ICONARP
International Journal of Architecture and Planning
Received: 29.01.2026 Accepted: 21.05.2026
Volume 14, Issue 1/ Published: 30.06.2026
Research Article *DOI: 10.15320/ICONARP.2026.355 E- ISSN:2147-9380*
ICONARP

Identifying and Prioritizing Disaster-Oriented Urban Transformation Areas Using GIS–AHP: The Case of Akşehir

Murat Ferit Altun *
Neslihan Serdaroğlu Sağ **

Abstract

The occurrence of material damage and loss of life due to disasters in human settlements has underscored the necessity of an integrated disaster management system that encompasses pre-disaster risk management. Within such an integrated framework, pre-disaster risk management primarily aims to identify disaster risks and to eliminate or minimize these risks as far as possible. Particularly in areas exposed to a high likelihood of severe economic losses and human casualties following potential disasters, risk identification constitutes a fundamental prerequisite for both the development of damage prevention strategies and the delineation of urban transformation areas and interventions. This article aims to identify and prioritize urban transformation areas under disaster risk in Akşehir, which is located in a first-degree seismic zone, to develop intervention strategies for disaster risk reduction. In the conceptual phase, the study focuses on key criteria and priorities used in determining urban transformation areas in earthquake-prone regions in Türkiye and constructs a matrix consisting of four main criteria and eighteen sub-criteria. The criteria included in this matrix were classified in the ArcGIS environment using the reclassification method based on existing condition analyses and expert opinions and subsequently weighted through pairwise comparisons using the Analytic Hierarchy Process (AHP). A weighted overlay analysis was then performed in ArcGIS to generate a spatial map of urban transformation necessity. Urban areas requiring transformation were prioritized according to expert assessments. As a result of the analysis, 23.1 ha were identified as first-priority, 8.8 ha as second-priority, and 62.2 ha as third-priority disaster risk-oriented urban transformation areas within the city center of Akşehir. The study demonstrates the applicability of GIS and AHP in identifying and prioritizing urban transformation areas in earthquake-prone regions, particularly in Türkiye, and is expected to serve as a methodological reference for the development of disaster-oriented urban transformation strategies.

Keywords: *Analytic hierarchy process (AHP), Akşehir, Disaster-oriented urban transformation, Geographic information systems (GIS)*

* Directorate of Planning and Urban Development, Akşehir Municipality, Konya, Türkiye
E-mail: muratferitaltun@gmail.com

**Department of Urban and Regional Planning, Faculty of Design and Architecture, Konya Technical University, Konya, Türkiye (*Corresponding author*)
E-mail: nssag@ktun.edu.tr

To cite this article: Altun, M.F., & Serdaroğlu Sağ, N. (2026). Identifying and Prioritizing Disaster-Oriented Urban Transformation Areas Using GIS–AHP: The Case of Akşehir. *ICONARP International Journal of Architecture and Planning,* 14 (1), 105-130. DOI: 10.15320/ICONARP.2026.355

INTRODUCTION

The Disasters have historically exerted profound impacts on the physical, economic, and social structure of societies. As a disaster-prone country, Türkiye has experienced its most severe and devastating consequences primarily as a result of earthquakes (Şenol Balaban, 2016). For this reason, the present study focuses on the identification of urban transformation areas based on seismic risk. Major earthquakes in Türkiye include the 1939 Erzincan, the 1999 Gölcük, and the 2023 Kahramanmaraş-centered events. In the Erzincan earthquake, 116,720 buildings were severely damaged, and 32,962 people lost their lives. Similarly, the Marmara earthquake caused damage to 328,113 buildings and resulted in 17,480 fatalities (Ministry of Environment, Urbanization and Climate Change, 2023). Following the Kahramanmaraş-centered earthquake, approximately 227,027 buildings were identified as urgently demolishable or heavily damaged (Ministry of Environment, Urbanization and Climate Change, 2023), and 53,537 fatalities were reported (Ministry of Interior, 2023).

The primary cause of the extensive human and material losses observed in these earthquakes has been identified as the prevalence of unhealthy, low-quality, and aging building stock produced through unplanned, illegal, and fragmented urbanization processes. The magnitude of these losses has brought urban transformation projects to the forefront as a strategic instrument for prioritizing the renewal and structural strengthening of urban building stock in order to ensure safe and resilient living environments (Serdaroğlu Sağ, 2023).

Cities, due to their high concentration of population and economic activities, have become increasingly vulnerable to natural hazards, as disasters tend to amplify social and economic impacts in urban settings (Johnson & Blackburn, 2014). In this context, enhancing resilience in disaster-prone areas by reducing hazard exposure and strengthening adaptive capacity has emerged as a central paradigm across multiple disciplines. Universal policy goals, such as building disaster-resilient cities (UNISDR, 2012), require the integration of disaster risk management, disaster risk reduction, sustainability in human settlements, and community-based approaches. Countries are gradually shifting from reactive disaster response and recovery-oriented cultures toward proactive risk reduction and safety frameworks characterized by resilience-building mechanisms (Güzey, 2016).

Urban transformation functions as both a pre-disaster risk mitigation strategy and a post-disaster recovery mechanism. In Türkiye, particularly after the 1999 Marmara Earthquake, disaster risk became the dominant conceptual driver of urban transformation, and disaster-oriented urban transformation gained legal recognition with the enactment of Law No. 6306 in 2012 (Ertürk & Topal, 2020). However, as evidenced by the aftermath of the 6 February 2023 earthquake, preparedness efforts have yet to achieve the goals of creating resilient communities and ensuring sustainable recovery and redevelopment (Özcevik et al., 2009). Disaster

DOI: 10.15320/ICONARP. 2026.355

risk criteria should therefore be more systematically incorporated as the core rationale for urban transformation, and disaster risk reduction strategies must be addressed within an integrated planning framework alongside economic and social vulnerabilities (Güzey, 2016).

Urban transformation projects are inherently long-term and capital-intensive processes. Given that it is not feasible to initiate transformation simultaneously across all risky areas, the most effective approach is to prioritize interventions by sequencing them from the highest-risk areas toward those with relatively lower levels of risk (Dişkaya & Emir, 2021). Based on this premise, the present study aims to identify and prioritize urban transformation areas under disaster risk in order to develop targeted intervention strategies for reducing disaster-related vulnerabilities in urban contexts.

The literature encompasses a wide range of studies focusing on site selection and implementation challenges of urban transformation projects conducted under the Law on the Transformation of Areas Under Disaster Risk (Bektaş, 2014; Adıgüzel, 2019), risk identification and risk-based prioritization (Özcevik et al., 2009; Güzey, 2016; Dişkaya & Emir, 2021), the sustainability of urban transformation projects (Haghighi Fard & Doratlı, 2022), and post-disaster redevelopment strategies (Özcevik et al., 2009; Ertürk & Topal, 2020). A common conclusion derived from these studies is the necessity of developing urban transformation models that aim to create sustainable and disaster-resilient living environments and to determine priority intervention areas accordingly.

Numerous studies in the literature have employed GIS, AHP (Zhou & Zhou, 2015; Dişkaya & Emir, 2021; Thammaboribal et al., 2025), and fuzzy methods (Zhou & Zhou, 2015) for identifying and prioritizing risk areas. Given the complex and multidimensional nature of urban transformation processes, the evaluation of such interventions through spatially explicit analytical frameworks is of critical importance. By synthesizing previous studies, this article proposes a comprehensive criteria matrix for the identification and prioritization of disaster-prone areas and empirically tests it through GIS and AHP-based spatial analysis. In this respect, the study contributes as a theory-informed and practice-oriented framework.

The study area, Akşehir city center in Konya Province, represents one of the settlements located within Türkiye's first-degree seismic risk zone. Identifying earthquake-prone areas and prioritizing them within the urban transformation process provides an opportunity to generate transferable knowledge and methodological insights applicable to other high-risk settlements across the country.

CONCEPTUAL FRAMEWORK: CRITERIA FOR IDENTIFYING DISASTER-ORIENTED URBAN TRANSFORMATION AREAS

Disaster risk is defined as the probability of potential disaster-related losses in life, health, livelihoods, assets, and services that may occur within a given society or community over a specified future period

(UNISDR, 2012). According to Johnson and Blackburn (2014), resilience in disaster studies refers to the capacity of a system to prevent, absorb, and recover from losses and damages caused by natural hazards. Urban disaster resilience is therefore directly associated with disaster risk management. Currently, the most widely adopted approach to achieving effectiveness in disaster risk management is the integrated disaster management system. This framework supports the use of urban transformation as both a pre-disaster risk mitigation strategy and a post-disaster risk reduction, recovery, and rehabilitation instrument (Adıgüzel, 2019).

In this study, the main and sub-criteria employed for identifying disaster oriented urban transformation areas are derived from existing legal regulations in Türkiye, planning documents, and commonly used criteria in planning research, analysis, and synthesis processes. Accordingly, the first step involves examining the criteria used in legal frameworks for the designation of disaster-prone areas.

Law No. 6306 on the Transformation of Areas Under Disaster Risk, enacted in 2012, constitutes the primary legislative framework governing urban transformation in Türkiye. The main objective of this law is the renewal of buildings located in disaster-prone areas. Article 5 of the Implementing Regulation of this law sets forth provisions regarding the identification of risky areas. Areas characterized by inadequate planning and infrastructure services, where public order or safety is disrupted to an extent that daily life is interrupted, and where at least 65% of the building stock consists of illegal or unlicensed structures are submitted to the President for approval to be declared as risky areas (Official Gazette, 2012, No. 28498). Upon approval, such areas are officially designated as urban transformation areas.

In parallel, the Ministry of Environment, Urbanization and Climate Change issued principles and guidelines in 2012 for the preparation of urban transformation strategy documents. According to this framework, areas subject to transformation are determined based on comprehensive urban analyses and synthesis studies, and are subsequently prioritized by considering potential loss of life, environmental impacts, and economic losses, as well as the anticipated economic and social benefits of transformation, residents' expectations, and financial requirements (Ministry of Environment, Urbanization and Climate Change, 2021). These regulations indicate that the condition of the building stock, together with the presence of risky structures and risky areas, constitutes one of the most fundamental criteria in urban transformation processes (Öcal & İnce, 2012). Accordingly, the Building Risk Analysis was identified as a primary criterion for determining urban transformation areas in this study.

Pala and Şaşmaz (2019) emphasize that in densely populated urban areas, high-rise and attached buildings constructed to maximize land use tend to collide during earthquakes, resulting in severe structural damage. In this respect, Building Height (Number of Storeys) Analysis and

DOI: 10.15320/ICONARP. 2026.355

Building Layout (Building Typology) Analysis were considered critical for assessing structural performance and seismic behavior, and were therefore defined as sub-criteria under the building risk analysis.

In urban transformation assessments, evaluating buildings typically begins with examining building permits and occupancy certificates. Following the Regulation on Buildings in Disaster Areas, design standards were significantly revised after 1999, and the regulation was most recently updated in 2007 as the Regulation on Buildings in Earthquake Zones (Öcal & İnce, 2012). Empirical evidence suggests notable differences in structural integrity between buildings constructed before and after 2000. Consequently, Building Construction Year Analysis was identified as a key criterion for assessing the necessity of urban transformation.

From an architectural perspective, building physics deficiencies can be classified into five categories: physical-chemical problems, water and moisture problems, mechanical problems, heating problems, and acoustic problems (Güler et al., 2010). In accordance with the performance requirements stipulated in the Earthquake Regulation (Official Gazette, 2007, No. 26454), Problematic Building Analysis was incorporated as a sub-criterion under building risk analysis to assess structural performance deficiencies.

Urban transformation legislation also introduces criteria such as ground conditions, building height and density, and area size as justifications for declaring risky areas. The Ministry of Environment and Urbanization's Circular No. 10337 (2008) mandates the preparation of updated geological and geotechnical survey reports to reduce disaster risks and to provide a basis for disaster-sensitive spatial planning (Chamber of Geological Engineers, 2021). In this context, Settlement Suitability Analysis, defined as a synthesis study that integrates area classifications and necessary mitigation measures guiding planning decisions, was identified as another major criterion in urban transformation.

Earthquake characteristics, including location, magnitude, and frequency, constitute essential inputs for hazard mapping. A review of urban transformation practices in Türkiye and worldwide indicates that floodplains, fault lines, and steep slopes are among the most critical determinants of transformation areas due to high hazard exposure (ADB, 2016). Considering Türkiye's disaster profile, spatial positioning on hazard maps, and legislative provisions, Geographical Risk Analysis—encompassing landslide risk, flood risk, slope, fault proximity, and settlement suitability—was adopted as a primary criterion for identifying urban transformation areas.

Urban transformation projects aim to regenerate deteriorated and overcrowded urban areas by addressing physical, infrastructural, environmental, cultural, and economic deficiencies in line with contemporary needs (Çelik, 2017). In this context, urban transformation offers a strategic opportunity to compensate for deficiencies in public service and amenity provision. Given their function as evacuation and refuge spaces during disasters, Urban Facilities Analysis was included as a key criterion.

Emergency assembly areas play a critical role in minimizing loss of life, meeting urgent needs, ensuring effective disaster management, and facilitating rapid recovery (Aydın et al., 2020). Therefore, Emergency Assembly Area Analysis constitutes another essential criterion. Key parameters include accessibility, road connectivity, functional adequacy, and spatial capacity. Accordingly, the combined evaluation of facilities and emergency assembly areas was operationalized as the Accessibility to Facilities and Assembly Areas Analysis, encompassing sub-criteria such as education facilities, health facilities, green spaces, and designated emergency gathering areas.

As stipulated in national legislation, areas where at least 65% of buildings are illegal or unlicensed are declared risky, making Illegal Building Density Analysis a relevant sub-criterion. Density is measured by the number of people within a unit area. In high-density urban contexts, insufficient service provision reduces quality of life and necessitates transformation (Çelik, 2017). Therefore, Illegal Building Density and Population Density Analyses were incorporated under the Density Risk Analysis criterion.

Kul (2018) identifies building condition, amenity needs, planning deficiencies, property ownership, and building stock characteristics as primary drivers of urban transformation. Özyeğit Altun and Öğdül (2021) highlight damaged buildings, risky areas, unsuitable settlements, building and population densities, open spaces, and strategic planning inputs as key variables.

Based on this synthesis, the main and sub-criteria adopted in this research for identifying disaster-oriented urban transformation areas are defined as follows:

- Building Risk Analysis (BRA) main criterion:
  Building Construction Year Analysis (BCYA),
  Building Height Analysis (BHA),
  Building Layout Analysis (BLA),
  Problematic Building Analysis (PBA).
- Geographical Risk Analysis (GRA) main criterion:
  Settlement Suitability Risk Analysis (SSRA),
  Landslide Risk Analysis (LRA),
  Flood Risk Analysis (FRA),
  Slope Analysis (SA).
- Facilities and Assembly Areas Analysis (FAAA) main criterion:
  Urban Facilities Analysis (UFA),
  Education Facilities Analysis (EFA),
  Primary School Accessibility Analysis (PSAA),
  Secondary School Accessibility Analysis (SSAA),
  High School Accessibility Analysis (HSAA),
  Health Facilities Analysis (HFA),

DOI: 10.15320/ICONARP. 2026.355

Green Spaces Analysis (GSA),
Emergency Assembly Area Analysis (EAAA).

- Density Risk Analysis (DRA) main criterion:
Illegal Building Density Analysis (IBDA),
Population Density Analysis (PDA).

These criteria collectively constitute the analytical framework for the spatial identification and prioritization of disaster-oriented urban transformation areas in this study.

RESEARCH METHOD

This study employs a mixed-method research design integrating a comprehensive literature review with an empirical field study. The literature review on disaster-oriented urban transformation was conducted through systematic screening of academic theses, journal articles, books, and scientific databases. The empirical component draws on official reports, planning documents, photographs, spatial datasets, and survey forms obtained from public institutions concerning Akşehir. The field study covers approximately 1,400 ha within the built-up urban boundary of Akşehir district in Konya Province, excluding agricultural lands. The methodological workflow was structured as follows:

1. Relevant criteria were identified based on the literature review.
2. Existing conditions were analyzed in accordance with the identified criteria. Spatial datasets corresponding to four main criteria and eighteen sub-criteria were mapped and converted into thematic layers. All analytical maps were generated in raster format using GIS. These maps were subsequently reclassified using the Reclassify method by assigning categorical values to each pixel.
3. Disaster risk analyses were produced. Existing condition layers were classified in ArcGIS using the reclassification method based on expert judgments. The criteria were weighted through pairwise comparisons using the Analytic Hierarchy Process (AHP), and a weighted overlay analysis was conducted in ArcGIS to generate a composite urban transformation necessity map scaled between 0 and 100.
4. Following the determination of weight vectors, all analytical layers were overlaid to produce a final composite map. Areas exceeding threshold levels of transformation necessity, as defined by expert evaluations, were aggregated and designated as urban transformation areas and subsequently prioritized.

GIS-Based Disaster Risk Analysis

Within the scope of the study, spatial analyses were conducted using ArcGIS software. Statistical Clustering, Kernel Density Estimation, Buffer Analysis, and Weighted Overlay techniques were applied, all of which were based on raster datasets. These methods enabled the spatial quantification and visualization of disaster risk patterns across the study area.

ICONARP – Volume 14, Issue 1 / Published: 30.06.2026

Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) is a multi-criteria decision-making method that enables the hierarchical structuring of factors and alternatives toward a defined objective and facilitates the systematic derivation of priorities at each level (Thammaboribal et al., 2025). The AHP procedure adopted in this study follows the standard methodological steps proposed in the literature (Saaty, 1990; Özbek, 2017; Thammaboribal et al., 2025):

Step 1: Problem definition. At this stage, criteria and sub-criteria are defined and their relevance is established.

Step 2: Hierarchy construction. The overall objective is placed at the top of the hierarchy, followed by criteria and sub-criteria at lower levels (Thammaboribal et al., 2025).

Step 3: Pairwise comparisons. Criteria at the same level are compared pairwise with respect to their influence on the upper-level factor using Saaty's (1990) 1–9 scale. Diagonal elements are assigned a value of 1, and reciprocal values (1/value) are assigned symmetrically across the matrix (Alkay et al., 2014).

Step 4: Normalization. Each element in the pairwise comparison matrix is divided by the column total to obtain a normalized matrix. Criterion weights are calculated by averaging the values across each row (Özbek, 2017; Alkay et al., 2014).

Step 5: Priority vector estimation. Row averages of the normalized matrix represent the relative importance of each criterion and are defined as the priority vector (Özbek, 2017).

Step 6: Consistency assessment. The consistency ratio (CR) is calculated to evaluate the logical consistency of the pairwise comparisons. A CR value below 0.10 indicates acceptable consistency; otherwise, the comparisons must be revised (Saaty, 1990).

Step 7: Pairwise comparison of alternatives. Alternatives are evaluated with respect to each criterion using pairwise comparison matrices, and consistency ratios are again assessed (Özbek, 2017).

Step 8: Aggregation of weights. Weighted scores are obtained by multiplying the global weight of each criterion by the preference values of the alternatives. The sum of these weighted scores determines the final ranking of alternatives (Özbek, 2017).

AHP Expert Survey Form

Within the scope of this study, a two-level AHP hierarchical model was developed, consisting of main criteria at the first level and sub-criteria at the second level. Expert judgments were obtained through an AHP questionnaire administered to professionals from diverse disciplines working in public institutions related to disaster management and urban transformation, all of whom had strong familiarity with the study area.

After data collection, the four main criteria and eighteen sub-criteria were classified and analyzed based on expert evaluations. Pairwise comparison matrices were constructed using expert-assigned values

DOI: 10.15320/ICONARP. 2026.355

ranging from 1 to 9. The relative influence of sub-criteria on their corresponding main criteria was first assessed, followed by comparisons among the main criteria to determine their importance within the overall decision-making framework.

Table 1. Types of interviewed stakeholders and their numbers.

		Institutional and Professional Distribution of Actors					
Actors	Institution	Urban Planner	Architect	Civil Eng.	Geological Eng.	Geomatic Eng.	Number
Administrative Actors	District Municipality	1	1	1	1	1	5
	Metropolitan Municipality	1	1	1	1	1	5
	Ministry of Environment, Urbanization and Climate Change	1	1	2	1	1	6
	University	2	2	1	1	1	7
Social Actors	Professional Chambers	1	1	1	1	1	5
Financial Actors	Private Sector	1	1	1	1	1	5

Each urban transformation initiative encompasses a unique set of actions characterized by context-specific processes. This process is inherently multi-dimensional and multi-actor in nature. The actors involved in urban transformation processes can be classified as follows (Hague, 2004):

- Administrative actors (central government, local authorities, universities and other academic institutions, public agencies and organizations),

- Social actors (local and national voluntary organizations, non-governmental organizations, professional chambers, and associations),

- Financial actors (real estate development companies, construction firms, private sector stakeholders, architectural and design offices),

- Beneficiaries, affected groups, and local communities within the transformation area.

Since the primary objective of this study is to evaluate expert judgments, local residents were excluded from the scope of the analysis. Accordingly, a total of 33 semi-structured interviews were conducted with disaster and urban transformation experts representing different actor groups during 2022 (Table 1).

FINDINGS: FIELD STUDY

General Characteristics of Akşehir

Akşehir district is a historical settlement located approximately 135 km northwest of Konya Province, with origins dating back to the Neolithic period. The city is situated on sloping terrain along the northeastern foothills of the Sultan Mountains (Figure 1).

Akşehir is located within a first-degree seismic zone (AFAD, 2018). Considering a 40 km radius centered on Akşehir, a total of 28 earthquakes

Figure 2. Residential complex plan

ICONARP – Volume 14, Issue 1 / Published: 30.06.2026

has occurred since 1900, of which seven exceeded magnitude 5.0 and two exceeded magnitude 6.0 (AFAD, 2021). Following the Mw 5.8 Bolvadin-centered earthquake that occurred northwest of Akşehir in 2000, revisions were introduced in the 2003 zoning plan, limiting building heights to a maximum of five storeys. This regulatory approach was maintained in the subsequent revision plans of 2010 and 2018. Furthermore, the 2017 microzonation report classified the city center as a precautionary area and mandated parcel-based geotechnical surveys (Akşehir Municipality, 2017).

Figure 1. Location of Akşehir (generated using Google Earth)

Within the scope of Law No. 6306, no area in the city center of Akşehir has yet been officially as a disaster-risk area; however, the application submitted by Akşehir Municipality to the Ministry of Environment, Urbanization and Climate Change is currently under evaluation. Following the official designation of the proposed risky area, the initiation of urban transformation interventions is planned.

Weighting of Criteria through Pairwise Comparisons Using AHP

Pairwise comparison matrixes reflecting the relative importance of the criteria were constructed, and AHP evaluations were conducted based on expert scores. The resulting tables present average values, normalized scores, and percentage weights of the criteria. Consistency analysis was performed for all pairwise comparison matrices, and the consistency ratios were found to be below the acceptable threshold of 0.10 (Table 2 = 0.07, Table 3 = 0.06, Table 4 = 0.07, Table 6 = 0.08, Table 7 = 0.04, Table 8 = 0.06, Table 12 = 0.04).

Table 2. Normalized weight percentages of the building construction year sub-criterion

Criterion	Pre-2000	2000-2010	Post-2010	Mean Value	Weight (%)
Pre-2000	0,75	0,80	0,62	0,72	72
2000-2010	0,15	0,16	0,31	0,21	21
Post-2010	0,10	0,04	0,07	0,07	7
Total	1,00	1,00	1,00	1,00	100

DOI: 10.15320/ICONARP. 2026.355

Table 3. Normalized weight percentages of the building layout sub-criterion

Criterion	Attached (Row) Development	Semi-Detached Development	Detached Development	Mean Value	Weight (%)
Attached (Row) Development	0,73	0,76	0,62	0,70	70%
Semi-Detached Development	0,18	0,19	0,31	0,23	23%
Detached Development	0,09	0,05	0,07	0,07	7%
Total	1,00	1,00	1,00	1,00	100%

Table 4. Normalized weight percentages of building risk main criterion

Criterion	BCYA	BHA	BLA	PBA	Mean Value	Weight (%)
BCYA	0,29	0,48	0,31	0,25	0,33	33%
BHA	0,07	0,12	0,23	0,16	0,15	15%
BLA	0,07	0,04	0,08	0,10	0,07	7%
PBA	0,57	0,36	0,38	0,49	0,45	45%
Total	1,00	1,00	1,00	1,00	1,00	100%

Table 5. Normalized weight percentages of the settlement suitability sub-criterion

Criterion	PA.2.1	PA.5.1	Mean Value	Weight (%)
PA.2.1	0,20	0,20	0,20	20%
PA.5.1	0,80	0,80	0,80	80%
Total	1,00	1,00	1,00	100%

Table 6. Normalized weight percentages of the geographical risk analysis main criterion

Criterion	SLRA	LRA	FRA	SA	Mean Value	Weight (%)
SLRA	0,62	0,73	0,48	0,43	0,56	56%
LRA	0,16	0,18	0,38	0,36	0,27	27%
FRA	0,12	0,05	0,09	0,14	0,10	10%
SA	0,10	0,04	0,05	0,07	0,07	7%
Total	1,00	1,00	1,00	1,00	1,00	100%

Table 7. Normalized weight percentages of the public facilities sub-criterion

Criterion	EFA	HFA	GSA	Mean Value	Weight (%)
EFA	0,40	0,50	0,33	0,41	41%
HFA	0,20	0,25	0,33	0,26	26%
GSA	0,40	0,25	0,33	0,33	33%
Total	1,00	1,00	1,00	1,00	100%

Table 8. Normalized weight percentages of the education areas sub-criterion

Criterion	PSAA	SSAA	HSAA	Mean Value	Weight (%)
PSAA	0,63	0,69	0,50	0,61	61%
SSAA	0,21	0,23	0,38	0,27	27%
HSAA	0,16	0,08	0,13	0,12	12%
Total	1,00	1,00	1,00	1,00	100%

Table 9. Normalized weight percentages of the facilities and assembly areas main criterion

Criterion	UFA	EAAA	Mean Value	Weight (%)
UFA	0.50	0.50	0.50	50%
EAAA	0.50	0.50	0.50	50%
Total	1.00	1.00	1.00	100%

Table 10. Normalized weight percentages of the density risk main criterion

Criterion	IBDA	PDA	Mean Value	Weight (%)
IBDA	0.83	0.83	0.83	83%
PDA	0.17	0.17	0.17	17%
Total	1.00	1.00	1.00	100%

Table 11. Normalized weight percentages of the main criteria

Main Criterion	BRA	GRA	FAAA	DRA	Mean Value	Weight (%)
BRA	0.65	0.74	0.50	0.59	0.62	62%
GRA	0.13	0.15	0.29	0.24	0.20	20%
FAAA	0.09	0.04	0.07	0.06	0.06	6%
DRA	0.13	0.07	0.14	0.12	0.12	12%
Total	1.00	1.00	1.00	1.00	1.00	100%

Following data analysis, the criteria and their corresponding weights used in the weighted overlay analyses were determined based on expert judgments. Building Risk Analysis was assigned a weight of 62%, Geographical Risk Analysis 20%, Facilities and Emergency Assembly Areas Analysis 6%, and Density Risk Analysis 12% (Table 12). The findings indicate that Building Risk Analysis has the highest weight in the identification of urban regeneration areas.

Table 12. Comparison of thermal loads in different thicknesses

Main Criteria	Weight (%)	Sub-Criteria	Weight (%)				
BRA	62	BCYA	33				
		BHA	15				
		BLA	7				
		PBA	45				
GRA	20	SSRA	56				
		LRA	27				
		FRA	10				
		SA	7				
FAAA	6	UFA	50	EFA	41	PSAA	61
						SSAA	27
						HSAA	12
				HFA	26		
				GSA	33		
		EAAA	50				
DRA	12	IBDA	83				
		PDA	17				

DOI: 10.15320/ICONARP. 2026.355

Generation of Risk Analyses

Building Risk Analysis

The inputs of the Building Risk Analysis consist of building construction year, number of storeys, building layout type, and problematic buildings analyses. The building risk map was generated through the weighted overlay of raster maps produced using the Statistical Clustering method in the ArcGIS environment for the preparation of the identified sub-criteria layers.

The data for the Building Construction Year map were derived from the base maps prepared in 2010 for the study area, supplemented by the examination of building permit files obtained from the Akşehir Municipality Directorate of Development and Urban Planning in order to identify buildings constructed after 2000. Structures built after 2010 were additionally identified through Google Earth, and thus the building construction year analysis layer was produced. In this analysis, buildings were classified into three categories: pre-2000, between 2000–2010, and post-2010. It was determined that approximately 80% of the building stock was constructed in or before 2000. This indicates the predominance of structures built prior to the implementation of contemporary regulations such as the earthquake code and compulsory earthquake insurance (DASK). According to expert judgments, the assigned weight scores were 72% for buildings constructed before 2000, 21% for those built between 2000–2010, and 7% for buildings constructed after 2010 (Table 2). The buildings constructed after 2010, represented in blue on the map, are predominantly located in the northwestern part of the city. In contrast, the city center and its immediate surroundings are largely dominated by pre-2000 buildings shown in red, while buildings constructed between 2000–2010, shown in green, are mainly distributed along the urban fringe (Figure 2a).

The data for the Building Height Analysis were also obtained through the examination of the base maps. In the weighting of this analysis layer, 1–2 storey buildings were assigned a weight of 25%, 3–4 storey buildings 50%, 5–6 storey buildings 75%, and 7–8 storey buildings 100%. The map indicates that 1–2 storey buildings, shown in yellow, are primarily located within the old urban settlement area and along the urban periphery. The 3–4 storey buildings, depicted in orange, are mostly situated along the immediate edge of the historic urban core and to the northwest of Akşehir Stream. The 5–6 storey buildings, represented in pink, are predominantly concentrated around the main urban corridors and newly developing areas (Figure 2b). The 7–8 storey buildings, shown in blue, constitute a relatively small proportion of the total building stock.

In the Building Layout Analysis, buildings were classified as detached, semi-detached, and contiguous. It was determined that within the urban core of Akşehir, 50% of the buildings are detached, 35% are contiguous, and 15% are semi-detached. In the weighting of the building layout type map, weight scores of 70% were assigned to contiguous buildings, 23% to semi-detached buildings, and 7% to detached buildings (Table 3).

ICONARP – Volume 14, Issue 1 / Published: 30.06.2026

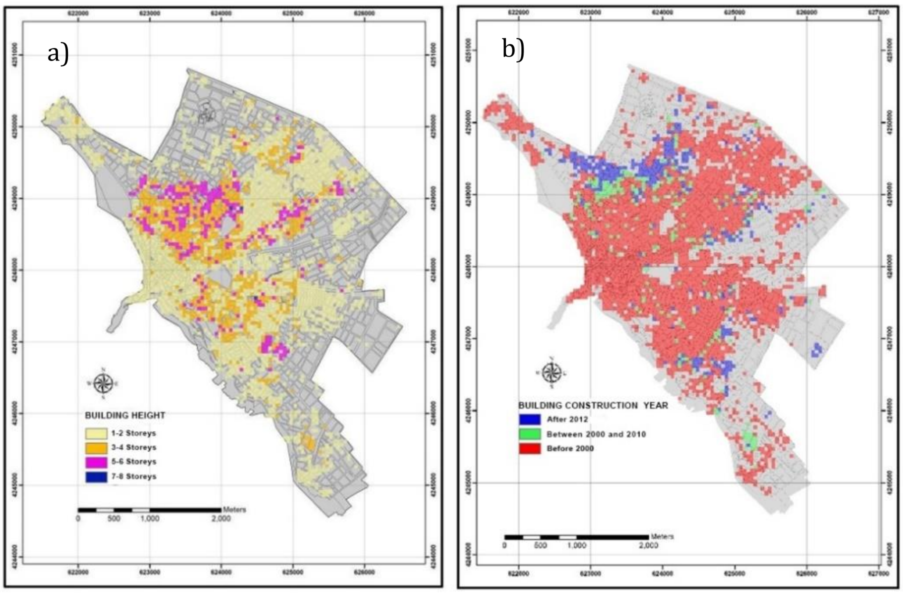

Figure 2. a) Building construction year analysis, b) Building height analysis

According to the map, contiguous buildings, represented in red, are predominantly located in the historic urban fabric, small industrial areas, and zones characterized by irregular or non-compliant development. Semi-detached buildings, shown in turquoise, are generally distributed along the periphery of contiguous building areas, whereas detached buildings, represented in yellow, are dispersed more widely across the study area (Figure 3a). Based on the structural performance requirements defined in the Turkish Earthquake Code (Official Gazette, 2007, No. 26454), data obtained from the Building Unit of the Directorate of Development and Urban Planning, together with on-site observational assessments, were used to generate the Problematic Buildings Analysis.

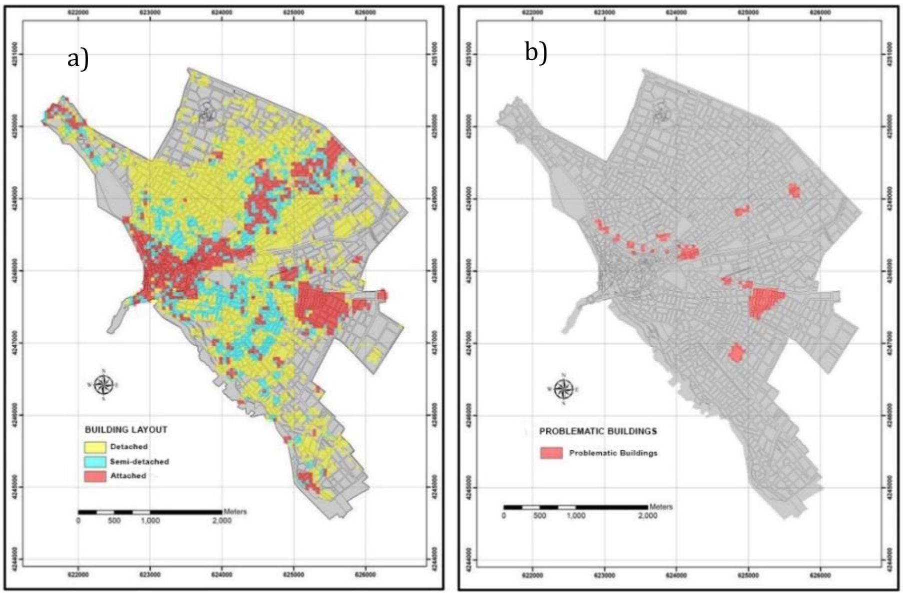

Figure 3. a) Building layout analysis, b) Problematic building analysis

In the weighting of the Problematic Buildings Map, problematic buildings were assigned a score of 100%. The problematic buildings,

DOI: 10.15320/ICONARP. 2026.355

shown in red on the map (Figure 3b), are mainly concentrated in the city center and in the small industrial area.

According to expert judgments, weight scores of 33% were assigned to Building Construction Year, 15% to Building Height, 7% to Building Layout Type, and 45% to Problematic Buildings (Table 4). The sub-criteria—Building Construction Year Analysis, Building Height Analysis, Building Layout Analysis, and Problematic Buildings Analysis—were overlaid using the weighted overlay method to generate the Building Risk Analysis map (Figure 4). In this map, building risk levels are visualized using a color gradient from green to red. Based on the expert-based weighting, the building risk values range between 0% and 85%. The highest-risk zones, represented in red, correspond to areas where problematic buildings are densely concentrated (Figure 4).

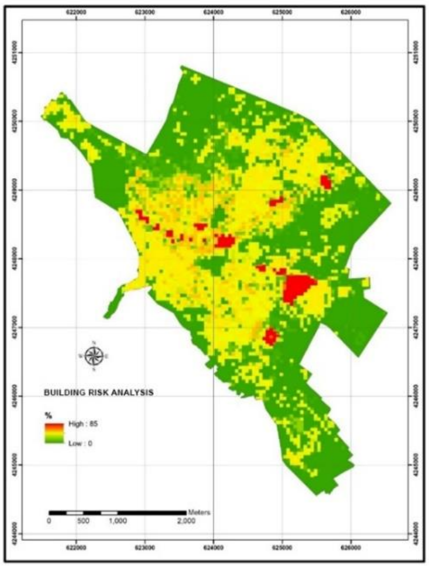

Figure 4. Building risk analysis

Geographical Risk Analysis

The Geographical Risk Analysis was produced through the weighted overlay of the following maps: Settlement Suitability Analysis, Landslide Risk Analysis, Flood Risk Analysis, and Slope Analysis. The data for the Settlement Suitability Analysis were derived from the Settlement Suitability Map of the Geological and Geotechnical Survey Report for Development in Akşehir (2017), which identifies geologically suitable areas for urban development.

Precautionary Area 2.1 (PA2.1) refers to areas requiring mitigation measures due to mass movement hazards and high slope-related stability problems. Precautionary Area 5.1 (PA5.1) denotes areas requiring engineering precautions due to geotechnical constraints. In the weighting of the settlement suitability analysis, expert evaluations assigned a weight of 20% to PA2.1 and 80% to PA5.1 (Table 6).

In the map, areas designated as PA5.1, shown in red, cover a large proportion of the urban settlement, whereas PA2.1 areas, shown in green, represent zones that require precautionary measures due to mass

ICONARP – Volume 14, Issue 1 / Published: 30.06.2026

movement hazards and steep slope conditions (Figure 5a). The landslide-prone areas indicated in red are located in the southwestern part of the historic city center, as well as along the foothills of the Sultan Mountains (Figure 5b). The Landslide Risk Analysis was generated based on data obtained from Disaster and Emergency Management Authority (AFAD) and the archives of the Directorate of Development and Urban Planning of Akşehir Municipality. Landslide areas were assigned a weight score of 100%.

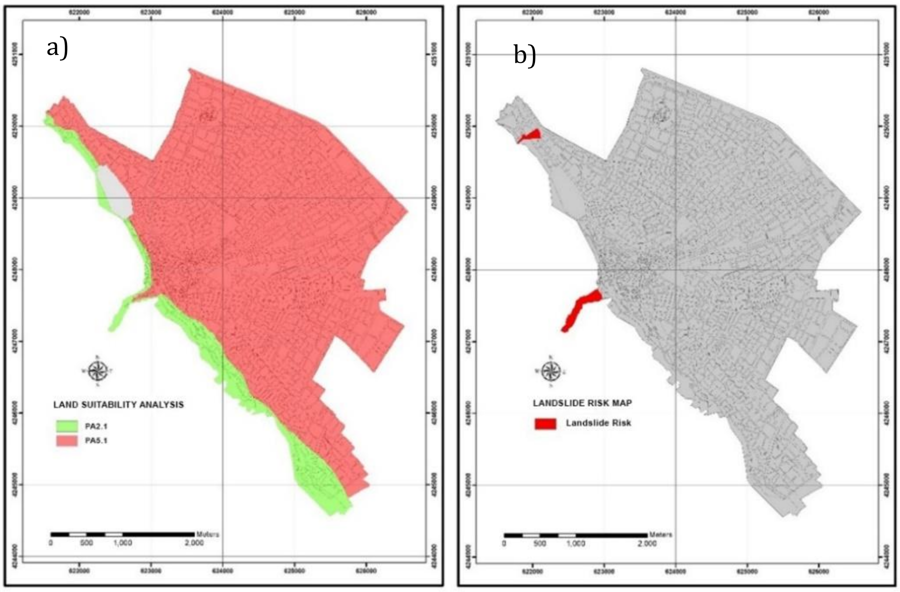

Figure 5. a) Settlement suitability analysis, **b)** Landslide risk analysis

The Flood Risk Analysis was produced by assigning a score of 100% to flood-prone areas, based on expert evaluations. In the map, the blue zones correspond to the floodplains of Kuru Creek, Kızılpınar Creek, and Kurtini Creek, as delineated by the State Hydraulic Works (DSİ) (Figure 6a). The Slope Analysis was generated using slope data obtained from "earthexplorer.usgs.gov". Scores ranging from 0 to 100 were assigned from low to high slope values. The slope increases toward the Sultan Mountains extending along the southeastern and northwestern parts of the city, with the color gradient shifting from green to red accordingly (Figure 6b).

In the construction of the Geographical Risk Analysis, expert judgments assigned weight scores of 56% to Settlement Suitability Risk, 27% to Landslide Risk, 10% to Flood Risk, and 7% to Slope Analysis (Table 6). In the resulting map, geographical risk levels are visualized using a color gradient from green to red. The geographical risk values range between 1% and 83%. The highest-risk areas are ranked respectively as landslide zones, flood-prone areas, PA5.1 areas, and PA2.1 areas (Figure 7).

DOI: 10.15320/ICONARP. 2026.355

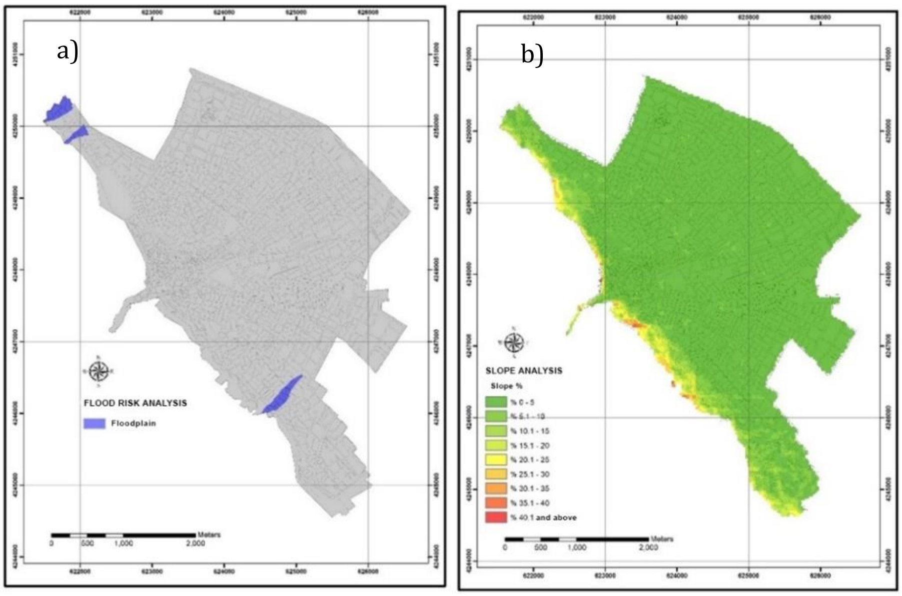

Figure 6. a) Flood risk analysis, **b)** Slope analysis

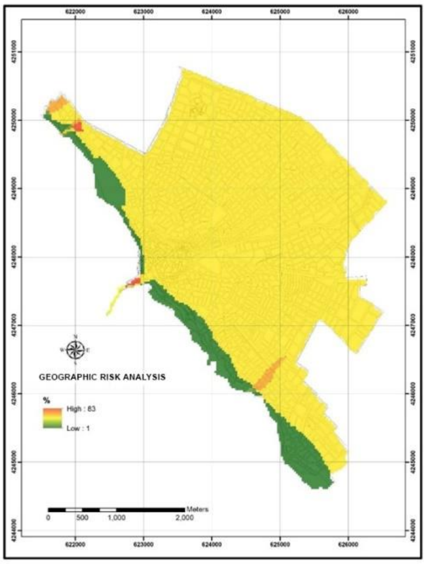

Figure 7. Geographical risk analysis

Distance to Facilities and Assembly Areas Analysis

The Distance to Facilities and Assembly Areas Analysis consists of two sub-criteria: Facilities Risk Analysis and Educational Facilities Areas Analysis. In accordance with the provisions of the Spatial Plans Construction Regulation (Official Gazette, 2014, No. 29030), service catchment areas were calculated using buffer distances of 500 meters for primary schools, 1,000 meters for secondary schools, 2,500 meters for high schools, and 500 meters for healthcare facilities. Areas within the service catchment zones were assigned a score of 100, while areas outside these zones were assigned a score of 0.

The Facilities Risk Analysis was subdivided into three main sub-criteria: education, healthcare, and green space. Within the education criterion, educational facilities were further classified into primary schools, secondary schools, and high schools. Areas not served by primary school catchment zones correspond mainly to undeveloped areas (Figure 8a).

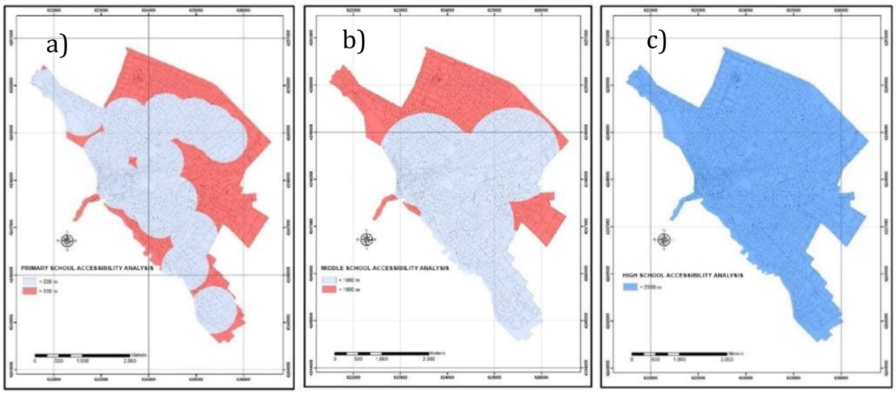

Figure 8. a) Primary school accessibility analysis, **b)** Middle school accessibility analysis, **c)** High school accessibility analysis

For secondary schools, areas within the service catchment are indicated in light blue, while areas outside are shown in red. The zones not served by secondary schools consist largely of already developed and newly developing areas (Figure 8b). The service catchment areas of high schools are shown in blue, and there are no areas outside the service range, indicating full coverage across the study area (Figure 8c).

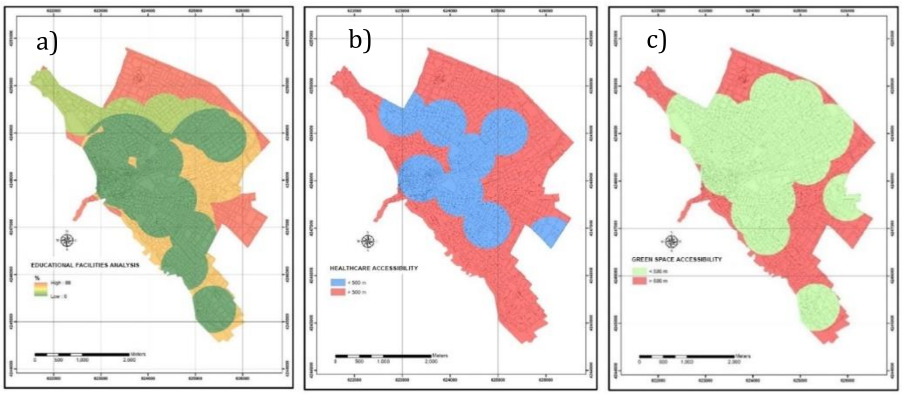

Figure 9. a) Educational facilities **b)** Healthcare accessibility **c)** Green space accessibility

Primary schools were assigned a weight of 61%, secondary schools 27%, and high schools 12%. Based on the weighted overlay of these criteria (Table 8), the Educational Facilities Analysis was generated (Figure 9a). The map was symbolized from green to red according to the level of access risk. Red and orange zones indicate areas with limited accessibility to educational facilities (Figure 9a). According to expert-based weighting, the results of the educational facilities weighted overlay analysis range between 0% and 88% (Table 8).

In the Health Facilities Analysis, areas within the service catchment were assigned a score of 100, while areas outside were assigned a score of 0. The service areas of health facilities are indicated in blue, whereas areas outside the service range are shown in red. Areas not served by health facilities are mainly located around the periphery of the city center (Figure 9b).

DOI: 10.15320/ICONARP. 2026.355

In the Green Areas Analysis, a walking distance threshold of 500 meters was adopted. Areas within the service catchment were assigned a score of 100, while those outsides were assigned a score of 0. Service areas are shown in green, and non-served areas in red. Areas lacking access to green spaces are generally characterized by low levels of development and industrial land uses (Figure 9c).

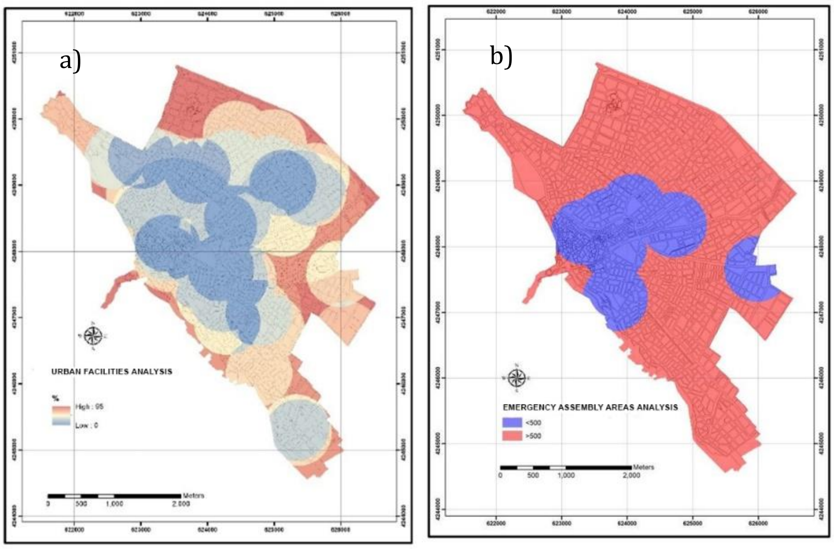

Figure 10. a) Weighted overlay analysis of urban facilities, **b)** Emergency assembly areas

Based on expert judgments, educational facilities were weighted at 41%, health facilities at 26%, and green areas at 12%. Through the weighted overlay of these sub-criteria, the Facilities Areas Analysis map was generated (Table 9). The Distance to Facilities and Emergency Assembly Areas Analysis was visualized from blue to red according to weighted risk levels. The results range between 0% and 95% across the study area (Figure 10a).

In the Emergency Assembly Areas Analysis, areas located outside a 500-meter radius of officially designated assembly points proposed by Akşehir Municipality and approved by AFAD were assigned a score of 100. Red zones represent areas with poor accessibility to assembly areas (Figure 10b). Based on expert evaluations, equal weights of 50% were assigned to the Facilities Areas Analysis and the Emergency Assembly Areas Analysis. The weighted overlay of these two layers produced the Distance to Facilities and Emergency Assembly Areas Analysis (Table 10). In the resulting map, red indicates the most unfavorable conditions (Figure 11).

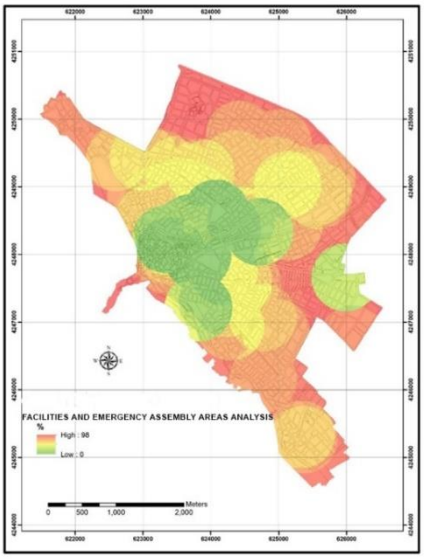

Figure 11. Distance analysis to urban facilities and emergency assembly areas analysis

According to expert-based weighting, the urban facilities and assembly areas analysis values range between 0% and 98% across the study area.

Density Risk Analysis

The Density Risk Analysis was generated through the weighted overlay of two sub-criteria: population density and density of illegal constructions. In the Illegal Construction Density Analysis, areas with 65% or more illegal buildings were assigned a score of 100, while all other areas were assigned a score of 0. Areas exceeding the 65% threshold are indicated in red (Figure 12a). These areas are mainly located in the northeastern part of the city, between İstasyon Street and Cumhuriyet Street, as well as in the Beşkavak district in the northwestern part of Akşehir.

The Population Density Analysis was derived from building-based population data obtained from the Konya Metropolitan Municipality Urban Information System. Using the Kernel Density method in ArcGIS, settlement areas were classified from low to high density and assigned scores ranging from 0 to 100. The results show that population density increases from blue to red, with the highest concentrations observed in the city center and northern parts of the urban area (Figure 12b). Population density decreases progressively towards the urban periphery.

DOI: 10.15320/ICONARP. 2026.355

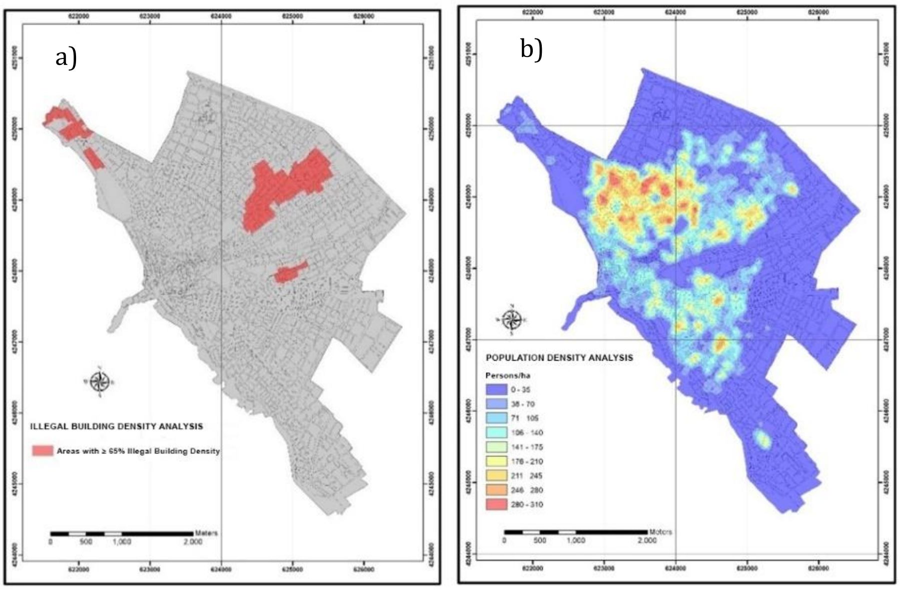

Figure 12. a) Analysis of illegal building density analysis, **b)** Population density analysis

In line with expert judgments, a weight of 83% was assigned to the Illegal Building Density Analysis and 17% to the Population Density Analysis (Table 10). Based on the weighted overlay of these two layers, the Density Risk Analysis map was generated. The map was symbolized from green to red according to the weighted risk levels. The results of the weighted overlay range between 0% and 93% in terms of density-related risk (Figure 13). Areas with the highest density risk are concentrated in the northeastern part of the city, between İstasyon Street and Cumhuriyet Street, as well as in the Beşkavak district located in the northwestern part of Akşehir.

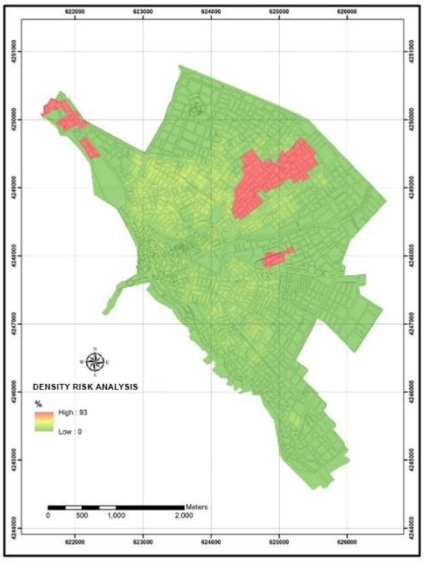

Figure 13. Density risk analysis

DISCUSSION: IDENTIFICATION AND PRIORITIZATION OF URBAN TRANSFORMATION AREAS

According to expert evaluations, the main criteria were weighted as follows: Building Risk Analysis (62%), Geographical Risk Analysis (20%), Distance to Facilities and Emergency Assembly Areas Analysis (6%), and Density Risk Analysis (12%) (Table 11). Using these weights, a composite weighted overlay map was generated in ArcGIS (Figure 14a).

The resulting map displays weighted values representing disaster risk and urban transformation need, ranging from 3% to 70% and symbolized from green to red. The highest-risk zones correspond to areas with dense concentrations of problematic buildings. Expert assessments and overlay results indicate that areas exceeding a 40% weighted value can be designated as urban transformation zones. For prioritization, phased implementation may be structured in 10% intervals above this threshold.

Accordingly, areas with values between 60.1% and 70% were classified as First-Priority Areas (23.1 ha), those between 50.1% and 60% as Second-Priority Areas (8.8 ha), and those between 40.1% and 50% as Third-Priority Areas (62.2 ha) (Figure 14b).

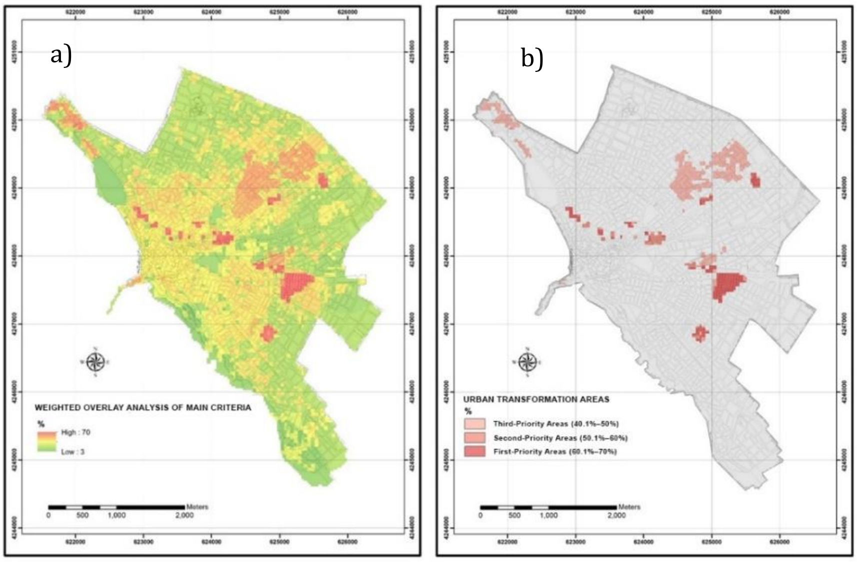

Figure 14. a) Weighted overlay analysis of main criterion maps, **b)** Urban transformation areas and prioritization map

The first-priority urban transformation areas are distributed across five key locations. The first is situated in Seyran Neighborhood, southeast of Mustafa Kemal Paşa Street, where the Bağkur Housing Estate is located. This area consists of 12 five-storey blocks comprising 120 housing units constructed prior to 2000. It is characterized by high population density and a large number of problematic buildings. Field observations indicate advanced physical deterioration, including visible structural damage to columns, indicating a high level of seismic risk. The second area is also located in Seyran Neighborhood, within the small industrial zone. It contains contiguous buildings constructed before 2000, most of which are physically obsolete and have exceeded their economic lifespan. The third area is located in İstasyon Neighborhood, where the Çavdarkent housing estate is situated. It is dominated by five-storey pre-2000 buildings, includes structurally problematic units, and has high population density with evident physical degradation. The fourth area, also in İstasyon Neighborhood, where the Bağkent housing estate is

DOI: 10.15320/ICONARP. 2026.355

located. Similar to the third area, it consists of pre-2000 five-storey buildings, includes problematic structures, and exhibits high density and visible deterioration. The fifth area comprises fragmented zones along 24 August Street in the northwestern part of the city center, dominated by old, five-storey, and structurally deficient buildings. These findings indicate that disaster-oriented urban transformation in Akşehir should primarily focus on areas located close to the city center. These findings suggest that, in Akşehir, disaster-oriented urban transformation should primarily focus on areas located in close proximity to the city center.

Second-priority areas are located around the Central Business District and extend intermittently along 24 August Street. These zones are characterized by contiguous four- to five-storey buildings constructed before 2000. Field observations indicate that buildings receiving engineering services prior to 2010 exhibit notable physical deterioration.

Third-priority areas are distributed across four locations. The first is in Çimenli Neighborhood, within the Tekke Boğazı area, which is affected by landslide risk, steep slopes, and rockfall hazards. Ongoing interventions involve the expropriation of old buildings and their conversion into green and recreational spaces. The second area is located in the Beşkavak locality of Yarenler Neighborhood, in the northwestern part of the city. It is exposed to both landslide and flood risks, with illegal construction exceeding 65%. The steep topography contains residential buildings and a primary school. The third area is situated in Yeni Neighborhood, south of the D-300 highway, and is characterized by over 65% illegal construction, contiguous pre-2000 buildings, and limited access to social and technical infrastructure, facilities, and assembly areas. The fourth area is located in Seyran Neighborhood, and similarly exhibits more than 65% illegal construction, contiguous pre-2000 buildings, and inadequate social and technical infrastructure.

CONCLUSION

This study presents an applied example of disaster-oriented urban transformation in Akşehir city center (Konya Province) through the integrated use of GIS and AHP for the identification and prioritization of urban transformation areas. In particular, the initiation of transformation strategies in the first-priority areas is considered urgent. The findings and evaluations presented in this study are expected to provide guidance for the preparation of an Urban Transformation Strategy Document for Akşehir.

The methodological framework employed in this study enables rapid and reliable decision-making and effective problem-solving. A key contribution of the study is the adoption of a participatory approach, in which criteria formulation and weighting were based on expert opinions from multiple disciplines. This approach facilitated the integration of diverse professional perspectives and resulted in more comprehensive and balanced outcomes.

Given Türkiye's high vulnerability to natural hazards, studies focusing on risk identification and delineation of risk-prone areas are of critical importance for ensuring the protection of life and property. Unlike past practices, disaster management should not be limited to emergency response but should also encompass pre-disaster risk management. Risk reduction plays a central role in the disaster management process. This requires, first, the identification of potential risks, followed by the mitigation or minimization of these risks through sound urban planning and development practices.

In this context, risks and priorities should be clearly defined, and multidimensional projects tailored to local physical, economic, and social conditions should be developed. Achieving healthy and sustainable urbanization is possible through the implementation of preventive measures and the formulation of strategic interventions that transform risks into opportunities. Within this framework, urban transformation practices represent one of the most significant opportunity areas for building resilient and sustainable cities.

NOTES

This article is derived from the master's thesis titled "Determination and Prioritization of Urban Transformation Areas within the Scope of Disaster-Oriented Urban Transformation: The Case of Akşehir" completed by Murat Ferit Altun in 2022 at Konya Technical University, Graduate Education Institue, Department of Urban and Regional Planning.

REFERENCES

ADB. (2016). *Reducing disaster risk by managing urban land use: Guidance notes for planners.* Asian Development Bank. https://www.adb.org/sites/default/files/publication/185415/disaster-risk-urban-land.pdf

Adıkutlu, S. (2019). *Resilience to disasters: Lessons from Turkish urban regeneration experiences* (Master's thesis). Middle East Technical University, Ankara.

AFAD. (Disaster and Emergency Management Authority). (2018). *Turkey Earthquake Hazard Map*. https://www.afad.gov.tr/turkiye-deprem-tehlike-haritasi

Akşehir Municipality, Directorate of Planning and Urban Development. (2022). *Archive records.*

Akşehir Municipality. (2017). *Microzonation Geological–Geotechnical Survey Report as a Basis for Land-Use Planning*.

Alkay, E., Akgün, A. A., Kerimoğlu, E., Koramaz, T. K., Kundak, S., Okumuş, G., & Özcevik, O. (2014). *Şehir planlamada analiz ve değerleme teknikleri.* Literatür Yayıncılık.

Chamber of Geological Engineers. (2021). *Settlement Suitability Assessment.* https://www.jmo.org.tr/resimler/ekler/d223e2d11d76ac6_ek.pdf

Çelik, K. (2017). Kentsel dönüşüm alanlarının seçimi ve dönüştürülmesine yönelik örnek bir uygulama araştırması: Gümüşhane. *GÜFBED,* 7(2), 221–235. https://dergipark.org.tr/tr/pub/gumusfenbil/article/309586

DOI: 10.15320/ICONARP. 2026.355

Dişkaya, F., & Emir, S. (2021). AHP-TOPSIS bütünleşik yaklaşımıyla deprem riski tabanlı İstanbul ili kentsel dönüşüm öncelik sıralaması. *Afet ve Risk Dergisi,* 4(2), 203–223. https://doi.org/10.35341/afet.983105

Ertürk, C., & Topal, C. (2020). Post-earthquake housing policy in Van: An evaluation from a social policy perspective. *İdealkent,* 11(30), 849–877. https://dergipark.org.tr/tr/pub/idealkent/article/632057

Güler, H., Şenkal Sezer, F., & Ülkü, S. (2010). Binalarda yapı fiziği problemleri: Bursa'da bir kamu kurumu örneği. *Uludağ Üniversitesi Mühendislik-Mimarlık Fakültesi Dergisi,* 15(2), 53–64.

Güzey, Ö. (2016). The last round in restructuring the city: Urban regeneration becomes a state policy of disaster prevention in Turkey. *Cities,* 50, 40–53. 10.1016/j.cities.2015.08.010

Haghighi Fard, S. M., & Doratlı, N. (2022). Evaluation of resilience in historic urban areas by combining multi-criteria decision-making system and GIS with sustainability and regeneration approach: The case study of Tehran (Iran). *Sustainability,* 14(5), 2495. https://doi.org/10.3390/su14052495

Hague, C. (2004). Konut alanlarının dönüşümü ve yenileme projelerinde başarı. *In Proceedings of the International Symposium on Urban Regeneration Practices* (178–186).

Johnson, C., & Blackburn, S. (2014). Advocacy for urban resilience: UNISDR's making cities resilient campaign. *Environment and Urbanization,* 26(1), 29–52. https://doi.org/10.1177/0956247813518684

Kul, S. (2018). Afet riski altındaki alanlarda kentsel dönüşüm süreci: Turhal örneği (Master's thesis). Ankara University, Ankara.

Ministry of Environment, Urbanization and Climate Change. (2017). *Urban transformation strategy document.* https://altyapi.csb.gov.tr/kentsel-donusum-strateji-belgesi-i-95271

Ministry of Environment, Urbanization and Climate Change. (2023). *Press release.* https://www.csb.gov.tr/bakan-kurum-84-bin-726-bina-yikik-acil-yikilacak-ve-agir-hasarli-olarak-tespit-edilmistir-bakanlik-faaliyetleri-38433

Ministry of Interior. (2023). *Türkiye'nin birlik ve dayanışma gücü depremle sınandı.* https://www.icisleri.gov.tr/turkiyenin-birlik-ve-dayanisma-gucu-depremle-sinandi-asrin-felaketi-asrin-dayanismasina-donustu8

Ocal, C., & İnce, H. H. (2012). Türkiye'de mevcut yapı stoğu ve kentsel dönüşüm. *SDU International Technologic Science,* 4(2), 89-95. https://dergipark.org.tr/tr/pub/utbd/article/273711

Official Gazette. (2007). *Regulation on buildings to be constructed in earthquake zones* (No: 26454).

Official Gazette. (2012). *Law No. 6306 on the transformation of areas under disaster risk* (No. 28498).

Official Gazette. (2014). *Spatial plans construction regulation* (No. 29030).

Özbek, A. (2017). *Çok kriterli karar verme yöntemleri ve Excel ile problem çözümü.* Seçkin Yayıncılık.

Özcevik, O., Türk, S., Taş, E., Yaman, H., & Beygo, C. (2009). Flagship regeneration project as a tool for post-disaster recovery planning: The Zeytinburnu case. *Disasters,* 33(2), 180-202. https://doi.org/10.1111/j.1467-7717.2008.01069.x

Özyetgin Altun, A., & Öğdül, H. (2021). Afet riski yönetimi kapsamında kent planlama: İstanbul planları ve uygulamalar. *METU Journal of the Faculty of Architecture,* 38(2), 145-172. http://dx.doi.org/10.4305/metu.jfa.2021.2.7

ICONARP – Volume 14, Issue 1 / Published: 30.06.2026

Pala, M., & Şaşmaz, Z. (2019). Kat seviyeleri farklı bitişik nizam yapılarda kat kütlesinin çarpışma kuvvetine etkisi. *ADYU Mühendislik Bilimleri Dergisi,* 10, 47–63. https://dergipark.org.tr/tr/pub/adyumbd/article/562833

Saaty, T. L. (1990). How to make a decision: The analytic hierarchy process. *European Journal of Operational Research,* 48, 9–26. https://doi.org/10.1016/0377-2217(90)90057-I

Serdaroğlu Sağ, N. (2023). Legal regulations for urban transformation in Turkey and associated problems. In H. İmamoğlu (Ed.), *International research in social, human and administrative sciences XIV.* Eğitim Yayınevi. 43

Şenol-Balaban, M. (2016). An assessment of flood risk factors in riverine cities of Turkey: Lessons for resilience and urban planning. *METU Journal of the Faculty of Architecture,* 33(2), 45–71. https://doi.org/10.4305/METU.JFA.2016.2.3

UNISDR. (2012). *Annual report 2012.* https://www.undrr.org/publication/unisdr-annual-report-2012

Zhou, T., & Zhou, Y. (2015). Fuzzy comprehensive evaluation of urban regeneration decision-making based on entropy weight method: Case study of Yuzhong Peninsula, China. *Journal of Intelligent & Fuzzy Systems,* 29(6), 2661–2668. DOI:10.3233/IFS-151969

Resume

Murat Ferit Altun was born in Akşehir, Konya, and is originally from Kağızman, Kars. He received his bachelor's degree from the Department of City and Regional Planning at the Faculty of Engineering and Architecture, Selçuk University, in 2009. He completed his master's degree in the Department of City and Regional Planning at the Graduate School of Konya Technical University in 2022. His academic and professional interests include urban planning, urban regeneration, mapping and cadastre, real estate development and management, local governments, and urban policies. He is currently employed as a Senior Urban Planner at Akşehir Municipality.

Neslihan Serdaroğlu Sağ was born in Sivas. She completed her BSc (2002), MSc (2005), and PhD (2011) degrees in the Department of Urban and Regional Planning at Selçuk University. Her academic work focuses on urban regeneration, urban conservation, urban sprawl, smart growth, urban design, coastal planning, and sustainable urban development. She has participated in TÜBİTAK and R&D projects and currently continues to supervise and coordinate undergraduate and graduate-level teaching activities. She is currently employed as an Associate Professor at the Department of Urban and Regional Planning, Faculty of Architecture and Design, Konya Technical University.

DOI: 10.15320/ICONARP. 2026.355