areas in Iran needs the implementation of different projects in order to improve environmental, economic, and social situation. Implementation of these projects will not be possible without people's participation (whether land owners or developers and investors). Thus, it is suggested multi-sectoral and multi-dimensional look to be existed when designing urban regeneration projects to all residents, managers and urban developers will accompany the project. Therefore, it is recommended to all designers to analyze coherently and comprehensively distressed areas by utilizing multi-dimensional measurement models. Undoubtedly, the result of this process will be followed by the improvement of achieving projects because of observing economic and environmental participation indices simultaneously.

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