

## Identify of Priority Areas of Old Texture Case Study: Zone 7 of Isfahan with Using the Incorporation Application of AHP & GIS

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### ABSTRACT

Undoubtedly, old texture is one of the most important challenges facing the cities especially major metropolitan cities in recent decades and is a major concern urban management, hence, policy makers, urban planners and managers have to consider to it. It follows issue in Iran particularly of the last few years in Isfahan also, from one side the tissues of Isfahan compound with historical aspects that are able to attract tourists and their income. It has plenty significant on the other side of the earthquake in Iran and management in any field requires a proper understanding of subject on the other hand it has been the subject of utility planning and management in each field to friends it is due to desirable to analyze the situation suitable in conclusion, it seems that the identification tissue classification of rekindling old priorities such contexts is the main problem it is an urban revival. The main objective of this study was to identify and prioritize the tissue to the restoration and renovation of the old district 7, in order to strengthen the foundations and theoretical foundations, necessary investigations by studying documents related done in this research, and to identify and prioritize the restoration and renovation of old texture of Isfahan district 7, according to the standard criteria such life impermeability and instability are considered for each of these criteria, the following criteria have been considered in order to achieve the desired information in relation to each of the following criteria, the database of the municipality see seven of the region. It required to perform the analysis of the model used AHP and the final results hierarchy combination is used as AHP and GIS

**KEYWORDS:** old texture, the region 7 of Isfahan, AHP, GIS

### 1- INTRODUCTION

City during time became development are so called the height and become wisdom and taken to the interaction with citizens so from should be sought fact that the roots of aging and wear and sloth city of residence symbols. From point of view engineering old tissue of are tissues are include structures with insufficient strength should be their destruction, and instead of making them more rigid structures. But from viewing the sociological this structures are built for man, social relationships between the components of more complex structures of human knowledge than the diameter of the rebar in the previous and the next structures; renewing relationships that lead urban management tools may not be available basically, it was not possible in the short term. Although the point are worn structures the tissue and buildings, but human relationships are definitely strong, sustainable in fact everything in the new city context is in relation to raw human society, unstable and fragmented, in contrast with the old tissue and the effects are more we face intertwined and increasing of human interaction. Consequently, with regard to what has lapsed, old tissue and restore the old context should be a priority for urban management and the fact that analysis of the current situation old texture classification and identification of priorities for renewing tissues such as base old tissue regeneration is worn in this study how the process investigated operation approach.

#### Research purposes

- Priorities for old texture of the Region 7 of Isfahan in order to restoration and renovation - Carry out Practical case for suitability analysis in Arc GIS software
- Integrated application geographic information system, GIS, and hierarchical analyses model AHP

Importance and urgency of the issue: Undoubtedly old texture is one of the most important challenges of most cities and in particular the metropolis during the past decades and urban management is a major concern, hence, policy makers, urban planners and managers have to consider, the issue of Iran and in particular in the last few years followed in Isfahan. Also, due to the tissues of the old city with historical aspects that are capable of attracting tourists and their income, these tissues are of great importance on the other side of the earthquake in Iran as in any field of knowledge management however, it is precisely the issue of the appropriateness of planning and management in each field to display the desired data subject and situation dependent, so it seems, how to identify and prioritize the restoration of the old tissues of these

tissues is your main problem in the revival of these urban. Approximately % 01 of old areas of the country are in Isfahan the city with more than % 01 of the rusty old texture

2 thousand 211 hectares of urban areas are in the context of aging and old approximately 0111 hectares forming historical context. In addition, under article 070 of the law prescribes 5 years annually, 01% of urban tissue is restored the figure of over Isfahan 221 hectares per year. now the 55 spots in distressed areas and areas of 00 districts, which are now 551 thousand people live in these areas that have been identified to now. In the area of 7 Isfahan hectares of old texture with 70/255 Isfahan ranked sixth in terms of the extent of the area of the old texture in the region. (e port renovation and improvement organization of the city of Isfahan, 2014).

However, the need to reconstruct the secret plans and restore the old context, in it is that these plans are associated with good economic justification. for example, according to the consultants in Isfahan, 011 thousand people lived in old the tissues who is now 551 thousand people has its place as estimate, investment in these tissues is affordable, it is better to related organs instead of giving attention to the development of satellite towns and construction housing seal of such policies, the capacity to provide for the restoration of worn tissues in the heart of the city.

## 2- MATERIALS AND METHODS

### 2-1 - Scope of the study:

The region of the study area is Isfahan 7ragion which is located in the northern city of Isfahan, unlike other cities, north of downtown and south of the so-called interpreted uptown the region has been historically disadvantaged area but the bulk of the apartment building projects, significant growth in the construction of streets, parks and alienation today, this area is considered almost an autonomous region the income and expenditure of the area has his feet. this area has 02 community-based statistics 2006 population was number of households in the 066/596 area and 276,506 households. the area is 0502 area households 255/70 hectares located in distressed areas the gross density of population is 000 ha (statistical yearbook, 2013).

Table 1: The gross density of population in the area of 7 ha segregated neighborhoods				
Density (persons per hectare)	Area (hectare)	Population 2010	Area name	Area Code
117	49	5760	Valiasr Town	701
38	166	6347	Milad Town	702
27	278	7603	Fadak	702
144	123	17762	Kaveh Town	704
108	57	6162	Rahim Abad	705
109	198	21523	Barazandeh	706
128	156	20082	Sheikh Eshragh	707
206	120	24749	Purya Vali	708
118	27	3243	Bab Al Dasht	709
210	63	13243	Molavi	710
222	91	20203	Shahed	711
186	64	11932	Farvardin	712
Source: Statistical Yearbook of Isfahan				

### 2-2-method Research:

The main objective of this study was to identify and prioritize the old texture area to the restoration and renovation of 7, is in order to strengthen the foundations and theoretical foundations, studies have been done by studying the relevant documents. in this context and in order to identify and prioritize to of Isfahan the old 7 district as the restoration and renovation according to the standard criteria such fine granule, impermeability and instability are considered for each of these criteria, the following criteria have been considered in order to obtain the desired information in relation to each of the following criteria, seven of the municipality is a reference to the database. It is used to perform the required analysis of the analytical hierarchy process (AHP), and is used to extract results from the combination of AHP and GIS (guide, 2005).

### 3- Analysis of the data

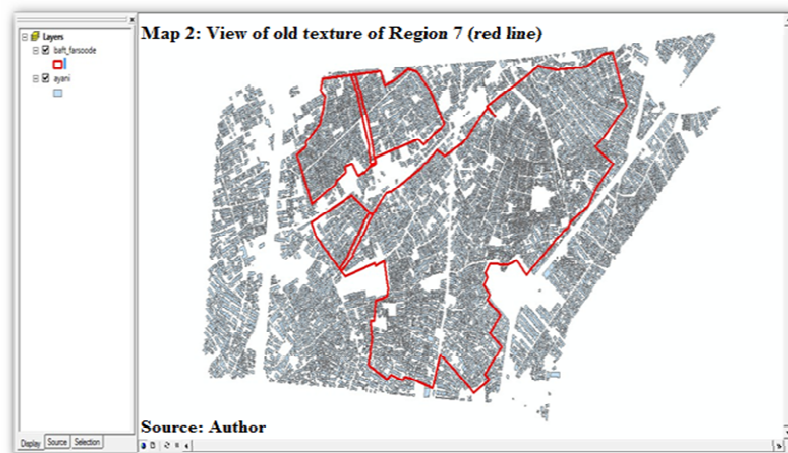
In this study, to analyze the results, The combination of AHP) AHP (along with geographic information system (GIS), is used. model AHP model AHP flexible, powerful and easy to decision making under the conflicting decision criteria, selection of options makes it more difficult, is used. The Multi Criteria Evaluation, beginning in 1991 with "Thomas L. Passion" was proposed and so far has numerous applications in various fields. (Adept, 2005) AHP decision begins with the identification and prioritization of elements.

These elements are: objectives, criteria, Characteristics and possible options.

AHP has five main stages as follows: 1. Establishing a hierarchical structure The coefficient of determination of criteria and sub criteria 3. Determination of Options 4. determine the final score priority Options 5. Adaptation of judgments. Analytical Hierarchy Process AHP is first or subject to a hierarchical structure converts , which the constituent elements of the structure that are considered part of the decision, Is assumed to be independent of each other. The AHP is a serious limitation the interdependencies between elements of the decision and are not considered the dependence criteria and sub options and hierarchical relationships and unilateral decision assumes. this assumption may not be true in some cases In such circumstances it may be the result of A.HP that it is in contrast to the leading ranks. That option may be to remove the results of the rating change options.so we should be careful in using a small A.HP, for all the problems of planning does not have a hierarchical structure.

(Zebar Dast 2009: 19) The major limitation of AHP's cause its pioneer, "Thomas L. clock" method of analytic network process given (ANP )the present and proposed that the complex relationships between and among elements of the decision be considered by replacing the hierarchical structure of the network structure. Using the analytic network process while maintaining all the capabilities of the AHP method, such as simplicity, Flexibility, the simultaneous use of both quantitative and qualitative criteria, examines the adaptation capability and the ability to judge the final rankings Options the serious limitations, Including the lack of consideration interdependencies between elements of hierarchical decision making and assuming that the relationship between the elements and the unilateral, Overcome and an appropriate framework provided for analyzing urban issues. (Adept, 2009: 46)

But doing the calculation is done using the process Network analysis (ANP) is the process longer and more complex, Therefore, in this study due to the simplicity of the calculation method of AHP A.HP) was used to analyze the data. As mentioned to analyze the data obtained in this study and simultaneously extract is used final results of the "GIS G.IS" and the "AHP AHP", Utility analysis steps taken under the pass.



Attributes of zayani **Table 2 displays descriptive information of old texture of Region 7**

FID	Shape	AREA	Jense_mase	mizane_far	ghedmat
304	Polygon	103.872643	2	3	3
305	Polygon	57.967337	2	3	3
306	Polygon	92.775569	3	4	2
307	Polygon	60.530647	3	4	2
308	Polygon	92.246332	3	4	1
309	Polygon	103.752782	3	4	2
310	Polygon	68.754376	2	3	3
311	Polygon	64.116439	2	3	3
312	Polygon	55.311728	2	3	3
313	Polygon	179.924332	2	3	3
314	Polygon	142.225835	2	4	3
315	Polygon	74.621356	2	3	3
316	Polygon	75.52252	2	4	3
317	Polygon	49.191778	2	3	3
318	Polygon	117.540236	2	3	3
319	Polygon	103.226107	2	3	3
320	Polygon	187.114288	3	3	3
321	Polygon	110.643677	2	3	3
322	Polygon	204.958980	3	4	1
323	Polygon	148.542405	2	3	3
324	Polygon	143.676468	2	3	3

Source: Author

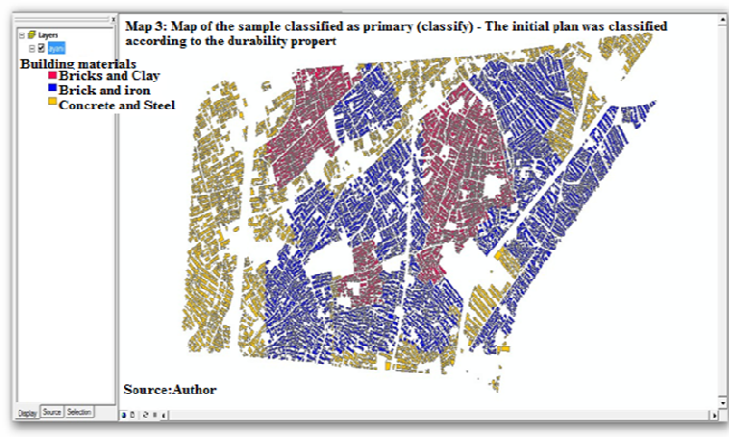
Records: 1 Show: All Selected Records (0 out of 2:800 Selected)

\*\*Codes current explanation are described in the table above description is provided in the table below.

Cod	Old estate	Cod	The rate of frazzle	Cod	Building material
1	Under 5 years	1	Vacant land	1	Brick and mud
2	5-15 years	2	Property useless old	2	Brick and iron
3	15-25 years	3	Can be worn Property	3	Concrete and Steel
4	25-33 year	4	Common property use		
5	33 year to up				

After defining criteria and indicators at the beginning of the Stop the initial plans are classified according to the criteria produced. To do this, go to the following address in Arc GIS maps produced these charges.

Classify done for real extent is quantities (because ordinal index) type classify done for dating grounding - durability grounding- burnout of the categories. this is due to the definition of code for each of the indicators in the database birth for example, all of the property 35 years, 5 had been beneficial in database related code property all have been worn or used 3code.hence categories classify is used.\*\* possibility classify the property back to the ordinal index using quantities there. Classify the last two criteria property and burnout due to their nominal values is possible only by way of categories.



In order to analyze the appropriateness of distressed areas and priorities for reform of old tissue and tissue deterioration, after defining criteria and indicators and basic classification we should scored based on standards and criteria, indicators Because this study was to identify priority areas to the right is the old tissue, thus

A: whatever the size of the property is lower, higher priority is to be worn.

(B) what the property is built using less durable materials, higher priority is to restore tissue.

C: whatever the estate dates back more, higher priority in terms of the old.

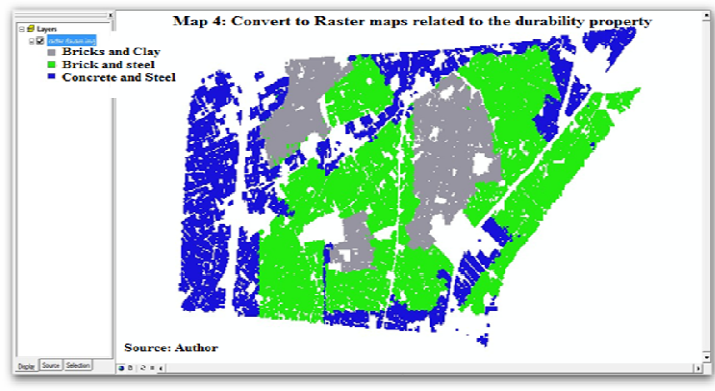
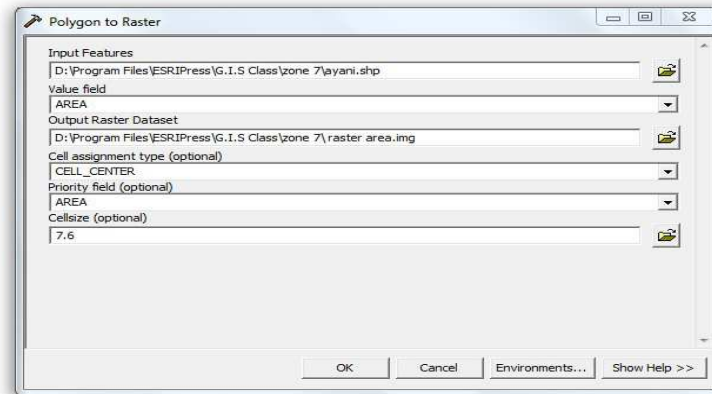
D: The property is more severe exhaustion, have a higher priority to restoration.

\*\* In the debate continues, the second stage of analysis, utility (Scoring values within each of the indicators) of passes.

But before the stage Rating for reclassification, vector and raster maps, the maps should be created before we produce.

To do this, go to the following address in Arc GIS

## Arc Toolbo Conversion Tools To Raster Polygon to Raster



(B) phase Rating to rating inner values

Score	Property area	Score	Old exam	Score	The rate of frazzle	Score	Durability
9	Below 03m	9	35 year to up	9	Vacant land	9	Brick and mud
7	03-123 sq.m.	7	25-35 years	9	Property useless old	5	Brick and iron
4	123-233 m	5	15-25 years	5	Can be worn Property	1	Concrete and Steel
2	233-33m	3	5-15 years	1	Common property use		
1	33 m high	1	Under 5 year				

At this stage, according to the table above lapsed the values within each of the indicators with regard to the same scale ruler, in this study, we ruler rated considered a mark of 1-9, Get a higher score represents the index of more non suitable. ( Because the aim of identifying distressed areas should be considered not suitable ).As previously mentioned, The study aims to identify priority areas to restore the old context, therefore,

A: what is lower the size of the property, higher priority is to be worn.

(B) what is built the property using less durable materials, higher priority to improve its texture.

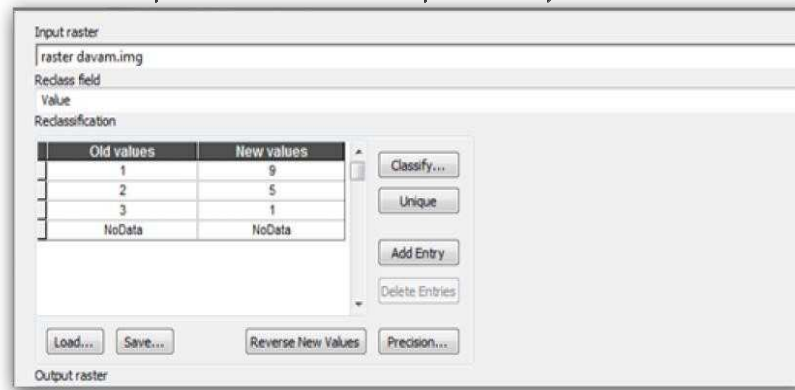
C: what is the estate dates back more, higher priority in terms of the old.

D: what is the property is more severe exhaustion to reform higher priority.

The method of scoring will vary based on above options.

The size of the property is less, the property was built using less durable materials, the estate dates back more ultimately, the property is more severe exhaustion, in terms of value will be the higher score. Then go to the following address in Arc GIS

Arc Toolbox → Spatial Analyst Tools → Reclass → Reclassify



In this environment, the inner values entered the parameters that were previously scoring and new maps separately traditional - sustainable-extent and rate of depreciation of property, we produce and thus the reclassification based on the intrinsic value is done the index. In this environment, according to the box value, old value new, inner values related to indicator in order to Reclassify new value is placed in the box.

(C) phase (Weighting) Determination of criteria ratio At this stage, using AHP model criteria and weighting and the weight of each criterion was obtained for this and to determine, criteria important factor to each of the table, "Thomas clock" is used efficiently.

explained	Definition	score
Two criteria are of equal importance in achieving the goal.	Equal importance	1
Experience shows that in order to do two important criteria for achieving the objective of the j i is slightly higher.	Slightly more important	3
Experience shows that to achieve the goal of i is greater than j.	More important	5
Experience shows that to achieve the goal, the significance of the j i very much.	Much more important	7
Experience shows that to achieve the goal of i to j is absolute.	Absolute importance	9
When there are intermediate positions.	Borderline significance	2,4,6

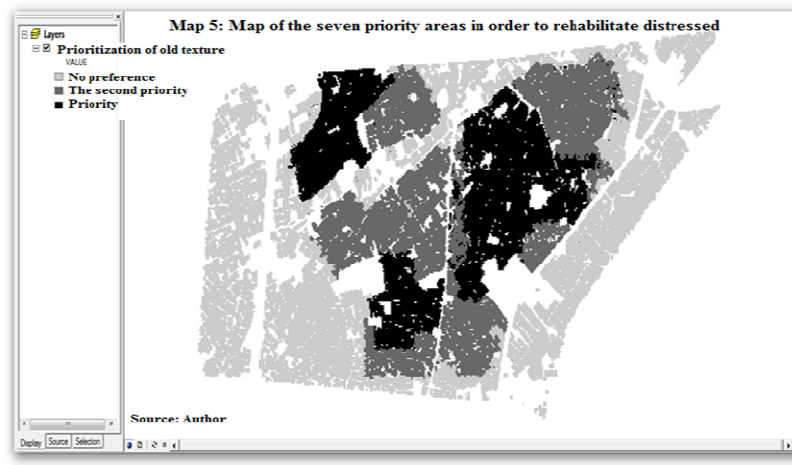
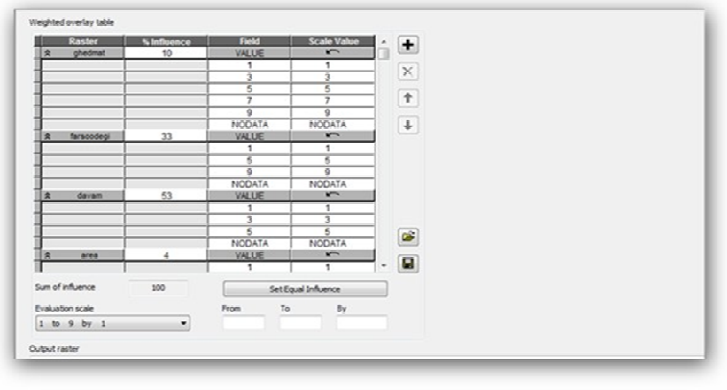
Important factor	Index
$Wa = 4643000$	Property area
$Wb = 4614100$	Old estate
$Wc = 4602500$	Property durability
$Wd = .033015$	The rate of frazzle



D: (overlapping layers step) based on the weight of each criterion which is a separate layer. after determining factor importance ratio of criterions (Go to the following URL Arc GIS Arc Toolbox Spatial Analyst Tools Overlay Weighted Overlay

In this environment, the specified influence% weight for each of the criteria entered thus, the effects of each of the layers of the highest standards in order to achieve the goal. )each criterion = one layer (ie, the weight of the criteria The same can be combined with each other and the final output is exported.

That is, after reclassification by analyzing overlapping layers of weighted according to the weight of each layer effect that the impact on the coefficients of each layer is exported the final output.at this stage, it can be used for analysis and GIS model can be used builder overlapping layers and the final output.



#### 4- Conclusion

The result of integrating application is "Hierarchical analysis model" and "GIS" in order to identify areas prone to revitalize urban characteristics, which indicated that ,First, the model is well managed according to four criteria considered (property - area dating to last property- property- burnout rate ) The nature of aging and consequently it is necessary restoration, Property in the study area is in need of modernization priorities Thus, the aim of the study have been met, The second map shows the prioritization of old texture, Not only property that are the highest priority to restoration and urban renewal, are scattered throughout the neighborhood, But this property in the neighborhood who have limited access to them.

As demonstrated in this study lapsed Projects "utility analysis" is one of the most practical GIS capabilities .For example, it is possible to produce the final output of the process of utility analysis High priority in this project prioritization, Low priority, lack of priority Seven of Isfahan old tissue area to the severity of fatigue and to the restoration and renovation is cause evaluation and for the next programming), such as phased restoration project to be used in performing – costing estimation and time schedule ).

## 5- REFERENCES

- Act of restoration and renovation and rehabilitation support of old structures adopted by the Parliament (2010)
- Contemporary urban Center portal ( 2014), [www.isfahan.ir.nosazi](http://www.isfahan.ir.nosazi) / .1oct.2014
- Guide Mohammad Rahim . (2006), integrating hierarchical application analysis model And GIS to identify the priority areas of development urban centers, Journal of Geography and Programing .number 26, p. 5.
- Statistical Yearbook of Isfahan (2013)
- The electronic portal of the renovation and improvement of the municipality organization (2014)
- Zebardast , Esfandiyar (2009), application urban and regional planning program A.H.P hierarchy. College of beautiful Arts. number 10.
- Zebardast , Esfandiyar (2009), application urban and regional planning program A.H.P hierarchy. College of beautiful Arts the No. 3.
- The strategic document of organizing and empowering the urban poor areas in Iran (2010), sixth edition.
- The parameters determining the physical deterioration of the urban fabric (approved by Supreme Council for Planning and Architecture) (2011).