



Analyzing and Categorizing the Abandoned Urban Lands (Case Study: Sari)

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Abstract: *The land is considered as the most important source among urban resources due to its economic, social, Physical and environmental effects in urban development. The land is the key to all human activities including Housing, urban services and facilities. Optimal and effective use of land resources is one of the important tasks of planners and city administrators. The lands and spaces abandoned during urban development leads to difficulty in managing the city, and inappropriate land planning and management allows for invasion of Green grounds on the outskirts of cities. Meanwhile, old and abandoned and semi-abandoned buildings and empty lands disturbs the environmental order and causes problems such as insecurity and environmental pollution. Many of the abandoned land in cities have become a site for garbage accumulation and construction's waste and rubbish, which endangers the health of citizens. While, in some neighborhoods of the city, we see some useless lands that people in the same neighborhood suffer from lack of sports space, green space, parking, and so on and these useless lands can be used in favor of the people instead of negative feedback. The best suggestion for these lands is to change their usage to the spaces like Parking, green areas and sports fields. This research tries to present the necessary and practical strategies to improve abandoned lands, in addition to analyzing and categorizing these lands in the studied city. In order to achieve this goal, we use the analytical-descriptive research method and collect the data in both documentary and field form. The population includes 91,679 heads of households living in Sari in 2011, which a sample of 374 people was selected based on Cochran formula and also 40 people from the population were assigned to the housing and land experts. Next, given the number of heads of households in different areas of the city, questionnaires were distributed by random systematic method and for distributing the questionnaires among the experts, we used random simple method. The results from testing hypotheses showed that there is an important relation between various factors (Socio-economic, juridical-legal, physical-environmental) and abandoning the lands in Sari.*

Keywords: *land, the city, urban abandoned, Sari city*

INTRODUCTION

The abandoned lands in Mazandaran province is always considered one of the problems of this province and it has economic, social, health and cultural side effects on the city and its citizens and sometimes it endangered the urban security. Failure of owners in cooperating in determining the assignment of these lands is the most important reason for being abandoned and turning them into danger centers. Nowadays, in our country, not only the job, but also the finance and land are important in the production of goods and wealth (Ghadiri A, 2009). Parking areas are the lost areas that have taken the urban core (city center) as a ring. Economically, the land is a good different from others, which is neither produced nor destructed, except in exceptional cases (Doyle W, 1999) neither movable nor we can live without it (Razvian MT, 2002). These features makes the supply and

demand law doesn't work for the land in the same quality that works for other goods. It means that for other commodities, increased demand leads to increase the supply, while increasing the demand for the land will not necessarily means increased supply, because the owners may expect more profits in future market and avoid from supplying and selling the land. From the viewpoint of classic economists, the land as a whole is a valuable natural potential that is also a kind of income. They believed that the land and capital are inseparable (Belching PN, 1985). The Contemporary Economists as Balchin and Jack Harvey have the same view of classic economists about the land. In their view, the land as a physically non-movable commodity has a serious distinct from factors such as labor and capital, but it can be exchanged as a commodity like labor and capital (Harvey J, 1996)

The land as a sort of asset is treated within the framework of private property and can be owned and sold for making money and for personal benefits (Saeed-Nia A, 2003). The land, the largest asset of the city, is the context and center of urban development. The way of owning, using and constructing the urban land in various cities and countries of the world is different and fits to their urban development management system. For instance, in some countries like UK, the land is a public property, but its usage is offered to the citizens. Optimal use of the land in such a way as to ensure economic efficiency, social justice and environmental protection, is a condition of sustainable development of society. Meanwhile, the lands and spaces abandoned during the process of urban development will doubled the problems of urban management. Brown lands (abandoned) are derelict, useless or under the use of commercial or industrial activities, which the potential of activity for their redevelopment has been stopped due to environmental pollution or possibly the previous activities (Usepa, 2005) Clearly, the revitalization and redevelopment of brown (abandoned) lands may provide a range of economic, social and environmental advantageous including restoring environmental quality, improving the quality of citizen's life, removing threats to health, supplying lands for commercial and housing goals, creating employment opportunities, and decreasing the pressure on the urban centers for developing green areas (Nrtee, 2003).

Sari is the largest city in Mazandaran province and its population has been 296417 people in 2011. Over the recent decades, its population growth has been subjected to the population growth fluctuations in the country. In many cities of Iran, especially Sari, physical growth has been faster than population growth and the actual need of the city and it has suffered an irregular horizontal expansion. During the dispersed and irregular development of this city, an important part of urban land with development potential has been left unused and it has been followed by consequences such as urban tropical phenomena, environmental pollution, increased service costs, conflicts in adjacent land use and so on. Traditionally, appropriate use of endowment lands and spaces prevent the irregular and dispersed development of the city, in addition to the inner city development, costs reduction, increased dynamics and vitality of the internal texture of the studied area and so on. Considering the capacity and potential of these spaces for inner development, infill development strategies can be utilized in order to use the land and the spaces mentioned. Sari, as one of the cities in Iran, is dispersed in urban areas and has abandoned lands in different parts of the city. To consider these sites can be one of the main strategies for Sustainable urban development. Thus, we can plan for different neighborhoods in the city by exploring and understanding the neighborhood, using the views of the people and the experiences of abandoned lands in other countries to a suitable future for development. Studying the economic and social and environmental challenges from these lands, we concluded that we can treat them as spaces with urban opportunity by using suitable methods. There are medium abandoned lands in Sari and some strategies and plans should be provided for optimal using, as well as improving the situation of abandoned land. So, one of the basic questions proposed is that what are the economic and social causes for staying some lands abandoned in Sari?

Research hypothesis:

- 1) It seems there is a significant relation between socio-economic features and abandoned lands.
- 2) It seems that legal factors and urban planning laws have a significant effect on Stay abandoned lands in Sari.
- 3) It seems there is a significant relation between physical-environmental features and abandoned lands is Sari.

Research background:

Generally, many researches have been conducted in the field of the research subject (land) within the country. However, not many researches have been done in particular and in relation to the analysis and categorizing of abandoned lands in Iran. Here, we summarize the results from a number of studies conducted in the field of land and abandoned lands.

Arasteh & Azizi (Arasteh M et al, 2010) in a research as "categorizing the abandoned urban spaces and their role in sustainable development and optimal management of urban environment", have studied the abandoned land in the city and concluded that the lands and spaces which are remained abandoned during the process of urban development, have doubled the problems of urban management and inappropriate land planning and management has increased the possibility of invasion of Green grounds on the outskirts of cities. Their findings showed that planning for abandoned spaces in the city has a significant role in sustainable urban development because developing and investing in these lands make the cities of the world one step closer to the smart growth of the cities. Meanwhile, investing in these lands may assist in more implementation of degeneracy projects and re-authentication, especially in worn or historical tissues.

Pourmohammadi & Taghipour (Pourmohammadi MR, 2012) in their research as "recycling urban arid lands" has studied the arid lands in the city and concluded that one of the main duties of urban planners and administrators is to use the land resources desirably and effectively. In this regard, the arid lands are one of the key potential lands used for supplying the needed spaces for public services (green spaces, parking, library and so on) in the scale of neighborhood, district and region, which are often neglected or ignored in the less developed countries. However, Significant parts of the land to be left unused within the city due to legal, economic or environmental reasons and instead large and dense constructions take place in other places.

Rasouli. S. Hassan, et. al., (Rasouli SH et al, 2017) in the research of "studying the infill development in urban endowment lands on the physical development of the city; case study: Sari", the results show that, institutional managerial, physical spatial, social and economic factors are the factors effect on determining the capacity of endowment land development in the areas under study. Among them, the institutional managerial factor with importance efficient has the most effect and the physical spatial factors with the importance efficient has the less effect and economic and social factors each with a given efficient has a negligible effect on measuring the capacity of endowment lands development in the studied area.

Sotomayor (Sotomayor, 2012) in his research as "Power and life-giving to the unconstructed and abandoned spaces", has studied the utilization unused spaces and obtained some results. In 2002, a group of Bike lovers developed a park with a variety of bike routes (Mountain Bike Park, Seattle, USA, 2002) by utilizing unused spaces under five inter-state highways. This abandoned space, crossing the center of the city, was known as a stamping ground for heroin addicts and had destructive effects on the culture. By establishing this park, the culture of biking and sport was injected into this area and positive social interactions has significantly enhanced so that thousands of visitors were just observed in the first phase of establishing this park in a year.

Aneel (Shlono A et al, 2012) in a research as "destroying the cities including the landscape of spatial, urban, environmental and urbanism structures" has studied open spaces. The results they obtained for Indonesia's Bandung urban Landscape between 1991 and 2001 show that the space of this city has increased from 141 to 210 square kilometers, viz., it has been doubled. In this new development, though, the open space ratio from the total city area is decreased, the peripheral development has been high and around 54% of the new development is laid in the suburb, in which 11% of the space is open and left.

Kallber (2013), in a research as "the future position of brown lands", has studied the layout of industrial abandoned land into Lucasarill residential complex in Dresden of Germany and concluded that by the layout of this complex in a large industrial abandoned land in the center of Dresden, despite the low demand for housing in this area of the city, most dwelling units of this complex has been sold before the completion, suggesting the success of this layout in German.

Theoretical foundation of research:

Land and urban land:

On a massive scale, the land is considered as a resource and its usage means the resources usage. In urban scale, the emphasis is laid on the capacity of using the land for establishing various activities, instead of evaluating the land from the perspective of production capacity of the soil or underground mines and the land is divided into groups such as production, distribution, services, housing, entertainment, transportation and other activities of an urban community and its capacity depends on several factors including the place and its situation (Bahraini H, 1998).

Abandoned land and abandoned urban land

An arid and empty land, which is useless and without especial usage and is sometimes remained uncultivated (without the history of recovery and civilization) in one level (Thornton GF et al, 2007).

Abandoned lands are ones affected by the past uses and or the surrounding lands and are abandoned or excessively exploited (Cabernet, 2005).

The arid and empty lands remained useless and abandoned in some parts of the city and the lands remained residue and unconstructed besides the high-rise buildings, as well as lands and margins devoid of people formed beyond the city roads and along the highways (Trancike R, 1986).

These lands have been already developed, and now are abandoned and empty and in some cases are polluted. These lands have no urban performance now, are abandoned or they do not have the performance efficiency (English partnerships, 2006).

The abandoned lands in the city may be inherently or artificially polluted; they are mainly located in developed urban areas and need intervention to return to profitable use (Mashayekh H, 2000).

The need to prevent the abandonment of urban lands

Change in the life and thinking style, the values, the emergence of new schools, and the arrival of new technologies to the life are the factors effecting on the abandonment of urban lands. For instance, the prevalence of economic theory and free market competition are the urban suburbs and segregation of income groups, which is finally effective on increasing arid lands. Looking the land as a good and personal capital and not a public and social commodity and also the weakness of the economic system especially in the case of production has led

to land hoarding and exchanging, which it finally causes to increase the arid lands. Inappropriate use of lands in the city, owning many lands, such as airports and military barracks, as well as being owned many of lands by governmental and semi-governmental agencies and urban regulatory are a barrier to development within the city and this is why the development extends beyond the scope of the law, which itself covers considerable areas and makes new settlements around it (Mashayekh H, 2000). Moreover, taking large compensation from urban lands construction for issuing building permission is one of the reasons for staying lands arid. Being Co-ownership the lands and disagreement in the division of lands, satisfying the partners, and the lack of an official documents ownership for the lands due to the failure to complete the cadastral plan is one of the factors for abandonment of urban lands (Najibzadeh AR, 2003). Inflexibility in urban plans, particularly in comprehensive plans and land-use planning schemas are another reasons (Pourmohammadi, MR et al, 2003) Farther distance between home and work and leisure increases the traffic volumes. In traditional centers of the city, people lost their job and population growth and reduction of income tax are mixed with poor urban quality. In such context, reunification of abandoned sites into economic and spatial structures are one of the most essential elements of sustainable urban development (Rescue, 2004)

Meanwhile, it is a complicated issue to develop abandoned sites. In addition to economic, environmental and social aspects, the abandoned sites are encountered to a wide range of technical and legal developments and different interests of different classes of shareholders such as investors to the land owners, land developers, consultants, academics, and community groups, financial and technological sectors. Thus, restoration of abandoned sites is not only one of the most important challenges but also most complicated challenges ahead for today's urban development and planning (Rescue, 2004)

For designing abandoned lands, there is a table, dividing the designing section into 4 stages with 11 sub-stages. This table is confirmed by the relevant organizations in Europe countries based on the definition of abandoned land in Europe, in particularly in UK.

Table 1- designing and phasing the abandoned land

The first phase: preparation	Second phase: Options	Third phase: designing	Forth phase: delivering the design
1- the beginning	4- evaluating options	6- designing details	9- Financial Evaluation
2- Feasibility study	5- the start of designing	7- planning and legislation	10- Preparation and implementation of work
3- Site evaluation		8- Legal, asset and budget	11- selling and marketing

The source: (Blanchfield L, 2011)

The goals of sustainable development of abandoned lands

Despite of the potential of these lands, many efforts has been conducted during restoration of abandoned areas and various countries with different performances in this part has always tried to progress their sustainable goals on urbanism, as the US Environmental Protection Agency has provided the technical and economic facilities necessary for developing abandoned areas through the approach based on 4 main goals of protecting

human and environment health, sustainable recovery, enhanced partnership and strengthening market. Accordingly, there is a table considering to the sustainable development concept.

Table 2- the goals of sustainable development of urban abandoned lands

Environmental	Minimizing the use of resources Minimizing the air pollution Preserving biodiversity and the natural environment
Social	Considering to suitable local facilities and services in the process of development Housing supply to meet local needs Integrating the development in the site Providing the high-quality and livable environment Enhanced culture of local protecting of cultural heritage
Economic	Business Enhancement and Efficient Competitions Support for diverse local economies Providing employment opportunities

Resource: (Williams et al, 2007)

Table 3- positive and negative effects of arid and abandoned urban lands

Negative effects	Positive effects
1- Getting away from the sustainable urban form (compact city), despite of many arid lands in the city	1- a potential for move towards a sustainable urban form
2- Rise in urban land per capita and after that raising in urban services costs	2- a potential for standardizing various usage per capita, particularly public uses like green space;
3- Health and social problems	3- arid lands as an adventure game model for children in which they build everything come to their minds;
4- decreased value of properties and its surrounding lands	4- an opportunity for better and more appropriate development to re-plan the city and the areas around these lands and a tool for transforming neighborhoods;
5- providing inappropriate view and bad urban furniture for the city	5- a suitable tool for re-planning the city and the areas around these lands considering to the changes in economic, social and physical systems;
6- Negative effects on the economy of the whole country.	6- Creating jobs and tax revenue for cities and the country.

Resource: (Hosseinzadeh K, 1999)

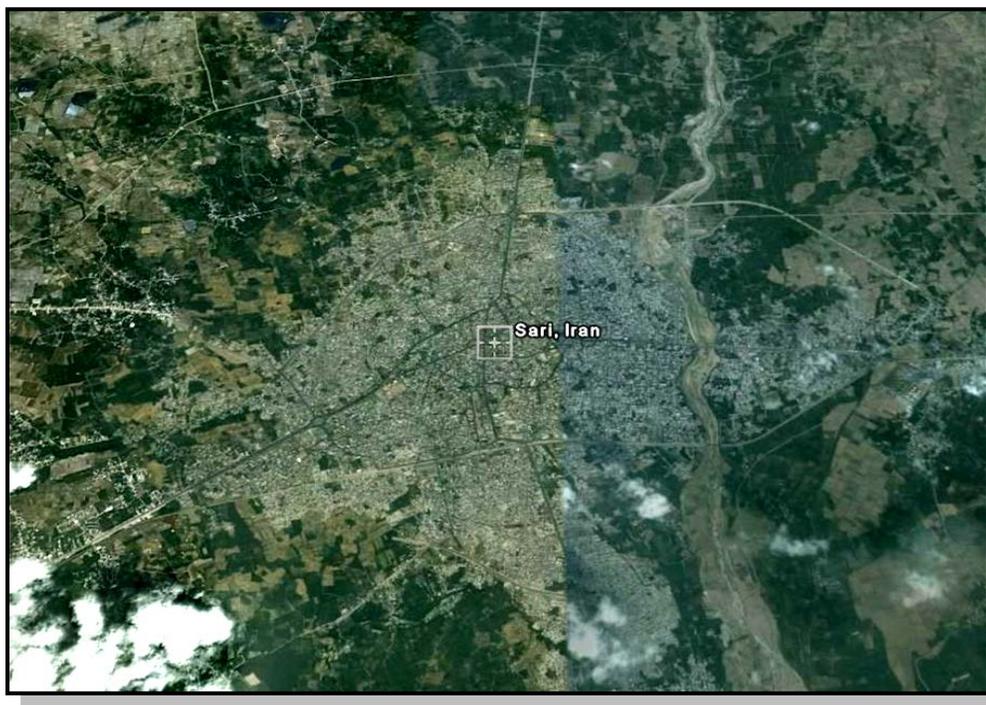
But the recoverable lands in the city include arid and abandoned lands, Worn-out contexts, lands with urban inefficient usage and marginal contexts and urban vehicles. Studying 28 countries, these lands involve a number of 15-20% of the lands inside the city. No doubt, a suitable population could be settled in these lands by proper planning for these lands or to ensure the social welfare threatened due to lack of sufficient facilities.

The arid lands can be an appropriate solution for developing and expanding public usage and services, which may possibly not to exist in a region or neighborhood of the city or there is a shortage of these services relative to the standards and urbanism per capita (Pourmohammadi MR et al, 2016)

Case study area:

Sari is located in the longitude of 52 degrees 56 'to 53 degrees 59' East and latitude 35 degrees and 58' to 36 degrees and 50' north. This city leads from the west to the cities of Joyebar, Ghaemshahr, and Savadkouh and from east to Neka, from the north to the Caspian Sea, and from the south it leads to the Alborz Mountains and Semnan province. The total areas of this city are about 3685.3 square kilometers, comprising of 5 sections, 15 villages, 4 towns and 441 villages with residents. The proper natural condition in this city has caused to increase population growth. Most of the population and human settlements are concentrated in the plain section of this city. Generally, the population of this city in population and housing census was 495,360 people. Of this number, 248013 are male and 247347 are female. Totally, it consisted of 132995 households. Given to the total population, 273972 people live in the city and 221388 live in the village.

Map No. (1) The location of Sari in the region and the feature around it



Source: (Comprehensive Plan, 2015)

Research analysis:

Table 4- one-way nonparametric chi-square test, to review comments of head of householder for the effect of economic factors in increasing the abandoned lands in Sari.

Row	Components	The average	Freedom degree	Chi-square coefficient	Significance factor
1	Increased the land price in long-term	3.96	4	195.465	**0.000
2	Speculation of lands by estate agents and consultants	3.88	5	313.112	**0.000
3	Land auctions by various government agencies	3.92	4	162.337	**0.000
4	The role of banks and Financial and credit institutions in the phenomenon of land speculation	3.84	4	154.717	**0.000
5	Granting large loans and applying them to buy and sell lands	3.81	4	125.706	**0.000
6	High construction costs	3.98	4	190.545	**0.000
7	Decreased effective demand for land and housing market due to excessive cost of land and lack of purchasing power	4.01	4	204.824	**0.000
8	Lack of sufficient resources and equipment, including financial credits in the municipal and administrative bodies to implement comprehensive plans and detailed approvals	4.02	4	215.545	**0.000
9	The high cost of land downtown, the urban low-income groups (ranging from old residents and immigrants) are not able to invest and build house in this section.	3.96	4	204.316	**0.000
10	The tendency to buy and hold lands in many organizations and even individuals	3.90	4	170.813	**0.000

The numbers: 374 ** the significance: at the level of 99% * the significance: at the level of 95% NS : non-significant reference: the findings from 2015

Table 5- Friedman Test for investigating the comments of heads of household about the effect of social factors on the increased abandoned lands in Sari

Row	Elements	Friedman's average rating	Effect of factors (rating)	Degree of freedom	Ki-square coefficient	Significance factor
1	Emigration of the land owner	2.40	4	3	10.900	(*) 0.012
2	Lack of safety around the abandoned land	2.46	3			
3	Integrated development of urban population and the formation of new neighborhoods without the principles of urbanization and resulting the emergence of abandoned lands	2.66	1			
4	Inefficient use of land by the marginal settlements and adjacency of these contexts with high-quality lands in the city	2.474	2			

Number: 374 ** Significance: at 99% level * Significance: at 95% level NS: non-significance

Reference: (Comprehensive Plan, 2015)

Table 6- on-way Ki-square test for investigating the comments of head of household for the effect of legal factors on increasing the abandoned lands in Sari

Row	Elements	The average	Freedom degree	Ki-square coefficient	Significance level
1	Co-owning lands	3.88	4	163.861	** 0.000
2	Disagreements in a division satisfying the partners	4.12	5	269.059	** 0.000
3	Lack of official document and conducting land transactions by letter of promise	3.90	4	167.310	** 0.000
4	The way of operating of land owner by private and public systems	4.02	4	613.620	** 0.000
5	Improper predictions by comprehensive and detailed plans on incorporation of wide areas to urban areas and consequently being abandoned some lands within the city	4.14	4	278.193	** 0.000
6	Strict rules (zoning, per capita, standards) within the cities and consequently turning people to the margins of the city, where there is no strong legal oversight.	3.90	4	169.984	** 0.000
7	Allocation of arid urban lands to public services in the constructed contexts in the comprehensive and detailed plans and unwillingness of service organizations to purchase these lands and consequently, these lands remained abandoned and useless in the city	3.77	4	137.176	** 0.000
8	incomplete, periodic and unsuccessful planning of land use in the city	3.96	4	199.503	** 0.000

9	Land price inappropriateness with the density and type of allowed usage	3.98	4	206.802	** 0.000
10	Taking high compensations from urban construction in return of issuing building permission	4.00	4	203.166	** 0.000

The number: 374 **significance level:99% *significance level: 95% NS: non-significant

Reference: (Comprehensive Plan, 2015)

Table 7- Friedman test for assessing the effect of legal strategies on solving problems and complications of being abandoned the lands in Sari.

Row	Elements	The Friedman rating average	The effect of factors (rating)	Freedom degree	Ki-square coefficient	Significance level
1	Logical oversight of related agencies on the activity of land and housing enterprises	2.94	4	4	40.271	** 0.000
2	Removing transactions with letter of promise on urban land management	2.89	5			
3	Taxation for abandoned and useless lands and forcing the owners to construct	3.07	1			
4	Tax for frequently land transactions in order to reducing land speculation	3.06	2			
5	Long-term tax exemptions on the construction of abandoned lands	3.03	3			

The number: 374 **significance level: 99% *significance level:95% NS: non-significant

Resource: (Comprehensive Plan, 2015)

Table 8- Spearman correlation coefficient for assessing the relation between the satisfaction of heads of household and the strategies provided to solve the problem of abandoned lands in Sari

Independent variable	Dependent variable		The correlation	Significance level
Satisfaction from Legal-regulatory solutions	Legal-regulatory solutions	Logical oversight of related agencies on the activity of land and housing enterprises	0.875	** 0.000
		Removing transactions with letter of promise on urban land management	0.876	**0.000
		Taxation for abandoned and useless lands and forcing the owners to construct	0.927	**0.000
		Tax for frequently land transactions in order to reducing land speculation	0.985	**0.000

		Long-term tax exemptions on the construction of abandoned lands	0.948	**0.000
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The numbers: 374 **significance level: 99% *significance level: 95% NS: on-significant

References: (Comprehensive Plan, 2015)

Table 9- on-way Ki-square test for investigating the comments of experts for the effect of legal-regulatory factors on increasing the abandoned lands in Sari

Row	Elements	The average	Freedom degree	Ki-square coefficient	Significance level
1	Co-owning lands	4.40	2	12.050	**0.002
2	Disagreements in a division satisfying the partners	4.45	2	14.600	**0.01
3	Lack of official document and conducting land transactions by letter of promise	4.55	2	19.400	**0.000
4	The way of operating of land owner by private and public systems	4.30	2	6.200	*0.045
5	Improper predictions by comprehensive and detailed plans on incorporation of wide areas to urban areas and consequently being abandoned some lands within the city	4.30	2	6.200	*0.045
6	Strict rules and regulations	4.22	2	4.550	NS 0.103
7	Allocation of arid urban lands to public services in the constructed contexts in the comprehensive and detailed plans and unwillingness of service organizations to purchase these lands and consequently, these lands remained abandoned and useless in the city	4.42	2	14.450	**0.001
8	incomplete, periodic and unsuccessful planning of land use in the city	4.30	2	6.200	*0.045
9	Land price inappropriateness with the density and type of allowed usage	4.45	2	12.950	**0.002
10	Taking high compensations from urban construction in return of issuing building permission	4.55	2	18.950	**0.000

The numbers: 374 **significance level: 99% *significance level: 95% NS: on-significant

References: (Comprehensive Plan, 2015)

Table 10- on-way Ki-square test for investigating the comments of experts for the effect of legal-regulatory factors on solving problems and troubles of the abandoned lands in Sari

Row	Elements	The average	Freedom degree	Ki-square coefficient	Significance level
1	Logical oversight of related agencies on the activity of land and housing enterprises	4.40	3	29.000	**0.000

2	Removing transactions with letter of promise on urban land management	4.32	3	23.400	**0.000
3	Taxation for abandoned and useless lands and forcing the owners to construct	4.42	3	32.600	**0.000
4	Tax for frequently land transactions in order to reducing land speculation	4.20	3	29.000	**0.000
5	Long-term tax exemptions on the construction of abandoned lands	4.52	3	37.400	**0.000

The numbers: 374 **significance level: 99% *significance level: 95% NS: on-significant

References: (Comprehensive Plan, 2015)

Table 11- Distribution of abandoned lands ratio in physical-environmental boundaries of various usages.

Physical-environmental criteria	Total area of abandoned lands existed in all kind of boundaries	The percentage of abandoned lands in all the boundaries	The percentage of abandoned lands in the boundary to all the abandoned lands
The boundary of textile industry	30338	3.6	60.5
The boundary of Non-metallic Mineral Industries	104561	12.5	
The boundary of Cemetery	106517	12.8	
The quantitative boundary of river	25047	3	
The qualitative boundary of rive	88086	10.5	
The boundary of high-voltage electricity pylons	141027	16.9	
The boundary of high-pressure gas	182751	21.9	
The boundary of railroad	121267	14.5	
The boundary of Inter-city roads	32355	3.9	
Total	831949	100	

Resource: The authors, based on calculations and statistics extracted from present land use map of Sari (Comprehensive Plan, 2015)

Totally, of the total area of abandoned lands in Sari equaling to 1373502, a total area of 831949 square meters equal to 60.5% are located in within the physical-environmental boundary of usage. Actually, 60% of 100% abandoned lands in Neka are located in the physical-environmental boundary. Of the total land available in the boundary, 3.6% of them are located in the boundary of textile polluting industries, 12.5% in the boundary of Non-metallic Mineral Industries, 12.8% in the boundary of Cemetery, 16.9% in the boundary of high-voltage electricity transmission, 21.9% in the boundary of high-pressure Gas transmission, 3% in quantitative the boundary of the river, 10.5% in the qualitative boundary of the river, 14.5% in the boundary of railway, and 3.9% in the boundary of inter-city road. Totally, most of abandoned lands is located in the physical-

environmental boundary of usages, indicating the effect of physical-environmental factor on the abandonment of lands in Sari.

Conclusion:

A first hypothesis proposed on analyzing and categorizing the abandoned lands in Sari is that it seems there is a significant relation between socio-economic features and abandoned lands in Sari, relating to the assessment of various economic and social aspects mutually affected with the abandoned lands. In this respect, one-way Ki-square statistics tests, Friedman test and Spearman has been used, which according to the results from these tests, it can be said that economic and social features has been very effective on abandoning the lands in Sari. However, the only point to consider in this hypothesis is the Spearman test, studying the relation between the level of literacy and the social challenges from the abandonment of lands in Sari. This test show a significant relationship in most indices except for a general index - Insecurity and irregularities for residents around-, indicating the lack of a proper planning for reducing the negative effects of these lands on the life of residents. And notably, considering to the increased number of these lands in this city, they couldn't be used as a capability yet, and It continues to be a challenge among citizens. Finally, considering to the results from all these tests, it can be concluded that the socio-economic features has a significant relationship with the abandonment of lands and they are mutually interacted. Accordingly, the first hypothesis of this research is confirmed with a very high level of confidence.

Table 12- the confirmation or rejection of the first hypothesis

Row	The first hypothesis	Conclusion	
		confirmed	rejected
1	H1. It seems there is a significant relation between socio-economic features and abandoned lands in Sari.	✓	
2	H2. It seems there is no significant relation between socio-economic features and abandoned lands in Sari.		-

Reference: (Comprehensive Plan, 2015)

The second hypothesis discussed in this field, is that it seems the legal and regulatory factors have been effective on the abandonment of lands in Sari. It generally pointed out to whether urbanism rules could assist in reducing abandoned lands. This hypothesis was about assessing various legal and law aspects effective on the condition of abandoned lands (increasing or decreasing). In this regard, Friedman statistical test, Chi-Square, and Spearman tests are used. These tests measured the comments of heads of households and expert in two general parts. First, the comments from heads of household have been assessed in order to affecting on the abandoned lands by the rules. Almost the majorities of people has had a positive opinion in this regard and were just dissatisfied from the way of enforcing this rules. Furthermore, considering to test measuring the opinions of experts and totally given to the various tests assessing this hypothesis from various sides, it can be argued that legal factors of urbanism has been able to influence on these lands and just the level of each legal component is different. Finally, this hypothesis can be confirmed at a relatively high level of confidence.

Table 13- confirming or rejecting the second hypothesis

Row	The second hypothesis	Conclusion	
		confirmed	rejected
1	H1. It seems that legal factors have a significant effect on the abandonment of the lands in Sari.	✓	

2	H0. It seems legal factors have no significant effect on the abandonment of the lands in Sari.		-
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Reference: (Comprehensive Plan, 2015)

The third hypothesis discussed in this research, stated that it seems there is a significant relation between the physical-environmental features and the abandonment of lands. According to local-spatial analysis and the studied discussions, we concluded that physical-environmental factors have a significant effect on the abandonment of many lands in Sari. Thus, some solutions and strategies should be provided to improve the situation if these abandoned lands and authorities must provide a practical and executive plan in order to improve this situation thoughtfully and to organize the lands mentioned. Given the above, this hypothesis can be confirmed in relatively high confidence level.

Table 14- confirming or rejecting the third hypothesis

Row	The third hypothesis	Conclusion	
		confirmed	rejected
1	H1. It seems there is a significant relation between physical-environmental features and abandoned lands in Sari.	✓	
2	H. It seems there is no significant relation between physical-environmental features and abandoned lands in Sari.		-

Reference: (Comprehensive Plan, 2015)

The recommendations regarding the results from one-way Ki-square Non-parametric test, Spearman and Friedman tests in the first hypothesis

- Developing Instructional and operational plans from related organizations in order to improve the municipals finances for performing approval of comprehensive and detailed plans for addressing the status of abandoned land in the city of Sari;
- Creating jobs and financial facilities and sufficient funds in the villages around the city to prevent migration of villagers to the city and resulting to decrease non-standard constructions in the city and finally improve the abandoned lands status;
- Providing a systematic and comprehensive programs such as decreasing the land price for housing or other uses;
- Low interest loans for the low-income people in order to purchase the land and moderate the land buy and sell market;
- Promoting safety, security and health around the abandoned lands on various neighborhoods of the city;
- Destroying the abandoned hot spot crime and turning them into lively places;
- Improving the quality of life around the arid abandoned lands to attract the applicant for construction on the land;
- Economic boom through increased construction in abandoned land in Sari.

The recommendations proposed based on the results from one-way Ki-square Non-parametric test, Spearman and Friedman tests in the second hypothesis

- Review of development and construction plans and also detailed plans of Sari;
- Levying on abandoned and useless lands and forcing the owners to construct;
- Developing urban infrastructures through posing urbanism proper approvals;
- Tax on frequently land deals;

- Decreasing land speculation;
- Getting the official document from owners in order to standard construction based on approvals and observance of the urban planning laws;
- Providing more moderated plans for taking compensation from constructing abandoned lands in Sari.

The recommendations proposed based on the results from local and spatial analysis in the third hypothesis

- Transferring heavy polluting industries from the city proper to the suburb on the places adjacent to which there is no desired uses;
- Creating green space within the boundary of cemeteries and mortuary for improving the current status.

General recommendations

- Locating on the precise rooting these lands by authorities of municipalities and in the upstream, the Housing and Urban Development Organization in order to proper decision making for booming these lands and receiving suggestions, meanwhile forcing the owners to decide and deal with the municipality;
- Determining the usage of these lands integrated with neighboring lands and removing restrictions for changing its usage;
- Proper policy making for controlling the price of these lands;
- Taking compensations excessively by authorities for these lands;
- improving the urban management, , the most effective way of removing barriers and encouraging the owners to construct;
- adjusting standards and reforming the urban planning regulations within the framework of Public interests and the interests of the owners;
- assisting to form lands development and construction organizations;
- planning for fixing the physical restrictions;
- solving the problem of undecided lands through reforming the urbanism rules and regulations;
- performing the proper usage on the empty space including Sports and green spaces
- Location and its accumulation for constructing residential buildings with new context.

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