

## **Strategic Planning Approach for Sustainable Development of Mountainous land overlooking 5th region of Tehran Municipality**

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### **Abstract**

The rapid development and expansion of Tehran metropolis in recent years, regardless environmental considerations and the strategic planning approach, especially in urban development plans and programs caused in the large area of the mountainous lands of the immediate area of the city being occupied by the built-up areas and Situations provided that the environmental balance between activities and the location of urban activities, especially in the northern heights of the city, will be eliminated and located in unsustainable situations. Hence, considering the nature of the subject of this study has regarding the identification and preparation of sustainable development strategies for these lands especially for the northern mountains overlooking the 5th region of the city, with the approach of strategic planning has been proceed. The method of this research is descriptive-analytic and content-based in a practical way and using the methodology of documentary studies and athletics done and using the SWOT analytical model. The results of the research showed that after identifying and analyzing the internal factors (strengths and weaknesses) and external factors (opportunities and threats) on the range of studies and addressing each strategy and their weight, among 9 strategies. The result of research, defense strategy (WO), consideration of ecological capability and the capacity of natural lands, the lands structure of mountainous lands, will be prioritized in order to achieve sustainable development.

**Keywords:** Sustainable development, Strategic planning, Strategies, Mountainous land.

### **Introduction**

Highly-speculative investments in land, the spread of the urban structure, and unnecessary high-rise constructions within the boundaries and landscape of the heights in the north of Tehran are some of the gravest problems the metropolis is currently facing. The proliferation of a particular range of constructions conducted by certain organizations in the “restricted highlands of Tehran” have transformed the natural landscapes of the heights, particularly those in the heights overlooking District 5, and made the area into a quasi-city, leading to the imbalanced, unstable growth of suburban areas. Excessive high-rise constructions in the northern heights of the city, especially those overlooking District 5 have led to the strain of water resources, damages to the local flora, water shortage crisis, and haze. As a result,

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preserving and sustaining these lands as a part of the boundaries and proper of Tehran are of considerable importance. The city proper is an opportunity that, if not managed aptly, can turn into a threat, and thus the present situation must be amended by planning and managing the highlands within the city limits through enforcing ubiquitous regulations for all centers of population and activity, and by proposing effective solutions.

Once recognized as a suburban area, Tehran Municipal District 5 stretches across the northern periphery of the city which was gradually attached to the metropolis as a result of migration and the erratic urban development. Spanning across 5700 hectares, the northern heights of Tehran District 5 feature the natural potentials of the city, and are among the last opportunities for sustainable urban development. They offer unique, valuable natural mountain attractions for recreational purposes and control the structural expansion of the city by creating a buffer zone that demarcates the urban structure and the natural environment. Given their ecological capacities and the possibility of an optimal use of the resources, adapting development plans and models can help to change these lands into a green roof for Tehran metropolitan area in near future, complying with the sustainable development model and drawing on a systematic planning approach.

Therefore, it is of great importance to adopt a strategic planning approach to obtaining sustainable development in this area to systematically resolve urban problems, aiming to balance the spatial form of the city through understanding the opportunities, possibilities, and threats, and to identify and allocate resources through correct, purposeful management. Given that the process of such planning complies with the municipal policies and dynamics of comprehensive urban plans, the significance of such considerations would be further highlighted (Chong et al., 2018).

In the following, some of the most notable studies on the subject are reviewed.

The limits of Tehran metropolitan area must be planned according to previous similar experiences around the globe. It is obviously impossible to find an ideal example that perfectly matches the situation in Tehran and can be referred to in any respect. Previous experiences in city limit management mostly revolved around environmental protection or, in other words, creating a greenbelt (Amati, 2008).

In the 1970s, the greenbelt built in Oregon, U.S. which was meant to control the expansion of city limits in a number of cities including Portland, separated the urban areas from rural areas and limited urban expansion (Pagniello, 2015). The project led to a higher density of buildings, facilitated navigation on foot, and reduced both household and commercial costs of energy and transportation.

Inspired by Ebenezer Howard's notion of Garden City, the greenbelt was experimented with in the UK (London, to be precise) in 1935 by the Regional Planning Committee for Greater London "to provide a reserve supply of public open space and of recreational areas, and to establish a Green Belt or girdle of open space" (Evans and Freestone, 2010). The policy proved successful in the development and renovation of the city proper by changing the wave of development from the suburban areas to the inner city (Lehrer and Wieditz, 2009).

Inspired by the experience in London, a greenbelt project was proposed for Seoul, South Korea in 1971, and implemented between 1971 and 1973 in Seoul and thirteen other cities. Issues specific to the city were considered in establishing the Seoul greenbelt. The plan aimed to improve security against a potential attack from North Korea, eliminate the formation of slum settlements around the capital, prevent an urban sprawl, reduce the concentration of population and industries in the capital, confront speculative investments in the land market, protect land for agricultural use and help the food security, and protect the environment and the natural resources (Dey and Greeshma, 2014). In other words, protecting and managing

city limits are the best development management solution in metropolitan areas such as Tehran.

Some publications addressing the subject of limits include “A Typology of City Limits and Global Experiences in its Planning and Management” (Rajaei and Mansourian, 2017). The findings of this study suggest that ensuring the correct function of urban limits, whether as regards greenbelts or construction control areas (major types of limits in other countries) is contingent upon providing legal and institutional support, promotion of novel, voluntary, unofficial methods of limit management, education, information, and research into the role of limits, and a reliable level of national, regional, and local will for protecting and improving the limits.

In another study on city limits entitled “City Proper Limit Management; A Systematic Solution to Urban Problems- Case Study: Mashhad Metropolitan Area” the author investigates the most notable contributing factors to problems with city proper limits in Mashhad, including the lack of an appropriate urban development model, the lack of a specific legal position, management and planning insufficiency, and lack of a unified management and administration (Hadizadeh Bazzaz, 2013).

In a paper presented by Ragheb et al. In 2022, a new approach to preserving and improving urban heritage while maintaining environmental, social, cultural and economic sustainability in the Egyptian city of Fouh using the SWOT method was proposed (Ragheb et al., 2022). The results of this study showed that in order to maintain sustainable urban development, it is necessary to present a new approach with the integration of different and comprehensive goals of urban management in order to maintain the vitality of historic cities.

In a study conducted by Rajput et al. In 2021, an urban development policy framework was proposed for the sustainable development of developing cities by combining AHP-SWOT-GIS for the city of Delhi, India (Rajput et al., 2021). The hybrid approach addresses important issues such as the impact of disasters, slum dwellings, lack of infrastructure and noise pollution in urban planning. According to the results of this research, the use of SWOT provides appropriate flexibility to engineering computational methods in order to achieve sustainable planning.

The Voukkali and Zorpas study in 2022 evaluated different systems of urban metabolism using the SWOT method (Voukkali and Zorpas, 2022). According to the results, in order to assess the state of urban metabolism, it is necessary to update the evaluation methods by considering new topics of sustainable development, such as the cyclical economy and the development of green transactions.

The main objective of this study is to analyze the role of the heights in the north of Tehran, and particularly those overlooking Municipal District 5 in attaining sustainable development, protecting urban limits, and controlling the excessive structural expansion of the metropolitan area with the help of measures foreseen in urban planning and sustainability drawing on the strategic SWOT model. The analysis of the current situation and identifying the strengths, weaknesses, opportunities and threats can help formulate development strategies and solutions to preserve and sustain these areas while minimizing their negative impacts and enhancing the economic, social, cultural, and political gains.

## **Material and Methods**

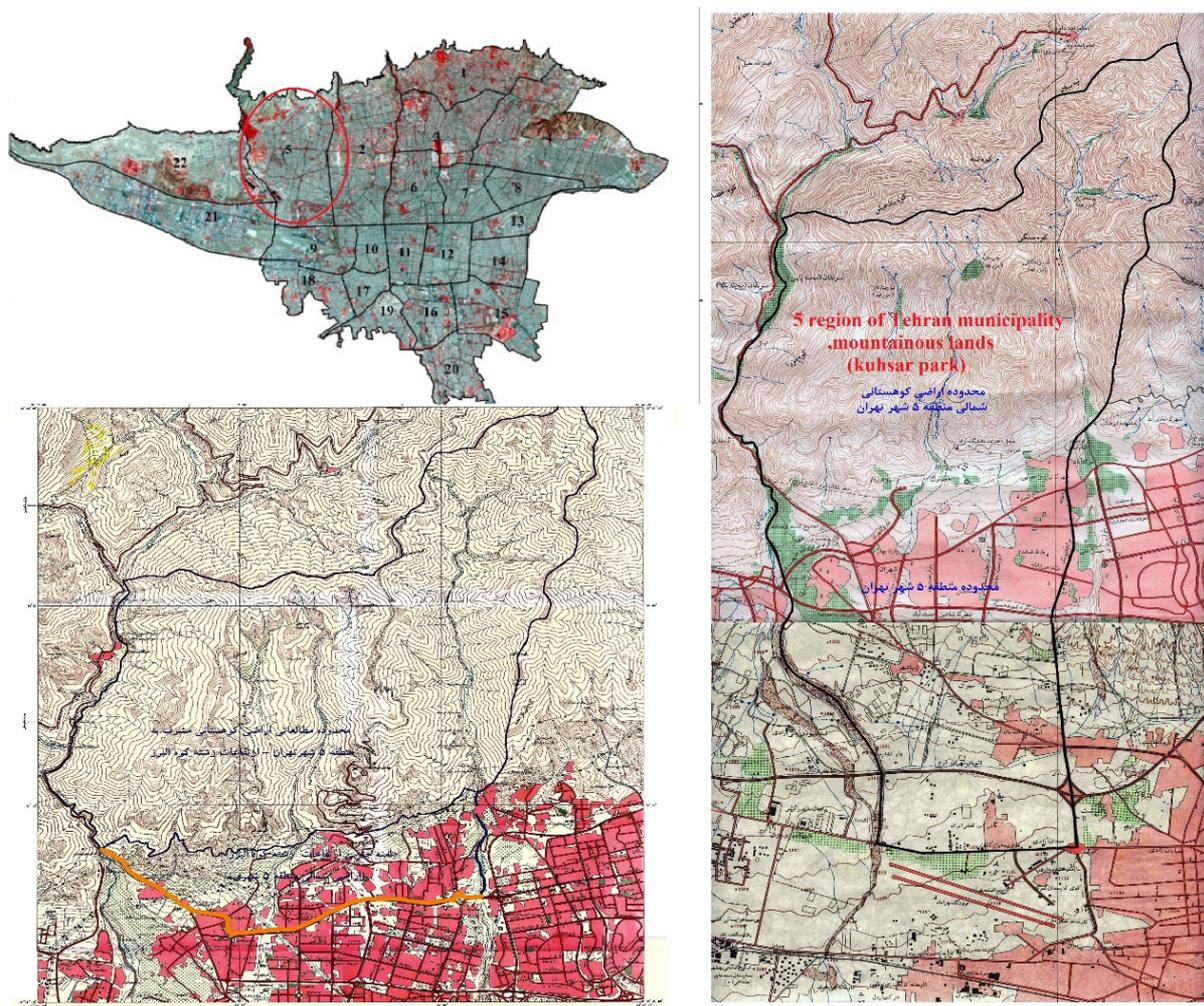
Expanding across 5413.6 hectares of the northwestern part of the city, District 5 is one of the 22 municipal districts in Tehran and is home to a population of over 800,000. Covering a total area of approximately 5700 hectares, the heights overlooking District 5 are a significant part Alborz Mountains in the northern parts of the city. Kuhsar uplands towering over District 5, between the Farahzad and Kan River valleys, are located in the city proper. The heights start

from 1400 m above sea level in the study region. The region is limited by the following features in the district:

Northern Limit: Looking out to the northern limits of Tehran at 1600-1800 m from sea level.

Southern Limit: Hesarak Boulevard; Western Limit: Kan River and the Souleqan Road; Eastern Limit: Farahzad Valley.

This study is dedicated to identifying and investigating the basic studies into physical upland resources overlooking Tehran District 5 (including the morphological and geomorphological structure, geological issues, pedology, weather and climate, hydrology, and water resources), the biological resources (the natural habitat), and human resources (including the demography and land use) with the help of field study reports, aerial and satellite imagery, and overlapping related maps by using of Arc GIS Software. Then the results of the study were employed in identifying internal and external factors affecting the study region.



**Figure 1.** The Location of study area

This is an applied-developmental study carried out using a descriptive–analytical approach. The research process involved collecting documents by note taking and accurate desk studies with occasional visits to the Tehran Municipality, the Iran National Cartographic Center, and the libraries of the Management and Planning Organization of Iran and the Statistical Center of Iran.

The field studies were carried out by direct observation, visiting different parts of the study region, and interviewing residents and experts, The municipal administrators and managers of District 5 and management of Kuhsar Nature Park and regional consulting engineers, then according to the SWOT technique and considering the investigated criteria, the subject matter, the information gathered in field and desk studies, the strengths, weaknesses, opportunities, and threats as regards the uplands of Tehran District 5 were analyzed in terms of economics, sociology, culture, nature, structure, and institutions. The analysis results are suggestive of the impact of both internal and external environmental functions on the sustainable development of the lands. This method results in strategies based on the principles of sustainability aiming to improve the conditions of the uplands and helps to analyze the main strategies in addition to prioritizing, and the ultimate establishment of development strategies based on the environmental and natural capacity with the help of experimental methods (Benzaghta et al., 2021; Padash et al., 2016).

The SWOT analytical method is a useful one in strategic planning. This method involves attempts to analyze the conditions and external and internal factors, providing a basic strategy for the survival of the urban environment (Candia et al., 2019).

Strategic evaluation methods such as SWOT have been used by researchers for a long time, but they are valuable and effective in terms of results. Because the purpose of the model is not to use computational complexity or accuracy in calculations, the use of SWOT is still widely used and the body of change in the computational process is used in many new studies (Benzaghta et al., 2021). The purpose of using the SWOT model is to structure the strategic evaluation approach to an issue. The high number of articles published in recent years using the whistle model confirms this approach (Benzaghta et al., 2021; Ghazinoory et al., 2011).

The opportunities and threats in this model demonstrate the major desired or undesired challenges for the urban area while, in contrast, the strengths and weaknesses (competencies, capabilities, skills, and insufficiencies) reveal the internal situation of the study region (Nejad et al., 2013). In brief, the objective in analyzing external opportunities and threats is to evaluate the problem of whether an urban environment can profit from opportunities while preventing threats; in particular, when confronting an uncontrollable external environment at the present.

## **Results and Discussion**

In this stage, it is necessary to initially identify the current situation by examining internal and external factors, possibilities, and limitations of the site (the external and internal factors affecting the study region) using the analytical SWOT model and the derived results of overlapping related maps, by using of Arc GIS Software by with visiting different parts of the study region, and interviewing residents and experts, the municipal administrators and managers of District 5 and management of Kohsar Nature Park and regional consulting engineers The necessary analysis has been done (Pazoki et al., 2020). This helps the management to integrate the adopted procedures when encountering external opportunities and threats. In other words, strategic planning presents the best solutions to find the best compliance between internal and external environments based on understanding both environments.

In the end, the strategies obtained from this planning must be applicable and efficient, and make use of the strengths and opportunities, and at the same time, minimize and overcome weaknesses and threats. The internal factors of the study region were divided into strengths and weaknesses while the external factors were classified into opportunities and threats in this. In the following, internal factors (strengths and weaknesses) and external factors (opportunities and threats) influencing the study area and their division have been identified.

### *Weaknesses*

1. The existence of qualitative and quantitative weaknesses in the field of facilities, services, equipment and urban landscape, the existence of identity weakness and the lack of proper space organization in terms of welfare facilities and services to provide the needs of the area visitors.
2. Lack of ecological capability and capacity of natural land, land structure and resources in choosing and locating existing land uses.
3. Existence of loading and locating restrictions for land uses, because of rocky outcrops and mountainous Highlands.
4. Roughness of the surface of the land and the presence of stones and pebbles in the lower soil of some parts of the research area that requires repair operations and soil enrichment.
5. Limitation of available water resources and soil depths for the development of green space and vegetation.
6. The presence of high power transmission lines in the sidewalks and in the middle sections of the site.
7. Interference between roadway and pedestrians in in the motion corridors and lack of safety for pedestrians.
8. Unique planting and diversity of forest plant species and lack of proper linkage in most parts.
9. Lack of attention to the master plan for the implementation and construction of the access roads in the area.
10. Lack of proper parking access for visitors.

### *Strengths*

1. The special strategic position of region because of being in uplands of Tehran metropolis and it's controller role against unauthorized and irregular development and indiscriminate privacy 5 region.
2. Benefit from the diversity of the varied climate and ecology in the tourism development sector, such as the existence of natural sights, perspectives, hills, valleys and corridors views because of the topography existence and differences of different height.
3. Having suitable vegetation due to the presence of rich and old trees and old-timer forests in the area and area studied as an element of urban identity.
4. Availability of water resources such as springs, qanats and seasonal and permanent waterways and the possibility of developing green space and forestry in parts of the site, especially in northern and southern parts.
5. The existence of Mosel and the river of Farahzad Valley as a natural potential in the northeastern corner of the study area and the presence of the Mosel and the valley of the Vosk and Ken on the western edge of the study area.
6. The existence of some leisure and tourism applications in the studied area.
7. The existence of open lands suitable for forecast and load the required welfare services land uses.
8. The existence of close relationship and interaction between man and nature (mountainous environment) and high statistics of visitors of the site due to the advantages of mountainous neighborhoods of the city.
9. Availability of study areas of the basic infrastructure needed, such as water, electricity, access roads, proper communication network and etc.

10. The existence of old and valuable rural tissues such as the Sulqan in the western margin and important pilgrimage sites such as Emamzadeh Davood in the northern part as one of the most important social cultural attractions of Tehran.

### *Opportunities*

1. Proximity to the metropolis of Tehran, which provides the opportunity to use the growing market demand for tourism and employment.
2. The increasing tendency of citizens to spend their leisure time in the natural surroundings of the city
3. Existence of natural open spaces in the northern and southern boundaries of the site with the possibility of development of green spots, forestry plans and enhancement of existing vegetation cover, in order to maintain its ecological function as a respiratory lung of the city.
4. Possibility of developing tourism and designing and organizing various tourist and recreational spaces in the area as an important regional and trans-regional tourist destination, considering the features and potential of the mountainous environment.
5. Welcome private sector investors to invest and participate in tourism development projects within the research area
6. Possibility of utilizing the potential of NGOs and public participation in the development of environmental activities and the revitalization of natural resources with the approach of protecting the mountain environment and other natural elements of the research area.
7. Close main infrastructure such as main highways, power lines and ... to the site
8. Possibility of consulting and negotiating with the owners in the region to create services and facilities for tourism using gardens in the form of recreational and cultural spaces.
9. Formation of Strategic Planning Thinking Based on Sustainability Principles among Urban Managers and the Existence of the Motive for Recreational Utilization of the Territories of the Cities as a Means to Protect the Arena.

### *Threats*

1. The vulnerability of the area because of the presence of the northern margin of the city and the growing urban population, which has caused the invasion of natural landscapes and uncontrolled construction without any criteria.
2. The tendency of existing owners to change the land uses of gardens to higher value added uses and, consequently, to intensify the process of destruction of vegetation in the region.
3. Lack of coherent and strategic planning consistent with the principles of sustainable development for the development and exploitation of land in the research area
4. Lack of attention to land use unbanning methods, ecological capability and land-use capability in developing and locating existing uses.
5. Reduce budget and not allocate adequate funds for maintenance and development plans of the site.
6. The sharp reduction of available water resources and atmospheric precipitation in recent years has weakened the existing natural cover and created a limitation on the development of new green spaces.
7. There is no guarantee of the rules for implementing laws to protect the environment and natural resources of the arena.

After identifying, evaluating, and classifying the internal and external factors influencing the study region, IFE (to evaluate the internal factors and the strengths and weaknesses of the

system) and EFE (to evaluate the external environmental factors affecting the system) tables were prepared, and the SWOT matrix was formed to derive fitting ST, WO, SO, and WT strategies for the study region (Elavarasan et al., 2020; Vladoš, 2019).

The results of the SWOT matrix for the area of the mountainous lands of the District 5 of Tehran are as follows. Therefore, the quadruple strategies derived from the SWOT analysis (include WO, SO, WT, ST strategies).

#### *The WO strategies*

1. Utilize strategic planning thinking based on sustainability principles among urban managers to prepare ecological capacity-building plans and natural land capacity and the land structure and resources.
2. Utilization of private sector investment in the qualitative and quantitative improvement of the facilities, services, equipment and facilities and services in the case study.
3. Utilization of the potential of NGOs and popular participation in the rehabilitation of single-species planting and create diversification of plant species and sustainability of appropriate green landscapes.
4. Utilization open and natural spaces in the northern and southern boundaries of the site to remove the restrictions of loading and locate land uses in the area.

#### *The SO strategies*

1. Beneficiary of the growing market tourism and tourism demand for development of tourism activities considering the capabilities and natural potential and strategic position of land overlooking the 5 region.
2. Utilize private sector investors to invest in and participate in tourism development projects in the area study due to the availability of basic infrastructure such as water, electricity, access roads, appropriate communication network and the existence of some leisure and tourism applications in the area.
3. Maximum utilization of the strategic thinking and motivation created among urban managers to prepare a development plan based on the principles of sustainability and improve the interaction between man and nature and upgrade the visitor statistics in the area.
4. Utilization the potentials of the non-governmental organizations in restoring the vegetation, old gardens, rural typology of the region, and plantation projects relying on the available water resources, including springs, qanats, and seasonal waterways.

#### *The WT strategies*

1. Attention to the ecological capability and capacity of natural lands, land structure and resources in developing and locating future uses.
2. Preparation project and a coherent and strategic planning based on the principles of sustainable development to improve the qualitative and quantitative weaknesses in the field of equipment and urban facilities and services and, services, urban and rural amenities and the establishment of welfare facilities and services.
3. Proceed watershed rehabilitation operations in the water and soil resources area to enhance the potential of utilizing existing water resources and solving problems such as surface roughness, soil erosion and flooding.
4. Serious and continuous authorities monitoring and other related institutions on the change of peripheral land uses, and the implementation of the detailed rules of the

region's master plan in order to maintain the region's natural lands and identity city's privacy in the future development plans.

#### *The ST strategies*

1. Encourage existing owners to preserve existing gardens to use of their potential to create tourist services according to the special strategic position of the region, being located in the uplands city of Tehran, the existence of some leisure and tourism land uses in the region and high rates statistics of visitors to the site.
2. Strengthen vegetation by rehabilitating existing water sources and using collection methods and surface runoffs
3. Utilization of climatic and ecological diversity for development of diverse activities in the tourism sector as a means to reduce the vulnerability of the area because of the presence on the northern margin of the city and the growing trend of encroachment to natural lands.
4. The allocation of the necessary budget and funds for maintenance and development programs with special attention to the strategic position of the region and its role in providing recreational spaces required's citizens and the existence of open land suitable for forecast and load the landuses welfare services.

#### *Evaluating the Strategies*

The roles and weighted impacts of each factor on the study area were determined through SWOT rating and weight-assignment tables according to the strategic planning matrix table and the results of the quantitative strategic planning tables SO, WO, ST, and WT. Nine strategies were obtained among which the proposed ones are presented in Table 1 by their priority. In this stage in accordance with the method and techniques scoring SWOT using maps data from the area studies and field research documents and studies. Also, for each factor, a weight coefficient is assigned between zero (non significant) and one (very important). In this case the sum the coefficients must be equal to an assigned weight.

In this case, the sum of the assigned weight coefficients should be equal to one And the status of each factor points to a score between 1 and 4. In this way, the weaknesses receive only the score (very weak) 1 or 2 (weak), and the strengths can only be scores of 3 (strong) and 4 (very strong) (Kazemi et al., 2018).

In determining the rating of the attraction, the question should be answered whether this factor affects the choice of strategy? If the answer to this question is positive, the attraction score should be given in a particular way and given the relative attractiveness of each strategy to another strategy.

The rating the attractiveness as follows:

Score 1 = low	Score 2 = has medium attractiveness
Score 3 = good attractiveness	Score 4 = very high attractiveness

#### **Conclusions**

The specific features and location of mountains overlooking District 5 in spatial structure and the current conditions of the city and its future potential impacts necessitates the prediction of particular objectives and planning for implementing comprehensive environmental development and reclamation plans and protection of natural limits of the city. As mentioned earlier, this study aims, among other things, to plan for overcoming threats and limitations and reinforcing advantages and promoting structural, economic and social transformations in

the study region. In this regard, analyzing the opportunities and challenges for the region on the path of attaining a systematic, strategic plan for these lands ensues a particular consideration of the main strategies derived from the results of this study.

**Table 1.** The Prioritization Strategies of Study Areas

Row	Weight Score	Kind of strategy	Strategy
1	9.74	WT	Attention to the ecological capability and capacity of natural lands, land structure and resources in developing and locating future uses. Utilize private sector investors to invest in and participate in tourism development projects in the area study due to the availability of basic infrastructure such as water, electricity, access roads, appropriate communication network and the existence of some leisure and tourism applications in the area.
2	9.2	SO	Preparation project and a coherent and strategic planning based on the principles of sustainable development to improve the qualitative and quantitative weaknesses in the field of equipment and urban facilities and services and, services, urban and rural amenities and the establishment of welfare facilities and services.
3	8.96	WT	Beneficiary of the growing market tourism and tourism demand for development of tourism activities considering the capabilities and natural potential and strategic position of land overlooking the 5 region.
4	8.45	SO	the allocation of the necessary budget and funds for maintenance and development programs with special attention to the strategic position of the region and its role in providing recreational spaces required's citizens and the existence of open land suitable for forecast and load the land uses welfare services.
5	8.27	ST	Utilization of climatic and ecological diversity for development of diverse activities in the tourism sector as a means to reduce the vulnerability of the area because of the presence on the northern margin of the city and the growing trend of encroachment to natural lands.
6	7.86	ST	Utilization open and natural spaces in the northern and southern boundaries of the site to remove the restrictions of loading and locate land uses in the area.
7	7.85	WO	Utilization of the potential of NGOs and popular participation in the rehabilitation of single-species planting and the create diversification of plant species and sustainability of appropriate green landscapes.
8	7.15	WO	Serious and continuous authorities monitoring and other related institutions on the change of peripheral and boundaries land uses, and the implementation of the detailed rules of the region's masterplan in order to maintain the region's natural lands and identity city's privacy in the future development plans.
9	7.06	WT	

The results from analyzing research data indicate that the highest-priority strategy among those obtained is the aggressive WT, weighted 9.74 according to Table 1. This is suggestive of the fact that the current development state of the uplands overlooking District 5 does not take into account the natural and ecological capacity of the region, which prevents sustainability in the study region. Therefore, given the significance and the potentials of these lands, immediate actions are required to minimize the synergistic damages of weaknesses and threats and to make the necessary arrangements to manage spatial and identity weaknesses with respect to the ecological and carrying capacity of the natural lands, the land structure,

and the resources, considering the vulnerability of the mountains to illegal constructions. As regards the development and location of future ventures, the long development procedures may be shortened and resource management facilitated by revising future development plans through a robust and specialized management system and allocation of the necessary authority to allow for in-time decision making and quick response.

So, considering the analysis results, both protection and development aspects of the subject must be taken into consideration to attain sustainable development in these lands based on principles of sustainability with due regard for preventive, revival, and protective aspects, such as, attention to the ecological capacity and the carrying capacity of the natural lands, the land and resource structure and the development and location of future uses; allocation of the necessary budget for preservation and development plans for the site; a purposeful, steady supervision of the changes in land use by the authorities and implementing the regulations of the regional comprehensive plan; encouraging the owners to preserve their gardens for providing services to tourists; relying on investors from the private sector for investing and cooperating in tourism development plans in the study region; exercising the potentials of the non-governmental organizations in restoring the vegetation, old gardens, rural typology of the region, are so important in this study area.

The results can be a useful reference point for policy makers, consultants, developers of developing cities with similar geographical and climatic conditions. Also, the use of comprehensive and studied perspectives can be a new approach for managers and experts in environment and urban management in the direction of sustainable development.

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