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ORIGINAL ARTICLE

Future Research on The Impact of Social, Economic and Physical Dimensions of Urban Resilience on the Sustainable Development of Tabriz City

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EXTENDED A B S T R A C T

Introduction

Resilience in cities means their ability to face crises and sudden changes. This concept depends on various dimensions such as social, economic, and physical, each of which in turn can help strengthen urban resilience. In the social dimension, active citizen participation and the creation of strong social networks can contribute to social cohesion and improve the quality of life of city residents. From an economic perspective, sustainable development requires the optimization of resources and the creation of sustainable job opportunities, which ultimately leads to the strengthening of economic resilience. Also, in the physical dimension, the design of public spaces and resilient infrastructure can reduce the vulnerability of cities to natural and human disasters.

In today's world, cities face numerous challenges, including climate change, natural disasters, and economic and social crises. Urban resilience has gained great importance as a key concept for confronting these challenges and ensuring the sustainable development of cities. Sufficient research has not been conducted on resilience and its impact on sustainable development in the city of Tabriz, and there is a perceived need for a deeper examination of this issue in Tabriz. Therefore, this study aims to investigate the impact of the social, economic, and physical indicators of urban resilience on sustainable development in the city of Tabriz, and seeks to answer the question of how future studies can predict the impact of the effective social, economic, and physical dimensions of urban resilience on sustainable development in the city of Tabriz.

Mothodology

This applied research is based on futures studies-analytical methods and was conducted using a combination of documentary and survey methods, with researcher-made questionnaires for data collection. The Delphi technique, MicMac software, and structural analysis were used, with structural analysis focusing on identifying and analyzing qualitative and structural relationships between variables. The combination of Delphi and MicMac provided a comprehensive and systematic analysis of factors affecting urban resilience. Delphi helped identify and build consensus on factors, while MicMac analyzed and prioritized their interrelationships. This combination enabled

the research to fully utilize experts' opinions and identify the complex relationships between factors affecting urban resilience. Using Delphi ensures that important variables are identified, and MicMac helps understand the relationships between these variables. In the first stage of Delphi, the dimensions affecting urban resilience on sustainable development were identified and extracted using experts' opinions in related fields. In the second stage, a questionnaire was used through Delphi across four rounds to ensure scientific confirmation and expert consensus on indicators and influential relationships. The first round (initial identification) involved an open-response questionnaire among panel experts to initially identify dimensions and indicators from their perspective.

The second round (evaluation and ranking) used a closed-response questionnaire based on first-round results, asking experts to rank each dimension and indicator by importance and influence. The third round (consensus building) asked experts to review their rankings in light of group results. The fourth round (final confirmation) aimed to achieve strong and stable consensus on the final indicators of urban resilience. After this round, indicators with consensus were identified as key and influential indicators of urban resilience in sustainable development.

The questionnaire was distributed among 20 specialists, experts, and managers in fields related to sustainable development, futures studies, and urban resilience. The research time horizon is 8 years, from 1403 to 1411 (2024–2032). The emphasis on futures studies through a long-term horizon (8 years) and analysis of mutual effects of indicators enables examination of possible trends and scenario-based decision-making. Then, the influential indicators of urban resilience for sustainable development were analyzed using MicMac software, which first identifies the variables from the initial stage and then enters them into the impact analysis matrix, where experts examine and determine the relationships among variables. After collecting the necessary information, the cross-impact matrix is prepared in two stages, with indicators placed in rows and columns, each potentially having mutual effects on others. This process helps experts gain a better understanding of the complex relationships among variables and ultimately make better decisions. This analysis can help clarify existing patterns and pave the way for further research and analysis. In the present study, the social, economic, and physical dimensions influencing urban resilience on sustainable development were examined based on futures studies in the city of Tabriz.

Findings

Based on the materials mentioned in the research method section, using library studies, the social, economic, and physical dimensions were identified as the influential dimensions of urban resilience on sustainable development in the city of Tabriz. After confirming the influential dimensions, 12 indicators influencing the future of urban resilience in Tabriz were extracted, and to ensure the comprehensiveness of the extracted components, experts were consulted. Based on the output of the MicMac software, the impact of the social, economic, and physical dimensions of urban resilience on sustainable development in the city of Tabriz is relatively stable, and the direct influence graph of the variables indicates that direct relationships exist between the variables. According to the graphs, "housing type," "adequate income," and "quality of life" have strong influence.

Discussion and Conclusion

The results of the research showed that the main dimensions influencing the urban resilience of Tabriz on sustainable development, in order, include building quality and age, quality of life, compensation for damages, adequate income, and housing type. This research is considered innovative in that it develops methods for measuring and quantifying the social

dimensions of resilience that are often overlooked, such as social capital, community cohesion, cultural identity, and citizen participation in decision-making processes, as well as developing models that can simultaneously and dynamically demonstrate the complex and mutual effects of the social, economic, and physical dimensions on resilience and sustainable development within a futures studies framework. An examination of the interviewees' opinions showed that physical and social factors play a more prominent role in the urban resilience process compared to economic factors. In general, considering the physical and social dimensions alongside the economic dimensions can not only enhance urban resilience but also contribute significantly to promoting sustainable development in the city of Tabriz.

K E Y W O R D S
Social Dimensions, Economic Dimensions, Physical Dimensions, Urban Resilience, Tabriz City.

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