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A Multilevel Model of Key Factors in Sustainable Development Management of Adventure Recreational Sports Tourism (A Case Study of Tehran)

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Abstract

Tehran, with its diverse natural and human resources, holds notable potential for adventure tourism, yet its development faces structural and managerial barriers. This study aimed to design a multi-level model of key factors for managing the sustainable development of adventure sports tourism in Tehran. The research adopted a mixed-methods design (qualitative-quantitative), applied in purpose and descriptive-analytical in nature. Data were gathered through library studies, focus groups, and structured-interpretive questionnaires. Thirteen factors were identified across six levels: safety, security, environment, natural attractions, and infrastructure (Level 1); human resources, management, and marketing (Level 2); socio-cultural and technological factors (Level 3); education and research (Level 4); economic factors (Level 5); and political factors, laws, and regulations (Level 6). In the subsequent analysis, political factors (Variable 1) emerged as driving factors. Economic (Variable 2), socio-cultural (Variable 3), technology and innovation (Variable 4), marketing (Variable 7), education and research (Variable 8), management (Variable 9), human resources (Variable 10), and laws and regulations (Variable 13) acted as linkage factors. Environmental factors (Variable 5), natural attractions (Variable 6), infrastructure (Variable 11), and safety/security (Variable 12) were identified as dependent factors.

The proposed model provides a practical framework for urban managers and planners to sustainably manage the development of adventure sports tourism in Tehran. Based on the findings, key actions include formulating formal policies, establishing educational and research infrastructures, developing designated adventure tourism areas, implementing safety guidelines, and strengthening stakeholder collaboration. Implementing these strategies can enhance Tehran's position as a tourism destination and promote sustainable urban development.

Extended Abstract

Introduction
This study highlights the growing importance of the tourism industry, particularly adventure tourism, in the global economy and sustainable development (Chavan, 2025). International statistics show that this sector has grown significantly after the pandemic and has played a major role in employment, GDP, and local economic development (World Travel & Tourism Council, 2024). Research conducted worldwide and in Iran indicates that factors such as infrastructure, safety, natural attractions, policymaking, stakeholder participation, and targeted marketing are key drivers in the development of adventure tourism (Norouzi Abatri et al., 2024). Despite Tehran's significant potential, there is still no comprehensive, structured, and localized model for planning and managing this type of tourism. Previous studies have mostly been general and have not focused on the specific characteristics of large cities; therefore, designing a multi-level model to identify and prioritize effective factors is essential. The aim of this study is to develop a localized, multi-level model for identifying and categorizing the key factors influencing the development of adventure sports tourism in Tehran. This model considers economic, social, cultural, environmental, and institutional dimensions and provides practical strategies for sustainable development. The main research question focuses on how these factors can be structured and leveled using an interpretive-structural approach.

Methods
This applied, descriptive-analytical study employs a mixed qualitative-quantitative approach to develop a localized multi-level model for the development of adventure sports tourism in Tehran. In the qualitative phase, a systematic review of domestic and international literature (2015–2024) and focus group interviews with 15 experts in tourism, sports management, and urban planning were conducted to identify and validate the key factors influencing development. In the quantitative phase, a structured interpretive-structural questionnaire was distributed to experts to analyze the causal and hierarchical relationships among factors. Data were analyzed using interpretive-structural modeling and MICMAC techniques to determine the influence, dependency, and classification of factors into driver, linkage, and dependent groups. Content and construct validity were confirmed through expert review, and qualitative data reliability was ensured via coding verification by experienced researchers. The study's innovation lies in

combining qualitative and quantitative methods, localizing the model for Tehran's context, and providing a comprehensive, evidence-based framework for sustainable development strategies in adventure sports tourism.

Results
The study identified 13 key factors influencing adventure sports tourism development, categorized into six hierarchical levels. Level 1 included Safety and Security, Environmental Considerations, Natural Attractions, and Infrastructure. Level 2 consisted of Human Resources, Management, and Marketing. Level 3 included Socio-Cultural and Technological Factors. Level 4 encompassed Education and Research, Level 5 Economic Factors, and Level 6 Political Factors, Laws, and Regulations. MICMAC analysis classified factors into driving, linkage, and dependent categories. Political factors emerged as independent drivers, economic, socio-cultural, technological, marketing, education and research, management, human resources, and regulatory factors were linkage components, and environmental factors, natural attractions, infrastructure, and safety/security were dependent factors. This hierarchical structure provides insight into priority areas for intervention and resource allocation. This model has practical applicability for policymaking, urban planning, and strategic decision-making, and can serve as a development framework for other cities in Iran.

Conclusion
The findings offer a practical framework for policymakers, urban planners, and tourism managers to implement integrated strategies for sustainable adventure sport tourism in Tehran. By addressing critical factors and their interdependencies, the model facilitates targeted investment, infrastructure enhancement, and coordinated policymaking. The multilevel approach ensures that the sector develops sustainably, balancing economic growth, social benefits, and environmental protection while enhancing tourist experiences. Overall, this research emphasizes the value of evidence-based, hierarchical modeling to guide the development of high-potential yet underutilized sectors in urban tourism. The main outcome of this study is providing a framework to integrate scientific knowledge with managerial decision-making in adventure sports tourism. The model enables managers to pursue comprehensive and sustainable planning and can serve as a blueprint for other cities in Iran, emphasizing safety, education, social participation, environmental protection, and the use of modern technologies.