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Scenario Writing for Sports Activities: A Sustainable Development Approach Using MicMac Software (A Case Study of Tehran, Iran)

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ABSTRACT

Background: Today, sport is recognized as one of the main tools to achieve sustainable development goals. Sustainability guarantees a quality of life. The present study aimed to write a scenario for sports activities in Tehran, Iran, with a focus on a sustainable development approach.

Methods: This mixed methods research was conducted based on Voros's Generic Foresight Process Framework. After theoretical saturation of variables and obtaining a 98% approval rate from experts, a questionnaire was administered. The collected data were subsequently analyzed using MicMac software. The key driving forces identified were then integrated into Scenario Wizard 4 software to design sports scenarios aligned with the realization of sustainable development goals.

Results: The results revealed that the number of no-impact relationships was the highest among the analyzed relationships, with 116 out of 208 cases categorized as such. This was followed by high-impact relationships (n = 61) and low-impact relationships (n = 55). Four variables "Investment in Sports", "Community Income Level", "Government Financial Support" and "Education and Promotion of Sports Culture" had the most susceptibility and effectiveness in the studied system. The selected drivers were classified based on two dimensions: optimistic and pessimistic.

Conclusion: According to the dimensions of the selected drivers, the scenario writing for sports activities was characterized by internal inconsistency, finally resulting in the identification of only two scenarios considered compatible.

1. Introduction

Today, it is clear that sports development is a multifaceted issue (Mohammadi & Kazemi, 2017). In general, sports development should be in line with improved design and more effective ways to promote and increase participation and performance in sports (Floyd, 2018). In the past, most models used for sports development were very simple and linear. In addition, such models were unable to analyze environmental changes and had insufficient flexibility. Considering the new variables and the current complex conditions, it is necessary to use a more appropriate model in future planning (Morren & Grinstein, 2016). One of the most important decision-making and planning tools used by modern society is scenario writing, or future research (Ralston & Wilson, 2006; Heidarogli et al., 2023). This approach facilitates clear thinking about complexities, enabling planners to engage in a common language about various factors and encouraging them to think about multiple possible situations while continuously gaining knowledge on critical decisions (Jiang, 2008). Accordingly, planning in the field of sports, especially championship sports, requires a re-engineering of traditional approaches to the planning stages (Dann & Cohen, 1991). Moreover, organizations are strongly influenced by developments in the external environment, including governmental changes,

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legal priorities or policies, changes in societal attitudes, and advancements in technology. Therefore, it is imperative to employ methods that mitigate the risk of being caught off guard by unforeseen future events (Godet, 2017). Achieving the Sustainable Development Goals is one of the factors influencing the future of all individuals and disciplines, including sports (Amreh et al., 2020; Al-Eslamieh et al., 2024). Sustainability is often understood in terms of the environment, society, and economy. Although these three dimensions are closely linked, some experts believe that the latter two areas (society and economy) are dependent on the first dimension, environmental sustainability (Shearman, 1990). Therefore, economic growth and social justice depend on our responses to and achievements in environmental sustainability. Modern sport is closely and reciprocally related to the environment, and its impact on economic and social well-being is significant (Mallen & Chard, 2012). Environmental performance indexes are numerical values that provide insights into the condition of the environment and human health (Azimizadeh et al., 2024). Every sport is influenced by the location, environmental conditions and the rules governing the sport. These parameters determine how the environment and human structures can contribute to creating fair conditions for all in a sporting event (Bahmanpour & Fahiminejad, 2020; McCullough et al., 2015). Sustainability-related conditions such as clean air, land use, and waste disposal are factors that influence the planning and design of a public space for physical or recreational activities (Bagheri et al., 2017). For example, there are several important criteria for proposing to host the Olympic Games in a region, including environmental protection and assessment of meteorological aspects (Bahmanpour & Towfigh Khattab, 2020). Implementing environmental sustainability activities has always been controversial for sports managers (Pfahl et al., 2014). Their reasons for not engaging in these activities vary and include concerns about costs, uncertain return on investment, and lack of interest or support from the organization or fans (Shahsavar et al., 2025). Sports managers can overcome these challenges by collaborating with sustainability experts because these experts have practical knowledge or analytical understanding of integrating environmental sustainability into sports (Kellison & Kim, 2014). However, current and future sports industry professionals need to understand sustainability, especially environmental sustainability, and its value to the organization and the natural environment (Lenskyi, 2008). Sustainability is sometimes referred to as the process of maintaining and sustaining positive changes in the economic, ecological, and socio-cultural realms of human and non-human life (Romero & Broder, 2012; Yahyaei et al., 2021). The term also refers to the allocation of ideals, values, goals, methods, and operational evaluations by which sustainable conditions can be identified and achieved (Kharrat Sadeghi, 2021). Robert et al. (2005) defined sustainable development by examining the history, goals, indicators, values, and applications of the term, whose approach was used in this section. According to previous studies conducted in Iran, the lack of planning based on the principles of sustainable development is one of the weaknesses that are evident in all national sports development models (Robertson, 2014). Since the metropolis of Tehran (the capital of Iran) has a multiplicity and diversity of ecosystems, socio-economic variables, and other fields, most of the plans and projects implemented in this urban complex are used as a model for future development, therefore emphasizing the necessity of conducting this research. Regarding future forecasting models based on scenario and fuzzy logic, various models have been presented and many researches have been conducted in this field. The intuitive logic approach of Hans & Honton (2003) is one of these approaches. The basic assumption in this approach is that an organization's decisions are made based on a complex set of relationships between economic, political, technological, social, and environmental factors. All of these parameters are considered external factors for an organization or company. However, changes in these factors must be properly considered and their effects must be understood as much as possible to make decisions and gain the necessary insight into various matters, including the development of new products, the expansion of production capacities, and the formulation of business strategies (Hans & Honton, 2003). In Iran, the history of future research dates back to five-year plans. The National Development Perspective Document for Horizon 2025 is the first strategic thinking and future research document. Accordingly, the axes of national development have been formulated in different sectors. By dividing the work, each of the country's departments has assumed responsibilities for realizing the desired future based on its capabilities (Maroofi et al., 2019). Aghababaei and Afshari (2022) investigated future studies in the sports economy of Iran. Esmailpour Barbaki et al. (2021) analyzed the factors affecting the development of educational sports in Iran using a future research approach (Pennington et al., 2017). Fathi et al. (2019) constructed a scenario for the future of university sports in the country using a future-oriented approach. Ramezani-nejad and Hejbari (2015) investigated the foundations of sports development in Iran and concluded that this issue could not be developed in the form of a model and that it was necessary to carefully identify and analyze multiple influential factors. Barker et al. (2014) showed that the economic factor was the most important parameter for the development of sports in a society. Jones and Navarro (2018) stated that governments alone cannot promote the development of sports in a society and that the participation of different sectors of a society is vital for the work. Watanabe et al. (2020) claimed that what bridges the gap between strategy formulation and implementation is the strategy map. Therefore, the growth and development of sports require proper planning and precise implementation of the strategy. Considering the importance of future studies and the great importance of the future of the environment, it seems necessary to examine the aspects of sustainable development based on different fields. The development of sports activities can play a role in realizing the principles of sustainable development. The present study attempted to

analyze the effective factors in the development of sports activities based on the principles of land use and with a future research approach.

2. Materials and Methods

Data collection in this research was done in two primary methods. First, relevant and effective components were extracted through an in-depth study of scientific literature and research records. Then, the data were classified using a coding method, with expert validation to confirm the findings. This mixed-methods research began with a qualitative approach to explore possible scenarios and used Voros's Generic Foresight Process Framework (2012). The steps of this model are outlined as follows:

2.1 Input determination (field survey)

This stage involved examining and extracting influential factors through library studies and reviewing reputable national and international books, articles, and reports. The resulting list was presented to experts for completion and validation.

2.2 Data Analysis

This stage focused on analyzing several environmental factors affecting the sports sector in Tehran. It entailed summarizing and identifying main trends, opposing impacts, emerging issues, and weak signals. Emerging issues, which are not yet integrated into potential future scenarios, are categorized as weak signals. The continuity of supply and universal acceptance of these emerging issues can lead to their transformation into megatrends or significant events in the future.

2.3 Interpretation and Conclusion

This stage monitored the direct and indirect effects of spatial and environmental planning components on sports. The components were identified using driving forces and the outcomes of environmental factors (Zahed Zahedani et al., 2016). The Voros's Generic Foresight Process Framework (2012) identifies the dimensions of future research in scenario writing. Each component of the framework necessitates specific implementation methods. Input data were determined using Political, Economic, Social, Technological, Environmental, and Legal (PESTEL) analysis for environmental scanning. The analysis and interpretation stages used the eight-step Global Business Model (GBN). The PESTEL analysis represents a framework of macro-environmental factors that are used in environmental assessment and the field of environmental research. It provides a specific perspective on the macro-environmental factors that an organization should consider (Robertson, 2014). The Delphi method was used to collect data from the expert group. The statistical sample included 23 experts in sports planning, environmental policy-making, land use, and geographic planning. Given that the members of the expert group did not have equal opportunity for selection, a non-probability sampling method was used (Mallen et al., 2010). After identifying the experts, the variables were completed through an open interview. After reaching theoretical saturation of the variables and obtaining a 98% approval rate from the experts, a questionnaire was distributed, and the collected data was imported into Mic Mac software. Mic Mac software is designed for complex cross-matrix calculations in future research. It initially identifies important variables and components in the target area and then enters them into a matrix for impact analysis. The degree of interconnection between these variables and the relevant area is determined by the experts (Maroofi et al., 2019). Finally, Scenario Wizard 4 software (2016) was used to design the scenarios. Reliability in qualitative interviews was carried out through processes of trustworthiness, transferability, dependability, and verifiability, involving feedback from half of the interviewees and five additional individuals who did not participate in the interview. Their opinions were solicited after the interview process to ensure a comprehensive validation interview process.

3. Results and Discussion

The macro-environmental factors affecting the research topic were identified based on the PESTEL model in the first step. Given that the identified variables belonged to separate categories and some of them could be placed in several different categories, the general classification of the variables was done by the opinion of experts. Table 1 lists the variables identified in the PESTEL model in different categories, including Legal factors (L), Environmental factors (E), Technological and Management factors (T), Socio-cultural factors (S), Economic factors (E), and Political factors (P). As explained, the data in this section was obtained through a review of scientific sources and expert opinion. The final classification was done by experts. It should be noted that the classification made in Table 1 is not definitive and some factors have multiple positions. For example, insurance is both a legal and an economic decision. Therefore, the classification factors can be moved by changing the group of experts and researchers. Changing the factors in the aforementioned classification would not lead to a change in the review and evaluation and ultimately the results, because the PESTEL analysis was used as a framework to examine all the factors. The next step was to identify the drivers. Drivers are factors that affect the results and efficiency of planning and are subject to uncertainty. Uncertainty means insufficient knowledge about the future that cannot be calculated. To identify the drivers from the factors listed in Table 1, a group of experts (Delphi research panel) was consulted. After identifying the drivers, they were prioritized in terms of importance, uncertainty, impact, and effectiveness. Figure 1 shows the importance and uncertainty of the selected drivers.

Table 1. PESTEL model designed for research

Legal factors	Environmental factors	Technological & Management factors	Socio-cultural factors	Economic factors	Political factors
Insurance	Climate and geography	Equipment quality	Population growth rate	Distribution of sports spaces and venues	Sanctions
Domestic overriding laws	Water resources	Research and development (talent identification)	Education and promotion of sports culture	Production of equipment	International relations
Privatization	Natural tourist attractions	Cultivation and championing	Non-governmental organizations (NGOs)	Community income level	Membership in sports associations
International commitments	Environmental quality	Research and academic centers	Spatial justice	Sports infrastructures & precipitate	Influence of politicians
	Benefit from renewable energy resources	Managerial opportunities and powers	Education	Investment in sports	
		Strategic and solution plans	International performance	Government financial support, such as tax breaks	
			Gender justice	Unemployment rate	
			Cultural and social structure	Gross Domestic Product (GDP) per capita	
			Local interest and support	Inflation rate	
			Dominant moral characteristics of people according to climatic conditions		

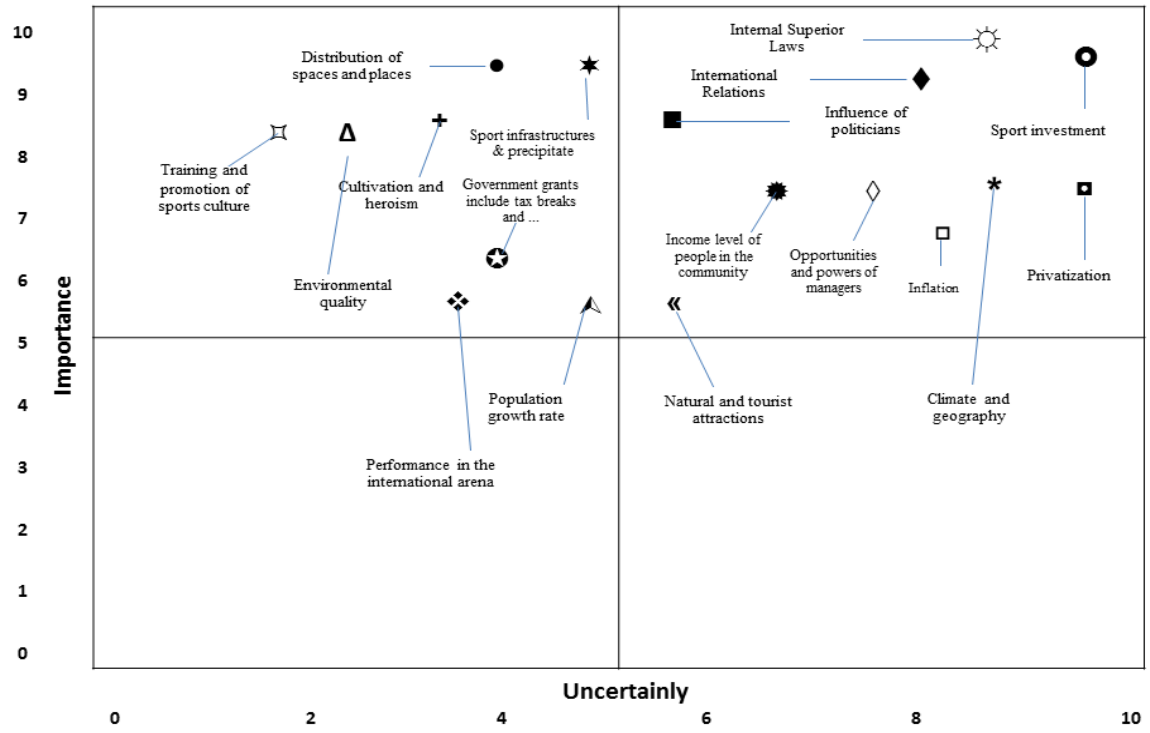

Figure 1. Degree of importance and uncertainty of the examined drivers (Source: Research Findings)

The components on the right side of the matrix have more uncertainty and the components on the upper part of the matrix have more importance. As can be seen, there is no component in the bottom 2 boxes, which shows that all the components under investigation have high importance and uncertainty. Drivers are factors that affect planning results

and efficiency and have uncertainty. It is possible that some of them have a direct effect on the sustainable development of sports, and others have an indirect effect. The experts through the examination of all the propellants determine this issue. Given that the drivers have both direct and indirect impacts, both impacts should be considered. The direct and indirect impacts of drivers were calculated using Micmac software and inputting the effectiveness-susceptibility matrix data. In scenario writing processes, it is more important than identifying the main future issues to identify the relationships between them, because in the real world, these variables affect each other and none can be defined independently. A summary of the structural analysis of the interactions included the following:

3.1 Indirect interactions

(1) Investment in sports (2) Education and promotion of sports culture (3) Government financial support (4) Community income level (5) International performance (6) Distribution of sports spaces and venues (7) Gross Domestic Product (GDP) per capita (8) Cultivation and championing (9) Local interest and support (10) Unemployment rate (11) Influence of politicians (12) Climate and geography (13) Inflation rate (14) Domestic overriding laws (15) Managerial opportunities and powers (16) International relations (17) Natural tourist attractions (18) Environmental quality.

3.2 Direct interactions

(1) Investment in sports (2) Community income level (3) Government financial support (4) Education and promotion of sports culture (5) Unemployment rate (6) Distribution of sports spaces and venues (7) GDP per capita (8) Cultivation and championing (9) International performance (10) Local interest and support (11) Domestic overriding laws (12) Climate and geography (13) Influence of politicians (14) Inflation rate (15) Managerial opportunities and powers (16) Environmental quality (17) Natural tourist attractions (18) International relations.

Figure 2 shows the result of direct and indirect effectiveness-susceptibility variables in the system under review.

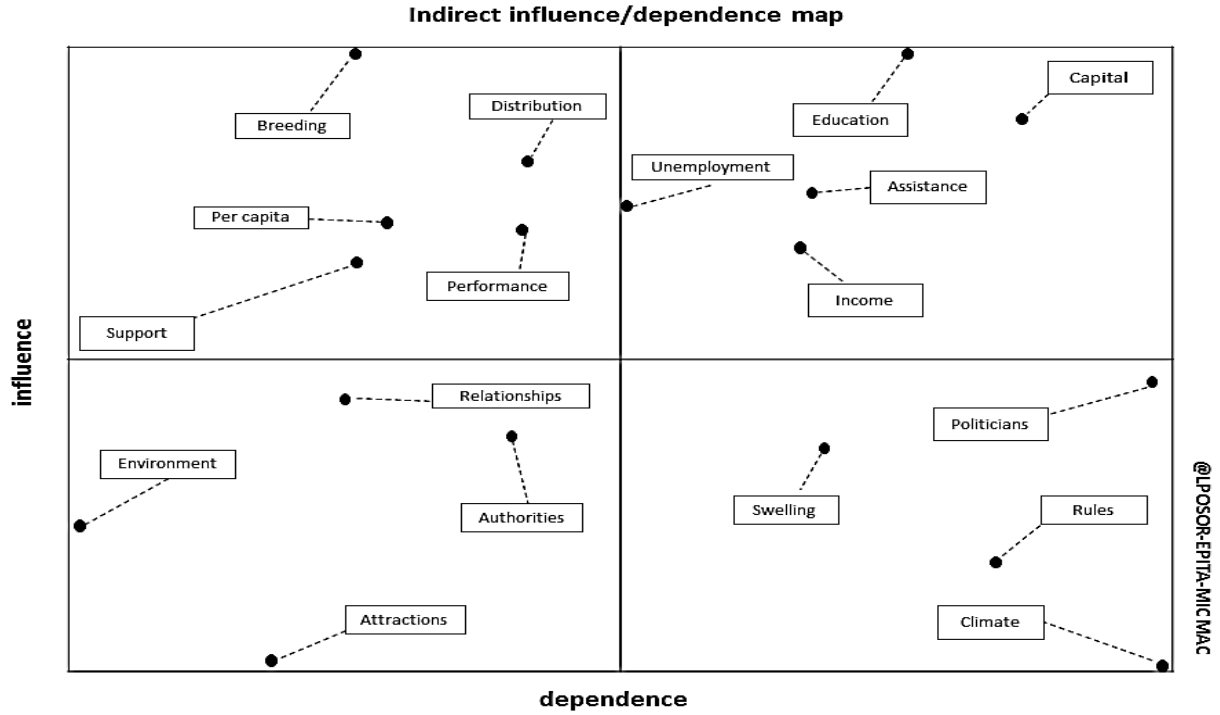

Figure 2. The final map of effectiveness-susceptibility factors (direct and indirect results)

The division was done based on the pairwise comparison of the components in the software matrix, the results of which are presented in this section. In other words, four variables of "Investment in sports", "Community income level", "Government financial support" and "Education and promotion of sports culture" had the most susceptibility and effectiveness in the studied system. On the other hand, the factors that had a large impact on the system and other variables, but did not have much susceptibility within the system, were: (1) Distribution of sports spaces and venues (2) Unemployment rate (3) International performance (4) GDP per capita (5) Cultivation and championing (6) Level of local interest and support. The third group of variables had high susceptibility in the system but low effectiveness, which were: (1) Influence of politicians (2) Climate and geography (3) Inflation rate (4) Domestic overriding laws. Finally, the fourth category was variables that lacked high effectiveness and had low susceptibility, which were: (1)

Managerial opportunities and powers (2) International relations (3) Natural tourist attractions (4) Environmental quality.

3.3 Analysis of system stability/instability based on effectiveness-susceptibility plot

According to the output of the MicMac software based on expert opinions, the state of sports activities in the country was somewhat "unstable" based on the environmental approach, and the current conditions governing the sports system in the country would change somewhat (but not drastically) based on environmental aspects in the near future (Figure 3). The distribution of variables on the effectiveness-susceptibility plot indicates the overall characteristics of the system. The shape of the distribution of variables on the plot determines whether the system is "stable" or "unstable". Unstable systems with both effectiveness and susceptibility variables would have drastic changes in the future and their current state would not remain stable. In unstable systems, the distribution of variables would be in the form of a rhombus and from southwest to northeast on the plot, or the variables would be located around the diagonal line of the plot. If the system had a large number of effectiveness factors and on the other hand, a large number of susceptibility factors, and the distribution of variables appeared in an L shape from the left side of the plot, the system was stable and the current conditions of the system would not change much in the future.

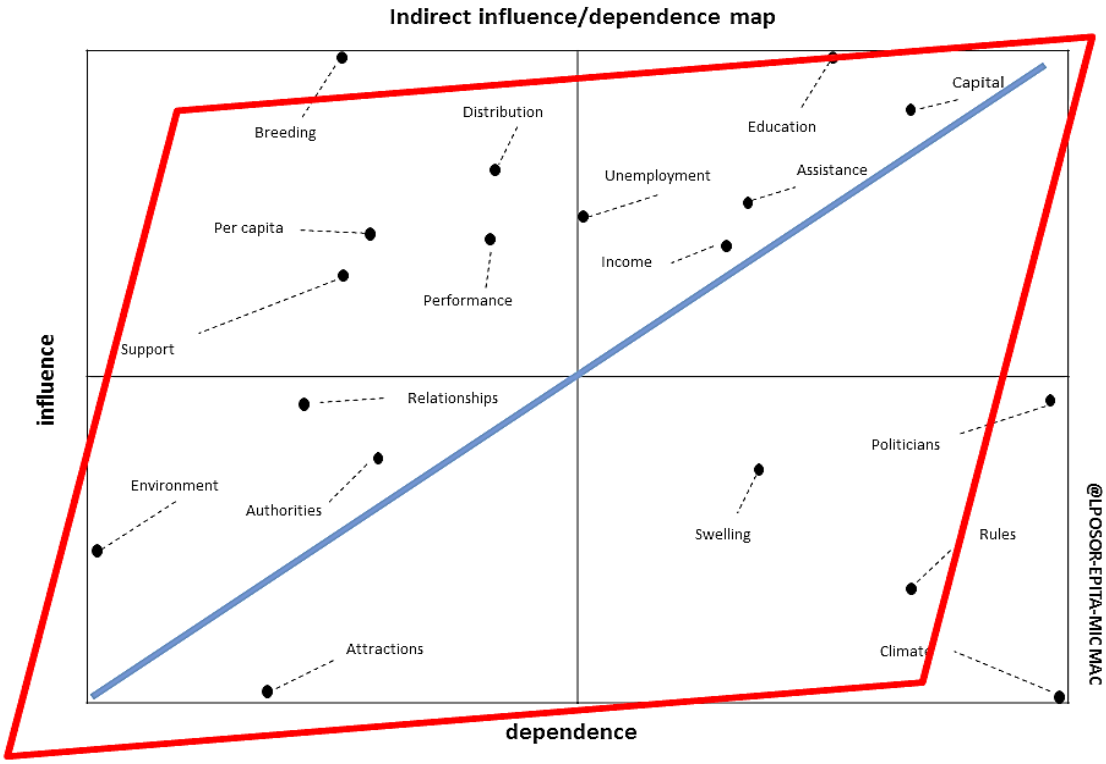

Figure 3. Instability of the system

As was clear from the results, three types of variables were not identified in this study. In other words, the extracted variables did not fall into the categories of "target", "risk", and "regulatory" variables.

3.4 Scenario Design and Analysis

As shown in Figure 4, the key factors identified in the software as factors affecting sports activities with a spatial planning approach were: (1) Distribution of sports spaces and venues (2) Unemployment rate (3) International performance (4) GDP per capita (5) Cultivation and championing (6) Level of local interest and support. Therefore, to develop the scenario, different situations in relation to each of the key factors were determined by the experts and distributed among the experts in the form of an uncertainty questionnaire. In this questionnaire, situations could also show a negative effect, and the numbers of the questionnaire ranged from +3 to -3. The main question of the questionnaire was " If state A1 of key factor A occurs in the future, what impact will it have, for example, on the occurrence or non-occurrence of state B2 of key factor B?" The answers were entered in a range from +3 to -3 and were finally analyzed by the aforementioned software. In the next stage, after scoring, they were imported into the Scenario Wizard software. First, the selected drivers were classified based on optimistic and pessimistic dimensions according to Table 2.

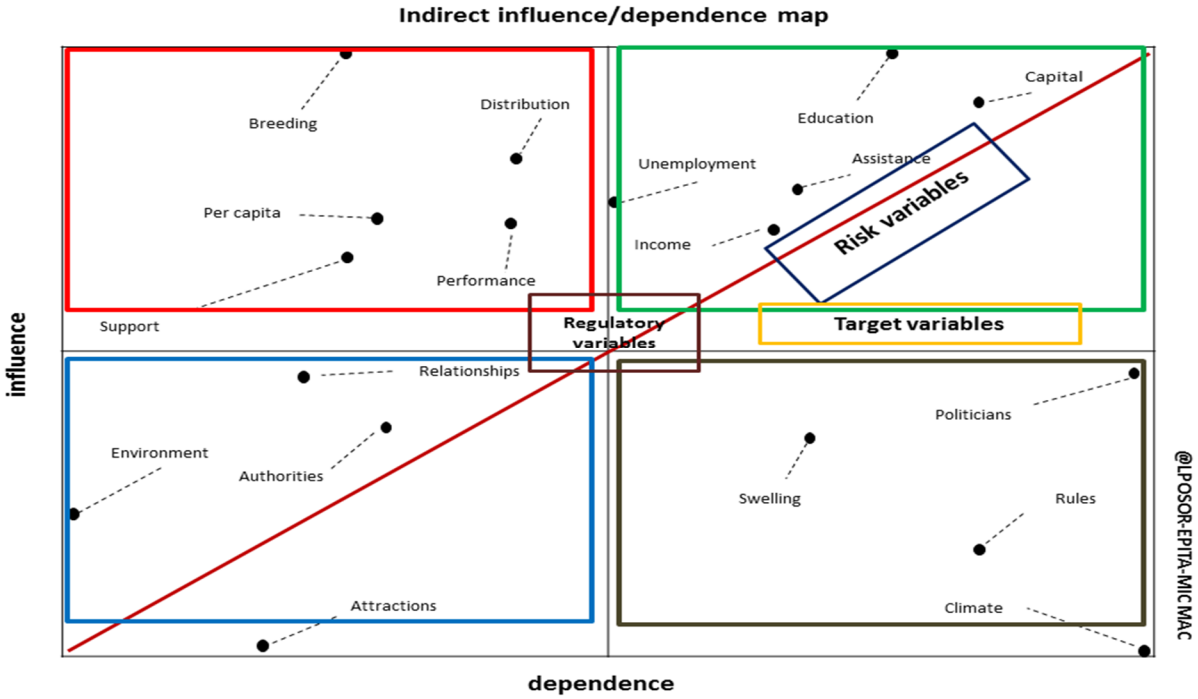

Figure 4. Status of key factors in structural analysis

Table 2. Drivers and relevant dimensions

Drivers	Dimensions	
	Optimistic	Pessimistic
Distribution of sports spaces and venues	Proper distribution of sports spaces and venues in the country	Improper distribution of sports spaces and venues in the country
Unemployment rate	A decrease in the unemployment rate	An increase in the unemployment rate
International performance	Optimal sports performance in international arenas	Unfavorable sports performance in international arenas
GDP per capita	An increase in the GDP per capita	A decrease in the GDP per capita
Cultivation and championing	Growing cultivation and championing	Declining cultivation and championing
Level of local interest and support	An increase in the level of local interest and support	A decrease in the level of local interest and support

Given the dimensions of the selected drivers, there were 26 possible scenarios (n = 64) determined using the questionnaire, the expert group's opinion and the Scenario Wizard software. The scenarios contained weak alternative assumptions. Hence, the scenario writing was described as internal inconsistency. Two final scenarios are set in different and opposite conditions. All their clauses are the opposite of each other. Ultimately, the software found only two compatible scenarios, including Scenario 1: Compatibility coefficient = 12, Total impact score = 55. (1) Proper distribution of sports spaces and venues in the country (2) Reducing the unemployment rate (3) Optimal sports performance in international arenas (4) An increase in the GDP per capita (5) Growing cultivation and championing (6) An increase in the level of local interest and support. Scenario 2: Compatibility coefficient = 12, Total impact score = 53. (1) Improper distribution of sports spaces and venues in the country (2) An increase in the unemployment rate (3) Unfavorable sports performance in international arenas (4) A decrease in the GDP per capita (5) Declining cultivation and championing (6) A decrease in the level of local interest and support. Figure 5 shows the conceptual model of the research schematically. The role and degree of importance of each variable, as well as the type and degree of effectiveness and susceptibility in sports activities, have been determined in terms of the land use approach in the country. In general, the purpose of developing scenarios is not to provide an accurate prediction of the future, but rather scenarios are a tool for better and more coherent thinking about the future. Scenarios are a tool for creating sufficient insight into the future in managers, which are used to identify environmental uncertainties in the best possible way, plan to face them, and manage uncertainties. None of the investigated scenarios could be fully accepted, nor could they be completely rejected. Of the possible scenarios, only two cases were identified as scenarios with acceptable compatibility, which were two sides of a continuum (0 and 1). One of them represented a completely optimistic state based on six positive dimensions, and the other represented a completely pessimistic state based on six negative dimensions. The final scenarios, based on the degree of compatibility, were: Scenario 1: Compatibility coefficient =

12 and Total impact score = 55. (1) Proper distribution of sports spaces and venues in the country (2) Reducing the unemployment rate (3) Optimal sports performance in international arenas (4) An increase in the GDP per capita (5) Growing cultivation and championing (6) An increase in the level of local interest and support. Scenario 2: Compatibility coefficient = 12 and Total impact score = 53. (1) Improper distribution of sports spaces and venues in the country (2) An increase in the unemployment rate (3) Unfavorable sports performance in international arenas (4) A decrease in the GDP per capita (5) Declining cultivation and championing (6) A decrease in the level of local interest and support.

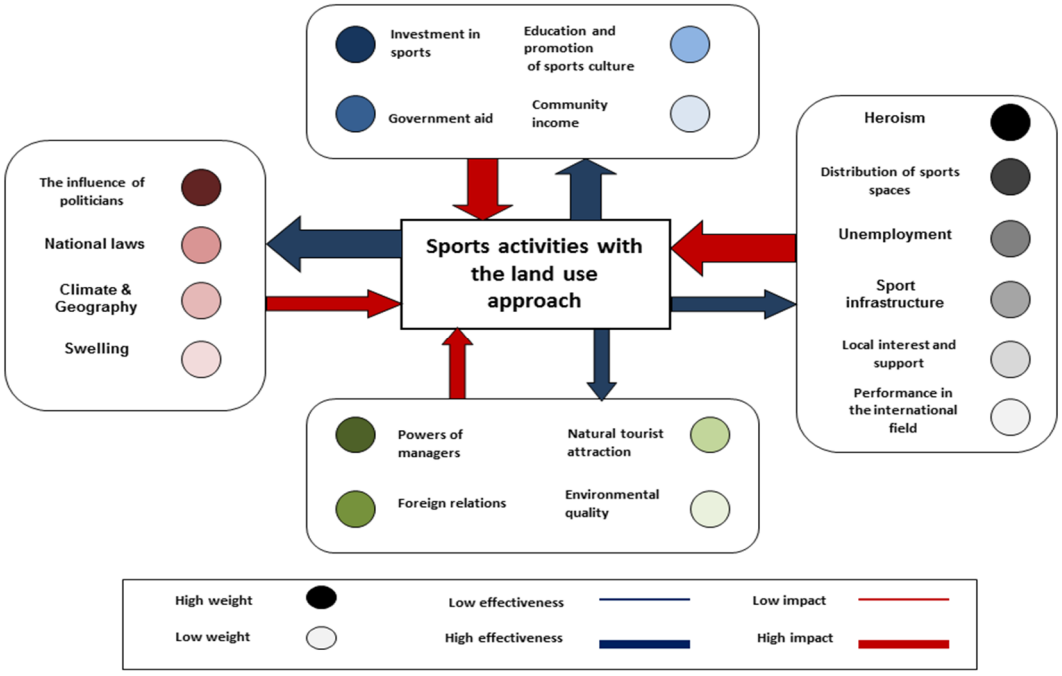

Figure 5. Conceptual model of the research

The first scenario referred to an optimistic state in which all dimensions of all six variables had positive reflections. In this situation, observing spatial justice and paying attention to the principles of land development leads to the appropriate distribution of sports spaces and venues in the country, considering the natural and human climatic and geographical potentials. This case referred to the category of talent recruitment at the provincial level of the country. As previously mentioned, land use planning was defined as a kind of long-term planning for a better distribution of population, facilities, and various activities to increase the welfare, comfort, and harmony of society (Mozafari, 2010). In the discussion of justice in sports, one of the significant issues is the possibility of using sports spaces and facilities for all different social groups. An important issue with this increasing population of older people is their potential increase in healthcare needs due to age-related chronic diseases and disabilities (Mirzaeimoghadam et al., 2023). Iran, as a geographically vast and diverse nation, possesses immense untapped potential across various fields, including sports. However, the challenge lies in effectively harnessing and transforming these latent capacities into tangible achievements. One of the best ways to achieve these goals is through a land development plan. By examining sports activities in different provinces, it is evident that Iranian athletes have achieved remarkable accomplishments in numerous disciplines. Moreover, with strategic investment and preemptive planning, additional promising fields could realize their full potential. Although efforts have been made at the national level in the field of sports education, these efforts have been mostly partial, limited to specific provinces, and lack a cohesive national framework grounded in scientific and evidence-based approaches (Amreh et al., 2020). One of the main goals of land use planning in sports is to emphasize the expansion of sports activities in geographical space and regional specialization to form a spatial division of labor. The concentration of sports activities in some specific parts of the country and their uneven distribution in the territory can be considered as one of the challenges facing the country's sports policymakers (Ojaghi et al., 2016). The desire to achieve rapid success is probably one of the main reasons for focusing on strengthening sports activities in areas that have more power to gain success (Kerr & Packer, 1998; Kellison & Kim, 2014; Lenskyj, 2008). Land use planning in sports, with its holistic and comprehensive perspective, considers the needs of all regions of the country (Pennington et al., 2017). Land use planning is the basis for organizing regional development (Alipour et al., 2017). Accordingly, paying attention to the category of "Proper distribution of sports spaces and venues in the country" can be considered one of the basic principles of land use planning in the field of sports.

Furthermore, integrating this approach with an analysis of GDP per capita can attract talented individuals and audiences, fostering growth in the sports sector. Per capita sports metrics, which measure the availability of sports facilities relative to the population, play a pivotal role in this context. Specifically, dividing the total area of indoor and outdoor sports spaces by the population provides an indicator of sports accessibility in a given region. In developed societies, enhancing per capita sports access is a priority for governments, as it contributes to improved public health, reduced healthcare costs, and the prevention of non-communicable diseases such as diabetes, obesity, and hypercholesterolemia. According to the report of the Ministry of Health and Medical Education (2018), about 60% of Iran's population over 18 years of age–exceeding 25 million people–suffers from overweight or obesity. This statistic highlights a lack of physical activity and insufficient access to exercise facilities. Current data indicate that the per capita sports space in Iran is approximately one square meter, reflecting the cumulative spaces managed by the Ministry of Sports and Youth, municipalities, and private entities (Ojaghi et al., 2016). However, these facilities are often geographically and functionally concentrated, with limited availability for diverse sports disciplines. International standards recommend a minimum per capita sports space of 2.5 square meters, increasing to 3 square meters in developed countries. In countries like Japan, this figure reaches approximately 8 square meters per person, underscoring the disparity. Similarly, the average per capita time spent exercising in Iran is 27 minutes, compared to 50 minutes in developed nations, indicating a gap of over 45%. Addressing these deficiencies through better distribution of sports spaces and increased activity levels can also create opportunities for employment and entrepreneurship. Sports development, thus, has the potential to significantly reduce unemployment rates and foster economic growth. Reducing the unemployment rate, whether through sports or other means, plays a critical role in fostering the development of sports activities. Given that many people in society has limited income and the costs associated with participating in sports-particularly in championship and professional contexts, are relatively high, there is a clear correlation between income levels and the inclination toward engaging in sports activities. Achieving success in championship sports, especially at the Olympic level, necessitates focused attention on medal-winning disciplines. In this context, the performance of Iranian athletes on international stages serves as a catalyst for increased interest and investment by managers and officials in specific sports. For instance, the widespread popularity of volleyball among Iranian families over the past 7-8 years can be attributed to the country's remarkable achievements in Asian and global competitions. Similarly, the growing public interest in fencing is closely linked to the notable performance of Iranian athlete Mojtaba Abedini at the Rio Olympics in 2016. A comparable trend is also evident in martial arts. While this study faced no significant methodological limitations, it acknowledges that Iran's unstable political and economic conditions pose challenges to the implementation of proposed strategies. Addressing these structural barriers will be critical to achieving the envisioned development in sports.

4. Conclusion

It became clear that the purpose of developing scenarios is not to provide an accurate prediction of the future, but rather scenarios are a tool for better and more coherent thinking about the future. We found that scenarios are a tool for creating sufficient insight into the future in managers, which are used to identify environmental uncertainties in the best possible way, plan to face them, and manage uncertainties. None of the investigated scenarios could be fully accepted, nor could they be completely rejected. According to the dimensions of the selected drivers, scenario writing for sports activities was described as internal inconsistency, and finally, only two scenarios were recognized as compatible.

Authors' Contributions

Hossein Shahsavar: Literature review; conducting laboratory tests and data collection; Writing the manuscript. **Ali Fahimi Nezhad:** Developing the research idea and methodology. **Bagher Morsal:** Project management; Visualization; Formal analysis. **Mojdeh Khajoo:** Writing, revising, and editing the manuscript.

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Conflicts of Interest

The authors declare that there is no conflict of interest.

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Ethical considerations

There were no ethical considerations in this research under the 1407689004 project number.

Using artificial intelligence

Artificial intelligence was not used in the compilation of this article.

References

1. Al-Eslamieh, Z. A., Fahiminejad, A., Morsal, B., & Bahmanpour, H. (2024). Identifying and prioritizing components and dimensions of green management in the context of Iran's sports with a focus on sustainable development by using (FAHP). *Anthropogenic Pollution*, *8*(1), 1-9.

2. Alipour, A., Vandeshkari, H., & Naderi Bani, A. (2017). Study of the legal status of land management in Iran's development programs. *The Second National Conference on New Approaches to Land Management in Iran, Shahroud,* 236-259.

3. Amreh, M., Godarzi, M., & Dehghan Qahfarkhi, A. (2020). Investigating the state of land preparation in selected medal-winning sports in Iran. *Sociology and Lifestyle Management Quarterly, 6*(15), 1-32.

4. Azimizadeh, S., Babaei, F., Karimzadegan, H., Bahmanpour, H., & Tabesh, M. R. (2024). Study of environmental performance index of mines using a balanced scorecard approach and fuzzy network analysis. *Journal of Human Environment and Health Promotion, 10*(2), 96-103.

5. Bagheri, P., Fataei, E., & Karbassi, A. R. (2017). Reduction of greenhouse gas in National Iranian oil products distribution company by clean development mechanism (CDM). *International Journal of Advanced Biotechnology and Research, 8*(4), 136-145.

6. Bahmanpour, H., & Fahiminejad, A. (2020). The importance of measuring noise pollution in sports spaces. *Environmental Management and Sustainable Development Quarterly*, *4*(2), 20.

7. Bahmanpour, H., & Towfigh Khattab, A. (2020). Evaluation and fitting of the sustainable development model of the country's sports based on the 21st agenda of the Olympic Movement. *Olympic Cultural and Social Studies Quarterly, 3*, 125-143.

8. Barker, D., Barker-Ruchti, N., Wals, A., & Tinning, R. (2014). High performance sport and sustainability: a contradiction in terms? *Reflective Practice*, *15*(1), 1-11.

9. Dann, G., & Cohen, E. (1991). Sociology and tourism. *Annals of Tourism Research*, *18*(1), 155-169.

10. Floyd, J. (2008). Towards an integral renewal of systems methodology for futures studies. *Futures, 40*(2), 138-149.

11. Heidarogli, M., Saadati, H., & Fataei, E. (2023). Point sources pollution index development in well capture zones with mathematical modeling approach (case study: Meshgin Shahr plain). *Journal of Water and Soil Resources Conservation*, *12*(4), 29-41.

12. Jiang, J. (2008). *Evaluation of the potential of ecotourism to contribute to local sustainable development: a case study of Tengtou Village, China: a thesis presented in partial fulfillment of the requirements for the degree of master of philosophy in development studies at Massey University, New Zealand.* Massey University, Palmerston North, 312-328.

13. Kellison, T. B., & Kim, Y. K. (2014). Marketing pro-environmental venues in professional sport: planting seeds of change among existing and prospective consumers. *Journal of Sport Management*, *28*(1), 34-48.

14. Kerr, J., & Packer, L. (1998). The impact of climate change on mammal diversity in Canada. *Environmental Monitoring and Assessment, 49*, 263-270.

15. Kharrat Sadeghi, M. (2021). A presentation of SWOT strategies for the sustainable tourism development on the Caspian Sea coast of Gilan province, Iran. *Anthropogenic Pollution Journal, 5*(2), 47-56.

16. Lenskyj, H. J. (2008). *Olympic industry resistance: challenging Olympic power and propaganda.* State University of New York Press, Albany, 279-286.

17. Mallen, C., Adams, L., Stevens, J., & Thompson, L. (2010). Environmental sustainability in sport facility management: A Delphi study. *European Sport Management Quarterly*, *10*(3), 367-389.

18. Mallen, C., & Chard, C. (2012). "What could be" in Canadian sport facility environmental sustainability. *Sport Management Review*, *15*(2), 230-243.

19. Maroofi, A., Sajadi, J., & Razavian, M. (2019). The assessment of participatory scenario planning in future-study of the environment in district 1, Tehran City. *Geography and Environmental Sustainability*, *9*(2), 97-114.

20. McCullough, B. P., Pfahl, M. E., & Nguyen, S. N. (2015). The green waves of environmental sustainability in sport. *Sport in Society: Cultures, Commerce, Media, Politics*, *19*(7), 1040-1065.

21. Mirzaeimoghadam, H., Nasirzadeh, M., Sayadi, A., & Abdolkarimi, M. (2023). The effect of an educational intervention based on the health action process approach on physical activity among retired female employees. *Journal of Human Environment and Health Promotion, 9*(4), 201-209.

22. Mohammadi, H., & Kazemi, A. (2017). Tourism management and planning and land management. *First International Conference on Tourism, Geography and Clean Environment,* 154-157.

23. Morren, M., & Grinstein, A. (2016). Explaining environmental behavior across borders: a meta-analysis. *Journal of Environmental Psychology, 47*, 91-106.

24. Mozafari, A. (2010). Future studies; The platform of crossing the borders of knowledge. *Quarterly of Order & Security Guards, 4*(2), 25-47.

25. Ojaghi, H., Sajjadi, S. N., & Goodarzi, M. (2016). *Identification of land management status in pre-medal sports* [Master's thesis, University of Tehran]. The Software for the Library and Documentation Center of Tehran University. https://lib.ut.ac.ir/site/catalogue/1385943

26. Pennington, D. N., Dalzell, B., Nelson, E., Mulla, D., Taff, S., Hawthorne, P., & Polasky, S. (2017). Cost-effective land use planning: optimizing land use and land management patterns to maximize social benefits. *Ecological Economics, 139*, 75-90.

27. Pfahl, M., Casper, J., Trendafilova, S., McCullough, B. P., & Nguyen, S. N. (2014). Crossing boundaries: an examination of sustainability department and athletics department collaboration regarding environmental issues. *Communication & Sport, 3*(1), 27-56.

28. Robert, K. W., Parris, T. M., & Leiserowitz, A. A. (2005). What is sustainable development? goals, indicators, values, and practice. *Environment: Science and Policy for Sustainable Development, 47*(3), 8-21.

29. Robertson, M. (2014). *Sustainability principles and practice.* Routledge: Taylor & Francis Group, 29-36.

30. Romero, S., & Broder, J. M. (2012). Progress on the sidelines as Rio conference ends. *The New York Times.* https://www.nytimes.com/2012/06/24/world/americas/rio20-conference-ends-with-some-progress-on-the-sidelines.html

31. Shahsavar, H., Fahimi Nezhad, A., Morsal, B., Khajoo, M. (2025). Scenario writing for sports activities: a sustainable development approach using Micmac software (a case study of Tehran, Iran). *Journal of Human Environment and Health Promotion, 11*(2), 110-119.

32. Shearman, R. (1990). The meaning and ethics of sustainability. *Environmental Management*, *14*, 1–8.

33. Yahyaei, M., Mofidi Shemirani, S. M., & Ahmadi, V. (2021). Investigating the role and importance of sustainable architecture in optimal fuel consumption and pollution reduction (case study: Semnan wind-catchers). *Anthropogenic Pollution Journal*, *5*(2), 104-112.

34. Zahed Zahedani, S. S., Hakiminiya, B., Tabiei, M., & Goli, A. (2016). Future study of environmental culture by scenario exploration and validation (case study: Isfahan city). *Quarterly of Social Studies and Research in Iran*, *7*(3), 441-468.