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Assessing the improvement and renovation projects with a tourism approach (Case Study: Yazd)

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ABSTRACT

Objective: Urban population growth and widespread environmental changes and concrete landscapes have driven many elements of the metropolis closer to exhaustion. This changed the appearance and body of the city, causing the erosion of urban space and urban activities. The purpose of the study is to evaluate the improvement and renovation projects in Yazd city with tourism approach.

Materials and methods: This study uses observations and literature research of Yazd city, collection of information and statistics, review and evaluation of improvement and modernization plans, and interviews and questions from relevant experts and residents living in Yazd. The area investigated in this study is the city of Yazd, where there are over 4,000 hectares of used textiles in Yazd province, of which about 2,600 hectares are located in the historical city of Yazd, and the rest in the historical Neighboring city of Yazd.

Results and conclusion: The main problem of the quality of life in these areas is the lack of social dignity in other urban areas, although the extent of benefiting these areas from urban services is comparable to other city centers. Also, in urban services, the worn-out fabric is the wear and tear of facilities, especially the accesses, because in the network of connecting roads, the worn-out fabric of the roads must communicate with other urban areas and is important for tourism in this city. These axes are well-suited in a dynamic environment, catering to the needs of tourists visiting the city. Yazd city's strong points, such as the abundance of historical and tourism elements, its central and accessible location, the promotion of culture through its historic neighborhoods, and its potential for development, contribute to its appeal for tourists. Consequently, these factors generate a wide range of uses that cater to the preferences and requirements of incoming tourists to the city.

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1. Introduction

According to Rizvani (2013), cities are considered attractive to tourists because they offer a wide range of services and facilities aimed at enhancing people's quality of life. These include economic, commercial, industrial, cultural, political, health, communication, and leisure activities, as well as historical and touristic attractions. The analysis and planning of tourism capabilities in any region are crucial because they have the potential to create a dynamic and active environment for the region's development (Fazli, 2016). At present, numerous developed nations worldwide view tourism as the most effective means of promoting cultural development, fostering global cooperation, and generating substantial economic revenue. The United Nations General Assembly has designated September 25 as World Tourism Day due to the significant role that travel and tourism play in promoting cultural excellence and fostering international understanding. In addition to the cultural and spiritual impacts, the movement of people brings substantial economic benefits (Dakheli Kohnmoui, 2013). Urban tourism spaces refer to areas that possess tourism resources (Mohvadi, 2016). Within present-day cities, these spaces can be differentiated into two classifications: contemporary or recent spaces such as parks, up-to-date shopping malls, cultural centers, squares, and beaches. According to Anuri et al. (2016), historic sites like markets, imamzades, cemeteries, gardens, and mosques are considered traditional spaces.Nowadays, numerous initiatives are being undertaken to enhance the appeal of urban areas, resulting in significant transformations in the spatial layout of cities. The main objective of these initiatives is to capture the interest and fulfill the needs of city dwellers. However, it is worth noting that tourists also reap the benefits of these initiatives, which focus on improving public welfare and enhancing the aesthetics of the city. Consequently, urban attractions play a crucial and invigorating role in the advancement of urban tourism. This emphasis on urban attractions stems from the growing fascination among people towards national cultural resources and heritage, as evidenced by the surge in popularity of major exhibitions and an increase in visits to valuable treasures and historical landmarks (Faraji Rad, and others, 2010).

Since the 1970s, it could be argued that the majority of major cities worldwide have grappled with the challenges of decay and deterioration. Supporters have made efforts to address these issues by implementing urban revitalization projects, enhancing the overall urban environment, and establishing collective organizations to tackle significant problems. In the organization of such plans, the main focus has been on addressing the rebuilding of areas and enhancing the economic conditions to attract investments. However, there has been a lack of attention to social aspects in these discussions. This lack of attention has resulted in numerous projects remaining incomplete and encountering significant challenges (Naqdi and Kollivand, 2015). Over the last few decades, there has been a notable rise in population with a significant number of individuals relocating to urban areas for various reasons. This trend, as highlighted by Han et al. (2009), has resulted in a peculiar phenomenon affecting both urban and rural regions, as emphasized by Ebrahimi et al. (2002). The presence of environmental problems and the development of cities and urban areas have resulted in the gradual deterioration of many places. This deterioration leads to the collapse of the city's landscape and, over time, the urban fabric loses its function and becomes worn out. Consequently, the once-beautiful landscape of the past is no longer visible. In simpler language, one can state that a city or a village is comparable to a human or a living organism that is continuously transforming and progressing. Similar to a living being, a city also develops and advances, akin to a living organism, and a city represents the framework of buildings and bustling streets. It is not stagnant, but rather continually changing. Consequently, these alterations directly affect the realm of health and well-being. Undoubtedly, the inhabitants of urban areas are deemed as the primary catalyst for the development and well-being of the city, owing to their substantial influence on diverse aspects of urban prosperity, including but not limited to culture, sports, aesthetics, and the environment (Hadian et al., 2012). The wear and tear experienced in both urban and rural areas contribute to social unrest in cities. This includes behaviors like delinquency and various social issues (Shahinifar, 2018). In a different context, it could be argued that an old tissue is not solely a physical problem, rather it can

pose potential risks to society's well-being. The city, similar to living beings, undergoes growth and constant transformation within its environment. Over time, without intervention, it will inevitably deteriorate. Naturally, the city's evolution and the emergence of various locations, alongside innovations in its development, will result in the original city becoming a historical site. Regrettably, this historical place, which holds significance as a symbol of the past, is endangered and subject to decay. A location that holds significant historical meaning and principles and possesses abundant resources can face diverse risks. Nevertheless, when effectively utilized, it possesses the potential to generate tourism value, preserve precious heritage, attract tourists, and foster economic prosperity, eventually becoming a cultural hub. In recent decades, many of Iran's cities, known for their rich history and significant historical sites, have experienced unfortunate displacement and transformation. As a result, these cities have gradually deteriorated without proper preservation measures, losing their original essence over time. This city offers a wide range of attractions, such as handicrafts, historical sites, and tourist destinations, among others. Preserving and taking care of these attractions plays a crucial role in safeguarding the country's culture and society, contributing to a sense of national pride (Habibi et al., 2016). This research focuses on the city of Yazd, which is located in the province of Yazd. Within the province of Yazd, there are over 4,000 hectares of deteriorated tissue, with approximately 2,660 hectares situated in the historical city of Yazd and the remaining hectares found in the nearby cities. The primary issue affecting the quality of life in these regions is the absence of social respect when compared to other urban areas, despite these regions receiving comparable urban services. Additionally, the deteriorated infrastructure, particularly the transportation routes, poses challenges in connecting these areas to other urban centers and impacts the tourism industry in this city. The primary objective of this research is to assess the tourism-oriented improvement and renovation plans for Yazd city. Additionally, the sub-objective of the study is to propose impactful strategies for enhancing and revitalizing the city of Yazd. 2- This research aims to assess the positive and negative aspects, as well as the potential opportunities and challenges, in the old and deteriorating urban areas of Yazd. With the main objective in mind, the following question is posed: How effective are the tourism-focused improvement and renovation projects in Yazd city? Furthermore, the secondary inquiries can be listed as follows:

1- When considering tourism, what are the positive aspects, drawbacks, potential advantages, and risks associated with the urban environment of Yazd city?

2- What are the effective improvement and renovation strategies to improve tourism in Yazd city?

All scientific investigations aim to address the hypotheses originated in the researcher's mind, which are formulated after analyzing various sources, conducting studies, and examining observations and field investigations. This study aims to address the identification of tourism indicators in Yazd city, which is a crucial step towards planning tourism development in the region.

1.2. Research background

researchers	Year	Title	Findings
Karimzadeh et al	2017	An analysis of tourism A city in regeneration Historical textures of the city Shiraz from the perspective of residents	The influencing factors prioritized on tourist-oriented urban regeneration are: social, economic, cultural, and physical dimensions
Saberi et al	2018	"The study focuses on the case of Lamar city and discusses the importance of	The first strength is seen in the transformation of unproductive and vacant land into adequate areas to enhance the environmental quality. On the

		enhancing and revitalizing the deteriorated urban infrastructure to improve the overall welfare and prosperity of its residents."	other hand, the first drawback lies in the limited availability of new and high-standard buildings.
Zahra Feni- Sajid Soleimaniyan	2021	Evaluation of factors affecting tourism in the historical context with an approach	The research findings indicate that developing sustainable tourism in Babolsar relies on reconstructing the city's culture according to its historical background. This can be achieved by enhancing the influence of factors such as indigenous culture, local creative industries, art, traditional crafts, and the preservation of historical structures. Also, the recreation of the cultural-historical context of the city is closely related to the development of urban tourism in Iran, Babolsar city in particular. Simultaneously, despite the distinct advantages offered by these textures, encompassing their physical and architectural allure, as well as their historical customs and traditions, there are significant challenges in recreating these textures. Scarce tourism infrastructure, restricted and temporary urban management perspectives, and severe shortages act as major hindrances to fully harnessing their potentials in this domain.
Soleimani Mehranjani-Ahmed Zanganeh	2021	Evaluation of the role of improvement and renovation projects of worn-out urban tissues in improving the quality of the urban environment (case study: Briyank neighborhood)	The findings of the research show that after the implementation of the project, apart from the physical and functional dimensions in which a slight improvement has been achieved, the implementation of the project to improve and improve the quality of life in Briyank neighborhood has not only failed to improve the condition of other dimensions, but this The dimensions have been decreasing and the level of dissatisfaction with these dimensions and in general the quality of the urban environment among the residents has increased.
Mustafa ShahiniFar	2022	2. Evaluating the effect of improvement and renovation projects in improving the quality of urban life (case study: worn-out fabric in the center of Kermanshah)	The results of this research showed that the implementation of improvement and renovation projects had little effect on the quality of life of the residents. These projects have had the greatest impact on physical indicators and other socio-cultural, economic and environmental indicators have had less impact on their rental. Therefore, it should be noted that improvement and renovation is not only a physical issue, and in addition to physical issues, social, economic and environmental issues should also be considered.
International articles			
Kozunico	2017	The prospect of renovating prefabricated buildings as a source of renovation without	The use of buildings for renovation without demolition and frequent construction has been tested to a great extent not only in the territory of

		destroying existing buildings	countries that have been exposed to commercial housing construction for a long time, but also in countries. This article has its practical value in the structure of the development of integrated video-ecological databases for the design of massive housing constructions.
Jingyi and Chan Shing	2018	Investigating the effects of tourism Culture on the coastal area Juhai from the perspective of changes cultural using the cultural change model	The connection between the growth of tourism, the cultural values brought by tourists, and the local culture of the host community must be acknowledged. As a result, a proposed framework has been developed using findings from Zhuhai, aiming to foster cultural tourism while safeguarding cultural resources.
Liu et al	2020	A system model and an innovation approach towards sustainable housing renovation	Innovation trends (linear vs. organic) and innovation typologies (product vs. process and business vs. social) towards sustainable housing renovation are discussed.
Georginia et al	2021	Improvement and renovation strategies of old cities, with a sustainable development approach, a case study: Tehran's 19th district	The results show that worn-out tissues are the weak points of the region. And at the same time, it has been optimized to benefit from the strengths and opportunities and to achieve the desired level and as a result of improved spatial organization.
Chao and Hsu	2021	3. Effects of urban renewal policies in Taiwan	The findings revealed that government policies, although crucial, have led to new challenges in urban growth, such as heightened traffic and population density, as well as a scarcity of open areas. The main factor behind these issues, resulting from the aforementioned policies, is the absence of synchronization between development goals and strategies at the regional and national levels, and the plans at the city and local levels. Additionally, the government's lack of achievement in enhancing and modernizing policies can be attributed to the utilization of a participatory approach that has proven ineffective based on the evidence, emphasizing the necessity to employ diverse participatory methods in this particular field.
Palumbo et al	2022	Strategies for the renovation and improvement of the city of Rome	The results showed that urban regeneration together with the government, and creating places to attract citizens' participation, in order to provide plans that make it possible to achieve sustainable urban development, has led to social evolution, and in cases where urban renewal and improvement policies have led to Urban instability appears as an obstacle.

2. Introduction

2.1. The concept of tourism

The terms "tourist" and "tourism" were initially employed by the League of Nations in 1937; however, the tourism industry predates this. Nowadays, tourism is widely recognized as a means to promote the economic and social progress of nations, particularly developing countries (Ajit 2004). Tourism cannot merely be defined in one dimension; instead, it encompasses various dimensions within different sectors, such as the economic, social, and cultural aspects. Additionally, the definition of tourism should take into account factors such as duration of visit, mode of transportation, destination, and demand. Ghanbari et al. (2016) argue that the development of tourism hinges on three primary factors. These three factors are the host society, tourists, and the characteristics of the tourist destination, which play the main and essential role in the development of the city's tourism.

Decay in texture: The urban textures suffer from organizational issues, imbalance, disproportion, and disorganization. The exhaustion factor contributes to the erasure of shared memories, the decline of authentic urban living, and the emergence of mundane urban life. Additionally, it leads to a shortened lifespan of buildings and hastens their deterioration, ultimately resulting in an accelerated rush towards their ultimate demise (Habibi, Maqsoudi, 2005).

Revitalization, improvement, and renovation plans are formulated within the framework of urban development plans, encompassing both comprehensive and detailed aspects in order to effectively implement urban revitalization, improvement, and renovation plans in accordance with urban planning principles, as well as technical and architectural considerations. These plans entail introducing new and necessary functions for dilapidated structures, while also encompassing the provision of public services and urban infrastructure, such as access networks, roads, construction projects, urban services, and green spaces, all of which adhere to urban planning standards and reflect the regional influence of Iranian-Islamic architecture. To ensure maximum participation from the owners and residents of the designated revitalization, improvement, and renovation areas, the implementation scope of approved plans is communicated in a positive and suitable manner. This method ensures that residents and owners are well-informed and engaged in the process (Morid Sadat and Mohammadian, 2017).

3. Research method

The purpose of the research is developmental, while the library research method is descriptive, analytical, and survey-based. The research targeted a statistical population of approximately 10,000 residents living in the old neighborhoods of Yazd. Using the Cochran formula, a sample size of 384 individuals was selected to complete the questionnaires. The research is categorized as applied research in terms of its purpose, descriptive-survey research in terms of data collection method, and quantitative research in terms of the nature of the data. Furthermore, it is regarded as a study related to tourism development. The gathering of information used various methods including documentary and library techniques, as well as field methods such as questionnaires, interviews with individuals, and discussions with tourism planners. A swot matrix was created to assess the strategies, with each strategy being compared to the factors of weakness, strength, opportunity, and threats. The total points obtained for each strategy were compared to obtain the final prioritization. The subsequent stages of the research involved the utilization of the SWAT analytical method to analyze the information and formulate a strategy. To start with, experts, specialists, and residents of the analyzed neighborhood were requested to complete a questionnaire in order to gather the necessary information for identifying and examining the internal factors (strengths and weaknesses) and external factors (opportunities and threats) that influence the success of projects aimed at enhancing the targeted area. Subsequently, the responses received were carefully assessed and verified by revisiting the location to ensure their

validity and precision, while also conducting interviews with experts and reviewing previous studies to gather additional information. This process aimed to determine the most significant internal and external factors impacting the development of the neighborhood. Previous cases were thoroughly examined as part of the investigation.

3.1. Research findings

Case study of the five regions of Yazd city

District One, also known as Region one of Yazd city, stretches across 2450.8 hectares in the northern part of Yazd city. This district extends from the Qur'an Gate Square in the north, Nime Shaaban Street and Bahman Boulevard in the east, Imam Khomeini Street, Nawab Safavi Boulevard, Daulat Abad Boulevard, 22 Bahman Boulevard, and Hefdeh Shahrivar Boulevard in the south, and to the end of Arman Street in the west.

District two comprises the eastern and central parts of Yazd city, ranging from the northern boundary of Shahid Beheshti Boulevard, Shahid Montazer Qaim Boulevard, Shahid Chamran Street, Deha Fajr Boulevard, and Imam Khomeini Street, to the eastern area of Hassan Abad Martyrs Street. Moving towards the south, it extends to Imam Hassan Mojtabi Street, Waliasr Street, West Fattah Street, and Shahid Hossein Jafari Street. Finally, it is bounded by Dazheh Boulevard and Kashani Boulevard to the west. The total area of this region is 2088.2 square kilometers.

District three encompasses the southern parts of Yazd city, covering an area of 2677.6 hectares. This region is defined by its boundaries, which include Madrasi Boulevard, Janbaz Boulevard, and Kausar Boulevard in the north. Moving to the east, it is bordered by Daghu Boulevard and Kashani Street. In the south, it is delimited by Jihad Boulevard, Ithar Boulevard, Pasdaran Boulevard, Shahid Qandi Boulevard, Ibn Sina Boulevard, and Holy Defence Boulevard. Finally, the western side leads to Wahi St., ultimately reaching Shahidan Naqvi Bridge.

District four encompasses the central and western sections of Yazd city, spanning across 2288 hectares.Its northern boundary is defined by Shahid Dehghan Monshadi Boulevard, Shahidan Takvizadeh Street, and Hefdeh Shahrivar Boulevard. To the east, it is bordered by Shahid Paknejad Boulevard and Shahid Bahonar Boulevard. The southern limits are marked by Kausar Boulevard, Janbaz Boulevard, and Modaresi Boulevard, while the western boundary is delineated by Shahidan Boulevard, ultimately leading to the beginning of Shahid Dehghan Manshad Boulevard.

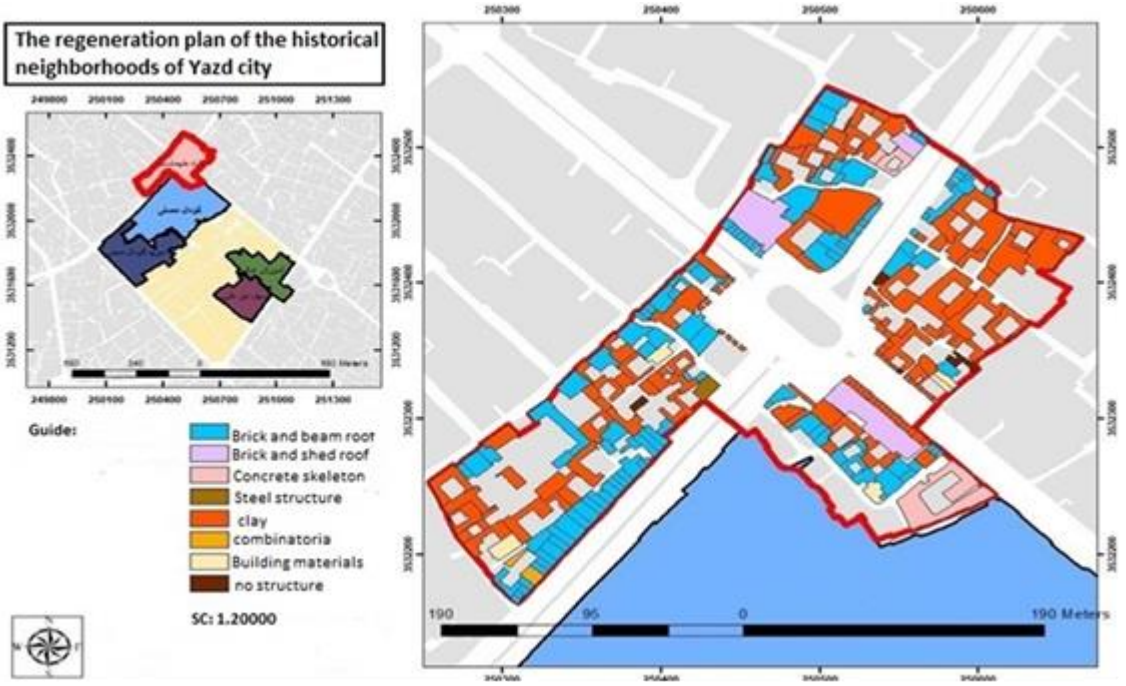

Fig.1.Study area .١

The historic zone comprises the central part of Yazd city and spans over 1285 hectares of land. It is bordered by 22 Bahman Boulevard, Daulat Abad Boulevard, and Shahid Nawab Safavi Boulevard to the north. To the east, it is bounded by Fahadan Street and Deha Fajr Boulevard. The southern boundary is defined by Shahid Chamran Street, Shahid Montazer Ghaem Boulevard, and Shahid Beheshti Boulevard. Finally, the western limit extends to Shahid Bahonar Boulevard and Shahid Paknejad Boulevard.

3.2. First part: Application of SWOT technique in developing development strategies

This section focuses on discussing the development strategies of Shahreza. The effective factors were categorized into two groups: internal factors (weaknesses and strengths) and external factors (opportunities and threats). These factors were analyzed from various perspectives such as economic-social, cultural-institutional, and ecological. To determine the significance of these factors, different weighting methods were employed, and the Likert spectrum of qualitative parameters was slightly altered based on their value.

The first step: effective internal factors in the city of Yazd

The objective of this phase is to recognize and assess the strengths and weaknesses within Shahreza, specifically, the factors that can support or impede the achievement of planning objectives. These strengths and weaknesses have been examined and categorized according to economic-social, cultural-institutional, and ecological development dimensions, as outlined in the provided table. The collection of internal factors that impact Shahreza was compiled through documentary sources and expert opinions. Firstly, the discussion began by highlighting the successful instances. These cases were analyzed in terms of their strengths and weaknesses in order to identify the internal factors that

had an impact. The primary objective of this stage was to categorize these factors as either weaknesses or strengths. To determine the significance of each parameter mentioned, weights ranging from 1 to 5 were allocated on the Likert spectrum. A score of 5 represented the highest level of impact, while a score of 1 denoted the lowest level of impact.

Table 3- Internal strategies

Evaluation table of internal factors (strengths and weaknesses)			
Strength factors	**Coefficient**	**Rank (3rd and 4th)**	**Score**
S1: Central and focal location and public access to the neighborhood	0.04	4	0.16
S2: Reasonable land price	0.03	3	0.09
S3: High percentage of private ownership	0.04	4	0.16
S4: People's desire to improve and renew in context	0.03	4	0.12
S5: The potential of establishing land use according to the arrival of tourists in the neighborhood	0.03	3	0.09
S6: The presence of Hosseiniyeh and Takaya as a religious index element	0.05	3	0.15
S7: Existence of historical and tourism elements	0.09	4	0.36
S8: Concentration of economic activities and income generation	0.05	3	0.12
S9: The potential of creating public participation in the improvement of the neighborhood	0.04	4	0.16
S10: Active and young population	0.04	4	0.16
S11: Potential for barren spaces	0.03	3	0.09
S12: The potential of creating recreational-tourism spaces	0.04	3	0.12
S13: historicity of the neighborhood and cultural promotion	0.05	3	0.15
S14: The existence of cultural centers in the neighborhood	0.07	4	0.28
S15: The growth of industries and the increase of the labor market	0.04	3	0.12
Weakness factors	**Weight factor**	**Rank (2 and 1)**	**Score**
W1: The low quality of some buildings and their wear and tear	0.05	1	0.05
W2: Not having a sidewalk and feeling unsafe on the roads	0.03	2	0.06
W3: The presence of some narrow and impenetrable passages in the neighborhood	0.04	2	0.08
W4: their unstable and eroded adobe structures	0.04	1	0.04
W5: Per capita lack of green, sports and cultural spaces	0.03	2	0.06
W6: Lack of financial ability of some residents of the neighborhood to participate in the renovation and improvement of the neighborhood	0.04	2	0.06
W7: Inappropriate visual qualities and spatial anomalies	0.04	1	0.04
W8: Not defining the public open space in the neighborhood	0.03	2	0.06
W9: Turning the ruined spaces of Baft into the gathering center of criminals and creating insecurity	0.05	2	0.1
W10: Entry of some noisy businesses and noise pollution	0.02	2	0.04
W11: Reducing the growth rate of neighborhood population in some years	0.03	2	0.06
Total	1	-	2.77

According to the studies, the sum of the scores obtained from the matrix of internal factors was 2.77, which shows that the strengths prevail over the weaknesses.

The second stage involves assessing the external factors that have an impact on Shahreza, with the aim of identifying the opportunities and threats related to its development.

Table 4- External strategies

Evaluation table of external factors (opportunities and threats)			
Opportunity factors	**Coefficient of importance of weight**	**Rank (4 and 3)**	**Score**
O1: The possibility of increasing public transportation	0.04	4	0.16
O2: The possibility of assigning passages to pedestrian and bicycle spaces	0.07	3	0.21
O3: The potential to attract private capital	0.05	4	0.2
O4: Employment creation potential	0.08	4	0.32
O5: The potential to create regulations due to being limited by the historical context	0.09	3	0.27
O6: the possibility of transportation-oriented development	0.06	4	0.24
O7: Maintaining the visual character of the streets	0.05	3	0.15
O8 Strengthening local handicrafts	0.06	4	0.24
O9: Creating a high potential for land investment in the area due to the high extent of barren and abandoned lands	0.08	3	0.24
Factors of threats	**Coefficient of importance of weight**	**Rank (2 and 1)**	**Score**
T1: Investors' uncertainty about the return on investment in Baft	0.07	2	0.14
T2: The limits and powers of each of the improvement and renovation organizations and municipalities are not clear	0.08	2	0.16
T3: Lack of credibility regarding the restoration of historical structures and buildings	0.06	2	0.12
T4: Lack of cooperation and investment of cultural heritage organization for historical places	0.03	2	0.06
T5: Lack of coordination of cultural heritage with the municipality	0.06	2	0.12
T6: intensification of the wear process	0.06	2	0.12
T7: Increase of indefensible spaces inside the neighborhoods	0.04	1	0.04
T8: increase in delinquency	0.06	2	0.12
Total	1	-	2.91

4. Conclusion

The study and research conducted on the feasibility of urban development plans in Iran, particularly in the city of Yazd, revealed that despite the four-decade span since the creation of these

plans, they have failed to meet their objectives in urban development. The inflexible and rigid structure, prioritization of the end product over the process, limited scope of comprehensive planning limited to physical aspects, and lack of strategic approach are identified as major issues of these plans. In addition, the absence of public participation in the development and execution of the plan, the insufficient scope of detailed plans in addressing underlying issues in urban areas, particularly in dilapidated areas, the narrow and traditional perspective of city managers, the absence of management for urban units, particularly in worn-out areas, a lengthy and unorganized process for obtaining necessary approvals, the need for consolidation of deteriorated structures, the prevalent expansion of detailed plans, the decrease in urban development funding and government assistance to municipalities, and the lack of hierarchical structure in the formulation of city development plans have all contributed to the failure to achieve most of Yazd city's proposed initiatives.

The disorderly state of deteriorated and susceptible buildings, the deficiencies and issues with the road network, the inadequate allocation of land for service purposes in proportion to the population residing in the region's neighborhoods, the interference of residential structures with workshop centers, the inappropriate closeness of different uses, the absence of green spaces, the demand for schools, specifically at the first and second secondary levels, the disregard for the importance of preservation and upkeep and the destruction of spaces and buildings with historical significance, the lack of influence of income regulations on the level of economic activity, household income, property transaction value, social indicators, and household income level are some of the challenges caused by the inefficiency of the improvement plan and the modernization of Yazd city. Furthermore, it is evident that improvement and renovation plans in the domain of worn-out structures lack effectiveness in providing specific and operational proposals. These plans also lack concrete and practical solutions for addressing the issues faced by such structures. The city of Yazd possesses numerous strengths, including its historical and touristic elements, its central location with easy public access, its cultural and historical significance, the potential for economic growth through tourism, affordable land prices, a high percentage of private ownership, the willingness of people to enhance and modernize the area, the presence of religious establishments like hosseiniyehs and takayas, the capacity for internal development, the concentration of economic activities and income generation, the potential for fostering public participation in the improvement efforts of Yazd, the existence of a vibrant and young population, the availability of open spaces, the possibility of establishing recreational and tourism areas, as well as the presence of cultural centers within the neighborhood. Based on investigations into the current state of the neighborhood, several weaknesses have been identified in the city of Yazd. These include the poor quality and deterioration of certain buildings, the absence of sidewalks, and a general feeling of insecurity on the roads. Additionally, the presences of narrow and inaccessible roads, as well as the erosion of non-resistant adobe structures, further contribute to these weaknesses. Furthermore, there is a lack of green spaces, sports facilities, and cultural areas on a per capita basis. Many residents in the neighborhood are also unable to financially contribute to the renovation and improvement of their surroundings. In terms of aesthetics, there are visual shortcomings and spatial abnormalities that detract from the overall appeal of the area. The absence of clearly defined public open spaces adds to this problem. Moreover, damaged areas have become hotspots for criminal activity, leading to an increase in insecurity. The presence of loud and disruptive businesses contributes to noise pollution, further detracting from the neighborhood's quality of life. Finally, the population growth rate of Yazd city has experienced a decline in recent years. Yazd city presents various opportunities, such as the potential to enhance public transportation, allocate specific areas for pedestrians and cyclists, attract private investments, generate employment, and enforce regulations within its limited historical setting. On the other hand, the city also faces threats, including a lack of investors' trust in the profitability of the fabric industry, unclear divisions and authority among organizations responsible for improvement and restoration, insufficient funding for the preservation of historical buildings, limited collaboration and investment from cultural heritage institutions towards historical sites, and a lack of coordination between these institutions and the municipality. Investigations conducted on the condition of renovation and improvement projects to organize and promote tourism indicate that historical contexts possess historical significance and are integral to the city, possessing physical, economic, cultural, and values. These values make them capable of playing a

pivotal role in attracting tourists. Historical contexts are regarded as national assets, and by preserving and enhancing their capabilities with specific objectives, they can contribute to the betterment of national capitals. These contexts, including their structures and physical entities, face fundamental challenges and require comprehensive problem-solving approaches to address these issues and threats. Adopting a tourism-oriented approach, by prioritizing the renovation and design of historical urban areas in a city rich in history and uniqueness like Kashan, and leveraging the historical, cultural, and tourist potentials of this city, tremendous success can be achieved in attracting visitors.

The findings of this study align with Rafiyan's research (2019). Tourism routes encompass more than just the connection between attractions; they also involve entrances and routes connecting the entrances to the residences. This means that in cities like Yazd, which have gained popularity among tourists due to their inclusion in the world heritage list, the presence of important attractions, historical context, and suitable tourism facilities alone is insufficient. Instead, a network of tourist routes based on a hierarchy of entry plays a crucial role. This is also consistent with Rakhsari's study (2022) on the characteristics of tourist' trips, which found that individual characteristics of tourists, mobility patterns, physical characteristics of the destination, and the distribution of attractions/activities greatly influence visitors' spatial mobility within the historical context of Yazd city. Additionally, seven patterns of spatial movement behavior were identified based on visitors' cognitive maps of the destination. According to the final model, the Amir Chakhmaq complex is the most favorable node within Yazd city's historical context.

5. Recommendation

To enhance the effectiveness of improvement and renovation projects in the old neighbourhoods of Yazd city, the following suggestions are proposed:

1. Identify and establish a pedestrian tourism axis to address the shortcomings in per capita service usage and local needs.

2. Increase the presence of urban green spaces and open areas.

3. Enhance the quality of houses and visual aesthetics, and designate local open spaces utilizing green areas at the heart of the neighbourhood.

4. Foster better coordination among agencies to ensure efficient planning and resolution of neighbourhood issues and problems.

5. Implement prudent urban management techniques to facilitate neighbourhood revitalization and preparedness

6. Establish a dedicated authority responsible for coordinating urban planning and construction activities in the area.

7. Preserve historical structures and enhance their capabilities with specific objectives in mind.

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Land Suitability Analysis for Physical Development Based on Natural Criteria (Case Study: Bojnord)

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ABSTRACT

Objective: Ignoring suitable land for urban and non-urban development, especially in zones that have physical and natural problems, greatly influences security and the costs of living and eventually, leads to human and environmental disasters..

Methods: This research intended to evaluate urban land suitability for physical development in Bojnord in north Khorasan based on natural factors and by using the Analytic Hierarchy Process (AHP) technique. The library and field research methods were employed for collecting data and the Arc GIS and Global Mapper 16 software for analysing the data and for making calculations. The studied geographical zone was the entire city of Bojnord and its surrounding areas. The investigated indicators included slope, vegetation, fault, geological characteristics, elevation, river, groundwater, and type of soil and its erosion..

Results: The analysis of the results showed that, considering the geographical and topographic features of the city, only about 9 percent (8804 hectares) of the available areas (distributed in the north western and southern parts of the city) were very suitable or suitable, about 9.98 percent (9869 hectares) moderately suitable, and 81 percent unsuitable or very unsuitable.

Conclusion: land-use planning for this city is of high sensitivity, and it is essential that results of studies on land suitability be employed.

1. Introduction

Despite attempts and claims made by humans, natural and environmental factors still exert undeniable effects on human life and activities, and people cannot easily achieve their goals and objectives without paying attention to natural rules and conditions. That is why some people believe that the environment is a deciding phenomenon in human life (Nazarian, 2009), and ignorance of ecological differences and environmental potentials will have undesirable consequences including soil erosion, desertification, reduced forests and rangelands, etc. (Jalaiyan and Ayubi, 2010). Consequently, identification of the productive constituents, elements, and factors in the environment is considered the

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prerequisite for any activity (Soroor, 2008). The effects of human activities on the environment and the appearance of these effects as natural and man-caused disasters attract greater attention than before now that cities occupy greater areas and support higher population densities (Ghanavati and Goodarzi, 2013). The reason for this is that these activities have led to the destruction of orchards and agricultural lands, encroachment on river boundaries and infringement on environmental values, development on steep slopes, etc. (Karam and Mohammadi, 2009). All of this has happened at a time that urban development is unavoidable and sensitivity to the environment and attention to its protection have acquired more fundamental dimensions and urgencies (Mirkatouli, 2011). Therefore, it is necessary that urban development takes place in areas that will have minimal undesirable consequences (Karam and Mohammadi, 2009).

Bojnord, the subject of this research, accounts for about 56 percent of the population in North Khorasan Province; however, it faces topographic obstacles to its urban development. Nevertheless, the managers of this city, who favor development and progress, consider it as the center of development in the northeastern part of Iran and believe that Bojnord has the capacity for urban population growth and for various industrial and commercial activities (Ziari, 1999). To test these claims and determine their validity, the present research intended to show that this city is facing various natural and physical bottlenecks even now and will be confronted by them in its future development, and hence, these problems have to be addressed in making policy decisions for the future. Based on this, land suitability for physical development of Bojnord was evaluated using natural factors and agents and employing the AHP technique combined with a geographic information system (GIS).

2. Materials and methods

This was an analytical-descriptive research with Bojnord as its statistical population. The library method was used to collect information regarding the background of the study and theoretical principles and the field research method, which included a questionnaire and interviews with 30 experts, was employed to collect data required to answer the question and achieve the goals of the research. The studied indicators were slope, vegetation, fault, geological characteristics, elevation, river, groundwater, and soil type and its erosion. The AHP technique and the GIS software were used to analyze the information, and the stages below were followed to determine the suitable areas for the physical development of the city:

Stage 1: Information was obtained from the related organizations. Of course, some of the required information layers such as the elevation layer of the study region were acquired by using the Global Mapper 16 software. Landsat images were employed for determining the current boundaries of Bojnord.

Stage 2: After collecting the initial information, it was entered into the geographical information system software (ArcGIS). This information included spatial information layers and various characteristics of the study region (in tabular form) (Fig 2).

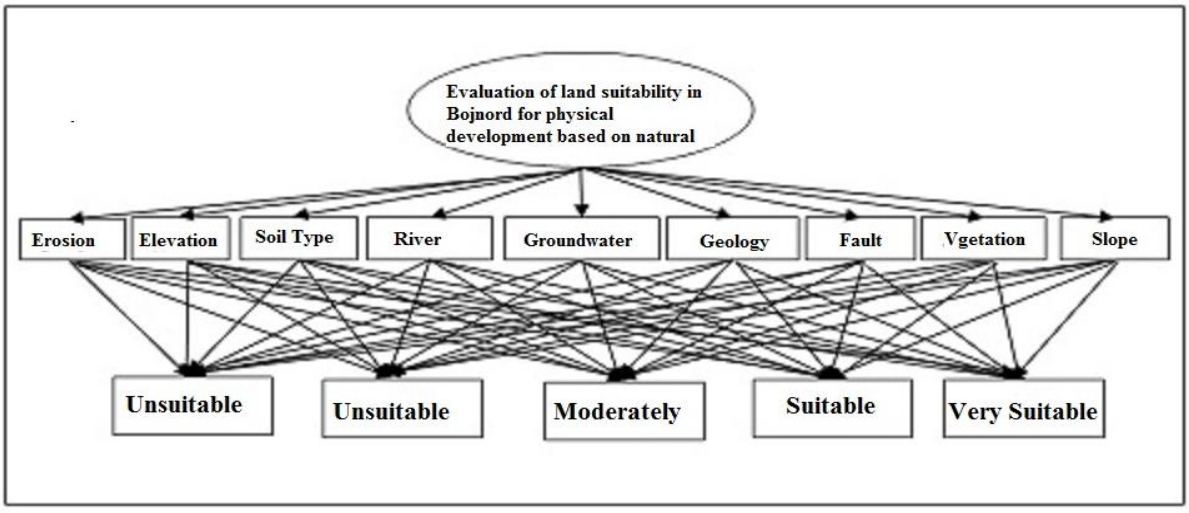

Fig 2: The model for determining land suitability for physical development based on natural criteria (theoretical principles)

Stage 3: Since the data entered into the GIS was in vector form, it was converted into the raster format so that various layers could be combined.

Stage 4: The indicators were classified and given scores. In this stage, all the raster layers were reclassified based on the various characteristics and each class was given a score according to its level of importance. For example, the percentage or degree scales and the meter scale, which are different from each other, were employed for measuring slope and distance from faults, respectively. Therefore, all of the constructed raster layers had to have the same scale, and hence, they were given the scores from 1 to 9 because these are the scores given in the AHP technique.

Stage 5: Each of the selected indicators for the physical urban development had a level of importance different from the others, and therefore, the weight of each index had to be determined, and the AHP technique was employed for this purpose.

Stage 6: In this stage, the weight obtained for each index was applied in the raster layers and finally, all the raster layers were combined.

Stage 7: the study region was prioritized with respect to physical development. Since most of the models and methods mentioned above have been described in previous studies, only the main model used in this research is illustrated briefly merely to show the methodology employed in it. The AHP technique is a comprehensive method for resolving the difficulties of multiple criteria decision-making (Tolga, 2004). It was introduced in 1971by Sa'ati as a tool for analyzing extended decision-making (Yu, 2002). This technique is based on paired comparisons and allows investigation of various conditions (Shokouhi and Moradi, 2012).

After the maps were prepared based on the indicators, and in order to blend and group them into specific classes, a table of indicators and scores was drawn up so that the AHP technique could be used together with GIS. The maps were then converted from the vector form into the raster format, and weight maps were prepared based on the new scores. The maps were then recalled in the combined AHP and GIS environment, and the priorities of the indicators in relation to each other were first determined based on the preference table introduced by Sa'ati. The weights and the coefficient of stability were then calculated and confirmed considering the standard value in the table mentioned above (which must be less than 0.1). Following that, the groundwork was prepared for the analysis

stage and for combining the indicators to determine land suitability for physical development based on natural criteria.

The spatial realm in this research was Bojnord with the longitude of 57˚20′, latitude of 37˚29′, and altitude of 1070m. It is bounded to the north and southwest by a fault and to the north and east by a river and many channels (Fig 1).

Fig 1: The geographical and political position of the study region

3. Results

1.3 Analysis of the Information

Considering the main goal of the research, the findings can be grouped into the following classes:

A. Zoning the Study Region Based on Slope

Slope directly influences land use policies and, in addition, redoubles vulnerability through its effects on the process of developments in the neighboring geomorphological phenomena. In fact, these features keep the phenomena of creep, landslide, and erosion always dynamic and active, and thus, directly or indirectly influence natural and human activities (Taghvaei et al., 2013).

As was stated above, reverse scoring was used for the slope layer. The classification of and giving scores to the raster slope layer were based on five groups, the results of which are presented in Figure 3. According to this figure, the first and second priorities were given to lands with slopes of 0-30˚ (the score of 9) and to lands with slopes of3-5˚ (the score of 5), respectively. Therefore, lands with the first and second slope priorities are in the southwestern and in a section of the northeastern part of the current city limits, and lands with the third and fourth priorities (and lands without priority) are distributed in other urban areas.

B. Zoning the study region based on topography

Topographical features are one of the most important factors that influence urban development, and Topography is important in many urban issues including determination of the routes for water and gas pipes, etc. (Jabbari et al., 2010). Furthermore, high elevations and mountainsides cause problems for movement and transportation. Reverse scoring was also used for the classification of and assigning scores to the elevation layer. The first priority was allocated to lands with elevations of 800-1000 meters, and lands with elevations of more than 1750 meters lacked priority. Therefore, the most suitable elevations, which have the first priority in value, are located northeast of the area surrounding Bojnord, followed by lands with elevations of 1000-1250 meters, which cover most of the study region

and especially the current city limits and areas surrounding the city to the northeast (Figure 4).

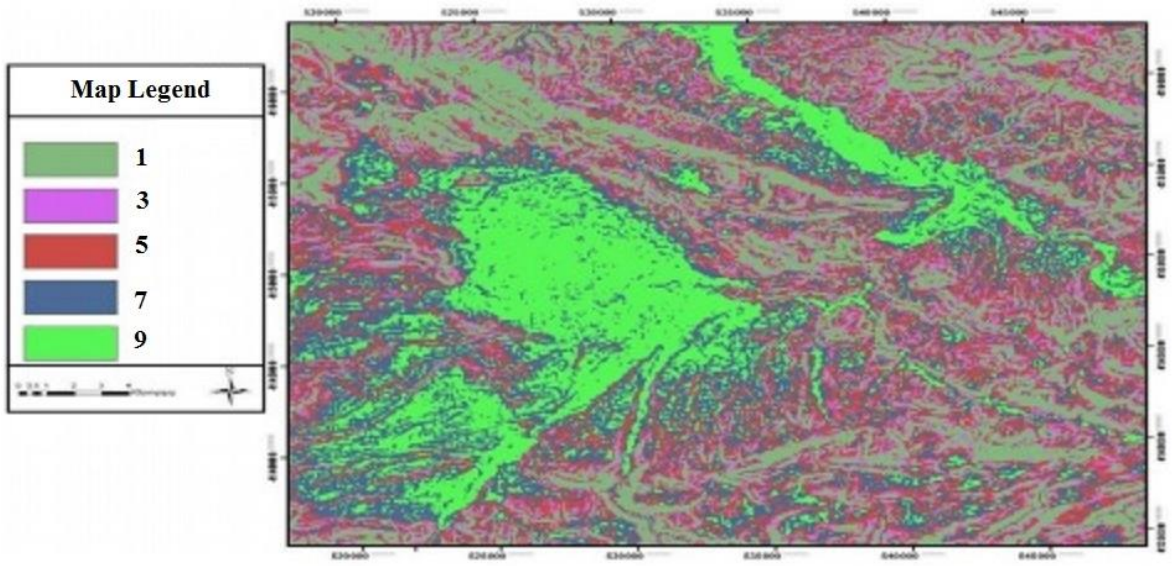

Fig 3: Classifying and reassigning scores to the slope layer (research findings, 2016)

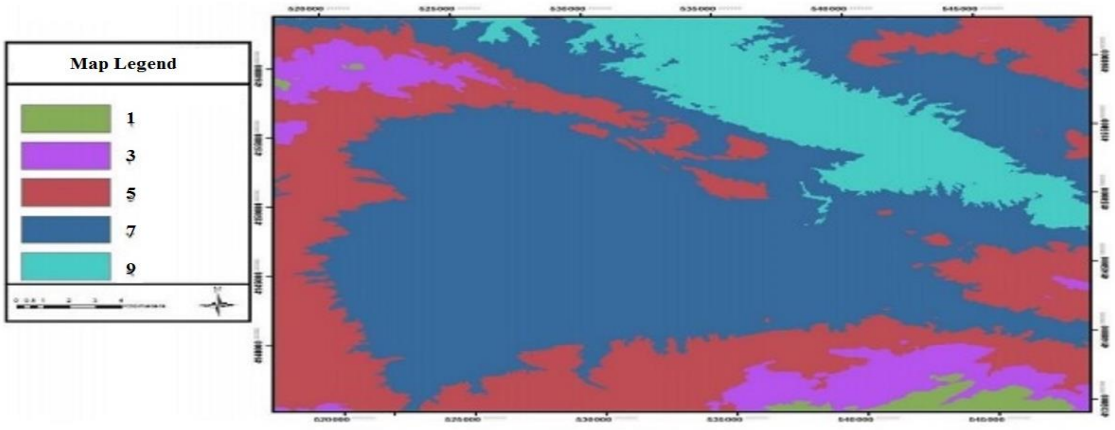

Fig 4: Classifying and reassigning scores to the elevation layer (research findings, 2016)

C. Zoning the study region based on water resources

The major water resources of Bojnord are its rivers, a number of deep wells, springs, and qanats. The layers formed by the wells, Qantas, and springs were changed into a single one, and the density rule was applied to convert this layer into the raster format. This function was used to determine the areas that contained the maximum amount of water (Table 1 and Fig 5).

D. Zoning the study region based on vegetation

The layer that represented vegetation was first converted into the raster format using the polygon to raster rule and was then classified and given scores based on vegetation type (Table 2 and Fig 6).

Table 1: Classifying and giving scores to the layer of water resources

Prioritization	Zoning based on access to water resources	Scores
First priority	0- 0.014	9
Second priority	0.014-0.048	7
Third priority	0.048-0.091	7
Fourth priority	0.091-0.146	3
Fifth priority	0.146-0.222	2

Reference: Research Findings, 2016

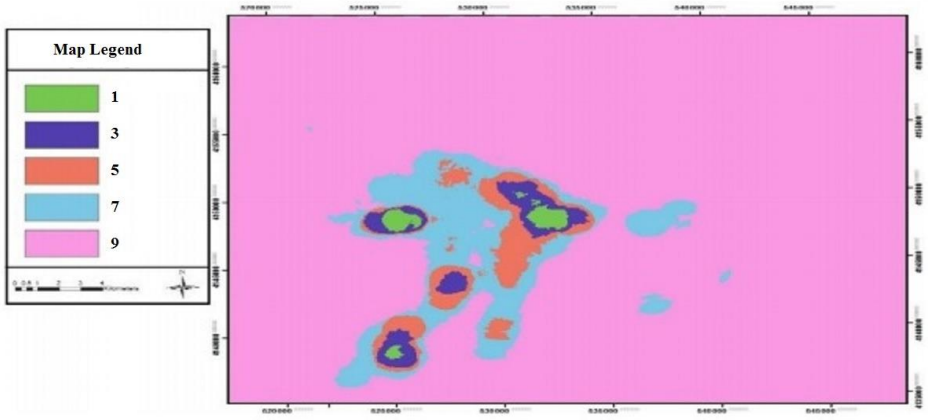

Fig 5: Classifying and reassigning scores to the layer of groundwater resources
Reference: Research Findings, 2016

Table 2: Classifying and giving scores to the vegetation layer

Prioritization	Zoning based on access to water resources	Scores
First priority	Built-up areas	9
Second priority	Low-density rangelands	7
Third priority	Moderately vegetated rangelands	5
Fourth priority	Densely vegetated rangelands	3
Fifth priority	Sparse forests, planted forests, rained and irrigated cultivation	1

Reference: Research Findings, 2016

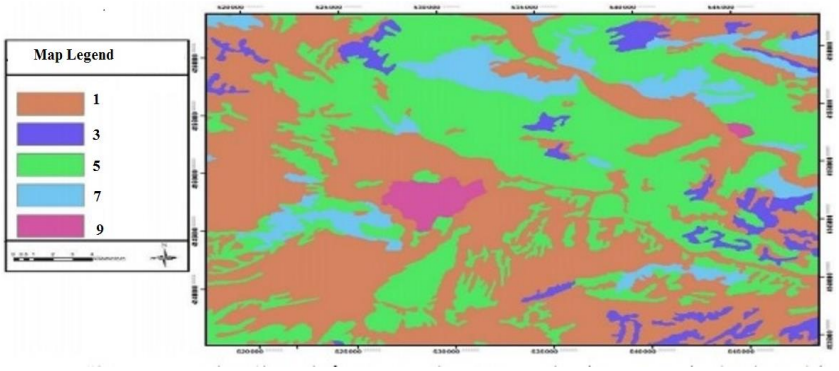

Fig 6: Classifying and reassigning scores to the vegetation layer

E: Zoning the study region based on distance from faults

In urban studies, it is necessary to observe fault zones, and type of land use must be considered with respect to fault lines (Babarian et al., 1992). Therefore, the study of the role played by this factor is very important and fundamental in determining land suitability. As usual, the types of information regarding this factor were given reverse scores (Table 3 and Fig 7).

Table 3: Classifying and giving scores to distances from the faults

Prioritization	Zoning the study region based on vulnerability to earthquakes	Scores
First priority	+6000	9
Second priority	5000-6000	7
Third priority	3000-40000	5
Fourth priority	1000-2000	3
Fifth priority	0-1000	1

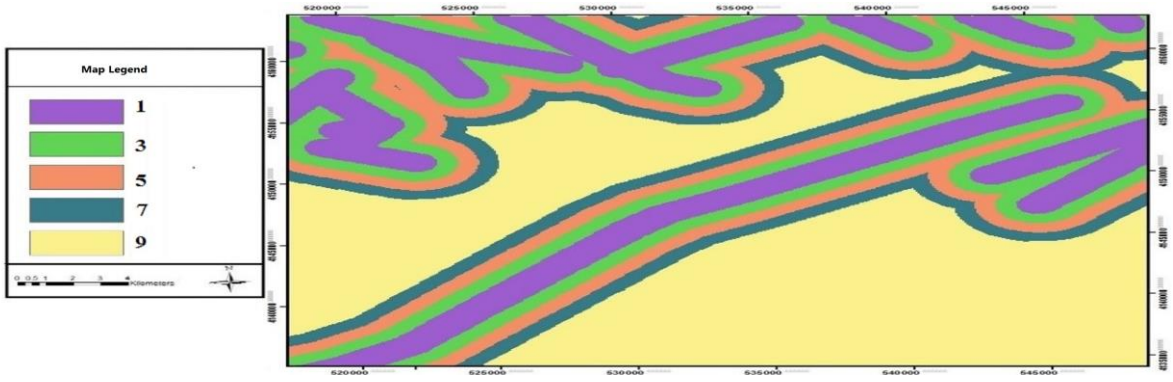

Fig 7: Classifying and reassigning scores to the layer of distance from faults
Reference: Research Findings, 2016

F: Zoning the study region based on distances from the rivers

Natural disasters resulting from river flooding and harmful environmental effects caused by river pollution and environmental pollution along river margins and banks are one of the problems cities and residential complexes face (Jabbari et al., 2010:40).In this research, areas at a distance of more than 3000 meters from the rivers were given the first priority, at 2000-3000 meters from the rivers the second priority, etc., and those at a distance of fewer than 1000 meters from the rivers the fifth priority (Fig 8).

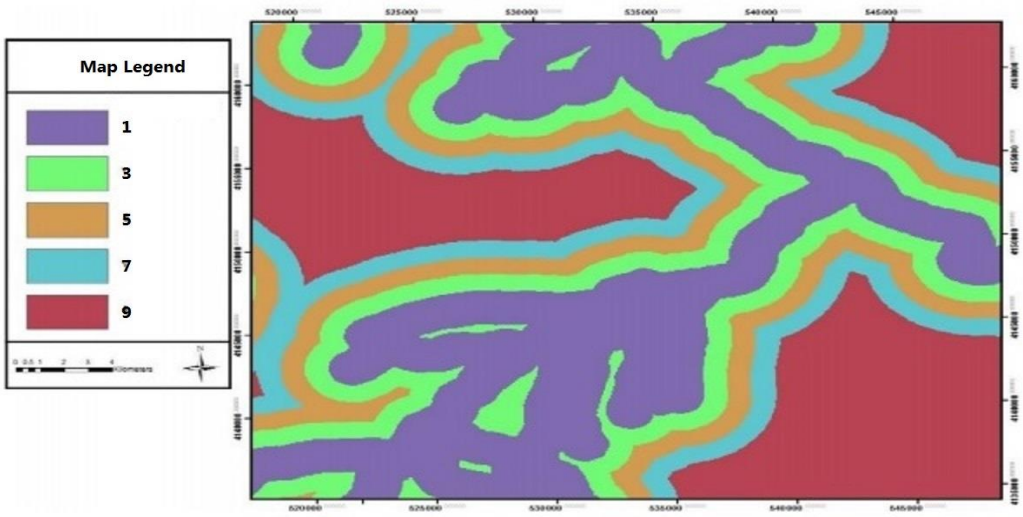

Fig 8: Classifying and reassigning scores to the layer of distance from the rivers
Reference: Research Findings, 2016

G: Zoning the study region based on soil type

The results of studies carried out in relation to zoning the soils in the study region are presented in Table 4 and Fig 9.

Table 4: Classifying and giving scores to soil type

Prioritization	Soil type	Scores
Fourth priority	Deep and fertile soils	1
Third priority	Relatively deep soils	3
Second priority	Moderately deep soils	5
First priority	Very shallow soils	7

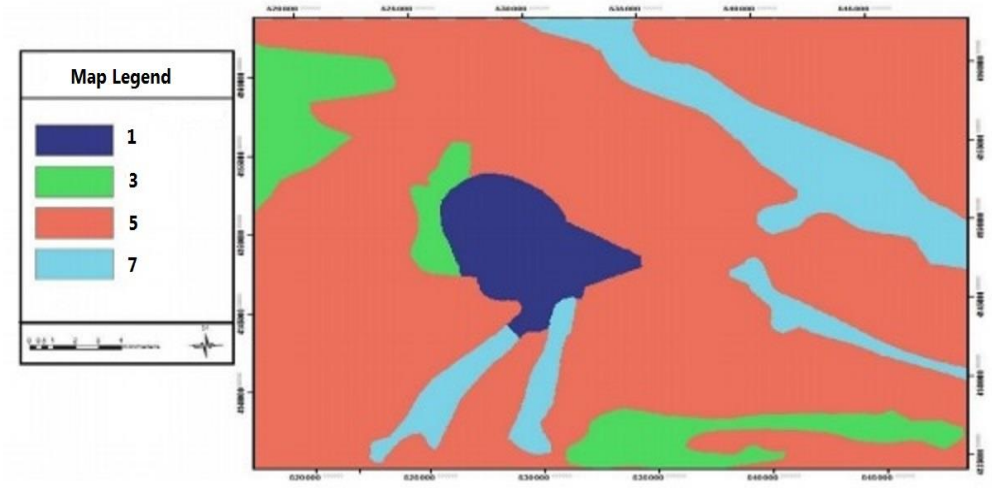

Fig 9: Classifying and reassigning scores to the soil layer - Reference: Research Findings, 2016

H: Zoning the study region based onthe intensity of soil erosion

This factor was classified and given scores to (in Figure 10) based on the first three priorities of moderate, slight, and very slight intensity of erosion**.**

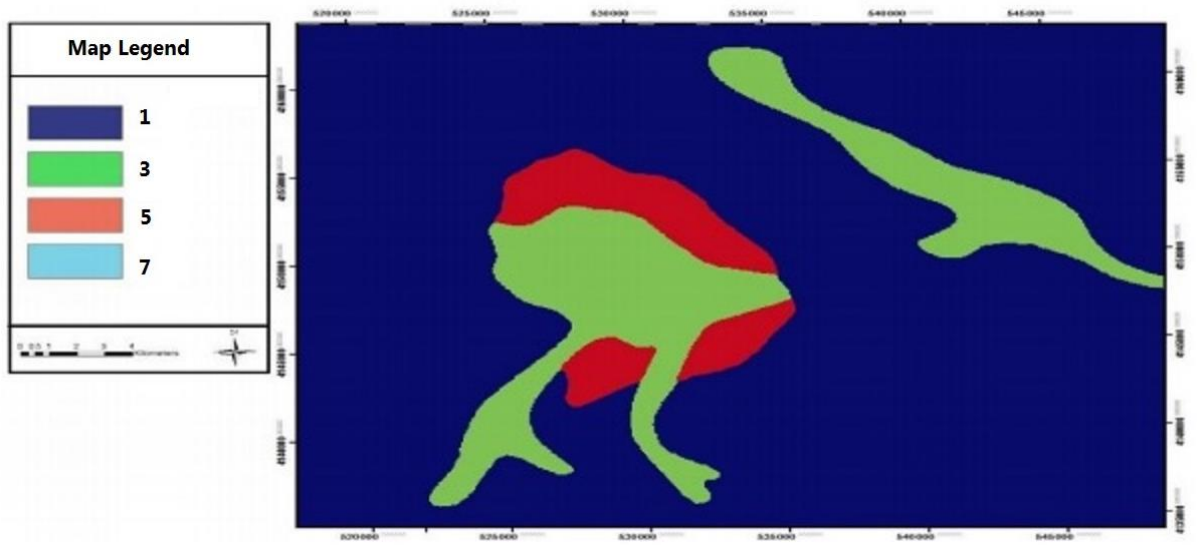

Fig 10: Classifying and reassigning scores to the intensity of soil erosion - Reference: Research Findings, 2016

I: Zoning the study region based on geological formations

Resistance to earthquakes and to digging required for urban infrastructure and capacity for wastewater disposal are provided by the existing geological formations. Moreover, considering other factors, these formations are prone to mass movement. Development on weak formations is accompanied by greater risk because these formations are more susceptible and less resistant to vibrations produced by earthquakes (Jabbari et al., 2010). The abovementioned conditions were given scores in Table 5 and Figure 11.

Table 5: Classifying and giving scores to geological formations

Prioritization	Geological formations	Scores
First priority	JkKsj.Jl.Ksn.Ksr	1
Second priority	Kat.Ktr.Ku	3
Third priority	Mur	5
Fourth priority	Peps	7
Fifth priority	Qft1.Qft2	9

Reference: Research Findings, 2016

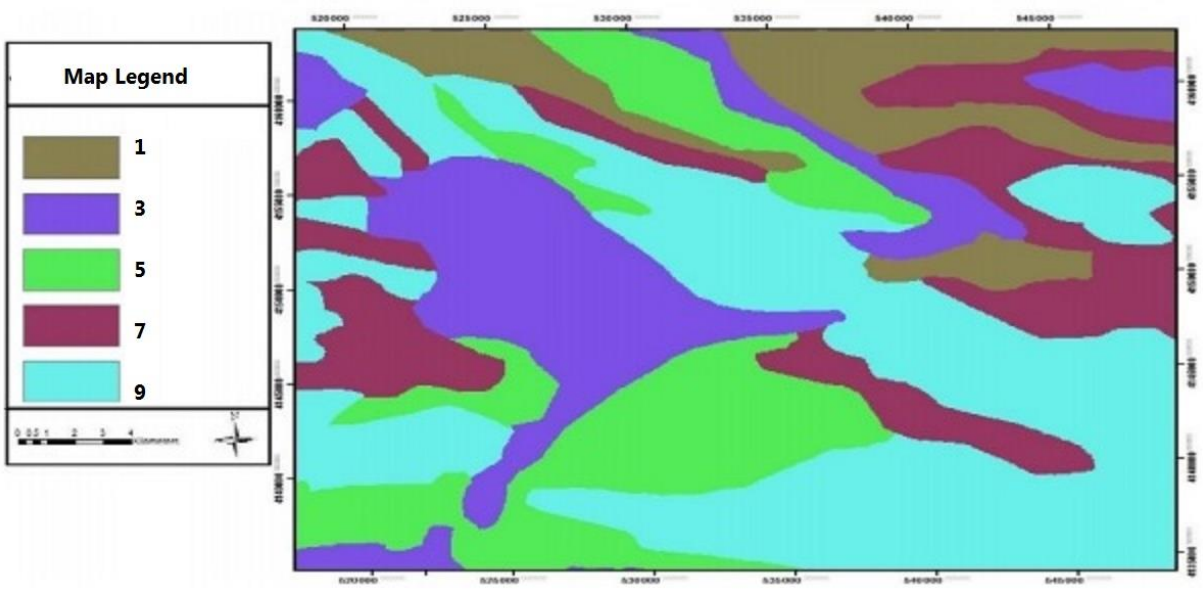

Fig 11: Classifying and reassigning scores to the geology layer - Reference: Research Findings, 2016

J: Zoning the study region based on urban surfaces

The indicator of the current city limits was also used in determining suitable sites for physical development. For this purpose, prioritization was performed in the form of built-up surfaces (score of 1) and unbuilt surfaces (score of 9) and the land areas were classified (Fig 12).

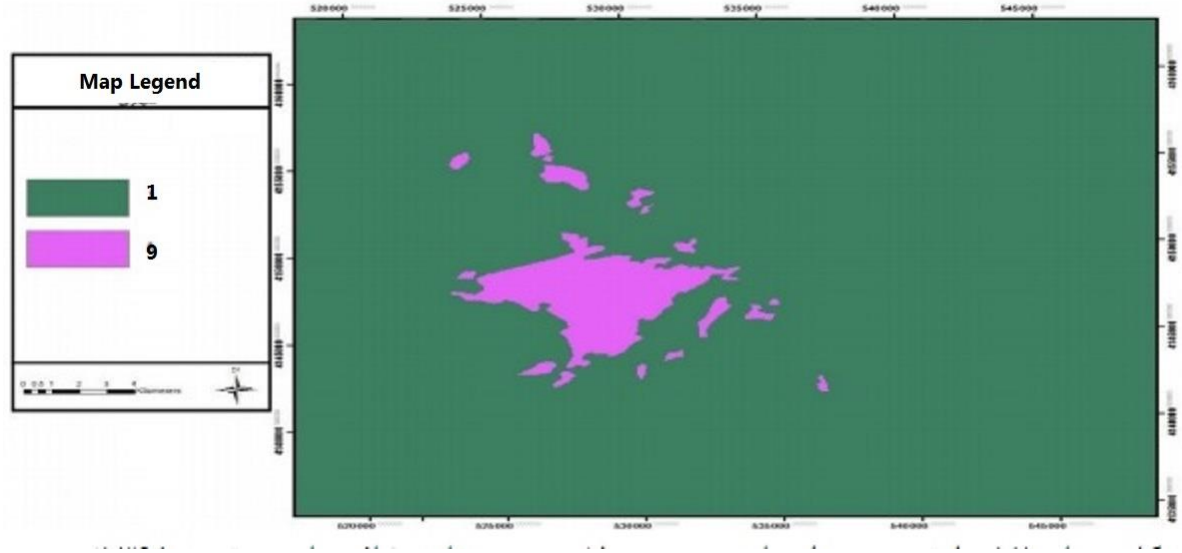

Fig 12: Classifying and reassigning scores to the geology layer
Reference: Research Findings, 2016

K: Determining the weights of indices

Since each of the utilized indicators had a different degree of importance, it was necessary to determine the degree of importance or the weight of each one. For this purpose, the AHP technique was used and the following stages were followed:

1: The pairwise comparison matrix of the criteria

A nine-point scale for pairwise comparison was used in prioritizing criteria. Taking the views of experts and researchers, the available references, and the executed projects and conducted research into consideration, weights were given to the criteria (Table 6).

Table 6: Pairwise comparison matrix of the criteria (research findings, 2016)

	Elevation	Slope	City limits	Erosion	Geology	Fault	Groundwater	Vegetation	River	Soil
Elevation		1.8	1.4	1.8	1.8	1.9	2.0	2.7	3.4	2.0
Slope			1.6	1.8	2.1	1.5	2.0	1.3	1.4	2.1
City limits				2.0	2.0	2.3	1.0	1.2	1.5	1.9
Erosion					1.8	2.0	1.2	3.0	2.1	2.1
Geology						1.0	1.0	1.7	2.6	1.4
Fault							3.0	1.4	2.1	1.0
Groundwater								1.6	1.0	1.4
Vegetation									3.0	2.0
River										1.2
Soil	Incon: 0.09									

M: The final weights of the criteria

The line average or, in other words, the row average related to each criterion was calculated to obtain its final weight. The sum of the weights given to each criterion was divided by the number of criteria, and the obtained number represented the weight and the effect of each criterion. In Table 7, average slope with the weight of 0.133received the highest score followed by the criteria of vegetation, faults, and geology that are very influential in the determination of urban land suitability for physical development based on natural factors. The criteria of elevation, river, groundwater, soil type, and soil erosion with weights of 0.0894, 0.0891, 0.082, 0.069, and 0.065, respectively, ranked fifth to ninth and had the least influence in determining land suitability for physical urban development.

Table 7: Final weights of the criteria

Criteria	Soil erosion	Soil type	Groundwater	River	Elevation	Geology	Fault	Vegetation	Slope
Final weight	0.065	0.069	0.082	0.0891	0.0894	0.117	0.119	0.121	0.133

Calculation of compatibility rate (CR): This rate expresses the degree of correctness and accuracy of prioritization in pairwise comparisons. If it is equal to or less than 0.1, the prioritizations and comparisons can be considered correct and accurate; otherwise, they must be repeated or corrected (Karam and Mohammadi, 2009). Compatibility rates are obtained by calculating compatibility indices (CI) from the following relation:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

In the above relation, λ_{max} is the eigenvector and "n" the number of options present in the problem (the number of criteria).

Calculation of compatibility ratio: Compatibility ratio is obtained by dividing the compatibility index by the random index:

$$CR = \frac{CI}{CR}$$

After weighing and before using the weights, the compatibility ratio must be compared to be sure of its accuracy, following which the compatibility rate can be calculated. The software automatically performed this stage of the calculations, and the determined compatibility index was 0.09.

Combining the weights of indices and layers: After obtaining the weights of all the layers, they were applied in the layers using the **overlay tools** in the ArcGIS software (Fig 13).

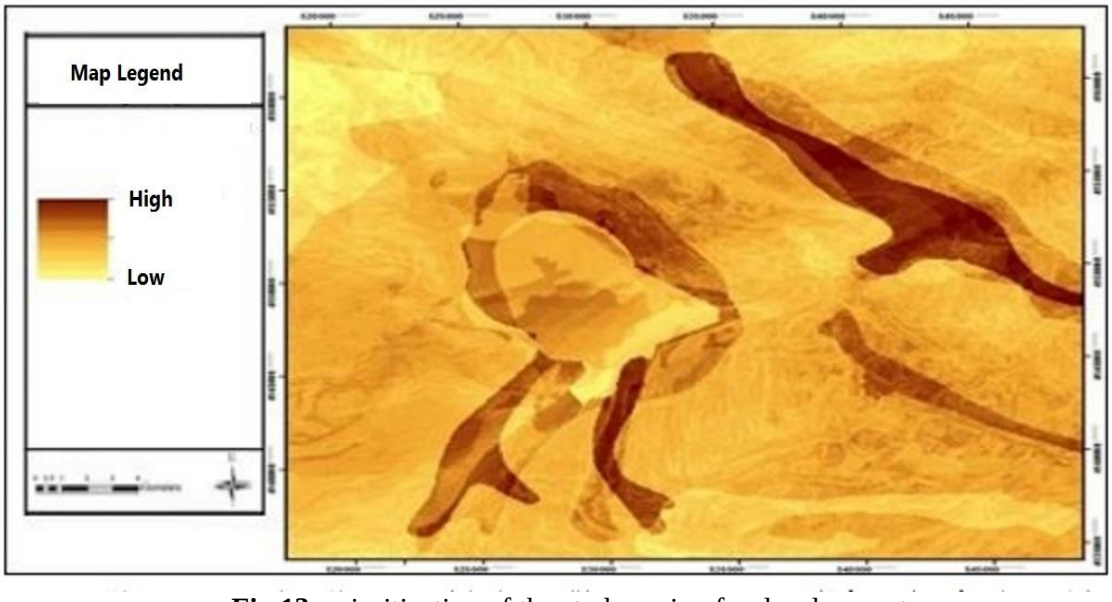

Fig 13: prioritization of the study region for development
Reference: Research Findings, 2016

4. Discussion and conclusions

The main purpose of this research was evaluating land suitability for the physical development of Bojnord and its surrounding areas based on natural factors. Natural factors (slope, vegetation, fault, geology, elevation, groundwater, and soil type and erosion) were first entered into the GIS software. The layers were then converted from vector form into the raster format, and the indicators were reclassified and scores were reassigned to them and their weights were determined.

Based on the results of the analyses (Fig 14), it was found that the city limits of Bojnord suitable for physical development were restricted to five areas that varied from very suitable to very unsuitable. In this classification, only 9 percent (8804 hectares) of the city limits distributed in the north western and

southern parts of the city were very suitable or suitable. Moreover, about 9.98 percent (9869 hectares) of the urban areas were moderately suitable, and about 81 percent (80203 hectares) unsuitable or very unsuitable (Table 8).

Table 8: Zones suitable and unsuitable for physical development of Bojnord

Number	Conditions	Area in hectare	Percent of the total
1	Very unsuitable	45,153	45.67
2	Unsuitable	35,050	35.45
3	Moderately suitable	9869	9.98
4	Suitable	5006	5.06
5	Very suitable	3798	3.84
6		98877	100

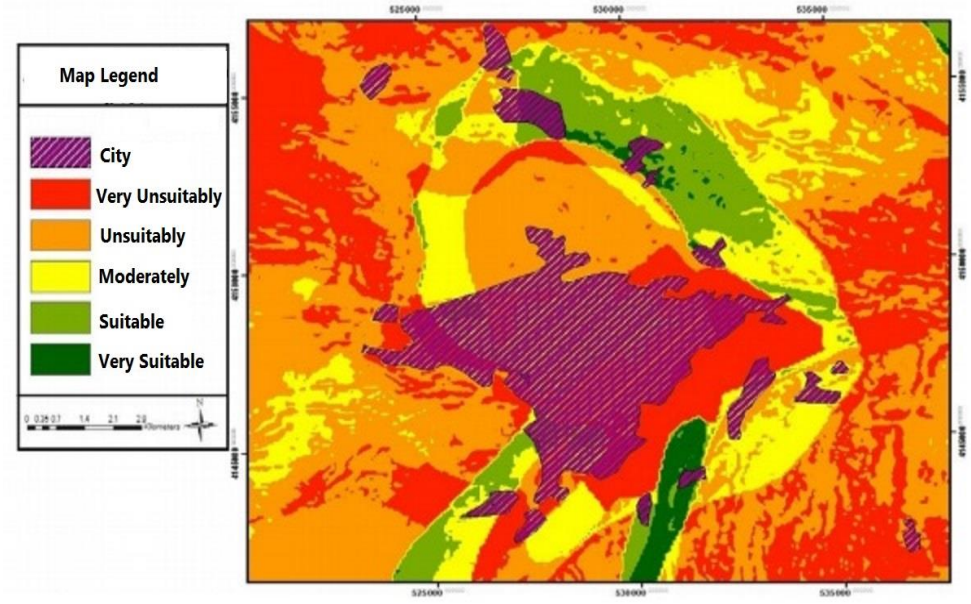

Fig 14: Prioritization of the study region with respect to land suitability
Reference: Research Findings, 2016

In general, suitable and very suitable areas for future development of Bojnord are in areas that have the best conditions with respect to elevation, are in suitable position in relation to slope, and are almost at a suitable distance from the rivers. Moreover, the soils in these areas are not suitable for agriculture, are of very shallow to average depths, experience an average intensity of erosion (with some places facing a very slight intensity of erosion), and their vegetation consists of spaces with low density and moderately vegetated rangelands. Furthermore, these areas have great access to groundwater resources and most of them are at a suitable distance (3000-6000 meters) from faults.

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Investigating the methods of monitoring the changes of urban land use using remote sensing data

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ABSTRACT

Background and objective: Remote sensing due to extensive coverage, high separation capacity and low cost of data acquisition from the ground as an efficient tool, has played an important role in the field of Earth science research and environmental monitoring. One of the most important applications of remote sensing are the ability to detect changes. Today's high-resolution satellite imagery makes it possible for these images to be used to produce urban maps or updating them to identify changes in urban environments. Precise and timely diagnosis changes, both locally and globally, are important for the management of the optimal use of resources. The purpose of this article is introducing all methods for detecting land use change using remote sensing data that has been presented so far.

Materials and methods: In this regard, these methods are examined and the advantages and disadvantages of each expression are expressed. Also, these methods are compared so that the user can, according to the application, select the appropriate method in this direction.

Results and conclusion: In this essay different methods of changes in urban grounds by the evaluation from distance were presented.

All of the mentioned methods include weakness and strength point and should be used based on the needs. The methods can recognize changes in urban regions by the satellite data and help in decision making and managing the urbiculture issues. In combined methods, surely all procedures improve and illustrate better output with a high accuracy and promotes the pictures as well.

1. Introduction

In recent years, the growth of urbanization and the increase of migration to the big cities of country, has led to sudden and abnormal outburst in Cities and the destruction of fertile land and natural resources and irreparable damage to nature.
The urban development phenomenon is one of the main causes of land cover and land use change, which causes many problems such as ruining Agricultural lands, water pollution, soil erosion and social-economic problems.
With increasing population of cities, there has been a great increase in the area built in the region, causing enormous changes in land uses around the cities and the degradation of the fertile land in the

suburbs, so that the continuation of this process can make Irreversible impacts on regional environmental resources. The monitoring and optimal management of natural resources requires timely and accurate information. Changes in land cover at different spatial levels and in different periods of time, expresses the interaction and opposition of the perpetual needs of the human and environmental communities

In this regard, land use / land coverage is considered the most important sources of information in the management of natural resources.

Today's high-resolution satellite imagery makes it possible for these images to be used to produce urban maps or updating them to identify changes in urban environments.

Also, updating information in urban areas is very important, because this information is the base of many usages Which includes studies on changes of user coverage and environmental studies.

Remote sensing satellite data is an opportunity for obtaining information from urban areas in different kind of accuracy and are widely used to identify changes. Identification of changes is called to the series of activities for defining the difference in the status of an object or phenomenon by observing it over different times, Several methods have been developed to identify changes using remote sensing data, and new methods are emerging. However, the correct identification of the land use of remote sensing data often due to the urban prospects are complex compounds of different levels, is difficult.

The remote sensing has proven to be a powerful tool for monitoring the rapid changes in land use

Over the past three decades, technologies and remote sensing techniques have progressed dramatically, including the series of sensors in a wide range of operating systems with potential benefits and positive impacts on land planning and land management in comparison with traditional method.

Remote sensing is a key technology for assessing the extent and of land cover changes. Through this technique we can act with use of multi time pictures collection and processing them with one of the appropriate methods available and almost high accuracy than detection of the desired changes in the region. By using and utilizing remote sensing data we can pay attention to scientific and efficient management of sensitive areas.

2. A review of the research done

In this section, the most important researches that have done, those who have worked in this field and also the methods presented in this particularly are:

Initially, we will express some of the work done by different people.

In 2005, Phalke and Couloigner have examined the man-made terrain changes in the urban area by using IKONOS images with high spatial resolution and terrain extraction techniques. This technique has done based on terrain extraction using the desired points and edges . The method is compared with the PCA method and ultimately the title has been introduced as a more effective method for detecting changes in linear handmade terrain[101]

Nikfar and his co-workers (2010) have done An investigation for Iranian to update coverage maps of 1:25000 . the result of this research is presenting an algorithm based on segmentation of images using spectral and geometric descriptors for segmentation. The important point of this research is using appropriate descriptors for the segmentation and classification of the image that with this method, The pixel classifications of the base and the object have been overcome. But the main weakness is that only general changes in small scale are investigated and in the context of urban area, especially constructional and single buildings in large scale have not presented a solution. [112]

In 2011, RAJA and colleagues concentrated on recognition of urban growth by comparing after the classification of the base wavelet. For utilizing wavelet they used two-dimensional wavelet transform and classification of images for Fuzzy-Cmeans clustering method . [123]

In 2012, Ahmad's brothers concentrated on modelling of urban land cover using the dynamics of growing multi-time satellite imagery in City of Dhaka, Bangladesh. They first categorized the terrain by using Fisher's classification, and then used three different models for simulating land cover maps in Dhaka in 2009.

Ahmad and colleagues in 2012 with an article entitled "Urban Growth Modeling" using multi-time imagery satellite analyzed city of Dhaka using Landsat satellite imagery in the years 19989 and 1999 and then predicted urban growth in2009. First, the images were classified into five classes and then, based on, three Randomized Markof models , automated cells of Markof chain and multi-layer Porstrone- Markof chain of growth stimulated in Dhaka city in 2009, Then the best compatible model with the fact that the multi-layer Prestrone is Markof chain, by that p Urban growth is predicted. [143]

3. analyzing the methods of land use change in urban landscapes

The following article explores and describes the methods are used to monitor changes in land use

3.1. Automatically detects kernel based on changes using multi-lingual images

One of the main challenges in producing map of changes in urban areas is the limitation in spectral separation of constructed lands and arid lands form each other in this area . [154] For this purpose, a method for detecting automated changes is used based on kernel and with capability of simultaneous use from spectral information and different spectral is proposed. At the first stage, the appropriate spectral indices for the separation of covering classes in urban areas are extracted from multi-time images.with the Assist of analyzing the vector component of the change and automatically determining the threshold, inaccurate quasi-tutorials models related to the change classes are extracted without change. [165]

The main idea behind the kernel-based methods is that a non-linear decision making function can be used for demodulation a linear decision making function in a higher-dimensional problem space. [16] That this space is called Space Reproducing Kernel Hilbert (RKHS). So we can expect a better separation between classes and a higher precision. [177] For the purpose of evaluating the validity and integrity of the algorithm, discovering suggested algorithm, was applied to multidimensional and multi-temporal Landsat 5 TM sensor satellite imagery.

In order to perform a comparative evaluation, the accuracy of the proposed kernel-based method in two types is based on the differential-probability method in Initial Entry Space (DFSS) and Differential Method in Specific Spaces (DFHS), with methods for detecting the changes based on (MNF) conversion, Spectral angle writer (SAM), and simple differential equation (DIFF), and for these 5 sets of features was compared. The results show the high efficiency and accuracy of the proposed algorithm than conventional methods of detecting changes and its high potentials in separating all types of spectral classes in urban areas.

3.2. Using coupled satellite images by forming a feature vector for image pixels

In this method, by forming a feature vector for image pixels, instead of the spectral information of each pixel, the image and the use The GeoEye1 stereo image, instead of its single vertical image, the usage of these data in identifying the changes that are created for Building layers and updating 1:2000maps is analyzed.[28]

Now with access to high resolution spatial images, sensors such as Ikonos-2, QuickBird-2, WorldView-1, WorldView-2 and GeoEye-1 and also by using the different detecting Methods Changes such as segmentation and image categorization, manual conversion, the use of combined data and image differentiation have provided Suitable opportunity for producing large-scale maps and accelerating their updating process.[189]

The main step in updating maps is the stage of change detection. A set of methods for detecting changes In order to update the data structure, can be divided into two general different levels:

First level: Analyzing the new image of the region and the old map (image to map)

Second level: New image analysis of the area and the image and the old map (image to image)

In order to identify the changes, a differential-based algorithm based on a feature vector pixel image , is designed to identify building changes, removes the extra pixels and the changes identified by the algorithm, than the actual changes that they were made is evaluated using an error matrix and its results are the most commonly used and produced accuracy are presented.

Due to the precision of the geometric data obtained from GeoEye1 images, we can consequence that these images in terms of planes and elevations are theoretically workable for 1:2000 urban maps

According to the results obtained to identify the changes using the GeoEye1 sensor pair, the proposed algorithm in low density areas has the necessary efficiency, and also in areas with a high density, we can introduce the areas with no change with high accuracy to operator (Fig. 1).

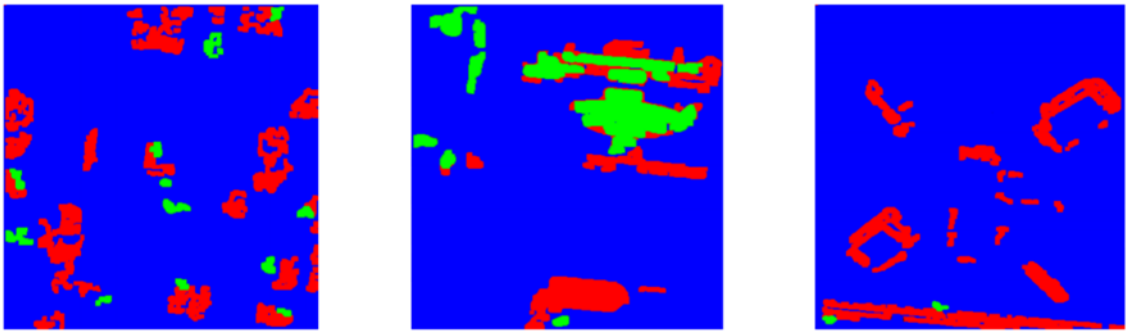

Figure1.The output image of applying the field condition filters to the results of the algorithm

(red and green land changes in a blue base ground)

3.3. Use of spatial-Spectral changes Indicators and Remote Sensing Data

The purpose of this method is to identify changes using Landsat 5 images through the comparison method after classification by considering the spatial- Spectral changes Indicators. [310]

Pixel based methods for identifying changes include algebraic, transitive, classification-based methods, directly comparing multi-time, phase and combined methods. Algebraic methods include visual difference methods, image regression, Image ratios, image vector analysis, and background subtraction, that all of these algorithms have a feature, and that is selecting the threshold for defining area changes.

Two issues in these methods are important criteria. One of these criteria is the selection of suitable video bands and the other is selecting suitable threshold for defining the areas of change. Among the methods based on classification, the comparison after the classification is very practical method [1911]. For example the new tools for identifying changes are classification-based phase methods.

In the proposed multi-time method, images of remote sensing were pre-processed and then spatial spectral change indices were extracted by three-dimensional wavelet analysis. In the next step, the

extracted indices and spectral properties were entered to Fuzzy-C Clustering method till four classes of study area, namely urban, arid land, road and plants cover were extracted. [2012]

In this study, the phase clustering output was used to extract educational data. Using educational extracted data and the maximum classification method are similar to the classes of use in the study area with a higher accuracy than phase clustering method that was extracted.

After classification of the maximum similarity of images, urban growth was identified by comparison method after classification and map changes in urban area were achieved. The resulting changes map with the classification of the maximum similarity and the indicators of changes the spatial spectral has a higher accuracy.

In this research 2 purposes were followed. In the first goal, accuracy of the results was dramatically increased when the function of indexes in classified spectral-locative changes was studied and a spectral-locative index was added.

In the second goal an observed classified method with an automatic solution to catch a didactic example was offered. The purpose was exploring the changes by the use of classified plans.

Results showed that the accuracy of utmost method in FCM by all data was purely practical than clustered method in FCM. Besides, a mechanical method was extracted in order to be compared with the clustered method. [2113]

3.4. Illumination of changes by the use of LCM

LCM (the model maker of earth) which is totally unified with EDRISI plan can be a tool to manage and plan the support for decision making. This model maker lets the user analyze ground alteration as fast as possible. [414]

One of the favorable methods of designers to control the covering of the grounds is modeling. Once this modeling was done by some PRESEPTRON and some layers of fake nervation and the result was amazingly positive. [515]

By studying the results of observed alteration, it can be said that the most growth in ground covering is related to urban areas and the most decline is related to arid places. According to the result of this practical research, horizontal transmittal is pushing cities into unstable situation due to its inappropriate economic and environmental condition.

3.5. Chained model of MARKOF

It must be said that, by the use of MARKOF we can predict the scale of abused grounds in the future. [616]

Therefore the only purpose of this research is investigating the process of alteration related to taken grounds in the past and future. By the prediction of the rate of utilization we can estimate the expansion and destruction of places and lead them to the appropriate spot.

Pictures are classified to 4 groups including pasturage, dry farm, residential area and farms. Prediction by MARKOF method is of great importance due to its eagle eyed view in order to manage the resources. This method of using the maps shows the most sensitive places to the groups in charge, in order to excel better planning and managing. This kind of models should be used for short term (5-10 years) plans because these models are fixed but the ground itself is changing all around the clock.

3.6. Observation upon the alteration by the use of satellite pictures and GIS

Urban area alteration is examined by the combination of satellite pictures, geographical information GIS and different vista including two methods below mentioned.

Classifying ground based on evaluation from a long distance and analyzing the alteration of it based on GIS.[2417]

Specifically, the ground analyzing is a combined and classified method along with GIS which is categorized by LANDSAT satellite pictures™. Finally the photos show a variety of changes on surface of metropolises.

Geographical data system provides a resilient space to penetrate, analyze and discern the expansion and alteration of a station. On the other hand, the combination of GIS and deliberation from a long distance can cause a better topography in urban areas.

For instance, the environs of clustered method have changed to spatial pattern.

Evaluation from a long distance provides a general lookout from the huge places coming back and harmonized with geographical technic.

The purpose of this research was to understand the view, the features of sensor and elicited technics. Some technics were used to assure the accurate classification of ground and covering the data. Based on radiometric, The LANDSAT ™ was used in order to decrease the climate changes to the respond of time spectral(Fig. 2).

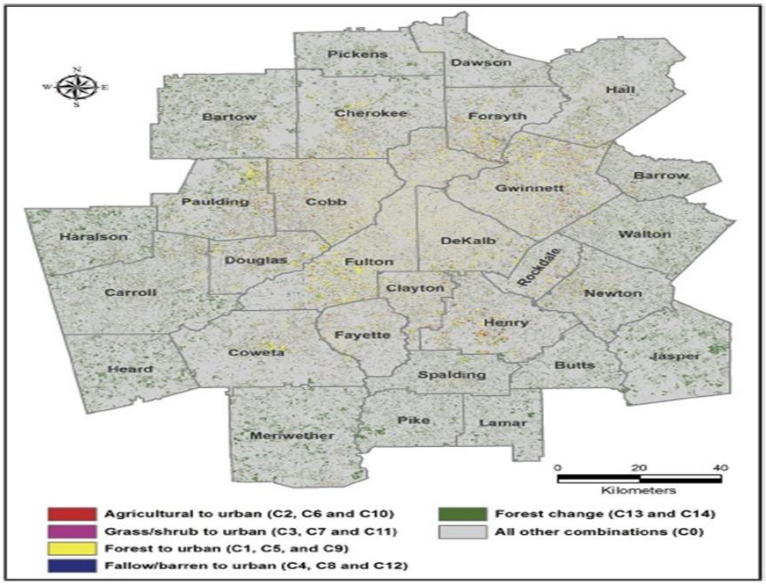

Figure2. A sample map, Land use/cover conversion for the 29 countries in the atlanta Atlanta metropolitan area during the period 2000-2010

3.7. Discernment of changes by the use of multipurpose satellite pictures

In most studies, changing the cover of ground has used LANDSAT™ as the only long term digital archive with an enough compatible clarification.

Acquiring accurate data in huge urban areas by the use of LANDSAT™ is quite hard. Requesting spatial high resolution data and process of important factures is necessary. Nevertheless, using the

multimedia data may result in more understandable and reliable information and also may provide an accurate potential about alteration of ground cover by different unification.[2518]

In this study a multi method plan including, analyzed PCA, 5-SPOT, LANDSAT-7 and panchromatic topography data is used. This act caused empowering and classifying way to diagnose the analysis of ground changes.

This combined method extracted from PCA, is provided with information about direction, nature, rate and place of the ground in order to fasten the industrialization.

PCA method showed a better function rather than the previous one. Nevertheless, there is bafflement in using the ground changes. Although the scale of changes was high, accuracy was for different classes. All in all, the result can be satisfying. Variance of time and spectral difference in separation of sensors caused a flaw in function of grounds and ended up to a mistake. An appropriate method can reduce imitation and increase accuracy at the same time. (Fig. 3).

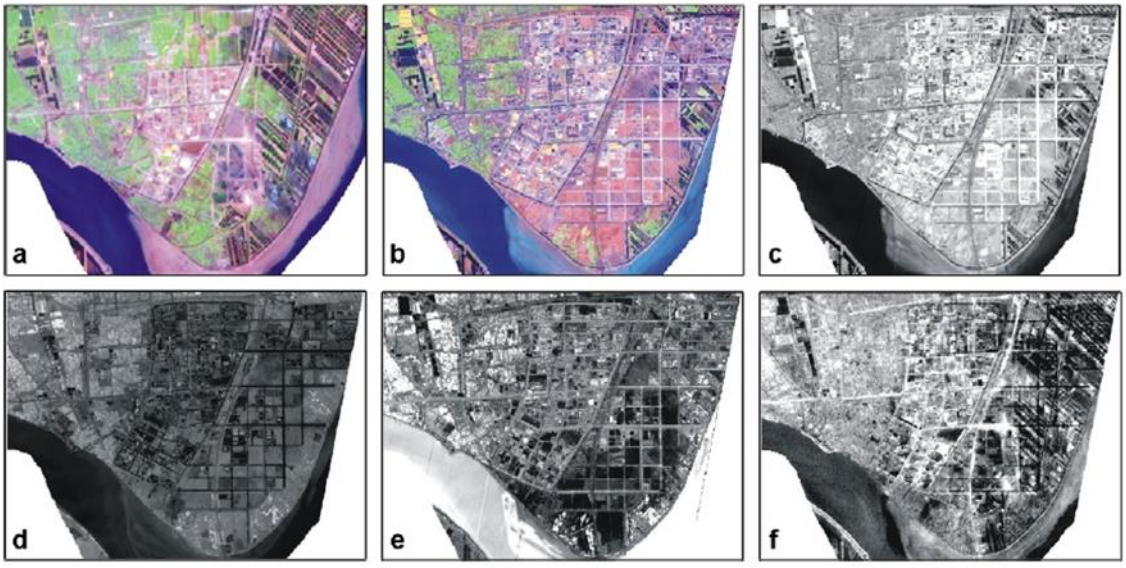

Figure3. Principal component analysis (PCA) of the stacked multi-sensor images: color composition image of Landsat-7 enhanced thematic mapper (ETM) in 2001 (a); color composition image of SPOT (systeme pour l'observationobservation de la terre or earth observation satellite)-5 in 2003 (b); and the first four components of the compressed PCA image (c–f).

3.8. Incorporation of related analysis and pixel base stuff by photic data in urban area

In recent years, analyzing important urban impositions such as buildings and trees from satellite pictures have caught researchers' attention.[719]

Classified and analyzed methods used in urban areas are struggling different and complex problems including detection of buildings and small trees, inappropriate border of trees, some roves overwhelmed with grass and imprisoned buildings by trees in shadow.[2220]

To progress the mentioned problems in previous part, a normal numeral model was offered. [2321]

In second part geometric, spectral, papilla and combined features by a SVM-GA are chosen. Among the mentioned features, the spectral one plays an important role in finding trees in shadow and blind spots.

In third part, a mechanical support through related analysis and pixel base stuff by the use of SVM-GA is functioned to analyze the urban imposition such as trees and buildings.

In forth part, the result of both classified levels is improved.

In fifth part, according to power of each level in analyzing the imposition, the focus was on the improvement of border of buildings and small trees.

The results show that combining two levels of object-oriented classification and base pixel improves identification results, especially in identifying small and low-rise buildings and trees.[23]

3.9. Disclosure of features in urban area changes by the use of optimized algorithm genetic

Despite of the all useful information in high qualified satellite pictures, sometimes using this information will not be enough due to increase in different copies and it will require modern methods which one of them is using the data related location in pictures.

Diversity and manifold features are needed in order to reach an optimized attribute.

In order to access the optimized features and finding an optimized parameter at the same time, crowd genetic particles are used. Also according to weakness of this method in disclosure of one class through bad condition of radiometric a two class version of changes revelation is used.[822]

In this method in addition to spectral feature, an extracted endobiotic attribute is used which has a high separation power in binary plans.

Accuracy of this method is coming from the excellence of crowd algorithm particles to access the binary plans.

3.10. Combination of distance and similarity-method in order to reveal the changes in grounds by over spectral pictures

This method is gradual and based on similarity and distance as well, which is presented in two levels including 1: revelation and 2: decision making.[923]

In the first level, the data gathered from the distance and similarity is put to a modern algorithm called similarity space. [2624]In this space the changed places are highlighted. Then the data sweeps to the second level where it is a binary place and changed places are shown with 1 and unchanged places are shown with 0. [2725]

The most important feature of these methods rather than previous ones are that: they are automatic, simplex, low volume in calculating and well accurate. To measure the function and accuracy of the presented method a set of HIPRON beyond spectral methods are used.

Evaluation of the output demonstrates that it gets the advantage of high accuracy and low warning alarm in comparison to revelation methods.

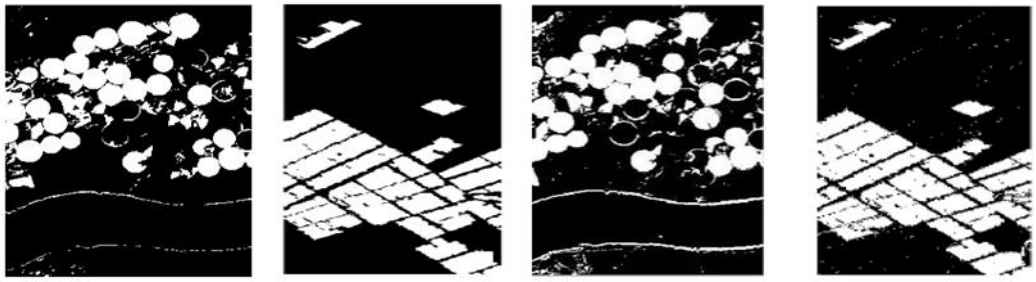

Figure4.Comparison of proposed method (right image) with ground reality (left image)

4. Conclusion

In this essay different methods of changes in urban grounds by the evaluation from distance were presented.
All of the mentioned methods include weakness and strength point and should be used based on the needs. The methods can recognize changes in urban regions by the satellite data and help in decision making and managing the urbiculture issues.
To represent the summery of strength points to each method, the below selection switches can be mentioned:
In automatic method the exploration of multi spectral photos use all data of class separation.
In the method of comparison, by comparing photos we can say which places have not changed and we can reduce the percentage of errors as well.
Utilizing the distance-spectral scales from a long distance proves its function.
Revelation of alteration by LCM and MARKOF methods which are prepared for future plans can help designers and managers decide well.
Observing the changes by satellite pictures and GIS can result in a ubiquitous up dating. Also GIS can save and evaluate data which without it almost all the process is impossible.
Recognizing the changes by the use of satellite multi-functional pictures can solve the problems of mono lateral pictures.
By and large, in combined methods, surely all procedures improve and illustrate better output with a high accuracy and promotes the pictures as well.

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