Enhancing Urban Resilience Strategic Planning with MetaSWOT in Tehran's Historic Residential Districts

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Abstract. In recent decades, the escalating impact of natural disasters and climate change challenges has not only increased financial losses and casualties but also posed significant challenges to urban infrastructures particularly in historical areas. In the city of Tehran, which has a historical fabric and enduring social connections, preserving cultural and historical identity along with increasing resilience against crises is important. This paper aims to enhance physical and social resilience in residential neighborhoods within Tehran's historical fabric by introducing effective strategies to address future challenges. This article uses a quantitative and qualitative combined approach and is implemented in three key stages. The initial phase utilizes the Delphi method to identify and verify indicators of physical and social resilience. The data and opinions are gathered from experts who have knowledge and experience in the conditions of historical fabrics, resiliency, and the Meta SWOT method. Then, utilizing the Meta SWOT technique as a multi-stage analytical method, a strategic roadmap is formulated to enhance resilience in residential areas within the historical fabric. Finally, analysis and evaluation of the strategic roadmap were conducted based on predefined criteria to ensure that the proposed solutions effectively enhance neighborhood resilience. This article highlights the role of citizen education as an external factor in increasing their knowledge and participation in resilience processes. Additionally, it emphasizes the reinforcement of a sense of place and identity as internal and indispensable resources for sustaining and advancing social and physical resilience in historical fabrics.

Keywords: Resilience · Residential Neighborhoods · Meta SWOT · Strategic Planning · Historical Fabric · Tehran City

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1 Introduction

Iran is a disaster-prone country that has experienced more than 250 natural disasters over the past century, including floods, earthquakes, droughts, storms, and others [1]. Disaster is defined as hazards that cause widespread financial, human, economic, and environmental damage, as well as the inability (or exceeding the ability) to deal with these factors due to the lack of resources in the community or society [2]. They damage ecological systems, reduce economic outputs, and cause death and disease, which are extremely costly for the well-being of society and individuals [3]. To further the sustainable agenda and protect development gains, it is essential to shield socio-economic assets and the environment from rising risks, signifying the need for achieving resilience in cities [4]. Resilience is a versatile concept used in engineering, ecology, social sciences, and psychology [5]. Resilience has gained significance as one of the primary goals of empowerment in recovery and reconstruction after crises. Today, for some researchers with a positivist perspective, resilience is defined as the ability to return to a stable state after any disruption in the system's performance or as the capacity to absorb forces or changes with the least disruption to its functionality [6].

In the contemporary urban landscape, the concept of resilience has emerged as a critical framework for strategic planning, particularly in the face of environmental, economic, and socio-political challenges. Tehran's historic residential districts, rich in cultural heritage and socio-economic significance, stand at the crossroads of vulnerability and preservation. The introduction of MetaSWOT—an innovative analytical approach combining the traditional Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis with a meta-analytical layer—offers a nuanced pathway to enhancing urban resilience. This article delves into the application of MetaSWOT in Tehran's historic residential districts, aiming to provide a comprehensive strategy that not only safeguards these areas against various risks but also leverages their unique assets for sustainable urban development. Through a meticulous examination of the specific challenges and opportunities inherent in these districts, the study unveils a tailored, actionable plan that aligns with global sustainability goals while honoring the historical and cultural essence of Tehran.

2 Methodology

In this research, an initial Delphi method was employed to meticulously explore the indicators of physical and social resilience in the historical fabric of Tehran. Subsequently, utilizing the MetaSWOT technique, a strategic plan for residential neighborhoods within the historical context of Tehran was presented.

The Delphi method, developed in the early 1950s, is a structured communication technique for gathering expert insights on a specific subject, typically through questionnaires [7]. MetaSWOT, an advanced iteration of traditional SWOT analysis, was introduced in 2012 by Agarwal and his team at Tuiret College, USA, focusing on leveraging a group's strengths and resources to impact future outcomes [8]. MetaSWOT serves as a strategic planning tool, reflecting the current trend where companies, organizations, and institutions are confronted with both external-to-internal and internal-to-external

strategic planning approaches [9]. In summary, this technique comprises seven stages: Stage 1 – Identifying research goals and prioritization, Stage 2 – Identifying and rating resources and capabilities, Stage 3 – Identifying competitive dimensions, Stage 4 – Evaluating resources and capabilities based on VIRO criteria, evaluates the four elements of Value (V), Rarity (R), Imitability and Non-substitutability (I), and Organization of internal resources and capabilities (O) in the VIRO framework compared to competitors. Stage 5 – Identifying and analyzing external factors, Stage 6 – Fit strategy, and Stage 7 – Drawing the strategic roadmap.

This research aimed at enhancing urban resilience strategic planning in Tehran's historic residential districts, employs a multifaceted approach that combines both the Delphi method and MetaSWOT analysis. This study is structured into three key stages as outlined in Fig. 1. Initially, the study employed the Delphi method to gather expert opinions and insights. This method proved instrumental in identifying key indicators of physical and social resilience within Tehran's historical fabric, leveraging the collective intelligence of experts through rounds of questionnaires to refine understanding and consensus on the subject matter. Following this foundational work, the research advanced by employing the MetaSWOT technique, which guided the development of a strategic plan for enhancing the resilience of residential neighborhoods within Tehran's historical context. Together, these methodologies provide a robust framework for strategic planning aimed at bolstering urban resilience in Tehran's historic residential districts.

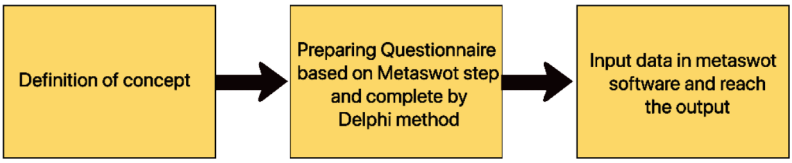


Fig. 1. Main phases of the methodology

3 Definition of Concepts

3.1 Resiliency

The term "resilience" in the Oxford culture refers to the ability of people or things to quickly achieve a better state after adverse events such as shock, damage, etc. It also means the ability of materials to return to their original state after bending, stretching, or compression [10]. The word "resilience" is derived from the Latin word "Resilio", which originally meant "to return to the original state" [11]. Holling used this term for the first time in 1973 in ecological studies [12]. He defines resilience as the level of system resistance and its ability to absorb change and disturbance while maintaining the relationship between the population or system variables [13]. Holling's (1973) major contribution lies in using the term resilience to describe dynamic equilibrium, encompassing what could exist in various spaces [14]. This perspective on resilience later became known as "ecological resilience" [15]. In general, ecology is a scientific field that conceptualizes

itself within the framework of systems [14]. After Holling, the term "resilience" evolved in the fields of materials science, ecology, and environmental studies and became conceptually available for use by professionals, planners, and academics. In such a way, resilience has been defined as the system's ability to return to a stable state after any disturbance in its performance or as the system's ability to absorb forces with minimal disruption to its functionality [16]. Figure 2 illustrates the evolution path of the concept of resilience across various sciences and disciplines.

3.2 Urban Resilience

The concept of urban resilience, originating from ecological sciences, poses challenges in its introduction and explanation as an objective approach to urban planning [5]. Urban resilience refers to the ability of cities to adapt, recover, and rebuild quickly in the face of various pressures, shocks, and disasters [11]. Assessing urban resilience not only helps to identify potential vulnerabilities and risks in advance, but also guides urban planning and construction, and improves the resilience and adaptive capacity of cities, thus mitigating losses caused by disasters [11]. Urban resilience, or flexibility, is generally defined as the capacity of an urban system or region to absorb and adapt to various shocks and stresses, a role increasingly vital as urban spaces become central to communal life [17]. A resilient city is a sustainable network of physical systems and human communities [18]. The built and natural components of the city's physical systems include roads, buildings, infrastructure, communications, and energy supply facilities, as well as water paths, soil, topography, geography, and natural systems [19]. During disasters, resilient communities must ensure the sustainability of physical systems, guide activities through social and institutional structures, and enhance capacities to survive, function, and adapt to economic and social changes in adverse conditions [20]. The resilience of cities hinges on the coordination between built and social systems, where their interaction plays a crucial role in maintaining functionality and tolerating stressful conditions during a disaster [21].

If the physical systems, like the body of the city, collapse, other systems will not be able to continue functioning. Similarly, if the social system, as the city's brain, fails, the city's performance cannot be considered resilient to disasters. Vulnerable communities and cities are not resilient to disasters; conversely, taking measures to reduce vulnerability alone is not sufficient for cities to become resilient to disasters. Resilient cities are built based on the lessons learned from past disaster experiences in urban environments. They may bend under the forces of hazards but do not break. In resilient cities, fewer buildings should collapse, there should be fewer power outages, households and businesses should be less exposed to risk, and there should be fewer casualties and injuries, there should be fewer communication disruptions and less discord, decentralization, and dispersion of networks, both economically and socially, are important characteristics of resilient cities [22]. The historical fabric and residential neighborhoods of a city encapsulate its history and identity, showcasing enduring social bonds. Recognized as the city's living spirit in architecture and urban planning, it bears witness to significant events and generations' impacts. With modernity, the challenge of social resilience grows, highlighting the importance of neighborhoods in societal resilience. These areas within the historical fabric are key to maintaining the city's authenticity and identity.

3.3 Physical and Social Resilience

The physical dimension is key to assessing community resilience, emphasizing the importance of building robustness, population density, service and emergency access, land use, and open space conditions during disasters [23]. If attention to social aspects of resilience is not more important than attention to physical and infrastructural aspects in crisis management, it is at least equally significant [24]. In a place where crime, homelessness, unemployment, and discussions related to inadequate nutrition and insufficient education are evident, it is no longer possible to place significant importance on disaster prevention issues [25]. Therefore, the concept of resilience has evolved gradually, shifting attention from its initial ecological concept towards a social-ecological concept, and eventually, towards a social concept [26]. Social resilience, a term first introduced by Adger, is defined as the capacity of groups or communities to cope with external stresses and disturbances brought about by social, political, and environmental changes [27]. He defines social resilience as the capacity of groups or communities to cope with external stresses and disturbances in the face of social, political, and environmental changes [28]. Social resilience encompasses the ability of individuals and social groups to adapt to environmental changes, essentially enabling society to restore balance or respond positively to adversities [26].

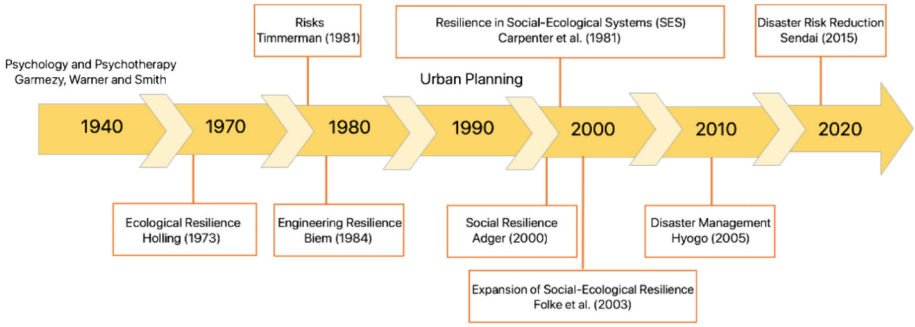


Fig. 2. Evolutionary trajectory of the concept of resilience in various disciplines

3.4 Neighborhood Resilience

Neighborhood resilience is defined as the "ability of a neighborhood to adapt to internal and external social, economic, and environmental pressures for strengthening and enrichment." In addition to defining neighborhood resilience, understanding in which context neighborhood resilience can be implemented is crucial. Often, resilience is defined as the ability to survive disasters such as earthquakes, and therefore, the necessity for the rapid ability to relocate for a return to the community is observed. However, resilience can be considered a response to gradual stresses such as climate change. Although the main characteristics of resilience may be similar, they are identified in different areas and may emphasize various dimensions of social, environmental, and systematic factors. Therefore, resilience has two characteristics: inherent capability for good performance during

crisis times and adaptability and resilience to ineffective responses during disasters [25]. Creating resilience in neighborhoods is considered neighborhood empowerment. This empowerment may be achieved by encouraging neighborhoods to establish their specific resilience indicators. Resilience, from this perspective, does not come about deeply; rather, it can positively impact the stability and preservation of strong neighborhoods.

Figure 3 provides a general overview of the conceptual framework of the research based on the theoretical literature under consideration.

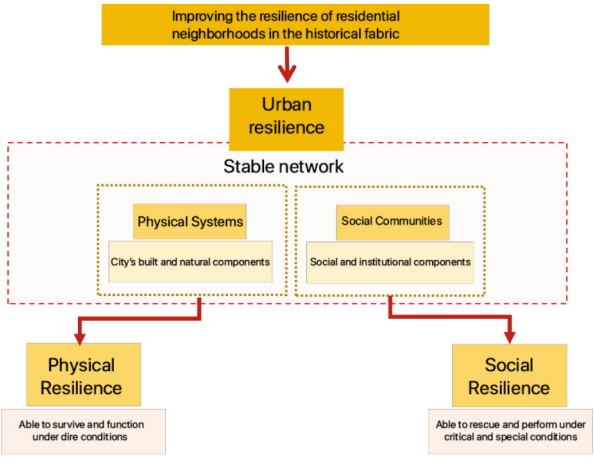


Fig. 3. Overview of the conceptual framework

4 Introduction of the Study Area

The city of Tehran spans an area of over 700 km^2, situated between 35° and 31 min to 35° and 57 min north latitude and 51° and 4 min to 51° and 47 min east longitude. The city is bounded to the north by the Alborz Mountain range, to the east by Lavasanat, to the west by Karaj, and to the south by Varamin. From a political subdivision perspective, Tehran is divided into 22 districts, 123 neighborhoods, and 354 blocks [29].

Historically, during the Tahmasbi period, Tehran comprised five neighborhoods: Sangalaj, Bazaar, Oudlajan, Imamzadeh Yahya, and Chaleh Meydan (Abshar). Presently, these neighborhoods are located within District 12 of Tehran Municipality. Therefore, in this study, with an emphasis on residential neighborhoods, research has been exclusively conducted in other neighborhoods excluding the Bazaar. Figure 4 illustrates the location of the study area.

Sangalaj, one of Tehran's oldest neighborhoods, is bounded by Amir Kabir Street (north), Molavi Street (south), Vahdat-e Eslami Street (west), and Khayyam Street (east), neighboring Oudlajan and Bazaar to the east. Home to a diverse population, it had 26,829 people across 8,814 households in 2016, with a gender distribution of 50.43% males (13,529) and 49.57% females (13,300).

Oudlajan, bounded by Shah Mosque (north), Bozarjomhori Shahri and Pamenaar/Amir Kabir Streets (south), and extending from Golestan Palace to Naser Khosrow, also includes Toopkhaneh Square. The 2016 census reported 2,932 people in 977 households for Pamenaar, with a gender split of 54.4% males (1,598) and 45.6% females (1,334).

Imamzadeh Yahya is bordered by Amir Kabir Street (north), 15th Khordad Street (south), Mostafa Khomeini Street (west), and Rey Street (east), with a 2016 population of 14,024 (52.22% males, 47.78% females) across 4,562 households. Chaleh Meydan (Abshar) is defined by Amir Kabir Street (north), Mahalati Street (south), Rey Street (west), and 17th Shahrivar Street (east), housing 22,250 people (49.7% males, 50.3% females) in 7,380 households in 2016.

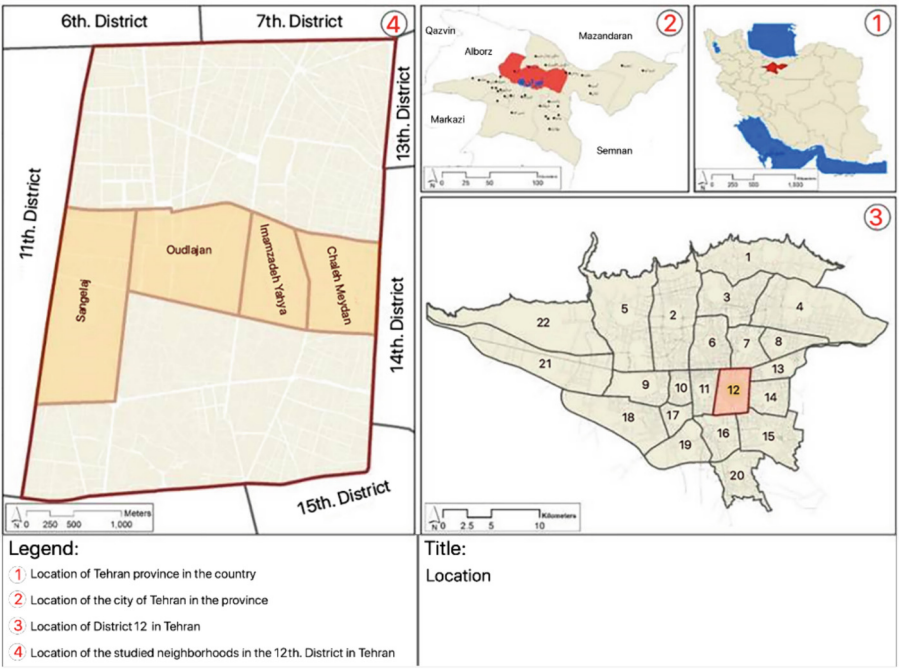


Fig. 4. Location of the study area

5 Findings

To obtain precise information required for the research, a questionnaire aligned with the steps of the MetaSWOT technique was prepared and provided to the experts. In this section, the Delphi method was employed with the involvement of 10 experts including urban planners, technicians, and academics who possessed knowledge about the MetaSWOT technique and had the necessary information regarding the conditions of the research areas. A 100% response rate was achieved, and the duration of the Delphi method was two weeks, during which consensus was reached in the second collective round, serving as the criterion for action. The implementation of the Delphi method occurred in seven stages, outlined as follows:

5.1 Stage One: Determining Research Objectives and Prioritization

In this stage, the research objectives were identified and aligned into four main categories. The experts' opinions were obtained to prioritize these objectives. The results obtained are presented in Table 1, which is available for review.

Table 1. Research Objectives Prioritization

Objectives	Priority
Enhancement of physical resilience in historical residential neighborhoods	High
Enhancement of social resilience in historical residential neighborhoods	High
Determination of the relationship between physical-social resilience components	Medium
Identification of conditions and factors influencing the resilience of residential neighborhoods	High

5.2 Stage Two: Identification and Rating of Resources and Capabilities

In this stage, utilizing the Delphi results for refining the research criteria and indicators, the adjustment questionnaire was developed. While obtaining expert opinions regarding the identified resources and capabilities, each item was scored to ensure that the total scores did not exceed 100. The obtained results are presented in Table 2:

Table 2. Scores of resources and capabilities

Resources and Capabilities	Score	Resources and Capabilities	Score
Sense of Belonging in Residents	5	Form and Fabric	4
Neighborhood Identity	5	Building Quality	9
Level of Social Interactions	5	Permeability	9
Social Cohesion	7	Road Width	7
Quality of Life	6	Number of Intersections	5
Prosperity	4	Ease of Access	6
Security	4	Emergency Evacuation Areas of Neighborhoods	10
Social Networks	9	Location of Stormwater Drainage Systems	5

5.3 Step Three: Identification of Competitive Dimensions

Since a competitive map will be drawn in the subsequent stages, it is necessary to categorize the factors related to resources and capabilities into two competitive dimensions. Considering the research objectives and the extracted resources and capabilities, competitive dimensions were categorized into two dimensions: physical and social.

Among the historical neighborhoods in Tehran, Sangalaj was considered as the base neighborhood, and other neighborhoods were considered as competitive neighborhoods. In other words, the competitors of Sangalaj neighborhood, in the order entered into the software, include Oudlajan, Imamzadeh Yahya, and Chaleh Meydan. The status of this neighborhood in comparison with other neighborhoods is presented in Table 3. By inputting the information from this table into the software, the competitive map of this neighborhood with other neighborhoods, along with the competition results in the form of a chart and table, will be obtained.

The competitive map illustrates the comparison of resources and capabilities of four neighborhoods based on two factors: social and physical dimensions. To prepare this map, one neighborhood is considered the main one, and the others are compared to it. This map is shown in Fig. 5, which presents the data from Table 3.

The results of the competitive map show that Chaleh-Meydan and Sangalaj have the same rating in the social dimension, positioned between two other neighborhoods: one unit lower than Oudlajan and one unit higher than Imamzadeh Yahya. Regarding physical dimension, Oudlajan and Imamzadeh Yahya are rated the same, slightly lower than Sangalaj and one unit higher than Chaleh-Meydan.

Table 3. Comparison of resources and capabilities in Sangalaj with other neighborhoods

Resources and Capabilities	Oudlajan	Imamzadeh Yahya	Chaleh Meydan
Sense of Belonging in Residents	Approximately Equal	Approximately Equal	Higher
Neighborhood Identity	Approximately Equal	Approximately Equal	Higher
Level of Social Interactions	Lower	Lower	Higher
Social Cohesion	Approximately Equal	Approximately Equal	Higher
Quality of Life	Higher	Higher	Higher
Prosperity	Lower	Lower	Approximately Equal
Security	Approximately Equal	Approximately Equal	Higher
Social Networks	Approximately Equal	Approximately Equal	Higher
Urban Form and fabric	Higher	Much Higher	Lower
Building Quality	Lower	Much Higher	Higher
Permeability	Lower	Much Higher	Higher
Street Width	Lower	Much Higher	Higher
Number of Intersections	Higher	Much Higher	Lower
Accessibility	Approximately Equal	Approximately Equal	Approximately Equal
Emergency Evacuation Zones	Much Lower	Much Lower	Lower
Location of Recreational Areas	Lower	Higher	Much Lower

5.4 Stage Four: Evaluation of Resources and Capabilities Based on the VIRO Criteria

In this stage, the identified resources and capabilities of each neighborhood are examined in comparison with other competitors. The VIRO criterion, evaluates the four elements of Value (V), Rarity (R), Imitability and Non-substitutability (I), and Organization of internal resources and capabilities (O) in the VIRO framework compared to competitors.

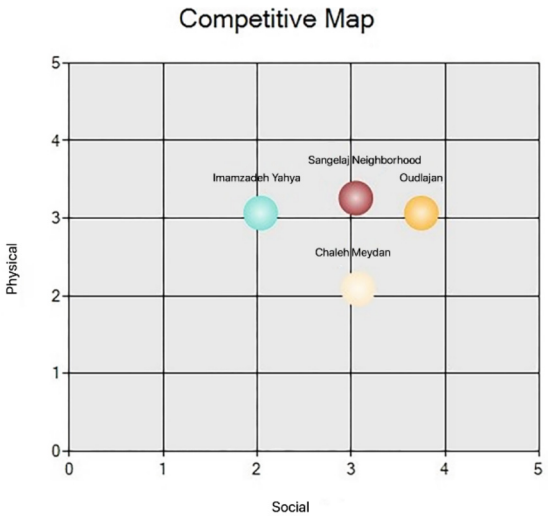


Fig. 5. Competitive map of Sangalaj neighborhood and other researched neighborhoods

Following the explanations provided in the MetaSWOT software, Rarity implies "our competitors do not have this factor," Imitability means "our competitors cannot easily develop this factor," and Non-substitutability and Organization signify "we benefit from this factor in profit-oriented decision-making." Expert opinions regarding the evaluation of these aspects are outlined in Table 4.

Table 4. Evaluation of resources and capabilities

Resources and Capabilities	Rarity	Inimitability	Non-substitutability
Sense of Belonging in Residents	Completely Disagree	Disagree	Agree
Neighborhood Identity	Completely Disagree	Agree	Agree
Level of Social Interactions	Disagree	Completely Disagree	Neutral
Social Cohesion	Disagree	Disagree	Agree
Quality of Life	Completely Disagree	Disagree	Neutral
Livability	Disagree	Disagree	Neutral

(*continued*)

Table 4. (*continued*)

Resources and Capabilities	Rarity	Inimitability	Non-substitutability
Security	Completely Disagree	Disagree	Agree
Social Networks	Completely Disagree	Disagree	Agree
Urban Form and Structure	Disagree	Agree	Agree
Building Quality	Completely Disagree	Disagree	Agree
Permeability	Disagree	Disagree	Agree
Street Width	Disagree	Disagree	Agree
Number of Intersections	Neutral	Agree	Neutral
Accessibility	Completely Disagree	Disagree	Agree
Emergency Evacuation Areas	Disagree	Completely Disagree	Agree
Location of Water Features	Disagree	Disagree	Disagree

5.5 Stage Five: Identification and Analysis of External Factors

In this stage, in addition to identifying external factors, the stability and dynamism (weight), the level of impact, the likelihood of occurrence, and the degree of urgency for each of these factors are evaluated.

Table 5. Analysis of external factors

Factors	Weight	Impact	Likelihood of Increase	Degree of Urgency
Citizen education	Very important	Strong	Moderate	Immediate
Conducting drills at different time intervals	Very important	Strong	Low	Soon
Consideration of incentive policies for resilience	Very important	Strong	High	Very soon
Natural disaster occurrence (earthquake, flood, etc.)	Important	Very weak	High	Long term
Occurrence of non-natural crises (war, airstrikes, etc.)	Important	Very weak	Moderate	Long term
Resource management	Very important	Strong	Moderate	Soon
Making appropriate and timely decisions and solutions	Very important	Strong	Moderate	Very soon

Following the explanations provided in the MetaSWOT software, “Weight” means “How important are these factors compared to average challenges?”, “Impact” means

"How strongly do these factors affect success?", "Likelihood of Increase" means "The likelihood of this factor occurring during the planning period," and "Degree of Urgency" means "The amount of need for this factor." Expert opinions on the evaluated items in Table 5 are as follows.

5.6 Stage Six: Alignment Strategy

– Fit between Resources and Capabilities with External Factors

Experts evaluate how resources and capabilities affect external factors, calculating strategic alignment by adapting internal or external factors. This stage aims to understand how resources and capabilities support opportunities and mitigate threats. The findings of the alignment examination by experts are outlined in Table 6.

– Alignment Between Resource and Capability Factors and Research Objectives

Table 6. Alignment between resources and capabilities and external factors

External Factors Resources and Capabilities	Training	Maneuver	Incentive Policy	Natural Disasters	Crisis Occurrence	Resource Management	Decision-Making
Sense of Belonging in Residents	W	N	W	VW	W	S	N
Neighborhood Identity	VW	N	W	VW	W	S	N
Level of Social Interactions	N	S	S	VW	W	S	S
Social Cohesion	S	S	S	VW	W	S	S
Quality of Life	S	W	S	VW	W	S	N
Well-being	W	N	W	VW	W	W	N
Security	VW	S	W	VW	VS	S	S
Social Networks	S	S	S	VW	W	S	S
Form and Structure	W	W	S	S	S	N	N
Building Quality	W	W	VS	VS	VS	S	N
Permeability	W	W	S	VS	VS	S	N
Road Width	W	W	S	VS	VS	S	W
Number of Intersections	W	N	N	S	S	N	VW

(*continued*)

Table 6. (*continued*)

External Factors Resources and Capabilities	Training	Maneuver	Incentive Policy	Natural Disasters	Crisis Occurrence	Resource Management	Decision-Making
Ease of Access	N	W	N	S	S	N	N
Emergency Evacuation Areas in Localities	S	S	VW	VS	VS	W	S
Position of Hazardous Land Uses	S	S	VW	VS	VS	W	S

N = Neutral, S = Strong, W = Weak, VW = Very Weak, VS = Very Strong

At this stage, experts evaluate how resources and capabilities influence research objectives. The process involves aligning internal factors with these objectives to determine their support level. Strategic alignment is thus assessed based on this criterion. The extent of support for research objectives by resources and capabilities is the primary focus. The findings from this alignment evaluation are summarized in Table 7.

Table 7. Alignment between resources and capabilities and research objectives

Research Objectives Resources and Capabilities	Enhancement of Physical Resilience	Enhancement of Social Resilience	Determination of the Relationship between Resilience Components	Identification of Effective Conditions and Contexts
Sense of Belonging in Residents	Strong	Very Strong	Strong	Strong
Neighborhood Identity	Strong	Very Strong	Strong	Strong
Level of Social Interactions	Neutral	Very Strong	Neutral	Strong
Social Cohesion	Strong	Very Strong	Neutral	Strong
Quality of Life	Weak	Strong	Strong	Neutral
Livelihood	Weak	Strong	Neutral	Neutral
Security	Weak	Strong	Weak	Neutral

(*continued*)

Table 7. (*continued*)

Research Objectives Resources and Capabilities	Enhancement of Physical Resilience	Enhancement of Social Resilience	Determination of the Relationship between Resilience Components	Identification of Effective Conditions and Contexts
Social Networks	Strong	Very Strong	Neutral	Strong
Form and Structure	Very Strong	Neutral	Strong	Strong
Building Quality	Very Strong	Weak	Weak	Strong
Permeability	Very Strong	Weak	Very Weak	Strong
Road Width	Very Strong	Weak	Weak	Strong
Number of Intersections	Strong	Strong	Strong	Neutral
Accessibility Ease	Strong	Neutral	Neutral	Strong
Emergency Evacuation Areas	Very Strong	Neutral	Very Weak	Strong
Location of Hazardous Land Uses	Very Strong	Very Weak	Very Weak	Strong

5.7 Stage Seven: Drawing the Strategic Map

In the strategic map, resources, capabilities, and external factors are evaluated using three criteria: proximity to external factors, directional orientation, and bubble size. Blue bubbles signify internal resources and capabilities. The X-axis measures scarcity, non-imitability, and organizational fit, while the Y-axis assesses the strategic fit level of the factors [8]. Factors leaning to the right are relatively valuable, rare, non-imitable, and irreplaceable, possessing strategic fit. Those leaning upwards have a high degree of strategic fit. The size of the bubbles indicates the degree of their fit with the objectives [23].

External factors, depicted by orange bubbles on the strategic map, illustrate factor power on the X-axis and necessity through bubble size, with proximity highlighting internal support for external factors [8]. In general, for both categories of bubbles representing resources and capabilities, as well as external factors, placement in the upper-right position indicates the highest score and rating [23]. At this stage, after analyzing data across six stages, a unified strategic map for the studied neighborhoods was created, reflecting shared objectives, resources, capabilities, and external factors, as depicted in Fig. 6.

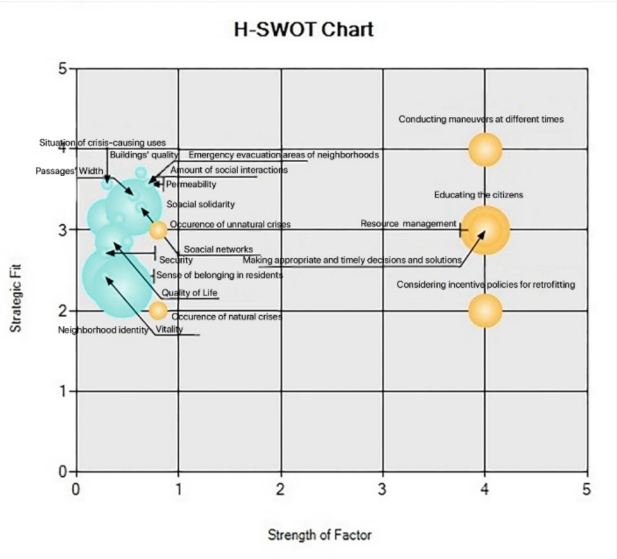


Fig. 6. Strategic map of Tehran's historic residential districts

5.8 Analysis of Strategic Map

Analysis of strategic map for residential areas based on the following criteria:

Proximity of Resources and Capabilities to External Factors

The closer the resources are aligned with opportunities, the more indicative it is of favorable conditions. In the extracted strategic map, depicted in Figs. 5 and 6, the available resources, and capabilities in the neighborhood, in both social and physical dimensions, are concentrated on the left side of the chart. This indicates a considerable distance from potential opportunities, such as providing education to residents, conducting maneuvers at different times, considering incentive policies for resilience, and adopting timely and proportionate decisions and solutions. On the other hand, the proximity of threats, including the occurrence of natural disasters (earthquakes, floods, etc.) and non-natural crises (war, aerial attacks, etc.), to resources and capabilities reflects the lack of necessary preparedness in these areas to confront threats.

Horizontal and Upper Direction of Factors, and Bubble Size

For a detailed examination, Table 8 shows the placement of each internal and external factor and the size of the bubbles.

Blue Bubbles on the Chart Representing Resources and Capabilities

The blue bubbles on the chart represent resources and capabilities, and their placement relative to the X-axis (less than 1) indicates that all these factors are imitable and non-scarce, accessible by other areas. The positioning of these bubbles concerning the Y-axis (all above the number 2) suggests that, in terms of strategic compatibility, they have high ratings. The highest of these are related to social networks, permeability, and emergency evacuation areas, indicating a high strategic fit for these aspects. It's worth mentioning that other factors also show a significant and appropriate strategic fit. The

Table 8. Placement and Size of the Resource and Capability Bubble and External Factors

	Resources and Capabilities/External Factors	X-Axis Coordinates	Y-Axis Coordinates	Bubble Size
Resources and Capabilities	Sense of Belonging in Residents	0.35	2.43	6.375
	Neighborhood Identity	0.45	2.29	6.375
	Level of Social Interactions	0.30	3.14	3.75
	Social Cohesion	0.56	3.29	6
	Quality of Life	0.36	2.86	3.25
	Livability	0.28	2.43	1
	Security	0.27	2.71	0.5
	Social Networks	0.63	3.58	6.35
	Form and Structure	0.40	3.14	0.58
	Building Quality	0.63	3.71	2.35
	Permeability	0.72	3.57	3.26
	Road Width	0.56	3.43	2.18
	Number of Intersections	0.50	2.86	0.62
	Accessibility Ease	0.42	3.14	1
	Emergency Evacuation Areas of Districts	0.70	3.57	2.54
	Hazardous Land Use Areas	0.30	3.34	1.08
External Factors	Education for Citizens	4	3	5
	Conducting Maneuvers at Different Times	4	4	3
	Consideration of Incentive Policies for Resilience	4	2	3
	Occurrence of Natural Disasters	0.80	2	1
	Occurrence of Non-natural Crises	0.80	3	1
	Resource Management	4	3	3
	Adoption of Timely and Proportional Decisions and Solutions	4	3	3

size of the bubbles serves as a measure, and the highest-scoring factors in terms of research objectives are the sense of belonging in residents, neighborhood identity, social cohesion, and social networks. Following these, factors like quality of life, building quality, permeability, road width, and emergency evacuation areas also exhibit the highest alignment with research objectives.

Orange Bubbles on the Chart Representing External Factors

The orange bubbles on the chart represent external factors, and their placement relative to the X-axis indicates the strength of these factors in achieving the research objectives. All identified opportunities, including education for citizens, conducting maneuvers at different times, considering incentive policies for resilience, resource management, making timely and proportional decisions, show significant strength toward achieving research objectives. In terms of strategic compatibility, conducting maneuvers and education for citizens, followed by making timely decisions and solutions, resource management, and incentive policies, exhibit relatively good strategic alignment. The bubble size indicates the degree of urgency, with education for citizens having the highest score among all factors.

6 Conclusion

The creation of resilience in neighborhoods is considered synonymous with empowering localities. This empowerment may be achieved by encouraging neighborhoods to establish their resilience indicators. Resilience, from this perspective, does not emerge deeply; instead, it can positively impact the stability and preservation of strong localities. In other words, neighborhood resilience contributes to improving the quality of place and life, both qualitatively and quantitatively. It also leads to the construction of more resilient structures in future crises and, due to emotional bonds, increased participation in problem-solving and, consequently, care for the place.

In this research, the MetaSWOT software has been utilized to develop a strategic plan for physical and social resilience in historical residential neighborhoods. The application of the MetaSWOT method, as a modern technique, is rarely seen in urban planning research. The six-step process of this technique was executed, and the strategic map of the researched neighborhoods was extracted in the seventh step. According to the obtained map, the sense of belonging in residents, neighborhood identity, social cohesion, quality of life, and social networks are of high importance for enhancing social resilience. In physical resilience, building quality, permeability, road width, and emergency evacuation areas also exhibit the highest level of alignment with research objectives.

Since residential neighborhood resilience is not possible without making the community resilient, the enhancement of resilience in historical residential neighborhoods is dependent on social resilience in these areas. Therefore, the resulting strategic map emphasizes the necessity of focusing on the social aspect. In this regard and considering the importance of citizen participation in creating resilient communities, citizen education, considered as an external factor, holds significant importance.

This research aims to draw attention to the importance of resilience in historical residential neighborhoods in Tehran, which have been neglected for a considerable period. Based on the research findings, the following suggestions are proposed for improving resilience in historical neighborhoods:

- Involving relevant organizations, such as municipal authorities, in intervention, with a focus on citizen education.
- Increasing citizen participation in the resilience-building process through citizen education.
- Optimizing and redefining the practical application of social dimensions in residents' urban life and outlining basic principles in social resilience through annual reports and establishing a task force for its analysis in neighborhood centers to monitor resilience goals.
- Organizing effective and practical training courses and drills to assess the preparedness of citizens.
- Reducing vulnerability levels and returning to pre-crisis conditions in case of any incident in these neighborhoods.

Ultimately, by formulating principles and policies for resilience in residential neighborhoods, especially those with historical structures, a better outlook for the future of the country's cities can be envisioned. In conclusion, researchers and scholars interested in urban resilience are encouraged to explore other dimensions of resilience at the intermediate and local levels, especially in residential neighborhoods, in future studies.

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