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Editorial

Mehmet Topçu (Editor in-Chief)

JOURNAL of DESIGN for RESILIENCE in ARCHITECTURE and PLANNING (DRArch) share new issue with the hope that 2022 will bring happiness to the world, science, life, art and all humanity. DRArch has published Volume 2 Issue 3 , which includes not only up-to-date research problems but also preservation and accessibility strategies for resilience with qualified articles as usual. We would like to repeat despite the fact that you have already known, DRArch is an open-access journal. In other words, all content is freely available without charge to users or institutions. Users can read, download, copy, distribute, print, search, or link to the full texts of the articles, or use them for any other lawful purpose, without asking prior permission from the publisher or the author. This is in accordance with the BOAI definition of open access. All publications in this journal are licensed by the Creative Commons Attribution 4.0 International License. Despite a very short period, DRArch journal has been indexed in different abstracting, databases & indexing. If you are interested you can check from our official website.

Volume 2 Issue 3 begins with the study by Fikret Zorlu which entitled “How local street networks contribute to the traffic accident occurrence: Mersin city case”. In this study, the issue of the accident frequency/occurrence in local residential streets where vehicle counts are not obtained is discussed and this study investigates the role of morphological characteristics of the street network where main arterials are excluded in the safety of residential neighborhoods of Mersin, Turkey. Another interesting paper deals with accessibility titled as “Accessibility in disaster-resilient cities” by comes from Hatice Ayataç. This study focuses on accessibility in disaster-resilient cities, and it aims to evaluate the components of urban resilience, which helps to eliminate the damages of disasters and to recover, with a particular focus on the accessibility of individuals with disabilities. The study highlights that accessibility in disaster and emergency management extends beyond spatial organization, and it is a prerequisite for social harmony and disaster resilience.

In this issue, DRArch has included articles dealing with historical settlements with the concept of resilience with possibilities and threats. The fascinating piece of work comes from F. Duygu Saban, Mustafa Mokhtar and Tuba Akar with the article titled “Kirkuk Citadel and the Old Town of Van”. Armed conflict is considered a major risk for cultural heritage since the Second World War and guidelines are prepared by international organizations such as UNESCO and ICCROM on risk management and protection of cultural heritage in conflict-affected areas. Within this context, this study aims to raise the question on how to manage change in the intentionally destroyed historic settlements and in order to achieve this aim, an examination on two case studies, Kirkuk Citadel and the Old Town of Van, which were both intentionally destroyed as a result of armed conflict is made using comparative analysis method. The conceptual discussion on the historical environment and resilience in the previous article takes place in new dimensions in the next article. The article “In search of preservation strategies for the historic cultural landscape of Karabağlar Yaylası in Muğla” by Feray Koca identifies the historic cultural landscape of Karabağlar Yaylası in a rural-urban continuum in search of preservation strategies regarding changing relations with modernization and urbanization. The article proposes some preservation strategies that care cultural values as far as natural values, perception of residents, collective memory, sense of community and their interaction with the land and this study has a potential to set up a research agenda in terms of preservation strategies for similar geographical settings.

Studies about Istanbul and Ankara, the two important metropolises of Turkey, are included. The article titled as “Spatial distribution of construction firms in Istanbul” written by Turgay Kerem Koramaz and Vedia Dökmeci investigates the spatial distribution of construction firms within the concept of multi-centre development in Istanbul. Sinan Akyüz has made the research titled “Redevelopment of squatting housing in Turkey in the case of Altındağ, Ankara”. The focus of this paper is the redevelopment of the squatter settlements in Ankara Turkey. The last article is “Naval museum spaces a study on accessibility and visibility based on the relationship between the sea and land” written by Nurcan Gül and Sevilay Erk.The study investigates two naval museums as Genova Galata Museo Del Mare in Italy and the Istanbul Deniz Müzesi in Turkey with a similar location and function are examined.

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As the editor-in-chief of DRArch, I would like to extend my deepest gratitude to all participants and all our readers for the support they provide to the Journal. And I would like to a special thanks to the referees. We look forward to your comments, contributions, suggestions, and criticisms. Despite the vital crises in the world in recent years, I hope your resilience to produce and enjoy life will increase in the new year.

Happy new year and best regards...

Following names that provided valuable contribution as referees of articles in this issue are:

Melda Açmaz Özden (Assist. Prof. Dr.), Çanakkale Onsekiz Mart University, Turkey

Semiha Akçaözoğlu (Prof. Dr.), Niğde Ömer Halisdemir University, Turkey

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DRArch's objectives are:

- to question how future building technologies are revolutionizing architectural design, city planning, urban design, landscape design, industrial design, interior design and education,

- to catalyze the processes that lean on interdisciplinary and collaborative design thinking, creating a resilient thinking culture,

- to improve the quality of built environment through encouraging greater sharing of academicians, analysts and specialists to share their experience and answer for issues in various areas, which distributes top-level work,

- to discover role of the designers and design disciplines -architecture, city planning, urban design, landscape design, industrial design, interior design, education and art in creating building and urban resilience,

- to retrofit the existing urban fabric to produce resilience appears and to support making and using technology within the building arts,

- to discuss academic issue about the digital life and its built-up environments, internet of space, digital in architecture, digital data in design, digital fabrication, software development in architecture, photogrammetry software, information technology in architecture, Archi-Walks, virtual design, cyber space, experiences through simulations, 3D technology in design, robotic construction, digital fabrication, parametric design and architecture, Building Information Management (BIM), extraterrestrial architecture, , artificial intelligence (AI) systems, Energy efficiency in buildings, digitization of human, the digitization of the construction, manufacturing, collaborative design, design integration, the accessibility of mobile devices and sensors, augmented reality apps, and GPS, emerging materials, new constructions techniques,

-to express new technology in architecture and planning for parametric urban design, real estate development and design, parametric smart planning (PSP), more human-centered products, sustainable development, sustainable cities, smart cities, vertical cities, urban morphology, urban aesthetics and townscape, urban structure and form, urban transformation, local and regional identity, design control and guidance, property development, practice and implementation.

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Editorial Team

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Research Article
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How local street networks contribute to the traffic accident occurrence: Mersin city case

Fikret Zorlu*

Abstract

In this study, the issue of the accident frequency/occurrence in local residential streets where vehicle counts are not obtained is discussed. The accident reports received from the Ministry of Interior include fatal and injury accidents. But since the number of deadly accidents is minor, a binomial regression was not employed in the statistical analysis. This study investigates the role of morphological characteristics of the street network where main arterials are excluded in the safety of residential neighborhoods of Mersin, Turkey. Results showed that commercial and industrial uses generate more traffic than residential neighborhoods, therefore, responsible for higher rates of accidents. The number of vehicles, employment, and population increase the accident rate. Empirical model results showed that population density, street length per capita (meters), and number of intersections significantly affect accident occurrence. Number of intersections increases accident frequencies while street length per capita reduces. In contrast, the number of links, street density, link to node ratio, and average link length have no significant effect on accident occurrence. Traffic safety cannot be achieved if the street length is not proportional to the number of vehicles. In addition, street design is also a matter of efficient use of urban space.

Keywords: street pattern, traffic accidents, traffic safety, street network design, Mersin

1. Introduction

There is extensive literature on street network design in the urban design literature. These studies deal with a broad spectrum of network properties, street properties, network performance, the network's relationship with land use, walkability, space quality, and traffic safety. However, there are limited studies on the safety and efficiency of the street network. Empirical studies are needed to measure the network efficiency, measured by indicators such as the share of the street network in the total urban area, street length per unit population, street length coverage per unit population, and the capacity utilization rate. On the other hand, traffic volume and density data are primarily available for main urban roads and the streets in the city center. Still, it is difficult to assess street networks' traffic safety and efficiency in residential areas due to limited traffic data. Hypothetical network efficiency is evaluated using simulation models in the literature, while space syntax methods measure street network geometric features. Therefore, the number of studies investigating existing networks' traffic safety and efficiency performances is limited.

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Traffic safety studies are mostly deal with main road networks and intersections. This fact is that vehicle counts are available for main roads, and data cannot be obtained for local streets in residential areas. A few studies have examined the relationship between accident occurrence risks in street networks in residential areas and road network characteristics. Studies dealing with the spatial distribution of accidents throughout the city search for the effects of variables like population, land use, and vehicle ownership. However, in zone-based analyses, main arterials and local streets cannot be distinguished. Since vehicle counts are conducted on the section of main arterials, the effect of the street network characteristics on accident occurrence cannot be specified in zone-based studies.

In this study, the central theme is the accident in local residential streets where vehicle counts have not been obtained. The accident data are obtained from the Ministry of Interior include fatal and injury accidents. Since the number of deadly accidents is meager, a binomial regression aiming at measuring the severity of crashes was not employed in the statistical analysis. This study investigates the role of morphological characteristics of the local street network in the safety of residential neighborhoods of Mersin city, Turkey. In addition, the efficiency of street planning, which refers to the street surface and street length per unit population, is discussed.

Mersin city is located on the southern coast of Turkey and hosts one of the country's major ports. The urban population of the core city was 873,027, while the metropolitan population was nearly one million in 2016. The research covers 85 neighborhoods in the core city, which accommodates central business district, industrial zones, free zone, port, commercial facilities, and most residential uses of the metropolitan area. In the last six decades, the city experienced a gradual economic development and a rapid increase in the population. Furthermore, increasing car ownership rates, irregular spatial development, insufficient mass transit infrastructure led to increasing traffic volumes and accidents at both significant arterials of the city and local streets of the neighborhoods. Today, traffic safety is one of the primary indicators of the wellbeing of society, and accident rates have shown that more efforts are necessary to reduce accident rates. There are limited studies on traffic safety problems in the city. The majority of those studies dealt with accidents at major arterial and intersections of the city. A limited number of studies dealt with traffic accidents in Mersin city. Özen (2020) investigated the relationship between traffic volume, intersection geometry, traffic control characteristics, and vehicular fatal/injury traffic crashes at 39 four-legged signalized intersections in the city and found that a total number of approaches increases accident frequencies while the higher ratio of traffic volumes at primary/secondary legs reduces intersection crashes. The rest of the studies investigated the roles and effects of socio-economic factors, motorization, driver and pedestrian profile. There is a gap in the research field of traffic safety for local streets. This study focuses on local street networks and their influence on traffic safety.

2. Literature

The adequacy and efficiency of the street network in urban space are related to the geometric properties of the network. Kansky (1963) defined some indices to compare the geometric properties of transportation networks with quantitative indicators. The gamma index is a ratio of edges and vertices of a given network, which refers to an observed number of nodes (fringes) to the possible maximum number of nodes. The gamma index (γ) is a ratio between 0 and 1, where an index close to 0 indicates weak connectivity and 1 indicates strong conrobustity. Alpha index (α) is the ratio of the number of actual circuits in the street network to the maximum possible ones (Kansky, 1963). If the alpha index is close to 0 the network is regarded as “weak,” and an index value close to 1 indicates “strong connectivity”. Beta index (β) is the node (edges) to link (vertices) is also called “node to link ratio (NLR)”. In this regard, link to node ratio (LNR) ($1/\beta$) can be regarded as a connectivity indicator. Connected node ratio (CNR) refers to the percentage of intersections (nodes connect more than one link) to a total number of nodes, including dead ends. This ratio also

indicates the degree of network connectivity, the higher the percentage, the higher the connectivity.

Haggett and Chorley (1969) related those indices to accessibility and efficiency levels of the street network. Litman (2005), based on the findings in the literature, recommends a minimum level of 1.4 for the Beta index and 0.75 for the CNR for walkable urban living spaces. The pedestrian accessibility index is the ratio of the length of the actual route to the geographical (bird's flight) shortest distance. If the index value is 1, accessibility for pedestrians is at the highest level; however, 1.5 is recommended as the upper limit (Litman. 2005). Southworth and Ben-Joseph (2013) stated that although grid-type connected street networks increase accessibility by providing shorter routes, they have relatively disadvantages in achieving livability, space quality, security, sociality, and public use. Less-connected networks (cul-de-sacs) are more advantageous in achieving the latter objectives. Since grid-like connected and dense networks offer many shortest path options, they reduce the total vehicle mile traveled (VMT), reduce energy consumption and carbon emissions, increase accessibility, and are more resilient networks as they provide alternative route opportunities in case of crises such as disasters (Sharifi, 2019). Zhang (2013) investigated the walkability and accessibility degrees of grid-planned and Radburn-like semi-connected networks for pedestrians, network density, alpha, and gamma indices and found that the former is more advantageous in terms of accessibility. Southworth and Ben-Joseph (1995) found that the annual average traffic accidents in grid-planned residential areas were 77.7 while only 10.2 in the networks, including cul-de-sac and three-legged street intersections. Taylor (2001) in less-connected networks (Radburn or similar type street geometry), the average vehicle volume on the main roads is 75% higher than those of the grid plan. In addition, the total travel distance (vehicle mile traveled) is 43% more in less-connected networks than the grid ones.

Findings reveal that although the closeness, centrality, and accessibility indexes are higher for grid networks, safety and road efficiency are more disadvantageous since the number of intersections is relatively high. Street surface per unit area is more than less-connected ones. Zadeh and Rajabi (2013) measured network efficiency with centrality indicators like betweenness and closeness. They simulated traffic on hypothetical networks and found that grid network is less efficient. In contrast, less-connected networks are more efficient since street length per area and population are lower than grids. This result can be explained by the fact that the number of vehicles per unit distance road section is higher in the less connected networks of residential areas since the traffic density is relatively more minor at the peripheries of cities. Giacomin and Levinson (2015) measure network efficiency by the number of routes provided by the road network in a specified area, the number of streets per unit area, and the ratio of the route length to the geometric (bird flight) shortest distance. Háznagy and Fi (2016) conducted a field study and measured six different networks' travel time, average speed, efficiencies, and road utilization rates. Soltani and Allan (2005) calculated the walking permeability distance index (WPDI), a function of street width, pavement quality, and street connectivity.

One of the most important indicators used to compare road network geometric properties is traffic safety. Studies in this direction examine the relationships between the frequency and severity of accidents and the connectivity degrees of the street networks, intersection characteristics, and frequencies. In their comprehensive study, Marshall and Garrick (2010) compared the street networks of 24 medium-sized cities in California; cities were classified into two groups, safe and less safe, based on the rates of accidents per 100,000 populations. Accident with injury, serious injury, and death per total vehicle mile traveled (VMT) are other safety indicators. Two-factor analysis of variance (ANOVA) was applied in that study. Street networks are classified into four categories according to connectivity and link to node ratio (LNR) indices; low (between 0-1.1), common medium (between 1.1 and 1.25), medium-high (between 1.25-1.4), and high (higher than 1.4). Street networks are also classified according to intersection density which refers to the number of intersections per square mile; low dense (less than 81 intersections), low medium dense

(81-143 intersections), medium-high dense (intersections between 144-224), and high dense (225 and more). Although different results were obtained in relatively safer (with fewer accidents per population) and less safe cities, no significant effects were obtained between the connectivity index (LNR) and the severity of the accident (fatality). Although the risk of fatal and severe injury accidents is relatively higher at four-leg intersections, statistically significant results could not be obtained since the number of crossings per unit area reduces the probability of an accident. Here, it is thought that the effect of vehicle speeds on the severity of the accident is high.

Marshall and Garrick (2011) examined 230.00 accidents in 473 cities in California between 1997 and 2007. They employed a negative binomial regression model to measure the relationship between street network properties and accident rates of 12 safest and least safe cities. Street networks were classified into 8 categories according to network densitycar. Accidents increase by 14.15 % when the intersection per square mile decreases from 144 to 81. When intersection density (per square mile) increases to 225 number of accidents decreases by 15.24% and 31.48% for 324 junctions per square mile. The findings can be explained by decreasing the number of vehicles per intersection. More vehicle crossings at fewer intersections can be described as a factor that increases the risk of accidents. Similar results were found for the rates of severe injuries and fatalities. Findings revealed that the accident rate increased as the link to node ratio (LNR) increased. When LNR increases from 1.25 to 1.4, the total number of accidents increases by 16.7% and the number of accidents with severe injuries increases by 13.9%, and the number of fatal accidents increases by 39.3%. In that study, there was a significant correlation between the total vehicle mile traveled (VMT) and the total number of casualties, the number of severe accidents. Still, no significant results were obtained between fatal accidents.

3. Method

In the literature, various forms of regression models are employed to measure the effects of variables on accident occurrence. In addition to socio-economic factors, physical factors like street network properties, intersection type, traffic control measures may contribute to accident occurrence. This study employs a series of regression models to understand how street networks influence accident rates. The linear form of the multiple regression equation is as follows:

$$A = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots \beta_n X_n e \quad (1)$$

Where;

A: Annual average number of accidents (dependent variable)
X_i: Independent variable
βi: Predictors
e: error

When the equation is specified for his study the regression model takes the following form:

$$A = f(PD.\ SL.\ SD)$$

Where;

A: Annual average number of accidents (dependent variable)
PD: Population density
SL: Streel length
SD: Street density.

Demographic and economic factors have a significant role in accident occurrence. In this study the roles of socio economic and physical attributes are investigated independently. By the way in the statistical analysis the most effective physical factors can be distinguished among all. Equation 1 was employed to explore the relationship between neighborhood figures and accident occurrence be operationalized in the following form

$$A = \beta_0 + \beta_1 P + \beta_2 E + \beta_3 C + e$$

Where;

A: Number of Accidents

P: Population
E: Employment
C: Number of Cars
β_0: the intercept
β_1, β_2, β_3: regression coefficients
e: the error term

In the second stage of regression analysis, street network properties by neighborhood are identified. Thus Model 2 be operationalized in the following form

$$A = \beta_0 + \beta_1 PD + \beta_2 SL + \beta_3 NL + \beta_4 SD + \beta_5 SLP + \beta_6 NI + \beta_7 LNR + \beta_8 ALL + e$$

Where;

A: Number of Accidents
PD: Population density
SL: Street length
NL: Number of links
SD: Street density
SLP: Street length per capita
NI: Number of Intersections
LNR: Link to node ratio
ALL: Average link length
β_0: the intercept
$\beta_1 \ldots \beta_8$: regression coefficients
e: the error term

The city's neighborhood is classified/ranked according to traffic safety indicators (accident per 1000 population). Then the street patterns of the most and least safe neighborhoods are elaborated according to the following indicators:

- Street density (**SD**)= Street Length (meters)/neighborhood area (hectares),
- Population density (**PD**)= Population/neighborhood area (hectares),
- Street length per capita (**SLP**)=Street Length (meters)/population,
- The share of street surface area (**SSA**)=Street surface area (sq.m), neighborhood area (sq.m),
- Street surface per capita (**SSC**)= Street surface area (sq.m)/population,
- Intersection density (**ID**)=Number of intersections/ neighborhood area (hectares),
- Share of three-legged junctions (**3LIR**)= Three-legged intersections/total number of intersections,
- Share of three-legged junctions (**4LIR**)= Four-legged intersections/total number of intersections,
- Link to node ratio (**LNR*/***=number of local street links/number of local nodes,

Traffic safety indicators that are used to compare the corresponding neighborhoods are as follows:

- Accident per 1000 Population (**APP**)= 1000*Number of Accidents/ Population,
- Accident per Kilometer Street Length (**APS**)= Number of Accidents/Street Length (kilometers),
- Accident per Intersection (**API**)= Number of Accidents/ Number of Intersections.

Although Connected Node Ratio (CNR) is mentioned in the literature as a significant indicator, the dead-end street (cul-de-sac) design is not common in Mersin city.

Accident data are obtained from the Ministry of Interior. General Directorate of Security. Population figures are obtained from the Turkish Statistical Institute (TUİK), demographic indicators by neighborhood database (https://biruni.tuik.gov.tr). Street network was obtained from Open Street (https://www.openstreetmap.org) and Google Earth.

4. Empirical Findings

In the city, 8131 accidents occurred in Mersin city from 2015 to 2017. While 30.2% (2453) of accidents occurred at local streets, the majority (69.8) of accidents occurred at major arterials (Figure 1).

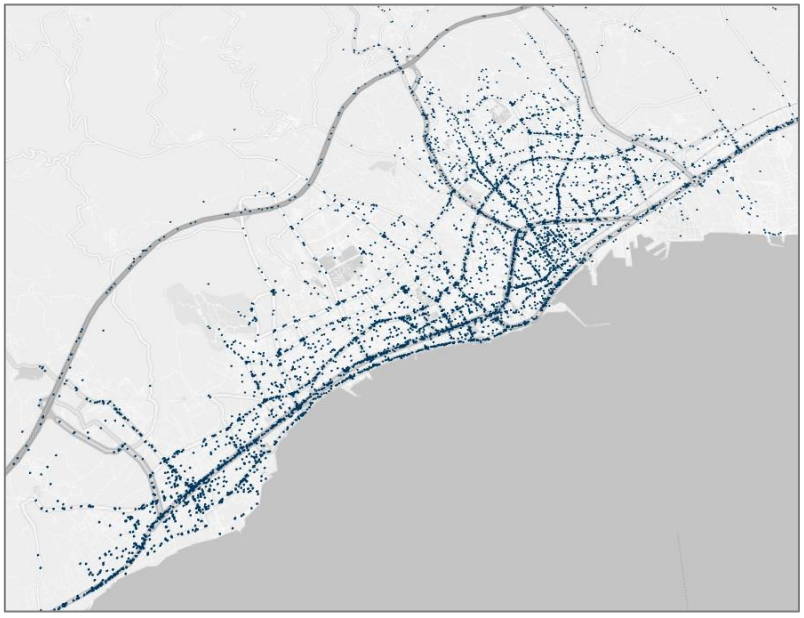

Figure 1 Spatial location accidents Source: from Ministry of Interior. General Directorate of Security. The map was prepared in MS Excel 2016.

Accident occurrence rates and densities are higher in the central business district and industrial zones, located in the eastern part of the city. Because at those parts of the city, population densities are relatively low, and non-residential urban activities (retail, industry, manufacturing, warehousing, business, and commercial) generate higher rates of traffic (Figure 2).

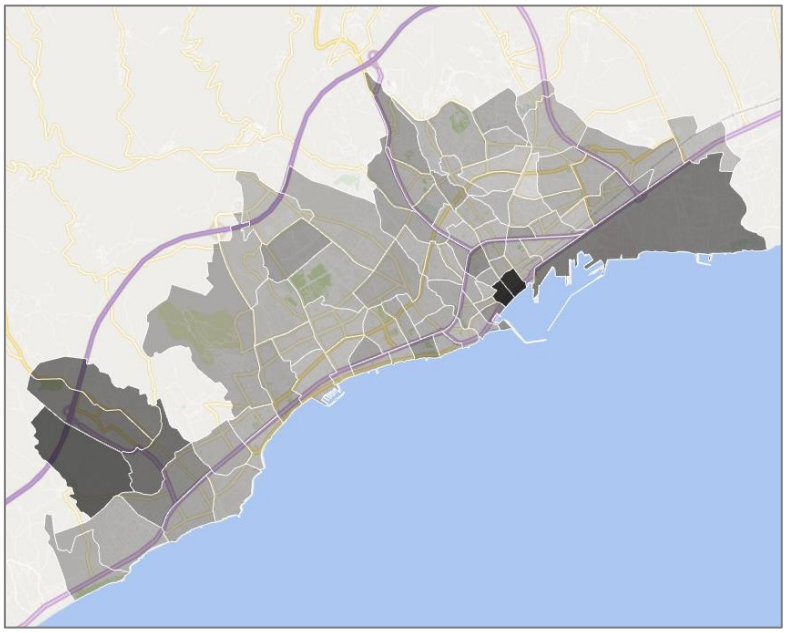

Figure 2 Accident per population by neighborhood (accidents at local streets only) Source: from Ministry of Interior. General Directorate of Security. Prepared in MS Excel 2016.

Regression analysis results showed that population, employment, and car (automobile) per neighborhood have a significant role in accident occurrence at the local street (Table 1). Results

show that 1000 population is responsible for 0.97 accidents, while additional 1000 employment causes 2.84 accidents and additional 1000 cars generate 5.57 accidents (R^2=0.664).

Table 1 Model 1 Regression Results (Model summary, ANOVA and Coefficients)

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.815[a]	.664	.652	11.375
a. Predictors: (Constant). # of Cars (2016). Employment (2016). Pop. (2016)				

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20754.970	3	6918.323	53.5	.000[b]
	Residual	10480.606	81	129.390		
	Total	31235.306	84			
a. Dependent Variable: # of Accidents						
b. Predictors: (Constant). # of Cars (2016). Employment (2016). Pop. (2016)						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.523	2.640		.956	.342
	1000 Pop. (2016)	0.97	.276	.320	3.507	.001
	1000 Employment	2.84	.592	.315	4.767	.000
	1000 Cars (2016)	5.57	1.229	.420	4.622	.000
a. Dependent Variable: Annul Average # of Accidents						

Model results in SPSS 20.0.

Research findings proved that car (automobile) ownership rate positively contributes to accident occurrence. In the city, higher rates are observed at the northwest and west parts of the city, while neighborhoods at the east and northeast parts accommodate the lowest rates (Figure 3).

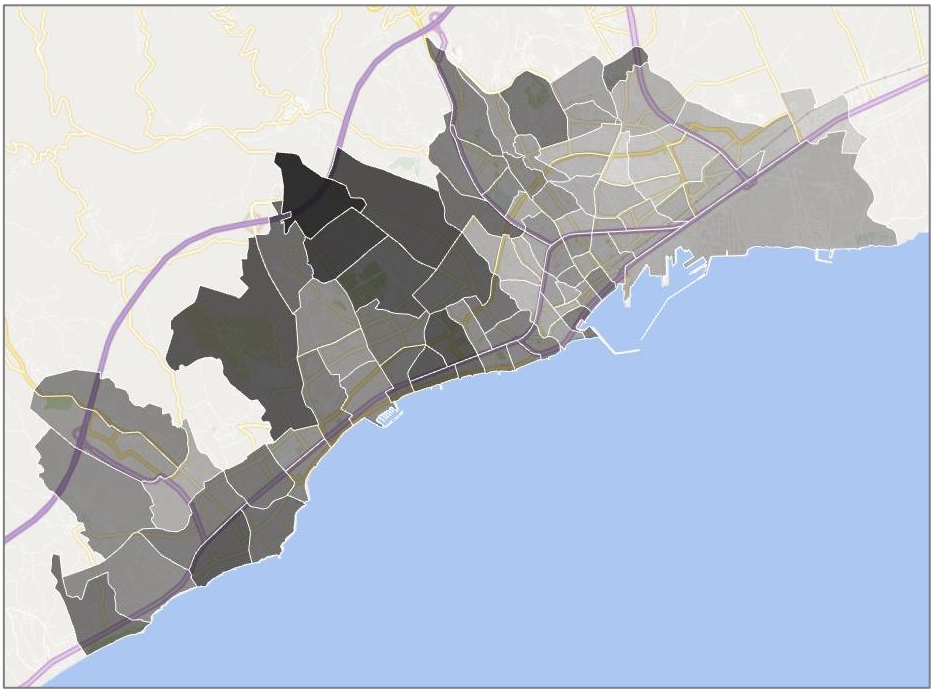

Figure 3 Automobile ownership rates by neighborhood Source: Adapted from Mersin Transport Master Plan (Boğaziçi Proje. 2015), Prepared in MS Excel 2016.

Model 2 results showed that population density, street length per capita (meters), and number of intersections significantly affect accident occurrence. Number of intersections increases accident frequencies while street length per capita reduces. In contrast, the number of links, street density, link to node ratio, and average link length have no significant effect on accident occurrence (Table 2).

Table 2 Model 2 Regression Results (Stage 2, Model summary, ANOVA and Coefficients)

Model Summary						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		,609[a]	,371	,323	15,89296	
a. Predictors: (Constant), average link length (m), # of intersections, street length per capita (m/p), link/node, street density, # of Links						
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11628,577	6	1938,096	7,673	,000[b]
	Residual	19701,729	78	252,586		
	Total	31330,306	84			
a. Dependent Variable: Annual Average Accidents (local streets)						
b. Predictors: (Constant), average link length (m), # of intersections, street length per capita (m/p), link/node, street density, # of Links						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-37,670	29,627		-1,271	,207
	# of Links	-,340	,252	-1,158	-1,349	,181
	street density	,013	,302	,005	,042	,966
	street length per capita	-3,197	1,180	-,271	-2,709	,008*
	# of intersections	,691	,345	1,742	2,001	,049*
	link/node	32,335	19,078	,257	1,695	,094
	average link length (m)	,066	,040	,175	1,649	,103
a. Dependent Variable: Annual Average Accidents (local streets)						

*Significant, p<0,05, Model results in SPSS 20.0.

It is observed that some variables have no significant effect on accident occurrence. Therefore, essential variables are selected in the third stage, d and a new form of the equation (Model 3) is identified, the model can be operationalized in the following form

$$A = \beta_0 + \beta_1 SL + \beta_2 NI + e$$

Where;
A: Number of Accidents,
SL: Street length,
NI: Number of intersections,
β_0: the intercept,
β_1, β_2 : regression coefficients,
e: the error term.

At the final stage, insignificant variables of Stage 2 are eliminated, and the model results of Stage 3 are presented in Table 3.

Table 3 Stage 3 Regression Results (Model summary. ANOVA and Coefficients)

Model Summary						
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	
1		,573[a]	,329	,312	16,01671	
a. Predictors: (Constant), # of intersections, street length per capita (m/p)						
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10294,446	2	5147,223	20,064	,000[b]
	Residual	21035,860	82	256,535		
	Total	31330,306	84			
a. Dependent Variable: Annual Average Accidents (local streets)						
b. Predictors: (Constant), # of intersections, street length per capita						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17,188	3,897		4,411	,000
	street length per capita	-2,329	1,072	-,197	-2,173	,033
	# of intersections	,219	,036	,552	6,085	,000
a. Dependent Variable: Annual Average Accidents (local streets)						

*Significant, p<0,05, Model results in SPSS 20.0.

Empirical results showed that street length per capita (SPC) is positively correlated with population density (PD), but the former one is an inverse exponential multiplier of the latter one (Figure 4A). In addition, positive correlation was found between street density (SD) and population density (Figure 4b).

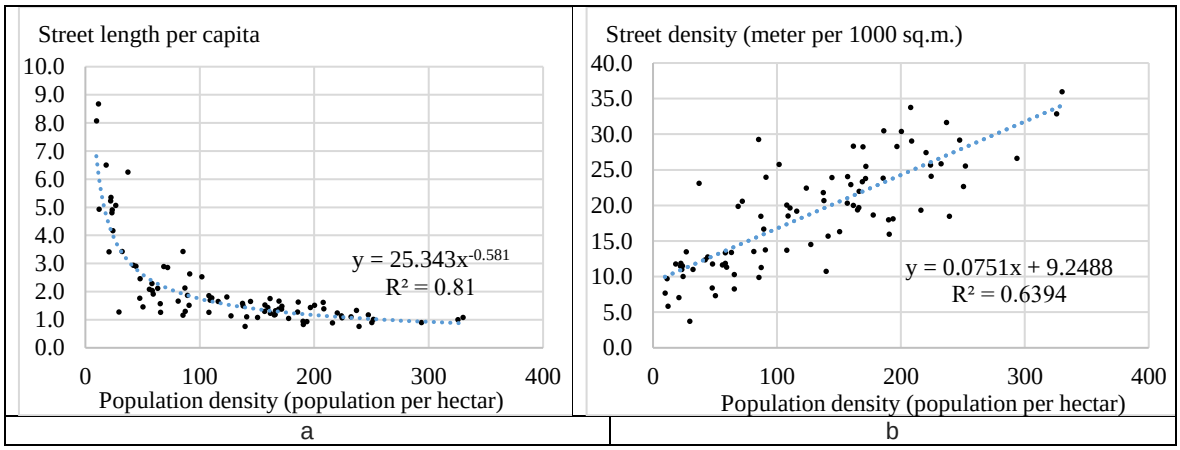

Figure 4 Correlations among street length per capita. street density and population density

Intersection type can be an influencing factor of accident occurrence and the severity of crashes. A disaggregate model is employed at the neighborhood scale to assess the role of intersection type, but significant results are not obtained. Therefore, an aggregate analysis is conducted, and it is found that 73% (1791/2554) of crashes occurred at intersections while 27% (663/2554) of them were observed at the roadside (street sections). However, the accuracy of coordinates is limited at street scale. In addition, further studies are necessary to investigate the severity of the crashes and the roles of vehicle type, traffic control measures, and driver profile. In this respect, Binomial Logistics Regression may provide more reliable results. The following section street network patterns of the selected neighborhoods where traffic safety indicators are highest and lowest.

5. Spatial Analysis

Empirical analysis revealed notable differences among neighborhoods in terms of traffic safety. Accident rates (accident per 1000 population) are dramatically high in the city center and around industrial zones. These figures are not surprising since the population is less while non-residential activities and traffic volumes are in those parts of the city. In the following amount, street networks of residential neighborhoods are compared to minimize the influence of land use and employment in the safety of the neighborhoods. Those located around the central business district and nearby industrial zones are excluded. Four residential neighborhoods with higher accident rates than the city average are Eski Mezitli, H.O.Merzeci, Mezitli-Merkez, and Aydınlıkevler (Table 4).

Table 4 Spatial Figures of Top 20 Neighborhoods (With Highest Rates of Accidents)

Rank	Neighborhood Name	Pop. (2016)	# of Accidents (local streets)	Car per 1000 pop.	Annual average accident per 10000 population (AAAP)	Population density (p/ha)	Street length	Street density	Street length per capita(m/p)	link/node	average link length (m)	Location of the Neigh. in the City and Land Use
1	ÇANKAYA (MERKEZ)	939	13	100	46.1	31	4.0	13.5	4.3	1.48	118	City Center
2	CAMİ ŞERİF	1737	22	136	42.2	47	8.6	23.2	4.9	1.73	120	City Center
3	ESKİ MEZİTLİ	1754	19	147	36.1	18	11.4	11.8	6.5	1.32	212	Residential
4	KARADUVAR	9913	79	73	26.6	10	79.8	7.7	8.0	1.22	191	Industrial Zone
5	MAHMUDİYE	3852	26	144	22.5	168	6.5	28.3	1.7	1.46	120	City Center
6	İHSANİYE	5190	32	140	20.6	110	9.2	19.7	1.8	1.53	128	Near CBD
7	ÜÇOCAK	4230	26	91	20.5	58	9.7	13.4	2.3	1.41	187	Near CBD
8	MESUDİYE	8585	49	104	19.0	329	8.6	32.9	1.0	1.42	77	City Center

9	KÜLTÜR	3337	18	176	18.0	92	4.1	11.3	1.2	1.48	90	City Center
10	YENİ (MERKEZ)	15830	83	110	17.5	190	13.3	16.0	0.8	1.42	135	Near CBD
11	KİREMİTHANE	3146	16	65	17.0	238	3.4	25.9	1.1	1.38	118	Near CBD
12	HAMİDİYE	4900	24	93	16.3	143	3.7	10.8	0.8	1.41	90	City Center
17	H.O.MERZECİ	5768	28	210	16.2	49	13.6	11.7	2.4	1.35	121	Residential
13	BAHÇE	3989	19	78	15.9	226	4.3	24.1	1.1	1.46	104	Near CBD
14	NUSRATİYE	10217	48	139	15.7	296	9.2	26.6	0.9	1.67	112	Near CBD
15	BARIŞ	5883	27	112	15.3	172	8.7	25.5	1.5	1.45	104	Near CBD
16	ÖZGÜRLÜK	6565	29	64	14.7	43	19.0	12.4	2.9	1.30	200	Industrial Zone
18	MEZİTLİ-MERKEZ	22776	92	208	13.5	99	31.8	13.7	1.4	1.38	147	Residential
19	AYDINLIKEVLER	10543	41	283	13.0	223	12.2	25.7	1.2	1.42	103	Residential
20	FUATMOREL	8644	32	324	12.3	19	32.1	7.1	3.7	1.37	206	Residential

Eski Mezitli is the first ranking residential neighborhood where the average annual accident per 1000 population was 36.1. The neighborhood is recently developed around a village. Therefore, the street network does not meet standards and increases vehicle trips (Figure 5). The high rate of accidents, in this case, can also be explained by the increased number of vehicles and limited number of links. In addition, intersections are not properly designed yet, which is a contributing factor in accident occurrence.

Figure 5 Street Network and Location of Accidents in Eski-Mezitli Neighborhood

Hüseyin Okan Merzeci is also a recently developed residential neighborhood. The street network is in an irregular form (Figure 6) and serves to increasing vehicle volumes generated by residents of newly built high-rise apartments. Improper design of street geometry and intersections contributes to high rates of accidents (16.2 average annual accidents per 1000 population).

Figure 6 Street Network and Location of Accidents in H.O.Merzeci Neighborhood

Mezitli Merkez is one of the most populated (22,776) neighborhoods and accommodates middle and upper-middle-income dwellers. Car ownership rate is over city average and one of the most effective contributing factors in the increasing number of accidents. Even though the residential and some retail centers are outcomes of the planned development, the street network and intersections are not properly designed (Figure 7); hence some streets accommodate a pretty high number of accidents (13.5 per 1000 population).

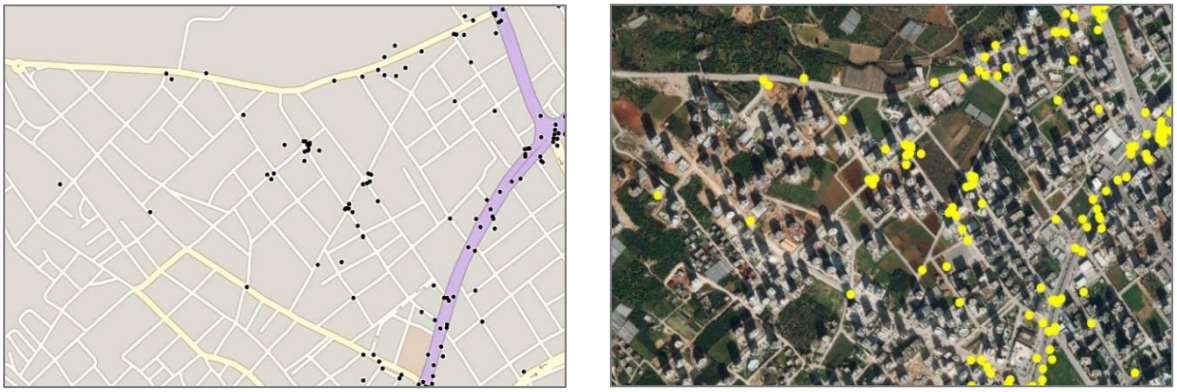

Figure 7 Street Network and Location of Accidents in Mezitli-Merkez Neighborhood

Residential development in the Aydınlıkevler neighborhood dated back to 1970's in an unauthorized way. After 1980's areas has experienced planned growth, and local plans promoted high-rise apartments. Street sections and intersections were not designed to accommodate vehicles (Figure 8), therefore increasing the rate of car ownership, increasing the share of non-residential uses, and street network are responsible for low traffic safety rates.

Figure 8 Street Network and Location of Accidents in Aydınlıkevler Neighborhood

Four residential neighborhoods where accident rates are lower than city average are Çağdaşkent, Kocavilayet, Piri Reis and Güneş (Table 5).

Table 5 Spatial Figures of Safest 20 Neighborhoods (With Lowest Rates of Accidents)

Rank	Neighborhood Name	Pop. (2016)	# of Accidents (local streets)	Car per 1000 pop.	Annual average accident per 10000 population (AAAP)	Population density (p/ha)	Street length	Street density	Street length per capita (m/p)	link/node	average link length (m)	Location of the Neigh.in the City and Land Use
66	ÇAVUŞLU	6203	14	127	7.5	68	18.0	19.9	2.9	1.73	117	Non-Planned
67	ZEKİ AYAN	6235	14	86	7.5	132	9.8	20.7	1.6	1.90	125	Residential
68	TOZKOPARAN	14791	33	140	7.4	207	20.8	29.1	1.4	1.65	138	Residential
69	GÜVENEVLER	19491	43	283	7.4	171	26.6	23.4	1.4	1.66	163	Residential

70	BARBAROS	12790	28	235	7.3	159	18.4	22.9	1.4	1.55	172	Residential
71	ÇAĞDAŞKENT	17517	37	209	7.0	79	30.1	13.6	1.7	1.67	192	Residential
72	EĞRİÇAM	17317	36	152	6.9	117	28.5	19.2	1.6	1.71	156	Non-Planned
73	MUSTAFA KEMAL	2954	6	76	6.8	46	7.6	11.8	2.6	1.35	181	Non-Planned
74	SELÇUKLAR	12087	24	82	6.6	201	18.3	30.4	1.5	1.50	142	Non-Planned
75	TOROSLAR	9201	18	112	6.5	142	15.5	23.9	1.7	1.52	147	Non-Planned
76	TURUNÇLU	7855	14	55	5.9	216	12.3	33.8	1.6	1.45	137	Non-Planned
77	KOCAVİLAYET	2485	4	473	5.4	10	15.3	5.9	6.2	1.29	243	Residential
78	PİRİREİS	9442	13	171	4.6	195	8.8	18.2	0.9	1.86	162	Residentialoffice
79	MÜFİDE İLHAN	4880	5	81	3.4	93	12.6	24.0	2.6	1.55	166	Non-Planned
80	KURDALİ	16077	15	62	3.1	237	21.5	31.7	1.3	1.52	116	Non-Planned
81	ÇAY	13109	12	25	3.1	67	20.3	10.3	1.5	1.37	97	Non-Planned
82	ŞEVKETSÜMER	24204	21	28	2.9	161	30.2	20.1	1.2	1.48	162	Non-Planned
83	GÜNDOĞDU	16575	14	68	2.8	191	26.5	30.5	1.6	1.49	163	Non-Planned
84	MEVLANA	16237	13	52	2.7	154	25.4	24.1	1.6	1.46	154	Non-Planned
85	GÜNEŞ	22783	16	25	2.3	336	24.4	36.0	1.1	1.46	99	Non-Planned

Some of the neighborhoods have similarities in terms of land use, physical development, housing types, and street patterns, and are advantageous in terms of traffic safety since car ownership rates are quite low (less than 100 vehicles per 1000 population). However, street networks are shaped in an irregular rectangular grid form and provide limited maneuver capability for vehicles, unlike others.

Çağdaşkent is one of the suburban types of planned development neighborhoods at the northeastern periphery of the city. Çağdaşkent is one of the identical examples of planned residential neighborhoods in the city since 1980's (Figure 9). Although car ownership rate (209 cars per 1000 population) was over the city average (150/1000), and street length per capita (1.7 meters) is below the city average, and accident rates are quite low (average annual accident rate per 1000 thousand population was 7.0). Singe family houses in a detached form (low-density development), clusters and cul-de-sacs, and loop-type street patterns seem to contribute to traffic safety. The street network of the southern part of the neighborhood is in a grid form, and the majority of the accidents occurred at that part. The street sections and intersections are appropriately designed to accommodate vehicles and reduce accident rates.

Figure 9 Street Network and Location of Accidents in Çağdaşkent Neighborhood

Kocavilayet is a village located at the northwestern periphery of the city. Housing development in the last decades is segregated into two forms; hoses of villages and detached low rise singe family houses of highest income dwellers (Figure 10). The recently developed houses are designed in clustered forms which is the typical form of residential development since 1990's. Even though the neighborhood has the highest rate of car ownership (473/1000) accident rate is quite low (5.4). Street length per capita is 6.9 is much over city average (1.7) since population density is still low. Residential development is ongoing and accident rates may increase due to increasing population and number of cars, however street network is in an irregular form and not properly designed to accommodate higher volumes of vehicles.

Figure 10 Street Network and Location of Accidents in Kocavilayet Neighborhood

The municipality adopted traffic safety measures like designing dead-end streets on a grid network. These measures effectively reduced accident rates in the Pirireis neighborhood, which is located at the western periphery of the city center (Figure 11). Accident rates are much lower than the city average, while car ownership rates are relatively high.

Figure 11 Street Network and Location of Accidents in Pirireis Neighborhood

Güneş is an unplanned neighborhood and has a rectangular but irregular grid street network (Figure 12). Local street widths range between 5-7 meters. Accident rates are pretty low (2.3) since the car ownership rate (25/1000) of the poorest income groups residing in these neighborhoods is much lower than the city average (150). Street length per capita, which is 1.1 meters, is much less than the city average (1.7). Figures showed that although street length per capita is relatively low and streets and intersections are shaped in an irregular form, the neighborhood is much safer than the rest of the city, thanks to the low rate of car ownership.

Figure 12 Street Network and Location of Accidents in Güneş Neighborhood

6. Conclusions

Research findings revealed that compared to residential neighborhoods, commercial and industrial uses generate more traffic; therefore, those land uses are responsible for higher rates of accidents. It is found that the number of vehicles and automobile ownership rate increases the accident rate. There was no significant correlation among street density, street length per hectare, street length per capita, and the number of accidents.

Model results reveal that street length per population reduces accident frequencies. Traffic safety cannot be achieved if the street length is not proportional to the number of vehicles. In addition, street design is also a matter of efficient use of urban space. On the other hand, the number of intersections increases the probability of accident occurrence. Empirical analysis showed that street length is proportional to population density in Mersin city. Another important influencing variable in the design of the street network is the car (automobiles) ownership rate, and hence number of cars per neighborhood. If the street length is proportional to the number of cars, accident rates can be reduced. Findings showed that the length of the street network is not proportional to the number of cars in the neighborhoods of Mersin city, and the accident rate is high in the neighborhoods where the number of vehicles is high and the street length is short. In order to achieve traffic safety, it is recommended that the street network can be designed not only proportional to the population density, but also proportional to estimated number of vehicles. It is expected that the street length per population will be higher in the neighborhoods where the number of automobiles is high and where the middle-high and high-income groups live. However, if residential areas are planned with high population density in neighborhoods where high automobile ownership rates are estimated, the share of the street area in the total neighborhood area will be very high. For this reason, it is recommended that residential areas can be planned and designed with lower population densities if automobile ownership is expected to be high.

In this research significant relationship between the intersection density (intersection per hectare) and the number of accidents was not found. Aggregate analysis at urban scale showed that 73% (1791/2554) of crashes occurred at intersections while 27% (663/2554) of them were observed at the roadside (street sections).

Figures reveal that some of the street network properties have a significant role in accident occurrence. In addition, pedestrian driver profile, traffic control measures, intersection design, sight view weather conditions, seasonal factors, day and night timeline may have a significant role in accident occurrence. Further studies may employ Binomial Logistics Regression to obtain more detailed, reliable, and sensitive results.

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Resume

Fikret Zorlu received his BSc. degree in City and Regional Panning from Middle East Technical University, Faculty of Architecture (1991-1996). Zorlu received his MSc, and Ph.D. degrees in City and Regional Panning from Middle East Technical University, School of Natural and Applied Sciences (1996-2006). Major research interests include urban transportation, city logistics and urban design. Zorlu has also conducted many research projects about urban design, urban transport and logistics. He contributed to published articles to many national and international publications and has received various awards in urban design and architectural design competitions. He teaches urban transportation, urban project management and planning studio courses at Mersin University.

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Accessibility in disaster-resilient cities

Hatice Ayataç*

Abstract

According to the World Health Organization, disasters are the unexpected consequences of occurrences that cause a level of suffering that exceeds the capacity of adjustment of the affected community. Available records indicate that natural, technological and man-made disasters -by causing loss of lives and property- affected more than 4 billion people worldwide in the last 20 years. People with disabilities are among those who are highly fragile and physically vulnerable to the dangers and risks posed by disasters. The actual reason behind why people with disabilities are rather vulnerable to the adverse effects of natural and man-made disasters is the fact that they have no access to social, spatial and civil resources. According to the United Nations Inclusive Disaster Risk Management Report, in the event of disasters and emergencies, individuals with disabilities are affected disproportionately due to the inaccessibility of the evacuation, response, and rescue efforts. The 7th Millennium Development Goal (1990-2015) emphasizes that improvements in humans' lives and in the environment are critical to ensure environmental sustainability, and it highlights the need to 'build a disaster-resilient community.' Resilience to urban disasters shows a community's ability to adapt to natural and man-made disasters and hazards, to keep any potential threats away, and to evaluate the consequences and modify existing conditions. This study focuses on accessibility in disaster-resilient cities, and it aims to evaluate the components of urban resilience, which helps to eliminate the damages of disasters and to recover, with a particular focus on the accessibility of individuals with disabilities. Based on the available literature, the study evaluates the outcomes of a workshop that was conducted with 40 participants in August-September 2021 as one of the events in preparation for MARUF21. The participants were local officials who are in charge of and accountable for disaster and emergency management, and individuals who are vulnerable to disasters and emergencies. The findings and results of the study are presented under four headings: (i) Accessibility of Urban Spaces in Disaster and Emergency Management, (ii) Risk Management and Accessibility in Cultural Heritage Areas, (iii) Social Policies and Accessibility in Disaster and Emergency Management, and (iv) Accessibility to Communication, Technology and Innovations. The study highlights that accessibility in disaster and emergency management extends beyond spatial organization, and it is a prerequisite for social harmony and disaster resilience.

Keywords: disaster mitigation, disability, resilient cities, accessibility, risk management

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1. Introduction

Each year, disasters affect millions of people worldwide and cause loss of life and property. According to the United Nations (UN, 2018), "*a disaster is a serious disruption to the functioning of a community, which causes human, material, economic and environmental losses beyond a community's ability to cope.*" In simple words, a disaster is the consequences of an event and not the event itself (AFAD, 2014).

Natural disasters include earthquakes, floods, landslides, droughts, and storms, while technological disasters include dam failures, agricultural accidents, economic depressions, and collapse of the electronic infrastructure, and fires, water and environmental pollution, and transport accidents are classified as man-made disasters (Kadıoğlu, 2008). Disasters can also be defined as "the unexpected consequences of occurrences that cause a level of suffering that exceeds the capacity of adjustment of the affected community" (WHO, 2013).

People with disabilities are among those who are highly fragile and physically vulnerable to the dangers and risks posed by disasters (AFAD, 2014). According to the World Health Organization (WHO, 2013), people with disabilities are individuals who have impairments of their body structure or body functions, have limited mobility, and face difficulty in performing a task or an action, and they correspond to 15% of the world's population.[1] When evaluated with a perspective on emergency and disaster management, people with disabilities can be classified as individuals with special needs, and they can be defined as "individuals who require additional or specialized services or adjustments in order to be adequately prepared for disasters and emergencies, to take the necessary actions in the event of such events, and to fulfill their needs in the aftermath of a disaster or emergency" (Subaş Yurtçu, 2019).

According to the UN Convention on the Rights of Persons with Disabilities (Article 9 of the CRPD, 2008), individuals with disabilities can live independently and participate actively in all aspects of life only if they are provided with equal access to the physical environment, to transportation, to information and communication technologies, and to the facilities and services available in both urban and rural areas. The actual reason behind why people with disabilities are rather vulnerable to the adverse effects of natural and man-made disasters is the fact that they have no access to social, spatial and civil resources. According to the UN Inclusive Disaster Risk Management Report (2018), in the event of disasters and emergencies, individuals with disabilities are affected disproportionately due to the inaccessibility of the evacuation, response (shelters, camps, and food distribution), and rescue efforts. Environmental hazards and natural disasters lead to the emergence of different types of disabilities, and inaccessible environments prevent people with disabilities from participating in economic and social activities. The 7th Millennium Development Goal (2015) emphasizes that improvements in humans' lives and in the environment are critical to ensure environmental sustainability.

Ensuring that people with disabilities have access to all amenities and services will help them to endure the hazards they face during disasters and will help to increase their resilience. Nowadays, 'building a disaster resilient community' is a common vision both in the international and in the domestic agenda (Jha et al., 2013; AFAD, 2011).

Resilience, which was coined by Holling (1973), was first discussed within the realms of ecology, and it was defined as the capacity of a system to recover from and adapt to any disruptions and damages. Over time, the concept also gained ground in other disciplines including social sciences, urbanism and urban design. In urbanism and urban design, resilience refers to understanding the

[1] 3.2% of the world's population (approximately 253 million people) suffers from blindness or visual impairments, while 466 million people worldwide (6% of the world's population) suffer from deafness and hearing loss. Roughly 200 million people have an intellectual disability, and 75 million individuals need to use a wheelchair (https://www.inclusivecitymaker.com/disabled-people-in-the-world-in-2021-facts-and-figures/). (Url-1)

dynamics in a city or part of a city in order to ensure increased ability to endure and adapt to any potential changes or threats. Urban resilience has become a popular concept on account of the fact that it enables improving the living conditions, increasing the level of knowledge, and creating a multi-actor process in decision making.

Resilience to urban disasters indicates a community's ability to adapt to natural and man-made disasters and hazards, to keep any potential threats away, and to evaluate the consequences and modify existing conditions (UNISDR, 2011). When it comes to urban resilience to disasters, it is necessary to focus on solutions in the long run. Therefore, resilience to urban disasters should be addressed in infrastructural, institutional, economic and social dimensions (Jha et al., 2013), (Figure. 1).

Figure 1 Components of Urban Disaster Resilience (Jha et al. 2013)

The resilience of the urban infrastructure (water, sanitation, energy, communication, and transportation) refers to eliminating the vulnerabilities of the built environment including buildings and transportation systems. It also indicates the housing capacity in cities, healthcare facilities, vulnerabilities of buildings to disasters, and the availability of evacuation routes and supply lines after disasters. The resilience of the infrastructure is directly related to the recovery capacity of a community. Institutional resilience refers to the capacity of those who are in charge of managing communities, such as governments and non-governmental bodies. Economic resilience illustrates the employment diversity in communities, and it refers to the capability to do work in the aftermath of a disaster. Social resilience indicates the demographic profile of communities, and it refers to the aspects of the social capital including age, gender, disability, ethnic background, immigrants, etc. The tie between social capital and place, and the sense of belonging are deciding factors during recovery from any vulnerability that affects the entire community (Cutter, Burton and Emrich, 2010 in Jha et al., 2013).

This study focuses on accessibility in disaster-resilient cities, and it aims to evaluate the components of urban resilience, which helps to eliminate the damages of disasters and to recover, with a particular focus on the accessibility of individuals with disabilities. Based on the available literature, the study evaluates the outcomes of the workshop that was conducted with local officials who are in charge of and accountable for disaster and emergency management, and participants who are vulnerable to disasters and emergencies.

2. Disaster Risk Management and Opportunities for Resilience

Referring to the statistics indicating that 60% of the world's population will live in cities by 2050, many experts suggest that a great number of mega cities are at peril of natural disasters including earthquakes, tsunamis, landslides, floods, and droughts. Risks are intensified not only due to the predisposition to disasters and risk levels in cities, but also due to increased migration, unplanned urbanization, insufficiency of resources, lack of knowledge, experience and equipment as well as unpreparedness (Urbanization Council, 2009). In order to alleviate risks and the vulnerability of communities and to eliminate the adverse consequences of disasters, it is necessary to formulate strategies to tackle disasters, and to carry out the necessary legal, political and technical studies (Urbanization Council, 2009). These can be collectively identified as 'disaster risk reduction' activities (Erdin, 2018).

Disaster risk management entails making the necessary administrative decisions, operational abilities, technical studies, intervention capacities, and preparations viable by means of legislative regulations as well as identifying and continuously practicing the necessary strategies and methods (Ertugay ve Düzgün, 2006). In other words, risk management is the process where hazards and risks are identified and analyzed, opportunities, resources and priorities to prevent and/or eliminate risks are identified, and policies, strategies and action plans are developed and put in practice (AFAD, 2014; Kadıoğlu, 2008). Today, disaster risk management refers to the analysis, planning, decision making and assessment processes that altogether organizes available resources for the purposes of (i) being prepared for any hazards, (ii) eliminating damage and risk, (iii) intervention, and (iv) recovery (AFAD, 2014; Kadıoğlu, 2008).

In 1987, the declaration of 1990-2000 as the International Decade for Natural Disaster Reduction (IDNDR) by the UN General Assembly (UN Resolution 42/169, 1987) paved the way for other important steps worldwide towards reducing disaster risk. Other critical steps to reduce the risks related to natural disasters include the Yokohama Strategy and Plan of Action for a Safer World (1994), the UN Millennium Declaration (2000), the International Strategy for Disaster Reduction (ISDR) (2000), the 'Global Assessment Report on Disaster Risk Reduction' (2004) prepared by the United Nations Development Programme (UNDP), the World Conference on Disaster Reduction and the Hyogo Declaration (2005) and the Hyogo Framework for Action (2005-2015) the Global Platform for Disaster Risk Reduction (2007). (AFAD, 2015),

In addition, the UN Conference on Environment and Development (the Rio Summit) concluded that sustainable economic development and sustainable development goals cannot be achieved unless adequate precautions and measures are taken to reduce disaster-related losses and highlighted the tight relationship between losses related to disasters and environmental degradation. The UN Conference on Sustainable Development organized in 2002 and 2012 (Rio+10 and Rio+20) accepted that settlements are highly vulnerable to disasters, and emphasized that, in order to reduce disaster-related damages, it is critical to take precautions aimed at reducing risks prior to disasters (Jha et al, 2013). The UN's Incheon Conference (South Korea, 2009) and the Incheon Declaration identified local governments as global actors (independent from central governments) given that risk reduction practices are usually performed at the local level, and also indicated that expenditures for risk reduction should be identified as 'investments' rather than 'costs.' Moreover, as an outcome of the Incheon resolutions, the 'Resilient Cities' campaign was launched (2010-2011). The International Strategy for Disaster Reduction not only identified the topics that local governments should consider in their risk reduction efforts, but also endeavored to include local governments in the process, to ensure experience sharing between local governments, to promote best practices, and to build a network of local governments. In late 1970s, the concept of resilience was solely used to understand the changes and the balance in ecology; however, by mid-1990s, the concept made its way in studies on disaster risk reduction. According to the UN ISDR (2009), urban resilience is "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions." In this definition, it is apparent that urban resilience does not only refer to structural durability and the ability to avoid damages, but it also refers to ensuring sustainability in settlements and to taking the necessary precautions to adapt to global events such as the climate change. According to the 'Making Cities Safe' campaign launched by the UNISDR, in resilient cities:

- Residents join local decision-makers as they plan and make decisions about the city based on the capacity and available resources,
- Local governments are competent and accountable ensuring the participation of all groups in the city to achieve sustainable urbanization,
- The entire population lives in housing and neighborhoods with adequate infrastructure and services,

- Many disasters are prevented by ensuring no informal settlements are built in flood plains or steep slopes, and by making sure that the city is built rationally built pursuant to development regulations,
- There is a robust local information infrastructure that detects hazards and considers the hazards and risks in relation to those who are affected and who are vulnerable,
- Necessary steps are taken to foresee disasters and to protect its assets,
- The amount of physical and social losses related to extreme weather conditions, earthquakes and other hazards are minimized, and
- The provision of the necessary resources prior to, during or after a disaster is guaranteed, and there is the ability to recover.

Currently, the Millennium Development Goals (UNDP, 2010) and the Hyogo Framework for Action (2005) are in effect to address the relation between disasters and development at the global scale.

The strategic goals of the Hyogo Framework for Action are: (1) integrating the risk reduction strategies to sustainable development policies and plans, (2) building and reinforcing the necessary organizations, mechanisms and capacity to increase awareness on disasters, and (3) systematically integrating the risk reduction approaches to emergency preparation, intervention and recovery programs. The actions with priority in the Hyogo Framework for Action are: (1) Organizational management: Reducing disaster risk and ensuring that strong organizational structures exist for implementation at the national and regional levels, (2) Definition of risk: Defining, assessing, monitoring disaster risks and developing early warning systems, 3) Information and education: Utilizing information, innovation and education to build a safe community highly aware of disasters, 4) Risk reduction: Reducing the risk factors that lie behind disaster risks, and 5) Readiness: Improving readiness at all levels for any type of disaster (Orhan & Keskinok, 2019; Orhan, 2010).

Local and central governments are primarily responsible of disaster risk management; therefore, they identify various enforcements to protect communities from the adverse consequences of disasters and to achieve resilience (UNISDR, 2011). In urban space, this entails ensuring safe and affordable urban infrastructure, identifying the building arrangement principles and overseeing the relevant expenditures, defining a disaster-safe layout for the settlement, and informing and guiding the local community. It is critical to ensure that the legal and administrative framework that is developed by local governments is put in practice and embraced by civil society, the private sector as well as national and regional organizations (Balamir, 2001).

Disaster risk management also proves to be a great opportunity to improve urban resilience. Disaster risk management should be performed with the participation of various stakeholders and sectors. According to the Hyogo Framework of Action comprehensive disaster risk management entails (a) identifying, assessing, and monitoring risk; (b) reducing risk through prevention and mitigation measures; (c) disaster risk financing and insurance; (d) emergency preparedness; and (e) post-disaster response, recovery, and reconstruction that reduces risk from future events (Jha et al., 2013)

When evaluated with an urban planning perspective, decision makers are in charge of achieving adequate level of preparedness before disasters, undertaking the expenses attached to intervention, rescue and recovery efforts. Making an accurate analysis of disasters eliminates the reasons in the disaster cycle and provides opportunities for disaster resilience. The 6 phases of the disaster cycle are presented in Figure 2.

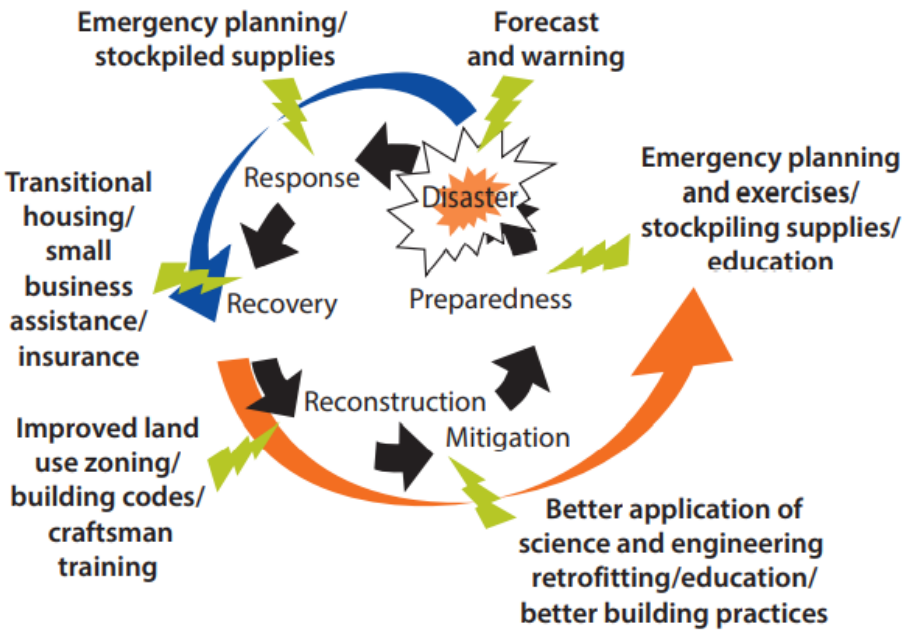

Figure 2 The six phases of the Disaster Cycle, Jha et al., 2013

The 'mitigation phase' involves not only enhancing resilience by reinforcing community ties, social organizations, and the economic base but also taking lessons from previous disasters to ensure sustainable urban development both for the present time and for the future. In the 'preparedness phase,' it is necessary to get prepared for the next disaster by means of preparing disaster and evacuation plans, performing trainings, and ensuring supplies are adequately stocked. In the 'disaster phase,' the focus is on warning and evacuation to reduce losses and to respond swiftly. In this respect, warnings allow for finding a shelter and moving valuable goods, foodstuffs, animals and vehicles. The 'response phase' involves rescue operations, public health precautions, shelter arrangements and food distribution. Interventions, such as containing fires and release of hazardous materials, emergency repairs to prevent further infrastructure failures, and restoration of crucial services, are aimed at preventing any major damage. The duration of this phase depends on the scale and type of the disaster and the amount of areas affected from the disaster. During the 'recovery phase,' which may take months depending on the size and the scale of the disaster, the aim is to recover social and economic functions, to move communities into semi-permanent housing, to reopen schools, to restore community organization, and to rebuild the infrastructure necessary for the economy to begin to function. The 'reconstruction phase' may take months to years given that it involves restoring what was lost as much as possible. Early in this phase, emergency responders leave the stage to normal government agencies (Kadıoğlu, 2008; Urbanization Council, 2009: Subaş Yurtçu, 2019).

3. Accessibility in Disaster and Emergency Management

According to the emergency events database (EM-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED), which has the most comprehensive database on disasters worldwide, 7348 natural disasters were reported in the last two decades (2000-2019). Over the period of time between 2000 and 2019, 3254 (44%) floods, 2043 (28%) hurricanes, 552 (8%) earthquakes, 432 (6%) extreme heat events, 376 (5%) landslides, and 338 (5%) droughts were reported worldwide (Turkish Red Crescent World Disaster Report, 2020). As a consequence of these disasters, more than 4 billion people around the world lost their lives or properties. According to the General Directorate of Meteorology (MGM) and official figures, in 2020, the number of natural disasters in Turkey reached the peak number of 984 (Doğan, 2021).

The research carried out by the Turkish Statistical Institute (TÜİK) and the Administration of Persons with Disabilities (ÖZİDA) indicate that there are 8.5 million people with disabilities in Turkey, and the number of people affected by disabilities reach 30 million when family members are included (AFAD, 2011). In the Bulletin on the Statistics on Persons with Disabilities and Elderly (2019), which was published by the General Directorate of Services for Persons with Disabilities and Elderly at the Ministry of Family and Social Services, in Turkey, 6.9% of the individuals aged 3 or older have one or more disabilities. Although the exact number of persons with disabilities affected from disasters remains unknown, the figures above enable us to calculate the possibilities and estimate the risks (AFAD, 2020).

Pursuant to the current international and domestic regulations and guidelines, in the event of a disaster and emergency, particularly individuals with disability should have access both to social resources and to communication so that they can receive information and support (UNISDR, 2014). Audio methods should be used to access persons with visual disabilities, while methods that stimulate other senses should be utilized to access those with hearing loss. Some auxiliary systems are quite useful during emergency events. Social accessibility is achieved by information and communications systems. For each and every individual, accessibility corresponds both to a product and to a service (Stough & McAdams Ducy, 2014). Accessibility may be a right entitled by laws; however, it should be provided in all spatial designs (Erdem et al, 2017).

3.1. Research Methodology / The Workshop Module

For the reasons and priorities mentioned above, an online workshop[2] on accessibility in disaster and emergency management was organized in August-September 2021. The workshop aimed to discuss social resilience and early intervention with relevant stakeholders and develop proposals for solution with a particular focus on the spatial issues in settlements that occur due to natural disasters caused by climate change, and the vulnerable groups during disasters and emergency events. The workshop method[3] was preferred because it is a hands-on scientific method that enables participants to work on and think and learn about a specific topic. Representatives from the Disaster and Emergency Management Presidency (AFAD), which is the primary organization in charge of disaster management in Turkey, representatives from the Turkish Red Crescent, representatives from local governments, representatives from a planning office plan involved in the implementation of plans, representatives from the General Directorate of Services for Persons with Disabilities and Elderly at the Ministry of Family and Social Services, academicians, Erişebilir Kent Atölyesi (EKA), and the Erişilebilir Her Şey Team participated the preparations of the workshop. Table 1 provides a summary of the roles and responsibilities of the participating stakeholders during an emergency event. The workshop was conducted in 4 phases: (1) informing organizations, discovering potentials, and getting familiar with the stakeholders, (2) brainstorming in sub-working groups with the guidance of moderators, (3) creating a common ground between groups, and (4) reporting.

Table 1 Participants of the workshop and their roles & responsibilities in disaster management

Organization	Responsibilities in Disasters and Emergencies	Workshop Participants
AFAD	Pre-disaster education, resource development, policy and strategy formulation, staff training, cooperation, coordination between stakeholders during disasters, coordinating search and rescue efforts	Office of the Governor of Eskişehir, Provincial Directorate for Disaster and Emergency Management
Turkish Red Crescent	Pre-disaster first aid trainings, raising awareness, raising awareness among the vulnerable groups,	Disaster Coordination Department of the Turkish Red Crescent,

[2] The Accessibility in Disaster and Emergency Management Workshop was carried out in the partnership of İTÜ and EKA-Erişilebilir Kent Atölyesi, and it was organized as part of the 'MARUF on the GO' activities that were carried out prior to the MARUF21.

[3] Workshop is a hands-on method preferred for activities where experts on a certain topic use cognitive processes for the transfer of knowledge. It is used to make preparations on a topic, and to develop ideas for the purposes of analysis and assessment. A workshop can be organized with as few as 5-10 participants or as many as 25-100 participants. The steps of a workshop are: (i) planning the preparations, (ii) working with the right stakeholders, providing the content, setting the rules, (iii) collecting individual ideas, (iv) brainstorming in sub-working groups, and (v) putting the finishing touches (Bo Westerlund, 2007).

	protecting vulnerable groups, management of the volunteering activities, emergency food services during disasters, provision of emergency housing and other services, management of the transition process with mobile bakeries, mobile canteens and tents, rehabilitation and training	İstanbul Metropolitan Women's Branch of the Turkish Red Crescent
Ministry of Family and Social Services	Developing, enforcing and auditing the legislation and the standards on accessibility	General Directorate of Services for Persons with Disabilities and Elderly
Universities/academicians	Providing data and information for the identification, analysis and process control for disasters and emergencies, ensuring collaboration between organizations	İTÜ, Beykent University
Local governments and planning & design offices	On-site surveying, field studies, redevelopment and reinforcement activities	ARI Urban Planning Office, Municipality of Yalova, İzmir Metropolitan Municipality (representing a local government that was affected by a disaster)
Non-governmental Organizations (NGOs)	Strengthen empathy with persons with disabilities and vulnerable groups, updating data, supporting the awareness building efforts	EKA; Erişebilir Her Şey

During the introduction to the workshop, the definition of disaster and emergency was provided, and then, information on the participating stakeholders' roles, experiences and activities was provided. The Ministry helped to provide further explanation on the current legislation and practices. The workshop was conducted with 40 participants (Figure 3), and the sub-working groups were organized under four different themes: (1) Accessibility of Urban Spaces' in Disaster and Emergency Management (2) Risk Management and Accessibility in Cultural Heritage Areas (3) Social Policies and Accessibility in Disaster and Emergency Management (4) Accessibility to Communication, Technology and Innovations. The sub-working group for each theme was moderated by academicians who have extensive knowledge and experience on the theme in question. Equal representation between organizations was ensured in the sub-working groups of the main session. The discussions in each sub-working group was planned considering the three main phases of the disaster cycle (before, during and after the disaster).

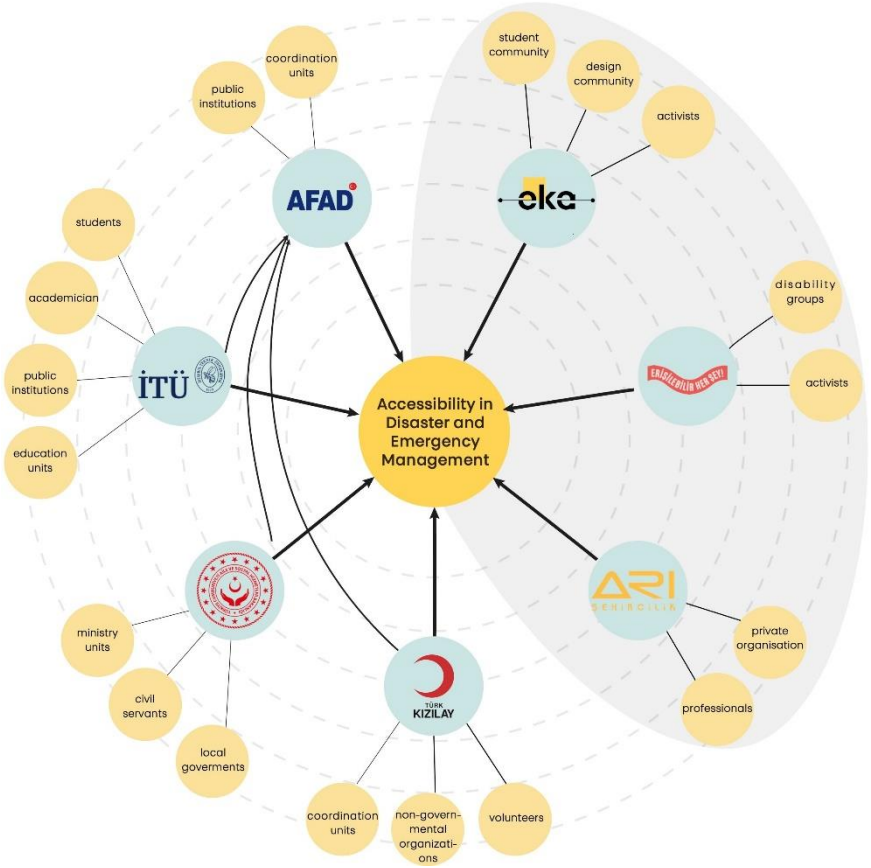

Figure 3 Workshop structure and participatory teams.

For 45 minutes, two primary questions were asked to participants in each of the sub-working groups in the Miro interface:

Question 1. With respect to the theme of your sub-working group, which activities does the organization you represent carry out before, during and after a disaster?

Question 2. With respect to the activities that will be carried out during the disaster and emergency management processes in terms of your sub-working group's theme, what kind of recommendations and contributions would you make?

Moderators of each sub-working group presented an overall evaluation of the discussions in their groups by using the notes that were recorded with the Miro interface, and the common results were formulated. The workshop was conducted online, and it was completed within the designated timeframe of 3.5 hours.

In light of the outcomes of the workshop, the evaluations on and the recommendations for the current disaster and emergency management process in Turkey are provided under four headings.

3.2. 'Accessibility of Urban Spaces' in Disaster and Emergency Management

In cities, equal and quick access should be ensured when managing emergency before disasters, when ensuring coordination during disasters, and when shelters, food and logistics services are provided in the aftermath of a disaster. AFAD is in charge of coordinating this process. Each province in Turkey has a Provincial Level Disaster Risk Reduction Plan (IRAP).[4] Developed under the supervision of AFAD, these plans also enable communication between non-governmental organizations. In order to ensure that inspections, and disasters and emergencies are managed effectively, the efforts to manage relevant authorities under the same umbrella is aimed at achieving a coordinated and swiftly-operating system. In cities, AFAD and the Turkish Red Crescent carry out the training, awareness and education activities before disasters within an institutional framework. Especially non-governmental organizations (such as Erişebilir Her Şey) and teams that focus on accessibility (such as EKA, Point) strive to address the concept of accessibility in detail in the workshops they organize with the youth. The planning process in cities is managed by local governments along with urban planning offices, and projects on urban regeneration and smart cities are developed. The relevant ministries are in charge of inspecting fire escapes and monitoring other accessibility components in buildings and structures. It is possible to state that activities performed before disasters focus on reinforcing the existing structures, training and raising awareness, and making accurate analyses and assessments. During the planning process, the design of public spaces of priority during disasters and emergency events (such as children's playgrounds, sports fields, public parks, etc.), and site selection for housing should be strictly inspected by means of environmental impact assessment reports and, when necessary, plans should be utilized to eliminate any potential dangers in the physical space before disasters. "Vulnerability analyses," "disaster-resilient neighborhood analysis," "needs-impact analysis" (Kadıoğlu, 2008) and "evacuation plans" are the spatial studies that are highly recommended to be completed before any disasters occur.

To properly implement accessibility, cities should create an 'accessibility chain'5 and strive to plan all urban activities around it. Pursuant to the 'accessibility' provisions in Article 9 of the United

[4] Provincial Level Disaster Risk Reduction Plan (IRAP) is a plan that reveals the disaster risk in a province as well as the potential effects of disasters, and it identifies the activities that should be performed and the people in charge of performing these before any disasters occur. The IRAP is formulated as a road map that should be developed with the collaboration of the institutions/organizations and all other relevant stakeholders in provinces. The IRAP should be adopted and put in practice by the entire province, and not by any particular institution or organization. IRAP is not a document that can be prepared and reported only once. Given that provinces have different dynamics and disaster risks, the local stakeholders in each province should identify the dangers, risks and risk reduction activities for their province and put the IRAP in practice as soon as possible. URL-2: https://irap.afad.gov.tr/en/42071/ABOUT-IRAP

[5] Accessibility chain indicates that the outdoor and indoor built environment as well as the transportation and information services that individuals use as they make their way from home to their destination and back to fulfill their social roles are fully accessible (Karadağ et al. 2020).

Nations Convention on the Rights of Persons with Disabilities, "to enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas" (2006/9). This provision defines "accessibility in buildings, and uninterrupted accessibility chain in the transportation system between places" as a condition to ensure that persons with disabilities can live independently and participate fully in social life (Hansen, 2009). In the research titled "Problems and Expectations of Persons with Disability," 66.3% of the persons with disabilities in Turkey state that the building they live in is not accessible, 58.4% indicate that public buildings are not accessible, and 66.9% express that pedestrian roads and pedestrian crossings are not appropriate for the use of persons with disabilities (TÜİK, 2010, pp.25-26). If the accessibility chain is not planned adequately in sidewalks and pedestrian crossings, buildings and yard gates, it is very likely that the accessibility chain will get interrupted in the event of a disaster or emergency. This is also addressed in the Circular on Accessibility Monitoring and Inspection Forms (Karadağ et al,2020). Thus, it would the best option to design building entrances without any difference in elevation and without stairs. If this cannot be achieved, ramps in front yards should be designed. In order to ensure that individuals with disabilities and the elderly can move comfortably on an equal basis with others, in the built environment, the physical space should be designed pursuant to the national accessibility legislation in the Zoning Regulation for Planned Areas (PAİY, 2017), the relevant standards, the international conventions, and the constitutional provisions (Karadağ, 2020). In addition to achieving a spatial planning that considers disasters, temporary shelters and assembly points should be designed to accommodate any unforeseeable risks (Erdin et al, 2016: Sarı et al. 2018).

Disaster response plans are critical because they identify which places are accessible for whom in the event of a disaster or emergency. The actions that inform disaster response plans are (a) identifying the primary evacuation routes, (b) identifying the secondary evacuation routes, (c) assessing the possibility to reach areas that are highly used at nights, and (d) identifying alternative evacuation routes (Kadıoğlu & Özdamar, 2008). Disaster response plans are critical because they identify which places are accessible for whom in the event of a disaster or emergency. In these plans, the coordination units and service groups that will be on duty in the event of a disaster or emergency should be identified, and the details of the organizations, teams and staff that are in charge of the operational plans should be provided.

Within the new spatial organization formed in the aftermath of a disaster, access to these essential activities is critical. Therefore, for disaster response teams, not only accessibility to the disaster area itself but also accessibility to the facilities that are used after the disaster (areas of deployment, logistics hub and storage areas, field hospital and mobile soup kitchens, alternative patient care locations, tent city locations, temporary shelter areas, public buildings and sports facilities appropriate for temporary housing, storage and distribution areas for aid and tents, etc.) is quite critical to ensure that post-disaster activities and services can be performed smoothly.

For the people who witnessed the disaster and who were affected by the disaster, accessibility means reaching safe areas before anything else. In this respect, immediately after an earthquake when panic is at its peak and people run to open spaces (time of the incident or immediately after the incident), accessible and safe open spaces are needed. Guiding decisions are necessary not only to eliminate or recover the consequences of a disaster but also to ensure that the temporary disaster coordination units select a safe site. Assembly points are typically outdoor public green spaces in adequate size that are in a convenient location for the residents and are accessible quickly in an organized manner. These are areas where those affected will spend time to comprehend what happened, to get help, to communicate with their loved ones, and to fulfill their needs temporarily. During the recent floods in Kastamonu and Sinop and the wildfires in southern Turkey, such areas

were also affected by the disaster. In terms of flood risk management, spatial planning measures prove to be a rational solution for areas prone to medium or low flooding risk, whereas in areas under high flooding risk, spatial and structural solutions should be considered together (ITU Report, 2021)

Given that the spatial planning period in the aftermath of a disaster is actually the period of time before a potential disaster strikes, spatial planning efforts should be completed swiftly and persons with disabilities should be included in the process.

3.3. Risk Management and Accessibility in Cultural Heritage Areas

Until the 1990s, 'risk' and 'risk management' were not at all mentioned in cultural heritage areas. UNESCO's 1954 'Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict,' which was enacted in the aftermath of the World War II, was the first international convention on the protection of cultural heritage against threats (Onur, 2019). In 1994, the concept of risk was addressed comprehensively for the first time in the 'Operational Guidelines' that was adopted in the World Heritage Committee's meeting in Phuket (Dinçer, 2012). In 1996, a declaration titled 'Cultural Heritage and Risk Readiness' was published following the meeting in Quebec, Canada (ICOMOS, 1996). In 1997, upon the call from Japan, the Kobe/Tokyo conference was organized with the title 'Risk Preparedness for Cultural Heritage,' and a concluding declaration was prepared (IATF, 1997). In 1998, with reference to IATF's heading on education and guidance, ICCROM's 'Risk Preparedness: A Management Manual for World Cultural Heritage' was published (Stovel, 1992). Risk preparedness and risk management were addressed in the World Conference on Disaster Reduction that was held in Kobe in 2005 - ten years after the city was hit by a major earthquake. Since 2005, risk and risk management were also included in the decisions and practices of the World Heritage Committee, and UNESCO formulated its principal approach to world heritage sites in the 'Disaster Risk Management Manuals.'

In Turkey, the Ministry of Culture and Tourism directly refers to the issue in the guidelines and specifications for the preparation of conservation plans with the following provision: "Conservation plans shall address the aims, strategies and implementation principles on how registered buildings, and the activities and the building stock in heritage sites shall be made more resilient and safe against disasters including but not limited to earthquakes, floods, landslides, rockfalls, etc. and these shall be included in the plan implementation report and plan notes." Another legislation in effect is the Regulation on the Preparation of Spatial Plans, prepared by the Ministry of Environment and Urbanism. When it comes to plans at the national level, AFAD's 'National Strategy and Action Plan on Earthquakes (UDSEP) 2023' addresses earthquake preparedness for cultural assets, and the 'Disaster Intervention Plan for Turkey' (TAMP) clarifies the interventions that will be performed for cultural assets after disasters (Zıvrali & Cabbar, 2015).

When accessible routes are designed in cultural heritage sites, not only wheelchair-users, persons with mobility difficulties, and persons with visual disabilities but also the elderly, children, persons who use strollers, and individuals with attention deficit should be considered. In accessible routes, accessibility may be enhanced by placing notifications in Braille for persons with visual disabilities and designing ropes and tactile surfaces along the route for persons with disabilities (Güler Akın & Tutal, 2017; Tutal, 2020).

In scope of the 'Accessibility Monitoring and Inspection' study, the Ministry of Culture and Tourism performs on-site inspections and monitoring to ensure physical accessibility for persons with disabilities in registered buildings. By suggesting the organization of arts & culture events in historical sites, the 'Erişebilir Her Şey' initiative aimed to ensure that persons with disabilities can experience these sites and to put the question out for relevant authorities on how emergency rescue and evacuation can be performed in these sites in case of a disaster or emergency. In light of the recent disasters that struck cultural and touristic sites, this project brought recommendations on how individuals with disabilities can be evacuated in the event of a disaster, how accessibility to

assembly points and outdoor public spaces can be ensured, and how accessibility to historic buildings can be provided for persons with disabilities. Evaluation reports on out-of-spec physical access features built in historic buildings and in their vicinities (such as accessibility ramps, entrance gates, elevators, restrooms, seating areas, etc.) were submitted to relevant authorities.

One of the most recent activities of the Turkish Red Crescent is a project that is conducted in Manavgat, Antalya in collaboration with the Ministry of Family and Social Services. The project helped to identify how tourists can move around in the aftermath of a disaster. Various tools were developed to ensure effective communication with foreign tourists, immigrants and refugees during and after disasters, and psychosocial aid was provided.

During the rescue efforts after the 2020 earthquake in İzmir, the Turkish Red Crescent realized the emergence of an important social need, and thus, put up a tent to collect the personal belongings found in the disaster area and to return these to their owners. Such an effort can also ensure the protection of historic assets in the buildings located in cultural heritage sites. There is no department that is in charge of the protection and evacuation of cultural heritage sites in the event of a disaster. In historic sites and buildings, there are teams with the necessary technical knowledge and equipment. These should be organized as a team within the Turkish Red Crescent, and those who hold the required accreditation should be employed. In addition, raising awareness among local residents on risk reduction and safety measures in historically significant areas before a disaster may help to improve the sense of belonging and the awareness on preservation.

Ensuring that public officers and staff who are in charge of disaster management are trained with a particular focus on the vulnerabilities of persons with disabilities, ensuring on-site participation of individuals with disabilities to disaster drills, providing audio definitions of the interior and exterior plans of buildings for persons with visual disabilities, and placing audio warning signs are critical.

3.4. Social Policies and Accessibility in Disaster and Emergency Management

Accessibility is an important aspect of human life, and it means safely reaching and using any of the services provided to society. In this respect, accessibility can be considered as a human right in the sense that it refers to, for individuals and for communities, having the ability to fulfill basic needs, having access to social and cultural amenities and opportunities, and being able to benefit from and contribute in the services provided (Çağlar, 2012 in Kalaycı, 2020).

UN Convention on the Rights of Persons with Disabilities is an international document prepared to ensure that persons with disabilities can live independently with dignity. The convention, which is based on the Universal Declaration of Human Rights, is the primary global document that entails protecting the rights of persons with disabilities and preventing any discrimination against individuals with disabilities. Turkey signed the convention on 27 May 2009. The 'European Social Charter,' which was opened for signature by the European Union in 1961 and became effective in 1965, was signed by Turkey in 1961. Article 14 of the Charter defines the "right to benefit from social welfare services," while Article 15 explains "the right of physically or mentally disabled persons to vocational training, rehabilitation and social resettlement." In Turkey, the first regulation was enacted in 2005, and the Law on the Human Rights and Equality Institution of Turkey enacted in 2016 proves to be an additional support and contribution towards solving the accessibility problems that persons with disabilities face and considering the needs of individuals with disabilities. In addition, the Law No. 5378 on Persons with Disabilities secures the social rights of individuals with disabilities to access social resources and services.

In recent years, in Turkey and around the world, the need for social aid has intensified, thus making its way into the agenda as a social policy tool to combat poverty. The Social Assistance Directorate General (SADG) has the most extensive organizational structure and numerous programs to provide social aid services in Turkey, and the SADG utilizes the online database system

called Social Assistance Information System (SOYBIS) to track the social assistance infrastructure. The Turkish Red Crescent and the Ministry of Family and Social Services archives the profiles of those affected from disasters in the Social Assistance Information System (SOYBIS). SOYBIS provides detailed information including household income, place of residence of household members, and number of persons with disabilities in the household, and the information is updated periodically (URL 3).

In scope of the comprehensive disaster management, descriptive and comprehensible animations were prepared for school children with visual disabilities and/or hearing loss to educate them on what to do before, during and after a disaster. The Turkish Red Crescent's 'Organizing the Community Leaders Project' entails selecting persons with influence on community (such as teachers, muhtars, religious officials, etc.) and training them on disaster awareness to spread knowledge and raise awareness among communities. The Club with no Disabilities within the Turkish Red Crescent offers first-aid trainings to volunteers. In order to mitigate disaster risks, a project on "how a mother can rescue her child, what can be done within the first 72 hours" is currently underway. The Turkish Red Crescent's Disaster System Module is being designed. Social aid requests will be collected in this system, and information such as which requests were fulfilled and what specific items are needed in a certain region will be stored digitally in this module (URL 4). Thus, equal access for all will be ensured.

In the event of a disaster or an extraordinary event such as a pandemic, education activities may be interrupted locally, and temporary or permanent solutions may be formulated depending on the effects of the disaster. During such times, it may look like digitalization in education makes things easier, but it may also lead to inequalities in education.

3.5. Accessibility to Communication, Technology and Innovations

Turkey is vulnerable to numerous natural disasters due to its geographic location. In addition to these, many disasters occur as a result of wrong decision-making processes, leading to significant loss of lives and property every year. The current communication technologies that enable us to access knowledge and the internet from virtually anywhere may prove to be helpful to prevent the emotional and material loss (Hoşgörmez, 2015).

New generation (4G and 5G) communication technologies enable rapid transfer of audio, video and data. Even though partially, phones provide uninterrupted communication in emergency events. Besides, the data shared by the local community in a disaster-struck area is collected and processed in the disaster command centers, enabling officials to analyze the situation and plan accordingly. IP cameras that can be connected to computers, mobile land teams, helicopters and planes can send very important images to command centers in real time. RFID technologies enables updating the systems with information on which treatment was performed on a certain disaster survivor and what kind of aid was provided to a certain person, and thus, prevents any duplications and abuses in the distribution of aids. This method is vital for those who are under risk in earthquake-prone areas. In short, though indirectly, the increased availability of communication technologies worldwide may help reducing the adverse consequences of disasters.

With the breakout of the COVID-19 pandemic in 2020, the scope of accessibility changed from physical accessibility to a space into accessibility to digital platforms. Relevant ministries should prepare, spread and make it easy to access public service ads, and persons with disabilities should be provided with proper access to the activities on disaster management and any relevant data. For disaster management, it is critical not only to provide access technologies and connection tools, but also to develop an infrastructure that can be combined with effective solutions towards facilitating communication and preventing any interruptions in access.

Increasing the frequency of disaster drills and raising awareness will help to further enhance social integration and cooperation before any disasters occur. At this point, special attention should

be paid to disaster literacy. An environment of confidence based on public participation should be created, and the correct methods for communication should be utilized. Disaster awareness should be made a part of daily life by creating data maps. A plan for communication should be developed. Paying specific attention to privacy and security, geographical data can be embedded into widely used application such as the HES and e-Government to create a shared database and communication system. This can further evolve into a system that provides risk notifications before disasters and creates regional reports on needs.

The Disaster and Emergency Management Presidency (AFAD) at the Ministry of Interior makes use of tools including VR, GPS, drones, early warning systems, and AYDES disaster management system to manage risks, preparedness and measures before disasters. During disasters, remote sensing systems are used effectively to calculate the effects of the disaster and the provide supplies to camps. AFAD also ensures swift data transfers between ULAKBIM and AFAD TVDM (Earthquake Data Center System of Turkey) systems. This system is an outcome of the collaboration between the Turkish Atomic Energy Authority and the General Directorate of Geographic Information Systems at the Ministry of Environment and Urbanism, and it enables the transfer of knowledge between public authorities with various tools.

Warning sirens and integration-based systems are also used during disasters. Moreover, the Ministry installs siren systems across the country and deploys mobile communication vehicles in various locations to ensure uninterrupted communication during disasters. Mobile coordination trucks are used for further support. And thus, disasters can be managed more effectively. With help of the AFAD-RED program, scenarios are formulated to foresee the extent of the damage a disaster may cause. In the aftermath of a disaster, ULAKBIM – AFAD TVDM system may help to assess the damage. There are roughly 111 data monitoring centers in Turkey. The data obtained from these centers are collected in a single point in the data center to prevent any misinformation (URL 5, URL 6).

Given that, during a disaster, citizens may not be able to access the data sources that were prepared before the disaster, alternative solutions should be developed. Examples to such alternative solutions include RFID wristbands and radio systems. During disasters, up-to-date data should be used to ensure accurate and direct intervention, and access should be provided for each and every citizen.

4. Conclusions

This study scrutinized the current situation under four headings in terms of the intersection between accessibility in disasters and emergencies, and urban resilience, and emphasized the need for social harmony and an inclusive perspective. In Turkey, the legislative background in disaster risk management is outlined by numerous documents. With AFAD ensuring coordination, the roles and responsibilities of the Turkish Red Crescent and other stakeholders are clearly defined. Based on the evidence-based evaluations performed during the workshop as well as the comments provided by vulnerable groups, it is possible to draw the conclusion that social awareness is the step that does not function properly.

The awareness, competencies and knowledge of individuals should be increased in terms of both spatial construct and the social aspect, and the disaster preparedness aspect of the disaster management process should be handled with extra attention. Indeed, giving priority solely to the planning of the rescue and recovery activities during and after a disaster is not sufficient to achieve disaster resilience. Resilience in urban disasters refers to the ability of a community to adapt, to avoid dangers, and to reevaluate the consequences of a disaster to update the conditions in the event of natural and/or man-made disasters and hazards. As highlighted in its description, resilience means “adapting,” “avoiding dangers,” and “learning lessons from previous disasters and make future use of these lessons.” When the expectations in these basic areas are met, it will be much easier to implement the policies in the specific topics mentioned under the disaster cycle.

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Resume

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Resilience in intentionally destroyed historic settlements: An examination on Kirkuk Citadel and the old town of Van

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Abstract

Armed conflict is considered a major risk for cultural heritage since the Second World War and guidelines are prepared by international organizations such as UNESCO and ICCROM on risk management and protection of cultural heritage in conflict-affected areas. However, the main concerns are reducing risks prior to the armed conflict by identifying, analyzing, evaluating, treating and monitoring risks and managing them before the risk occurs. The literature is quite narrow in respect to the ways of protecting cultural heritage and sustaining life for both buildings and people in intentionally destroyed historic settlements. Within this context, this study aims to raise the question on how to manage change in the intentionally destroyed historic settlements and how to strengthen resilience in conflict-affected areas. In order to achieve this aim, an examination on two case studies, Kirkuk Citadel and the Old Town of Van, which were both intentionally destroyed as a result of armed conflict is made using comparative analysis method. The cases are chosen to represent different time periods, scales and types of destruction. Depending on the international law and guidelines, the study tries to understand the impact of armed conflict on the historic settlements embracing tangible and intangible cultural heritage, types of risks that threaten them and the ways to strengthen resilience in such areas. It is revealed as a result of the study that for both case study areas, being in the tentative list of UNESCO World Heritage is seen a primary step to be internationally recognized and to claim help for future actions aiming to reduce risks. Nevertheless, it can be argued that strategies have to be developed depending on the size and level of destruction, and the level of intervention to preserve and to rehabilitate life in such historic settlements, as each intentionally destroyed historic settlement has unique cultural, political and economic characteristics.

Keywords: cultural heritage, armed conflict, resilience, the old town of Van, Kirkuk Citadel

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1. Introduction

Armed conflict and the protection of cultural heritage against hazards thereof constitutes a worldwide problem since the end of the 19th century, which has been treated in a large scale since the Second World War, however destruction of cultural heritage in former Yugoslavia, Syria, Mali and Iraq in the last decades raised new discussions. Starting with the Declaration of Paris in 1856, an international consensus on the conduct of war has been tried to be established (Higgins, 1909). One of the earliest texts stating regulations concerning the treatment to cultural heritage during war is the First Hague Convention, dated 1899, determining in Article 27 that "*In sieges and bombardments all necessary steps should be taken to spare as far as possible edifices devoted to religion, art, science, and charity, hospitals, and places where the sick and wounded are collected, provided they are not used at the same time for military purposes*" (Brown Scott, 1920, p. 257). Keane (2004, pp. 6-7) claims that the following 1907 Hague Regulations concerning the Laws and Customs of War on Land expanded the legal protection of cultural heritage, included the term historic monuments to Article 27 and that International Military Tribunal Sitting in Nuremberg, Germany in 1945-1946 marked the beginning of the customary protection of cultural property. The failure of protecting cultural properties in Europe during the First and the Second World Wars, despite The Hague Regulations, resulted in organizing a special convention for the protection of cultural property in the event of armed conflict in Hague. The 1954 Hague Convention1 (Url-1) recognizes that cultural property has suffered grave damage during recent armed conflicts and that, by reason of the developments in the technique of warfare, it is in increasing danger of destruction, and states that damage to cultural property belonging to any people whatsoever means damage to the cultural heritage of all mankind, since each people makes its contribution to the culture of the world and that cultural heritage should receive international protection.

In Article 9 of the 1954 Hague Convention, it is declared that the High Contracting Parties should ensure the immunity of cultural property under special protection which is listed in the International Register. In the Register list dated 2015, it can be seen that only Germany, Mexico, The Netherlands and Vatican City State have their cultural heritage registered (Url-2). The reason behind this fact lies in the 5th paragraph of Article 8 of the text, which is "*If any cultural property ... is situated near an important military objective ..., it may nevertheless be placed under special protection if the High Contracting Party asking for that protection undertakes, in the event of armed conflict, to make no use of the objective...*". Keane (2004, pp. 16-17) argues that this is one of the major shortcomings to the system of special protection and the other is that States may object to a proposal for entry into the International Register, which resulted in rejecting the inclusion of Angor Wat complex into the list depending on the grounds that four States did not recognize the legitimacy of the Cambodian government.

Despite the shortcomings of the text developed as a result of The Hague Peace Conference in 1954, it is clear that consideration of cultural heritage as a product of the contribution each people makes and that should belong to all mankind has been the main motive for cultural heritage protection. Since then UNESCO has the central role in relation to both the development of the 1954 Hague Convention and to strengthen it, which has engendered World Heritage Convention in 1972 (Boylan, 1993, p. 127). Boylan (1993) emphasized UNESCO's role in decisively implementing regulations stated in 1954 Hague Convention, increasing the number of High Contracting Parties and to constitute effective national and international measures for protecting cultural heritage. Depending on Boylan's report and discussions undertaken (Chadra, 2001), the Second Protocol to The Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflicts was adopted in 1999. The Second Protocol mainly simplified the procedure for the grant of special protection and introduced 'enhanced protection', tightened the concept of military necessity, and established individual criminal responsibility and an institutional mechanism to promote respect for cultural property and monitor its implementation. Article 10 of the Protocol

[1]For detailed analysis of the 1954 Hague Convention see Schipper, F. T. and Frank, E. (2013).

declares that three conditions should be met to be placed under enhanced protection; being of the greatest importance for humanity, being protected by adequate domestic legal and administrative measures and not being used for military purposes or to shield military sites. The Protocol also expands the coverage by stating that it shall apply in the event of an armed conflict not of an international character, occurring within the territory of one of the Parties in Article 22.

These efforts however arguably have been relatively effective in protecting cultural heritage. UNESCO, with the help of bodies such as ICOMOS and ICCROM has been the leading authority to identify heritage properties for protection, by way of introducing World Heritage List. The list does not necessarily include cultural heritage under threat of an armed conflict but establishes a worldwide knowledge of valuable heritage properties belonging to all mankind, and therefore UNESCO also has the responsibility for introducing measures to protect them. Lostal (2017, p. 35) argues that the 1999 Second Protocol Committee aimed to examine the synergies between enhanced protection and world cultural heritage in order to revamp the enhanced protection regime of the protocol, as there were more than eight hundred cultural sites on the UNESCO World Heritage List at the time of the preparation of the Protocol. Nevertheless, UNESCO aiming to keep guiding to the States and related bodies that desire to keep their cultural heritage safe, bring about new topics for discussion, trace developments in the world and develop and publish new declarations such as UNESCO Declaration Concerning the Intentional Destruction of Cultural Heritage in 2003, Managing Disaster Risks for World Heritage in 2010, and so on.

The 2003 UNESCO Declaration Concerning the Intentional Destruction of Cultural Heritage states that the international community recognizes the importance of the protection of cultural heritage and reaffirms its commitment to fight against its intentional destruction in any form so that such cultural heritage may be transmitted to the succeeding generations, and defines intentional destruction as "*an act intended to destroy in whole or in part cultural heritage, thus compromising its integrity, in a manner which constitutes a violation of international law or an unjustifiable offence to the principles of humanity and dictates of public conscience*" (UNESCO, 2003, p. 448). The Declaration gives responsibility to the States both to take measures to prohibit, prevent, stop and punish any intentional destruction of cultural heritage within the extent provided for by international law, and also to establish jurisdiction over and provide effective criminal sanctions against individuals who commit or order to be committed acts of intentional destruction. Nevertheless, the intentional destruction that was practiced before the 2003 Declaration endangered the integrity of cultural heritage in various parts of the world. Therefore, one of the major problems concerning the intentional destruction against cultural heritage is the type of strategy to be developed in order to both regain the integrity of the heritage areas and also to make sure that the States and relevant bodies would be prepared for possible risks in the future.

1.1. Armed Conflict and Cultural Heritage

Threats to cultural heritage in the event of armed conflict are argued to result from intentional destruction, collateral damage, forced neglect, as well as from the organized looting and illicit trafficking of cultural objects (UNESCO, 2015, pp. 1-5). UNESCO (2015, pp. 1-6) defines the combination of the intentional and systematic destruction of cultural heritage, the denial of cultural identity, including books and manuscripts, traditional practices, as well as places of worship, and of memory and learning as "cultural cleansing". There is argued to be a widespread tendency towards considering cultural heritage less important while people's lives are at stake. However, it was suggested in 2016 referring to the armed conflict in the Middle East and Asia that "*The fight to protect the peoples of the region and their heritage cannot be separated*"[2]. Therefore, the idea of considering cultural cleansing and mass atrocities as intertwined concepts are getting more supporters every day and suggestions are made for future actions to both protect cultural heritage and also to sustain cultural continuity (Weiss and Connelly, 2017, pp. 44-45).

[2]Middle East Institute, Asia Society, and the Antiquities Coalition (2016)

Nevertheless, it is revealed as a result of the literature review that all efforts are focusing on identifying risks that cultural heritage is facing during armed conflict, trying to prevent them or plan treatment methods before an armed conflict, manage change and threats during an armed conflict, and to manage the whole process with the inclusion of all related bodies in an international environment. Therefore, the success of the process arguably depends on the intention of the Party States, and whether they are willing to cooperate with UNESCO and other authorized bodies that can supply expert intervention. It is clear that there are other major issues that have to be taken into account considering the unexpected scale of destruction of heritage sites, which might result in the extinction of life and cultural heritage. Within this context, this study aims to raise the questions on how to manage change in the intentionally destroyed historic settlements and how to strengthen resilience in conflict-affected areas.

2. Method

Depending on the international law and guidelines, the study tries to understand the impact of armed conflict on the historic settlements embracing tangible and intangible cultural heritage, types of risks that threaten them and the ways to strengthen resilience in such areas. In order to achieve the aims mentioned above, an examination on two case studies, Kirkuk Citadel and the Old Town of Van, which were both intentionally destroyed as a result of armed conflict is made using comparative analysis method. The cases are chosen to represent different time periods, scales and types of destruction, and both were destroyed as a result of internal armed conflicts. While the Old Town of Van was burnt down in 1915 by the Armenian citizens, Kirkuk Citadel was destroyed in 1998 aiming to force Turkmen (Turcoman) community living in the area to move out.

The examination is undertaken following the scientific methodology introduced by ICCROM in 2016 which was directed to the cultural heritage professionals and institutions in the Middle East region for risk examination and assessment.

3. Resilience to Disasters and Risk Management

Resilience is defined as "*the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions*" (IPCC, 2012, p. 5). It is argued that resilience could apply to both people and the built and natural environment and is shaped by both physical and social factors (Murthy, 2013, p. 21). Concerning the role of cultural heritage, it is widely accepted that the intrinsic historic or artistic value, fundamental spiritual and psycho-social support and the sense of belonging it provides to communities during the disaster recovery phase make cultural heritage an important aspect and that its protection should be promoted for a robust culture of resilience in heritage sites.

Murthy (2013, p. 30) accepting that cultural heritage includes knowledge, beliefs, values and behaviours that give communities their unique identities, emphasizes the role of cultural heritage in promoting resilience to disasters focusing on two aspects, the role of traditional knowledge in building resilience and the role of culture in mobilizing actions that reduce disaster risk and support disaster recovery. Therefore, it is possible to argue that despite international legislation and set of guidance provided by UNESCO and other relevant bodies, there is a need for understanding the cultural codes, beliefs, values and behaviours at the local level in order to develop successful strategies for providing resilience to disasters.

Nevertheless, it is widely accepted that the first step for ensuring resilience to disasters is to understand the context and identify the risks threatening cultural heritage and heritage sites in general. Risk, is defined as '*the chance of something happening that will have a negative impact on our objectives*' (ICCROM, 2016, p. 9). Applying the definition to the cultural heritage, risk management would advise a methodology to preserve the existing cultural heritage from the expected loss of value to the heritage assets (ICCROM, 2016, p.10). It is the process of

understanding and dealing with possible negative impacts on the cultural objectives, including identification, analysis, and evaluation of risks. Followed by application of an action to 'treat' risks, avoiding and eliminating or reducing the risks that are considered unacceptable. Also, it is important to mention that risk management is a continuous process, to ensure that negative impacts on cultural objectives will be minimized by continuous monitoring of the risks and adjusting the actions to it accordingly (ICCROM, 2016; p. 14).

ICCROM Guidance (2016, p. 20) aiming to understand all aspects of the context in which the heritage asset is situated, identified political environment, actors and stakeholders, administrative and operational aspects, financial context, legal aspects, physical environment and socio-cultural environment as the major topics that should be examined. And also defined 10 agents that can cause deterioration and loss to heritage assets as physical forces, dissociation, incorrect Relative Humidity, incorrect temperature, light and UV, pollutants, pests, water, fire and criminals (ICCROM, 2016, p. 27). Within the scope of this study, the chosen case studies and their current situation are examined in accordance with the aforementioned guidance in order to develop an understanding of the general context of intentionally destroyed historic settlements and to identify risks they are facing to discuss challenges that face them and suggest ways to promote resilience in such areas.

3.1. The Case of Kirkuk Citadel

Kirkuk City has a multi-ethnic society consisting of three major ethnicities, the Kurds, Arabs and Turkmens, as well as several other ethnic groups. Given to both geopolitical, social and economic status of Kirkuk City, and the continuing ethnical conflict during the last decades, between different local political parties over the ownership of the City, the cultural heritage and especially Kirkuk Citadel experienced severe deterioration. In the year 1998, the Iraqi regime (Saddam Hussein's government) forced all the ancient Citadel's population to move out (MacFarquhar, 2003). The latter population were Turkish speaking ethnicities basically Turkmens and Chaldeans, the regime then enforced an Arabization policy towards non-Arab ethnicities in the City (Bet-Shlimon, 2019). After evacuating the Citadel, authorities demolished almost all the residential buildings in the existing historical urban fabric, keeping only 50 out of around 800 houses and some monuments (Saatci, 2003), leaving the remaining buildings in vacant fields detached from their original fabric (Figures 1 and 2).

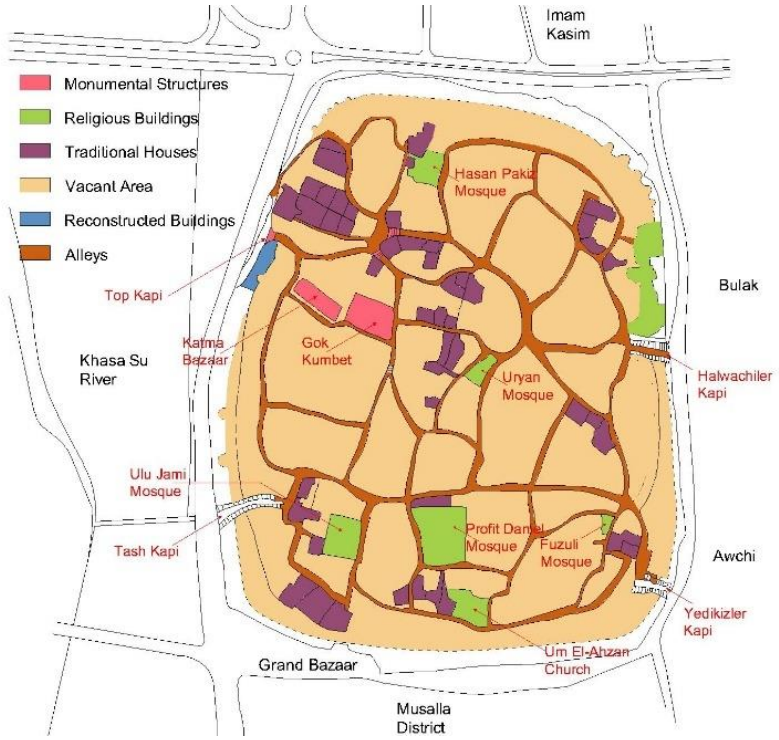

Figure 1 The current land use of Kirkuk Citadel, redrawn from the hand-drawn site plan of the Citadel by Kirkuk Directorate of Antiquities and Heritage (KDAH) (Mustafa Mokhtar's archive)

Figure 2 Ariel photos of Kirkuk Citadel, before the destruction (left) and the situation in 2010 (right) (Mokhtar and Korumaz, 2017, p. 130)

Kirkuk Citadel was built above an archaeological tell, where 51 tablets found in 1923, showed that the history of the City goes back to the middle of the second millennium B.C. (Baqer and Safar, 1962). After the Citadel's position as a defensive fortress had ended, the outer walls were disappeared and replaced by residential buildings, which gave the Citadel a civilian character more than a military fortress. Excavations in the year 2000 lead by the Kirkuk Directorate of Antiquity in the northern sides of the Citadel, discovered remains of walls built by thick adobe bricks with semi-circular abutments. The topography, climate, construction materials, absence of orthogonal grids, consideration of civil aesthetics and social segregation in Kirkuk Citadel is a clear evidence of being a cultural descent of the ancient Mesopotamian cities, like Erbil Citadel and many others (Oliveira, 2016, p. 54).

3.1.1. The Cultural Heritage of Kirkuk Citadel

The Citadel has a semi-rectangular shape with rounded corners, having a dimension of approximately 500x400 meters and nearly 20 meters high above the nearby ground level. There are four gates which allow entrance to the Citadel, Tash Kapi in front of Tash Kopru (stone bridge), Top kapi (canon gate) opening to Khasa Su river side, YediKizler gate and Halwachilar gate both lead to the east side of the Citadel. Only Top Kapi was remained, which was built with stone and traditional gypsum mortar named "Nura". The same building technic was used in most residential buildings in the Citadel. The urban fabric was distributed in three districts which are Hamam, Aghaliq and Meydan (starting from south to north), and Hamam district was divided into two parts, the Christian Hamam and the Muslim Hamam.

Ulu Jami (meaning the great Mosque in Turkish) or Meryem Ana Jami (Virgin Mary Mosque) is the only functioning mosque (beside Profit Daniel Mosque) till this day, every week people from nearby areas gather here for Friday prayer. The mosque has a rectangular plan with a single dome on the west side. Only the base and part of its minaret on the east side of the building has survived.

This mosque was originally converted from a previous Church, the exact date of its erection is unknown, but it is estimated that it was built after the 12th century (Saatci, 2003).

The other important mosque is Profit Daniel Mosque, containing three tombs inside, which are believed to belong to Jewish rabbis. Although it's called a mosque, it is more like a shrine which is considered divine even by the Muslims, with people visiting it weekly every Saturday. This mosque is converted from a Jewish temple, but neither the date of the conversion nor the date of its erection is known. The part of the building that contains the tombs is covered with twin domes, which is a distinctive character. Furthermore, this mosque has a minaret, nearly 15-meters high, constructed with special curved bricks, embodying the characteristics of the mosque architecture in the 15th century (Saatci, 2003). In the east side of the latter mosque lays the oldest cemetery in the city, the marble inscription over its entrance indicates that it was restored in the year 1665.

Another mosque located in the north-western side of the Citadel known as Hasan Pakiz Mosque was built by the governor of Shahrizor (the state of Kirkuk at that era) Firari Hasan Pasha in the beginning of the 18th century, being originally part of a religious complex, which included a madrasah (Islamic school) (Saatci, 2003, p. 35). The other two mosques are the Uryan and Fuzuli Mosques. Alongside with these Mosques, a ruin of a Church named Um El-Ahzan is located in southern side of the Citadel in Hamam district. All these mosques and the church were built by local stone with traditional gypsum mortar.

There is also a free-standing mausoleum surrounded by newly built arcades, known as GokKumbet or the Blue Dome. The octagonal brick structure of this monument is decorated with brick panels in all of its facades. The inscription on this monument bears the date 1361 A.D. dating back to the Jalairid Sultanate. As a result of extensive repairs in the 1980s, a pyramid shaped roof was added to the top, which was later changed into a dome by another restoration in recent years. It is important to mention that the Mausoleum was once located inside the courtyard of a destroyed traditional house within the old urban fabric. Among the ruins of the Meydan district near Top Kapi gate, there is a small, covered bazaar known as Katma Bazaar or Kilchiler Bazaar. It is composed of two rows of 17 small shops with a covered hallway between them. The Bazaar remained hidden underground till the demolition project in the year 1998, when excavation and restoration projects took place for this building (Saatci, 2003, p. 35).

The other important elements of the heritage assets of Kirkuk Citadel are the traditional houses. As mentioned previously only 50 houses survived from about 800 houses. Similar to the other traditional houses in the region of Kirkuk characterized by particular architectural and typological features, these houses reflect Turkmen ethnicity's way of building in the region. The most obvious feature is the typology of the Dor-Ataba part of the houses, which functions as the modern living room. This part can be seen in almost every traditional house of the Turkmen populated cities and villages in the region. Only a dozen of these houses are restored, the remaining are in very poor condition and deterioration is increasing every passing year.

After nearly 20 years in the destruction of Kırkuk Citadel and with the change in the regime, The Permanent Delegation of Iraq suggested to add Kirkuk Citadel to the tentative list of UNESCO World Heritage, which was approved on 6th of April 2021 (Url-3). The justification of outstanding universal value depends on meeting Criterion iii and iv, and described as follows:

> *Criterion (iii): Kirkuk Citadel represents a unique testimony to an existing civilization that has not disappeared, as urban monuments, especially the heritage houses inhabited so far, as well as the places of worship in the citadel.*

> *Criterion (iv): The architectural styles on which the architectural features of the citadel were built are unique, and they adopted the construction methods prevailing in Iraq during*

that period, and those architectural styles were preserved through the restoration and preservation work that was carried out in the citadel.

It is also stated that "*the historical design of the citadel was preserved through the relationship between the components of the citadel and the citadel is still vibrant and inhabited by the people. The preservation and restoration process is still taking place in the citadel and the use of traditional building materials and archaeological investigations are underway in many parts of the castle, to link existing landmarks to each other and establish a sequence (stratigraphy) for the site's layers*".

Although the justifications in the nomination dossier claim that the citadel is still vibrant and inhabited by people, the level of intervention has to be in large scale in order to bring life back to Kirkuk Citadel, as the majority of the area within is vacant and only the monumental buildings are subject to restoration. Currently Turkish Ministry of Culture and Tourism is restoring officers' graveyard next to the Prophet Daniel Mosque and the Gok Kumbet (which was named The Green Dome in the text). Apart from Gok Kumbet, it is seen that Turkish names were changed into Arabic phrases such as Uryan Mosque was put into the text as Al-Aryan Mosque and Topkapi as Bab al-Toub. These facts bring new areas of discussion about the political intention of the Iraqi State, ensuring social life for Turkmens, who were the real residents of the site and the preservation of tangible and intangible cultural heritage in the Citadel.

3.1.2. The General Context of the Citadel

Alongside the heritage assets of Kirkuk Citadel which have been discussed earlier, the other relevant aspects of the context in which the Citadel is situated includes the administrative, legal, political, socio-cultural, economic and climatic environments.

Administrative Aspects

Kirkuk Citadel and the heritage assets underlying within it, are in the responsibility of "Kirkuk Directorate of Antiquities and Heritage" which is a branch of "Antiquities and Heritage General Authority" in Baghdad within the administration of the "Ministry of Culture, Tourism and Antiquities" (MCTA, 2015). "Kirkuk Directorate of Antiquities and Heritage" which directly administrates the Citadel, coordinates with "Kirkuk Governorate" in mutual projects or any affair concerning the sites within the authority of the Directorate. It should be noted that there are two Mosques (Prophet Danial and Ulu Jami) which are under the administration of the Iraqi "Sunni Endowment Office". The responsibility of securing the Citadel is upon the "Police of Antiquities and Heritage", which is one of the "Iraqi Ministry of Interior's" department. Today there are only four guards securing the whole site of the Citadel (IMI, 2019).

Economic Context

Usually the financial assets that support projects concerning the Citadel comes from the "Ministry of Culture, Tourism and Antiquities". Recent turbulences and the austerity policy applied in Iraq, significantly reduced the share of the Ministry from the Federal Budget of the Country, as a result, serious conservation or restoration projects for the Citadel never occurred. This kind of dilemma between different governmental establishments directly or indirectly responsible for the Citadel, derives from the long period of dereliction towards the historical site and is not helpful in protecting cultural assets.

Legal Aspects

As mentioned above, the Iraqi regime during 1998 had forced all the Citadel's population to move out, forcibly expropriating their houses and giving them in return distant land pieces in the City as compensation. Therefore, all the land property in the Citadel nowadays are in the possession of the "Kirkuk Directorate of Antiquities and Heritage". In order to protect and conserve the antiquities and heritage, and organizing excavation and restoration operations, the Iraqi "Supreme

Judicial Council" legislated the "Antiquities and Heritage Law" numbered 55 for the year 2002 (Al-Musawi, 2012). The antiquities and heritage assets should be declared by a decision of the Minister of Culture and the authorities of antiquities and heritage have the right to expropriate the real estates that contain antiquities within it. The law implies severe punishments for various types of intentional damages to the antiquities and heritage assets (Al-Musawi, 2012).

Political and Socio-cultural Environment

Generally political parties in Kirkuk are distributed ethnically and each party claims the cultural and historical ownership of the City. As Kirkuk Citadel is the major cultural and historical feature of the City, it occasionally became a subject for the ethnical tension. In March 2017, when the previous Governor of Kirkuk decided to raise the flag of Kurdistan Region of Iraq over Kirkuk Citadel, the United Nations Assistance Mission for Iraq (UNAMI) raised concerns about the decision (UNAMI, 2017). Despite being uninhabited, deteriorated and left for decay, many people still visit the Citadel periodically every Friday and Saturday, an old tradition in the City which is still practiced. They gather for the Friday prayer in Ulu Jami and visit Prophet Danial's tomb on Saturdays. Since 2003, the Newroz spring festival is annually celebrated in the Citadel and people from inside and outside Kirkuk also visit the Citadel to explore the historical monuments and the remaining traditional houses of the city. Kirkuk Citadel represents a very important socio-cultural feature in the city for all its inhabitants, and also attracts small number of tourists from other cities in Iraq and rarely foreign tourists.

3.1.3. Risk Assessment of Kirkuk Citadel

Within the scope of the study, the 10 agents of deterioration for Kirkuk Citadel are discussed in short and summarized in Table 1, in order to have a comprehensive understanding of the possible risks and their impact on cultural heritage.

The Citadel of Kirkuk has a history of poor interventions during several restoration projects that took place in this historical site, which led to the loss of many ornamental features in the survived buildings. Furthermore, the majority of the survived historical and traditional buildings from the destruction are unused, unlocked and totally susceptible to all kind of physical risks. After the fall of the previous Iraqi regime in 2003, and the security vacuum in the country accompanied with it, plenty of moveable parts in the remained buildings of the Citadel, like original iron window frames and wooden doors were stolen. In addition to previous criminal acts, a lot of graffiti vandalism could be seen on the walls of the heritage structures. Due to majority of the buildings being disused with no electrical installations or equipment and furniture, fire risks are rare in the Citadel. The few buildings which are in use recently (like Prophet Daniel and Ulu Jami Mosques) are vulnerable to fire incidents. Rainwater is the major agent of deterioration of the historical buildings in the Citadel. About 40 houses from the all 50 remaining traditional houses in the Citadel are ruined, their ceilings partially destroyed and the interior of the houses are exposed to rainwater and all other deterioration agents. Among all kinds of pests, termites have the most effective causes of damage to the historical structures in the Citadel, especially to the wooden doors and window frames. Dust storms are the main pollutants in the region and the most contaminative towards the buildings in the historical site. These storms usually occur during the summer season.

Table 1 Risk agents in Kirkuk Citadel considering the types of occurrence

	Rare Events	Common Events	Cumulative Processes
Physical Forces		- Destructive interventions - Collapsing of overloaded ceilings	

Criminals	- Ideological vandalism	- Theft - Visitors damaging parts of the buildings	- Graffiti vandalism
Fire	- Large and small fires		*Generally, not applicable
Water			- Water leaks - Cracking - Moisture
Pests		- Termites damage	
Pollutants		- Color fading of buildings	- Visitors' littering
UV	*Generally, not Applicable	- Color fading of gypsum covering and marble in the buildings	
Effect of Temperature		- Fragile mortar	- Façade dissociation
Effect of RH (Relative Humidity)		- Cracking - Moisture	
Dissociation		- Information loss	

The majority of the buildings in the site have no doors nor glasses in their openings -being looted or damaged-, therefore the interiors are in exposure to all kinds of pollutants. The UV index of sunlight in Kirkuk reaches extreme levels in months like June and July, with level of 11, which causes extensive change in colour to gypsum covering and marble decorative parts of the historical buildings' exterior and interior, colour changes are more explicit in the southern facades. And finally, a lot of inscriptions on the monumental buildings, have been lost by vandalism or other physical effects, which contained information about the monuments that were not documented, resulting in dissociation.

3.2. The Case of the Old Town of Van

The old town of Van, located on a plain land is circumscribed with Van Fortress in the north and double city walls in the other directions, which were built in the eleventh century (Uluçam, 2000, p. 21). Although the Castle houses ruins from Urartian Kingdom centred at the Lake Van basin between the ninth and sixth centuries BC, and early Christian temples, the old town of Van was settled much later. Being a prosperous Ottoman town until the beginning of the 20th century because of trade, the town had 243 streets, 5000 dwellings, a military barrack, four markets, a jailhouse, courthouses, pharmacies and inns at the end of the 19th century (Cuinet, 1892, p. 694). The town faced invasion by the Russian army and Armenian gangs which started in 1915 and ended in 1918, resulting in the evacuation of the town and destruction of almost all buildings, and the town has not been settled since then (Öztürk, 2004, p. 53).

3.2.1. The Cultural Heritage of the Old Town of Van

There were four gates of the city walls of the old town of Van. Tebriz Gate on the east had two towers on both sides (Evliya Çelebi, 2000, p. 253), on the south walls there were Middle Gate and Pasha Gate, of which Pasha Gate was reconstructed, and on the east there was Port Gate, which was completely destroyed. Apart from the gates there were several religious buildings within the city walls. While Great Mosque of Van (14th Century) and Red Minaret Mosque (13th Century) were built prior to the Ottoman Period (Güzeloğlu, 1995; Kuban, 2002; Saban Ökesli and Akar, 2012, pp. 41-43), they both show unique features of the traditional construction techniques and the materials. The Ottoman mosques that have survived are Kaya Çelebi Mosque (16th-17th century) (Güzeloğlu, 1995, pp. 36-37; Uluçam, 2000, pp. 51-54), Hüsrev Pasha Complex (16th century) (Uluçam, 2000, pp. 38-48), Kethüda Ahmet Mosque (19th century) (Uluçam, 2000, pp. 59-60), Horhor Mosque (17th century) (Uluçam, 2000, pp. 55-58) and Beylerbeyi Mustafa Pasha Mosque (17th century) (Uluçam, 2000, p. 58). Although all of them were greatly damaged as a result of the

destruction in early 20th century and earthquakes that occurred in the area in later years, Kaya Çelebi Mosque and Hüsrev Pasha Complex were reconstructed in early 21st century aiming to reflect the Ottoman life in the old town of Van (Figures 3 and 4).

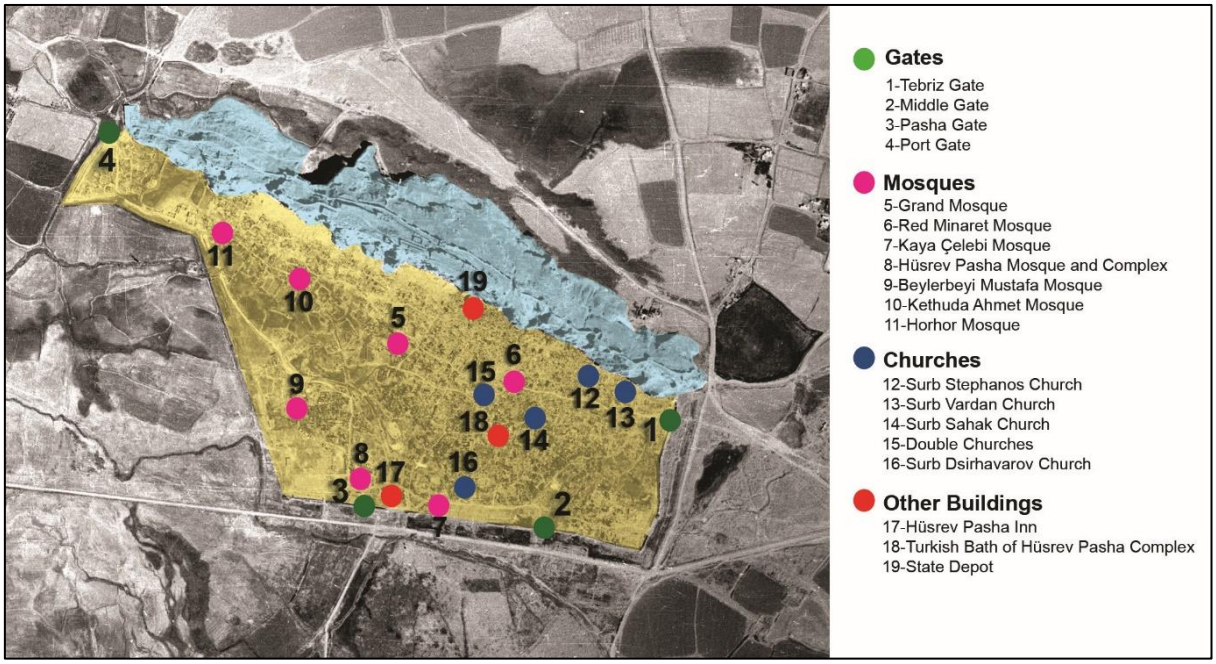

Figure 3 Historic monuments in the Old Town of Van (redrawn form Saban Ökesli and Akar, 2012, p. 36)

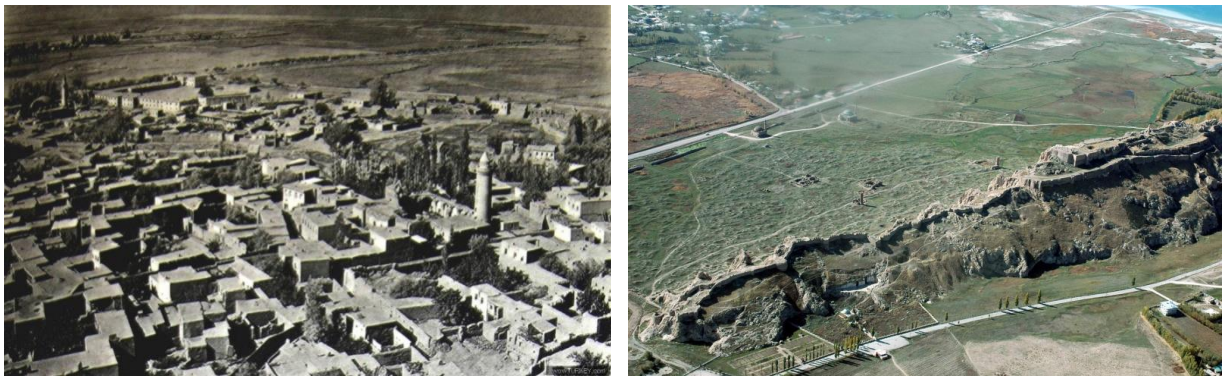

Figure 4 The Old Town of Van before 1915 (left) (Saban Ökesli and Akar, 2012, p. 29) and the situation in 2012 (right) (Saban Ökesli and Akar, 2012, p. 17)

There are also ruins of churches within the walls of the town, although construction dates are unknown, which are Surb Stephanos Church (Uluçam, 2000, p. 67), Surb Vardan Church (Uluçam, 2000, p. 65), Surb Sahak Church (Uluçam, 2000, p. 61), Surb Dsirhavarov Church (Uluçam, 2000, p. 68) and Double Churches (Surb Paulos and Surb Petros) (Uluçam, 2000, p. 63; Güzeloğlu, 1995, p. 39). Amongst them Surb Dsirhavarov Church is recently restored, however the building is under risk of flooding (Saban Ökesli and Akar, 2012, p. 55). Apart from these buildings there are also ruins of Hüsrev Pasha Inn (16th century), Turkish Bath of Hüsrev Pasha Complex (16th century) and State Depot (18th century) (Uluçam, 2000, pp. 68-69) within the walls of the Old Town of Van.

The Old Town of Van was added to the tentative list of UNESCO World Heritage in 1986, however the application was renewed and the Permanent Delegation of Turkey nominated Tushpa/Van Fortress, the Mound and the Old City of Van to the tentative list of UNESCO World Heritage, which was approved on 13th of April 2016 (Url-4). The justification of outstanding universal value depends on meeting Criterion ii, iii, iv and vi, and the justification for the Old Town of Van were described as follows:

Criterion (ii): *Van Fortress and surroundings as shaped by the Urartian architects proved to be a convenient habitat for future generations. The rock architecture, for example, was fully exploited by the Ottomans and it was one of the largest castles of the empire in Anatolia. The fact that Persian, Parthian, Sassanian, Christian and Ottoman remains are visible in the site makes it unique in cultural continuity and legacy. Besides all these, it is the single most important centre that Ottoman urban fabric along with that of Urartu is observed.*

Criterion(iii): *The Kingdom of Urartu, with its political structure, institutions, architecture and other cultural remains, was one of the most developed state structures in the first millennium BC in Anatolia. Representing all the characteristics of the Kingdom of Urartu, the capital Tushpa/Van Fortress bears exceptional testimony to this disappeared civilization. Along with other cultural remains, the site has the richest and longest collection of Urartian inscriptions, making it the most important source for the reconstruction of the Urartian history. Just as it was a witness to the foundation of the Urartian Kingdom, the Lower settlement of Tushpa inevitably contains important archaeological information for the decline and the new comers arrived in the aftermath.*

Criterion (iv): *Royal rock tombs, monumental open air sanctuaries and palaces are the most prominent architectural features of the capital, which is a unique and still-standing example of a citadel. Every corner of the outcrop, which is by itself a monument, was utilized by the Urartian architects. Monumental rock-cut royal tombs and niches with accompanying inscriptions make the site the most distinctive settlement of the region in the first millennium BC. The royal tombs in particular have no parallels in Mesopotamia and Anatolia in that period.*

Criterion(vi): *Until its abandonment due to the heavy damage inflicted by the events of 1915, the Old City of Van was home to many religious and ethnic groups for 800 years allowing them to leave their unique marks of material culture. This multiculturalism, on the basis of mutual respect, is evident in religious and civilian architecture.*

The justifications stated in the nomination dossier emphasizes the importance of the Urartian civilization, and while defining the significance of the Old Town of Van, the prominent justifications are being an example of the Ottoman urban fabric, which was destroyed more than 100 years ago and multiculturalism which is argued to be evident in religious and civilian architecture. The truth is that only two mosques and a chapel were restored in the Town, which do not serve to any residents as there is no settlement within the city walls. The other monumental buildings are in ruins and none of the residential buildings had survived. Therefore, these facts bring new discussions such as considering the size of the Old Town of Van, and that there is no population living in it, how beneficial is the restoration aiming the reuse of some of the monumental buildings and how the conservation plan for the Old Town of Van can be useful for promoting life in the Town.

3.2.2. The General Context of The Old Town of Van

The general context of the Old Town of Van is explained below under the same topics as Kirkuk Citadel.

Administrative Aspects

As the Old Town of Van is abandoned for more than 100 years ago, and there are mostly ruins of heritage assets within the old town, the land is under the responsibility of the State of Turkish Republic.

Economic Context

Having an area of approximately 45 hectares, the restoration or reconstruction of the cultural heritage within the city walls and re-establishing the Ottoman urban fabric in the Old Town of Van is not viable financially, unless an international consensus is provided.

Legal Aspects

The cultural heritage in Turkey are protected according to the provisions of The Law Concerning the Protection of Cultural and Natural Assets numbered 2863, adopted in 1983 and relevant regulations developed since then. There is also a National Inventory for Cultural Heritage, and the Old Town of Van was added to the list in 1979 as a First-Degree Archaeological Site, which has to be protected as intact as possible (Saban Ökesli and Akar, 2012, p. 10).

Political and Socio-cultural Environment

As the new settlement of the city of Van following the destruction of the old town within walls was moved towards northeast, there is no intention of settling back within the city walls. However, the Old Town of Van and the Van Castle surrounding the northern border having remains from Urartians and Ottomans and is a popular destination for tourists especially because of the view from the castle towards the plain land and the Lake of Van. Following the preparation of conservation plan for the site in 2012, the Old Town of Van and its close surroundings were restricted for construction activities.

3.2.3. Risk Assessment of the Old Town of Van

The city of Van has been subject to earthquakes throughout history, and it is still affecting the area. The last earthquake occurred in 2011, resulted in the destruction of the restored mosques within the Old Town of Van. Touristic activities and having no control of tourists bring about problems of security and vandalism to the cultural heritage within the area. As the land within the city walls is empty and too large to control, growing plants are under the threat of fire which cause risk to the remains of monumental buildings (Table 2).

The major natural problem is the high level of groundwater which could not be drained especially in the western part of the old town, adjacent to the Lake of Van. As the main material of construction was adobe (mud brick) within the Old Town of Van, especially for residential buildings, heavy rains for more than 100 years as well as the groundwater, combined with the earthquakes resulted in the extinction of the built environment and the land currently is comprised of small hills, reflecting the presence of houses once in the area. In addition, UV and effect of temperature weaken the survived adobe structures. Pests, pollutants and effect of RV are generally not applicable in the area, however visitors' littering is a problem both for the perception of the area and also because of creating risk for fire.

Table 2 Risk agents in the Old Town of Van considering the types of occurrence

	Rare Events	Common Events	Cumulative Processes
Physical Forces		- Earthquakes - Collapsing of restored monuments	
Criminals		- Visitors damaging parts of the buildings	- Graffiti vandalism
Fire		- Large and small fires in the open land	*Generally, not Applicable
Water			- Moisture - The high level of groundwater because of the lake
Pests		*Generally, not Applicable	
Pollutants		*Generally, not Applicable	- Visitors' littering

UV	*Generally, not Applicable	Fragile mud plaster	Loss in the material
Effect of Temperature		Fragile adobe structure	Loss in the material and demolition of the structures
Effect of RH (Relative Humidity)		*Generally, not Applicable	
Dissociation		- Information loss	

4. Conclusions

Aiming to raise the questions on how to manage change in the intentionally destroyed historic settlements and how to strengthen resilience in conflict-affected areas, this study examined Kirkuk Citadel and the Old Town of Van, in order to discuss challenges of post-conflict destruction. It is ascertained as a result of the study that the size of the historic settlement, the scale of destruction and the time passed after the destruction are major determinants for the level of intervention. Although the destruction in both case studies is grand in scale, because of covering a smaller area restoration and reconstruction projects developed for Kirkuk Citadel might be effective once they are implemented to re-establish the urban fabric. At the same time, the fact that the efforts to protect the destroyed Kirkuk Citadel started approximately 20 years after the demolition, ensures that the ties of the inhabitants with the site and cultural heritage are re-established before they break. However, in the case of the Old Town of Van, reconstruction of three religious buildings has had no significant improvement in the area because of the size of the Town. In addition, the beginning of the interventions for conservation in the Old Town of Van about a century later, as well as the relocation of the urban settlement, resulted in the rupture of the tangible and intangible ties of the residents with the site. In this case, it is necessary to differentiate the methods, models and conservation scenarios to be followed for strengthening the resilience of cultural heritage that have been similarly destroyed in line with the dynamics of the area.

Furthermore, lack of documentation is another major problem, as only some of the monumental buildings, which constitute only a minor part of the built fabric were recorded. This fact brings about a primary problem, meaning that it is impossible to re-establish the original urban fabric and a major question, is it viable to promote resilience in the areas where physical structure cannot be put back again.

Considering the nomination of both heritage sites to the tentative list of UNESCO World Heritage, it can be argued that ruins of the monumental buildings were seen as a starting point to attract international recognition and a step to raise the potential of the sites for investment. However, does the existing national and international legislation and the know-how really give the opportunity to develop strategies and long-term plans for the recovery of historic settlements intentionally destroyed as a result of armed conflict? Or do we need new and innovative ways of managing such areas, not necessarily focusing on recovering the whole of the area and reconstructing the urban fabric which is not viable because of the level of destruction?

This brings the importance of the involvement of the community, fundamental spiritual and psycho-social support and the sense of belonging to communities. The study revealed that although the level of destruction is grand, cultural and social life can survive and cultural rituals can continue if an even small part of the community keeps living in the area. It can be argued that only total extinction of life in a historic settlement results in the absence of cultural life and sense of belonging, as even the recovery is intended it might take generations to implement, which might result in the loss of traditional knowledge.

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In search of preservation strategies for the historic cultural landscape of Karabağlar Yaylası in Muğla

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Abstract

Historic cultural landscapes consist of pattern of layers reflecting mutual interaction of the local people with the land through time. They have material and immaterial traces of collective practices of the initial inhabitants and a local culture. Traditional determinist approach has a tendency to split material and immaterial, natural and cultural values and evaluate them separately. However, the concept of cultural landscape has been arisen as a criticism against this duality and distinction and thereafter landscapes started to be regarded as cultural representations that are shaped by both natural and cultural values. This article explores the historic cultural landscape of Karabağlar Yaylası in a rural-urban continuum in search of preservation strategies regarding changing relations with modernization and urbanization. Karabağlar Yaylası is a semi-urban and semi-rural settlement close to Muğla city centre. The seasonal migration and socio-economical interdependency have been two significant facts that sustain the settlement. However, the historic cultural landscape of Karabağlar is under threat of urban sprawl and increasing development pressures with urbanization. Modernization tools and implementations have fragmented and transformed the distinct socio-spatial pattern of Karabağlar and destroyed its character defining features over the last five decades. In order to reveal socio-spatial transformations in Karabağlar, a survey analysis was conducted. Two similar face-to-face questionnaires carried out in 2006 and 2020 are evaluated comparatively. The questionnaires have been structured over how the inhabitants of Karabağlar perceive the space, how they develop land use and the symbolic meaning they attribute to the space. Findings related to field research and the empirical results of the questionnaires are evaluated holistically and changing social, economic and environmental relations are elaborated. To combat with the problems arising due to socio-spatial transformations, the article proposes some preservation strategies that care cultural values as far as natural values, perception of residents, collective memory, sense of community and their interaction with the land. This study has a potential to set up a research agenda in terms of preservation strategies for similar geographical settings.

Keywords: cultural landscape, socio-spatial transformation, preservation, Karabağlar Yaylası,

1. Introduction

The traditional approach that dominated the preservation of heritage values considered cultural and natural values as two opposite concepts and evaluated each value as measurable and objective. This idea generally stemmed from the inability to integrate the cultural belonging to the human

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being with the natural belonging to the land. With the influence of the science of ecology, it has become prevalent in time that the protection of the environment will include both natural and cultural values and the definition of these values may also include the subjective dimension because of the things belong to human being.

The concept of cultural landscape was introduced, especially in the early 1990s, after international conservation organizations re-evaluated the concepts of natural and cultural heritage. With the new conservation approach, which aims at the continuity of natural and cultural patterns in continuity and integrity and which eliminates the urban-rural, natural-cultural duality; geographical areas containing unique landscape elements have begun to be considered as 'cultural landscape areas' that should be preserved.

This article aims to search preservation strategies against the deterioration of historic rural-urban cultural landscape of Karabağlar Yaylası. It is a semi-rural area of historical importance, which stands out with its unique geomorphological structure, natural and cultural landscape elements and spatial pattern, on the periphery of the city of Muğla, approximately 4-5 km from the city centre. The seasonal cyclic movement between Muğla and Karabağlar occurring for centuries that has been the remnant of transhumance culture characterizes the settlement as it creates an interdependency and interaction with the city. It both contributes to the city's economy with agricultural production and meets the recreational needs of the citizens.

Karabağlar Yaylası was formed by the society shaping nature with different practices throughout the history and witnessed different social rituals and social events. The interaction of the society with the environment has created the unique spatial pattern of the settlement. In this respect, Karabaglar keeps the cultural history of initial inhabitants and presents cultural richness. The known history of Karabaglar dates back to the 17th century when the first sedentary settlement movements started with Turcoman nomads. According to the Ottoman cadastral registers, Karabağlar took a noticeable place in the agricultural production of the city. With the seasonal migration movement, it is observed that the inhabitants of Karabağlar have been multi-spatial. Until 20th century, Karabağlar preserved its authentic character of being backyard of the city. With modernization, especially after 1950s, socio economic and technological dynamics have altered the significance of Karabaglar for town economy and social life. After 1960s, the technological developments especially in transportation have been effective in the restructuring of Karabaglar settlement pattern. The cultural landscape of Karabaglar started to transform into new residential area of the town as a result of urbanization. In the recent century, developments in the economy, technology, and transportation have changed the preferences of people that influence the lifestyle and the building practices in Karabaglar. Hence, the original character, natural and cultural qualities could not sustain their existence.

This article evaluates the cultural landscape of Karabağlar Yaylası in a rural-urban continuum therefore it sets an agenda by developing preservation strategies for settlements such as Karabağlar Yaylası by revealing the changes from the past to the present, in a perspective of changing society, changing perception and preservation approach. For this purpose, after defining the concept of cultural landscape in the rural-urban continuum, how the studies on the protection of the cultural landscape have developed is succinctly explained. The character defining features consisting of natural and cultural values of Karabağlar Yaylası are examined through the historical existence of Karabağlar. As the method of the study, two questionnaires carried out on different dates in the settlement are compared, some of the similar problems in the 14 years old period are explained, and the main values, perceptions and the preservation perspective of the residents of Karabağlar are revealed. Social, economic and environmental changes in Karabağlar are explored with the changing conditions of time and modernization process. Finally, the article discusses the preservation strategies by evaluating the historic cultural landscape of Karabağlar in combination with the perception of the society and examining the perpetuation of Karabağlar's being.

2. Conception of cultural landscape in rural-urban continuum and the preservation of cultural landscape

The concept of cultural landscape was first used formally by German geographer Otto Schlüter to explain territorial areas in the early 20th century. Cultural geographers used the term to describe the visible and tangible man-made forms on the landscape. In time, the concept has spread to other social and behavioural sciences like archaeology, history, ethnology, anthropology, environmental psychology, landscape ecology and became interdisciplinary (Conzen, 2001).

Cultural landscapes can be explained as the manifestations of interaction of human being with their natural environment over space and time. Common to all the fields, the traditional approach has a tendency to highlight the contrast of 'cultural' and 'natural', 'urban' and 'rural'. By creating a dichotomy, cultural and natural landscapes, urban and rural settlements are usually conceptualized as the two opposite ends of human settlements. Nevertheless, population movements, temporary seasonal migrations and socio-economic dependencies among rural and urban settlements have weaken this widespread conception.

The concept of cultural landscape has been put forward as a criticism against the traditional approach, which tends to create a distinction in the process of assigning value to everything related to culture and nature. Criticisms were made not only on the natural and cultural distinction, but also on the nature of value. It has been suggested that natural and cultural values, which were evaluated only objectively until then, can be evaluated subjectively, as they can gain moral value with the perceptions of the observer or users. The concept of landscape ecology, which emphasizes the mutual interaction and inter-relatedness of natural and human forces, has been an important starting point in this sense. The idea that cultural landscapes, which have a complex network of relations formed as a result of the relationship between human and natural factors, form a pattern in layers has started to become widespread (Jacques, 1995). It has been determined that natural and cultural values should be evaluated in an integrity and continuum with the concept of cultural landscape. Since the settlements that contain natural and cultural values together are socio-cultural assets produced by urban and rural practices, they should be evaluated in rural-urban continuum.

Analyzing the morphology of the settlements, Kostof (1989) evaluates the natural and cultural, rural and urban dilemmas as a visual contrast. He claims this dichotomy as essentially two aspects of a single continuum. He defines rural-urban continuum as a seamless physical continuity of time and space. He emphasizes the mutual dependency between rural and urban as the continuous processes of settlement: "The traditional labor of the farmer and the husbandman, set in the plains and pleats of the land and subject to seasonal rhythms, stands in millennial juxtaposition to the affairs of the city" (Kostof, 1989, p.112-113). In brief, the dependency of rural and urban is a spatio-temporal continuous process. When this continuum is broken with technological and rational developments of urbanization, discontinuity changes the existing role and significance of settlements by alienating them from their cultural, historical, traditional, local characteristics.

Arntzen (2002) describes the cultural landscape in two categories: material and immaterial. Material cultural landscape is the physical and visible manifestation of human activities. Immaterial cultural landscape, on the other hand, although they do not have any physical and visible traces, they can have symbolic meaning due to the importance they have for the members of the culture. The cultural landscape is not static, on the contrary, it is in constant change. It includes human actions that change over time, the meaning they attribute to space, and the relationship of material and immaterial values to the place. Therefore, all cultural landscapes have associative values (Taylor, 2018). To understand this associative value system, it is necessary to view cultural landscapes as a form of representation instead of physical reality. In order to understand and record the cultural landscapes, cognitive mapping is more useful instead of physical mapping. Cultural landscape is a phenomenon that depends on experience rather than observation. Therefore, the experienced dimension has an important role for the society that creates and maintains the cultural landscape (Smith, 2010). By highlighting the human role for the organically evolved and associative

landscapes, UNESCO (2021) defines cultural landscapes as part of our collective identity in the aspect of experience.

In the late 20th century, preservation studies started to evaluate cultural landscapes not just as a visual object, they had the awareness of interconnectedness and interdependence between human being, their social and natural environment (Taylor, 2018). The first legal document to recognize and protect the concept of cultural landscape was the World Heritage Convention signed in 1992. For the first time, the Committee decided to include the cultural landscape with three categories on the World Heritage List. According to this Convention, cultural landscapes represent "the combined works of nature and of humankind" with their distinctive geomorphological structure. This concept includes the long and intimate interaction of humanity with its natural environment (UNESCO, 2021). Cultural landscape is a kind of form of social history reflecting human values and perceptions. Preservation studies and ethic emphasized the pivotal role of landscape in people's sense of place, place meaning and values. Thus, in 2011, a special interest of UNESCO to historic cultural landscapes that have the traces of different human experiences and rituals within layers lead to recognition of the management of change and values in preservation process (Taylor, 2018).

3. Method

This study is based on researches in the case area of Karabağlar Yaylası over a period of 20 years. The changes are recorded in the area with cadastral maps, spatial plans, photographs, land use records and ownership. In the scope of this article, a survey analysis was conducted in Karabağlar Yaylası in order to reveal socio-spatial transformation of the settlement. Within the survey analysis, two similar face-to-face questionnaires conducted in Karabağlar Yaylası in 2006 and 2020[1] were evaluated comparatively. Both questionnaires were carried out during the summer months due to traditional way of life based on seasonal migration. While in 2006, 200 respondents were chosen from the local landowners who possess minimum a parcel homogeneously from Karabağlar settlement pattern; in 2020, 150 respondents were chosen with similar features. The questionnaire of 2006 consisted of three-part questions to understand the land, the building structures in the land and the user character, and open-ended questions to understand the natural and cultural values deteriorated by the changing land use. The questionnaire of 2020 mostly consists of questions to determine the character of the users and to understand ecologic and cultural situation of the settlement and the main problems and expectations that the users have. The results obtained from the two questionnaires were examined comparatively on some similar and subsequent questions and changes in relations and expectations that were determined over 14 years old period. Thus, the socio-spatial transformation, perception of residents about the change in the landscape of the settlement and the preservation activities of the local people are evaluated with the help of the empirical data obtained from the questionnaires.

4. Historic rural-urban cultural landscape of Karabağlar Yaylası and character defining features

Karabağlar Yaylası is a cultural landscape area that offers a unique combination of rural and urban features and processes in a historical perspective. Since its historical formation depends on the social, economic and environmental interdependency and interrelatedness between urban and rural structures, it should be considered as a socio-spatial product of cultural and natural processes.

Karabağlar Yaylası is both a semi-rural and semi-urban settlement that is 4-5 km far from Muğla city centre. The settlement is separated from the city centre by Hamursuz Hill (Figure 1). Although Karabağlar is slightly lower in altitude (approximately 625 m) than Muğla town center (650 m), it

[1]The questionnaire conducted in 2020 was carried out by Muğla Karabağlar Development and Beautification Association within the scope of the "Sustainable Use of Biodiversity and Cultural Landscape Areas in Karabağlar Yaylası" Project supported under the UNEP (United Nation Environment Programme) Global Environment Facility Small Grants Programme.

was called 'Karabağlar Yaylası (Plateau)' by the local people. With this attribute, Karabağlar is the only plateau in Anatolia that can be reached by descending.

Karabağlar Yaylası is a cultural heritage with its natural, cultural and ecological components and its unique traditional way of life is in harmony with these components. For centuries, Karabağlar Yaylası has served as a 'yaylak' (summerplace) for the people of Muğla who migrated in the summer, a 'bağ' (vineyard) consisting of vineyards that Evliya Çelebi mentioned in the 1670s, a 'bağ-bahçe' (orchard) that contributes to the agricultural production of the city, and a 'sayfiye yeri' (countryside) that the urban people interact with nature. It is perhaps one of the few settlements in the world that can respond to all these different land use demands. Accordingly, Karabağlar Yaylası was registered as an urban and third-degree natural site whose cultural heritage should be protected in 1977. A conservation plan, emphasizing the regulation of secondary housing density was prepared by using traditional conservation management mechanisms and ratified by Muğla Municipality in 2003.

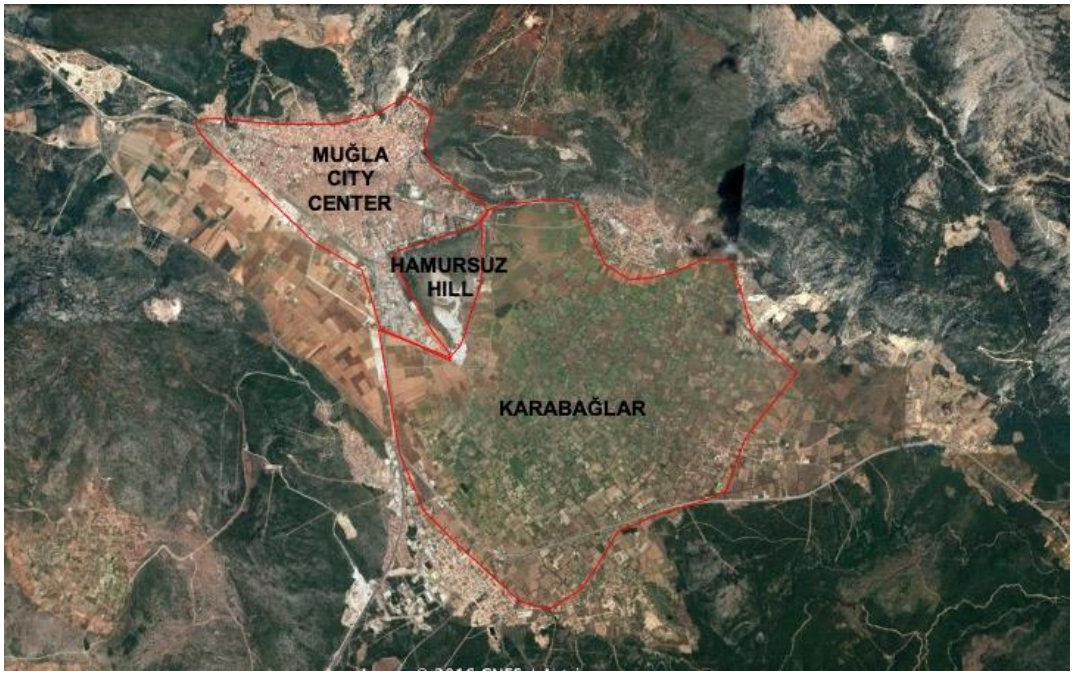

Figure 1 Location of Karabağlar Yaylası

There are some character defining features that enable Karabağlar Yaylası to be accepted as historic rural-urban cultural landscape.

4.1. Distinctive geomorphological structure

Karabağlar Yaylası is a depression polje (plain) with karstic-based alluvial deposits formed by tectonic movements. The main material underground consists of limestone with a porous structure, and the presence of a waterproof clay layer at a deeper level allows the formation of rich underground water. In Muğla, heavy rains in winter and spring accumulate underground thanks to the porous structure of the multi-part limestone layer and form a stable underground water source. The streams and ponding areas in the polje, which has a slightly sloping ground, allow alluvial soils to be collected on the polje floor, thus creating a very fertile and arable agricultural soil. There are well-like structures called as duden (sink-holes) that allow excess groundwater to drain. They prepare Karabağlar for a productive planting period every spring (Koca, 2012) (Figure 2). For this reason, heavy rainfall, the porous limestone layer that provides rich underground water, streams flowing on the surface of the polje, ponding areas and dudenler are indispensable structures for the continuity of Karabağlar Yaylası. Any intervention to this integrated structure can damage this ecological system irreversibly.

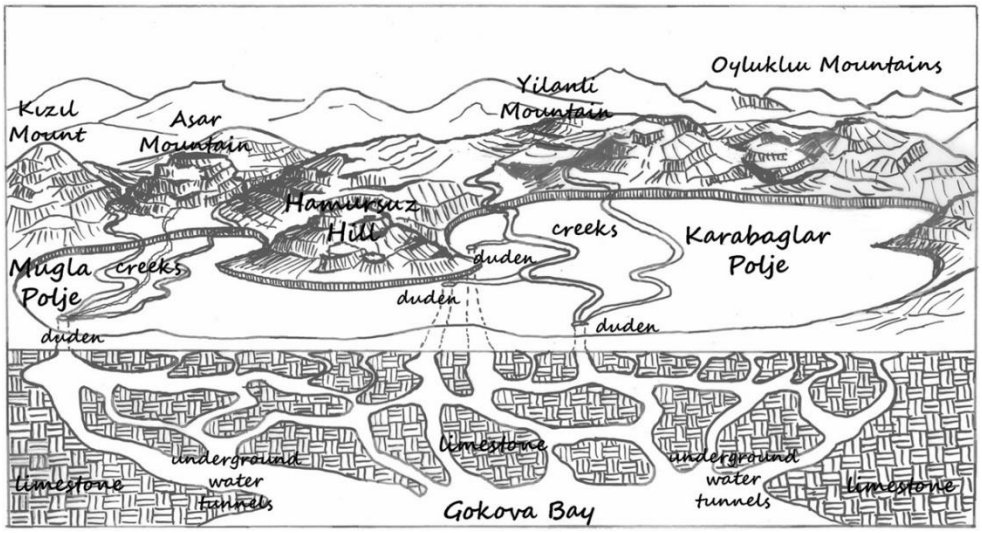

Figure 2 Geomorphological structure of Karabağlar Polje and dudenler

4.2. Distinctive landscape components

'Irim', 'kesik', 'kabalık' are the distinctive landscape components that shape Karabağlar. From the past to the present, these structures have been shaped by the society for social and economic purposes. In the context of the landscape element, although 'kesik' literally means 'a ditch opened around a field, vineyard, garden' in the dictionary, in Karabağlar this word refers to bushes and tree groups on the earthen elevations surrounding the fields. They are usually 1-2 m wide and 1.5-2 m high. The formation of kesikler absolutely depends on irimler. İrim, which we sometimes encounter as dead end in Karabağlar, is actually a road network and creek ground created between kesikler to pass from field to field or from one parcel to another. It is generally 3 meters wide and 2 meters deep (Barlas & Koca, 2006). In Figure 3, section of irim and kesik is given.

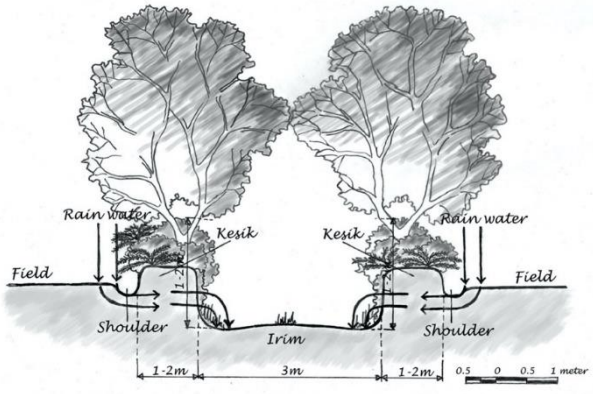

Figure 3 Section of irim and kesik

4.3. Biological diversity

The presence of rich ground water and bioclimatic comfort conditions in Karabağlar offers an incredible biological diversity. The kesikler contain many kinds of wild fruits and shrubs such as rosehips, blackberries, grape vines, elms, wild pears, quince, walnuts, figs, plums, cranberries, hawthorn, oak, vines and chinchillas. The strong vegetation that grows on the kesikler creates a living and breeding area for fauna (Koca, 2012). Ensuring the continuity of the kesikler without interruption provides circulation and freedom for the fauna on it. Therefore, preventing the kesikler from being transform into wire fences or walls is crucial for the survival of the fauna.

4.4. Distinctive socio-spatial pattern

Social life in Karabağlar begins in the 'yurt', which constitute the smallest unit of the settlement. Although the meaning of the word 'yurt' describes the tent in a circular form used by nomadic Turkmen communities (Sözen & Eruzun, 1992), it has also begun to express meanings such as the place settled, homeland, and motherland over time. In Karabağlar, the land consisting of a field (vineyard-garden), residence and a well is called as 'yurt' (Figure 4). Although different in size, yurtlar have similar spatial components such as residence, sofa, field, well, outbuilding, barn, courtyard, irrigation pool, fireplace, wooden bedstead, fruit trees and flower beds. Karabağlar has approximately 2890 agricultural plots with an average size of 3000-5000m2 clustered under 48 locations (Koca, 2012) (Figure 5). The word 'yurt' in Karabağlar contains both existential and conceptual meanings as a product of a social understanding that sees land and home as inseparable entities. Each yurt has become a part of social life in every sense beyond being just an agricultural land. The fact that the owners of the yurtlar are called by their nickname or surname is the proof of this situation (Koca & Barlas, 2014). In Karabağlar, yurtlar are located around the focal points where service structures such as summer coffee houses, summer masjids, grocery, bakery, shoemaker, barber, tailor etc. The focal points, which are usually referred to by the coffee name or the name of their owners, serve the yurtlar around them and form the clusters together with the yurtlar. These focal points, which are the product of private property, became a common gathering area for the local people and functioned like public squares.

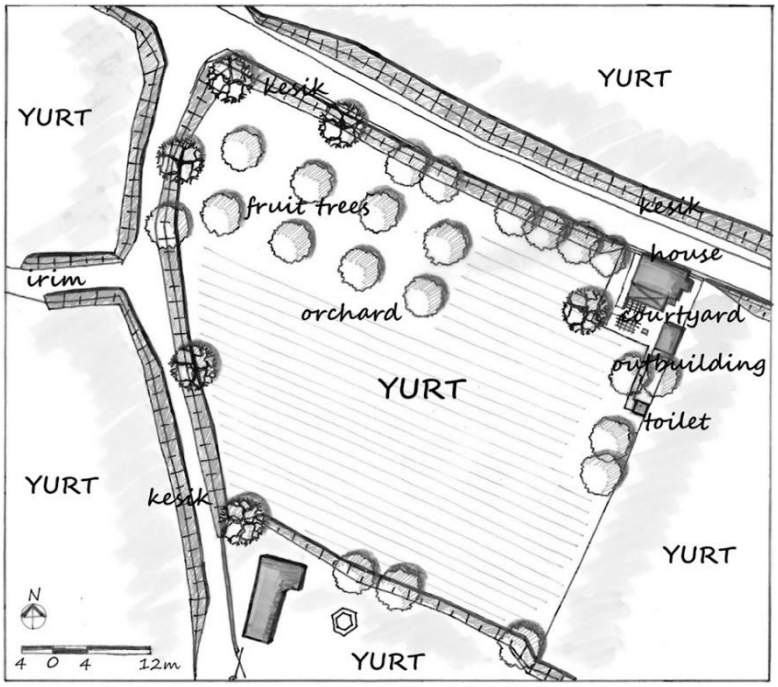

Figure 4 Plan of a 'yurt'

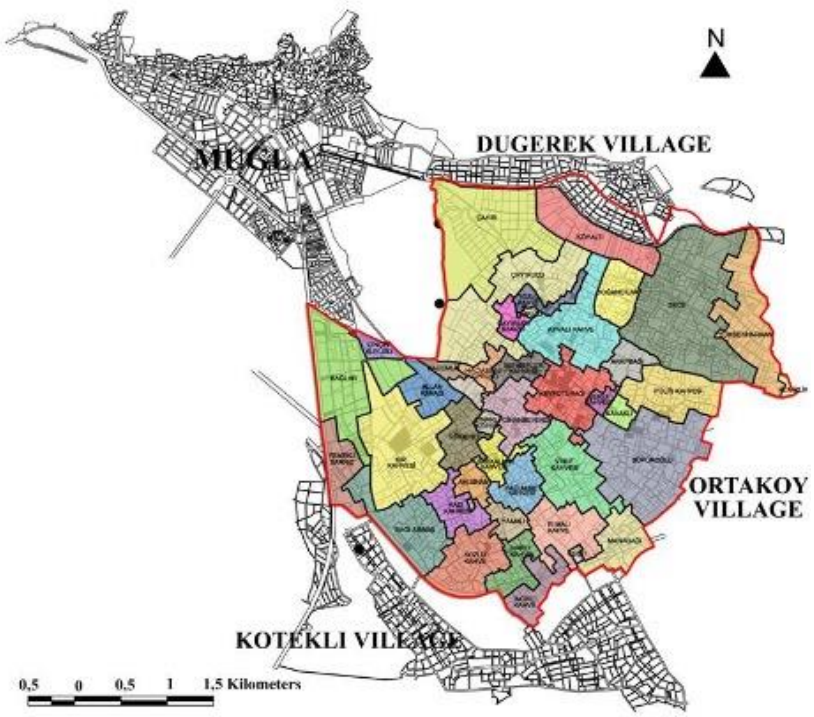

Figure 5 Karabağlar and its 48 locations.

4.5. Traditional way of life based on seasonal migration

Traditional way of life in Karabağlar is based on the seasonal migration between city center and the plain, which takes place between May and October every year. This seasonal migration-based displacement has been a necessity for the continuation of life in the past. Those who migrated to Karabağlar are not only local people, but also the craftsmen who offer services to clusters. This seasonal cycle makes the life in Karabağlar an extension of the city. Seasonal migration is obligatory because natural conditions such as ponding areas in Karabağlar formed as a result of the rains after October and the flooded road network and irimler make it impossible to stay there (Koca, 2012).

5. Results of comparative questionnaire analysis

Since landscape is a cultural structure that reflects human values, it is necessary to adress intangible values that creates social history in landscape studies. The intangible components of cultural landscapes that refer to historic, social and spiritual values and cultural responsibilities are the perceptions of the local inhabitants and their interaction with the natural environment (Taylor, 2016). For this reason, in this study, questionnaires were conducted in order to reveal the perspective of the people living in Karabağlar towards perceiving and using the space and giving meaning to it. Although the questionnaire conducted in 2020 is similar to the questionnaire conducted by the author in 2006, new questions were added in 2020 to address the main problems identified with the results of questionnaire of 2006.

The demographic structure of the respondents gives us information about the local users in Karabağlar Yaylası (Table 1). According to this table, the age groups of 50-59 constitute the majority of the residents in 2006, the age groups of 56-66 in 2020. It has been observed that the middle-aged and older group over 50 years of age generally resides in Karabağlar and the majority of the users still adopt the seasonal migration-based traditional lifestyle. In terms of gender characteristics, it is observed that the ratio of men and women is almost close to each other. The reason for this is that the users who sustain their traditional lifestyle in Karabağlar consist of mainly couples. When we look at the birthplaces of the respondents, it is observed that most of them were born in the city center of Muğla, while the rate of users coming from different provinces was 15.7%

in 2006, the ratio increased to 27.9% in 2020. The fact that Muğla has been a metropolitan city in a 14 years old period, has received immigrants from different provinces and the accessibility and recognition level of the settlements has increased from local to country-wide. In terms of educational background, the majority of respondents graduated from an elementary school in both questionnaires. It has been observed that the number of high school and university graduates has increased in 2020. This increase can be associated with the increase in educational opportunities in the 14 years old period. When we regard occupational information, in 2006, the housewives and professions with a certain area of expertise including retirees, respectively, had a high percent (27.1% and 27.3%) among other respondents, while in 2020, the rate of housewives (26%) and professions with a certain area of expertise (26%) have the highest rates. The rate of farmers has increased in 2020. When occupations are associated with age, it has been determined that the age group of 50-60 is generally composed of retired people, housewives are in the age group of 60-70, and farmers are in the age group of 40-60. When occupations are associated with education; farmers, self-employed people, workers, retired people and housewives have an educational background of elementary school in general. According to demographic results, Karabağlar households are mostly two person families composed of retired couples with an age range of 50-70.

Table 1 Frequencies table related to demographical information of landowners

LANDOWNER		Percent (%)		Percent (%)
YEARS OF QUESTIONNAIRE		2006		2020
AGE	0-9	4,8	18-25	10,7
	10-19	11	26-35	4,0
	20-29	13,3	36-45	5,3
	30-39	7,3	46-55	29,3
	40-49	12,4	56-65	36,7
	50-59	21,1	66+	14,0
	60-69	20		
	70-79	7,6		
	80-90	2,5		
GENDER	man	47,3	54,0	
	woman	52,7	46,0	
PLACE OF BIRTH	Muğla city center	50,6	66,7	
	towns of Muğla	33,7	5,4	
	different provinces	15,7	27,9	
EDUCATION	illiterate	3	-	
	before elementary school	3	-	
	elementary school	55,4	48	
	high school	25	38	
	university	13,6	14	
OCCUPATION	farmer	8,4	15,3	
	student	15,2	8,7	
	self-employment	7,6	8,1	
	worker	6,3	7,3	
	officer	3,3	7,3	
	Professions (retired, bank employee, teacher, engineer, architect, lawyer, doctor, etc.	27,3	26	
	housewives	27,1	26	
	others	4,8	1,3	
INHABITANCY STATUS	always	22	27,3	
	seasonal	78	72,7	
TOTAL		100%	100%	

The socio-spatial existence of Karabağlar depends on seasonal migration that occurs every year between Karabağlar and Muğla city center. Geomorphological constraints of the region have made seasonal relocation as a necessity for centuries. However, developments in transportation technology, changing needs according to changing social and economic conditions with urbanization, recreational expectations prioritized over economic imperatives have depleted the seasonal dependency and mutual interaction between the two settlements over time. In terms of inhabitancy status, most of the respondents in the questionnaires still reside seasonally. The seasonal inhabitants are composed of traditional users, part-time farmers and hobby farmers. Today, with the development of transportation system, many town residents can reach Karabağlar at any time in any season. The permanent users originally consist of village migrants who choose Karabağlar because of its closeness to urban services and some migrants from different provinces who do not know the significance of seasonal migration. Thanks to floods and ponding areas in winter, many inhabitants still prefer to reside in Karabağlar only in summer.

Respondents were asked that why they choose Karabağlar to reside and answers listed in Table 2 reveal the meaning of the settlement for the respondents. 26.8% of the respondents in 2006 found cool micro-climate important. Respectively, hobby farming and resting, natural setting and healthy life, calmness were found to be important. In 2020, more than 40% of respondents stated that they are accommodating due to calmness. The distinctive geomorphological structure of Karabağlar and dense vegetation create a cool climate. However, the effects of climate change have started to be felt in Karabağlar in recent years. The cool climate feature of Karabağlar Yaylası deteriorated due to reasons such as temperature changes and decrease in annual precipitation rates, decrease in groundwater and unfair water distribution with uncontrolled wells. However, when we compare Karabağlar with Muğla city center, the scattered and low-density settlement pattern creates a calm environment, and it is a reason for the preference for rest. In general, the survey results show that preferences for recreational purposes outweigh preferences for economic purposes.

Table 2 Answers to the question: Why do you choose Karabağlar?

OUESTION:	**Percent (%)**	**Percent (%)**
Why do you choose Karabağlar?	**Year 2006**	**Year 2020**
Economic contribution	12,7	16,7
Cool climate	26,8	-
Natural setting, healthy life	13,3	12,7
Tradition	10,9	-
Hobby farming and resting	15,9	-
Closeness to town (for children' school, other urban service sectors)	7,4	1,3
Calmness	11,8	43,3
Investment	1,2	-
All	-	16
No answer	-	10
TOTAL	100%	100%

Respondents were asked if they know the functions of two distinctive landscape elements, 'irim' and 'kesik' in Karabağlar (Table 3). A great majority of the respondents in both questionnaires have a consciousness for these two components. However, in 2020, the rate of awareness is gradually decreasing. This may be due to the fact that people who moved to this settlement from different provinces have not yet learned the value of local landscape formations.

Table 3 Answers to the question: Dou you know the functions of 'irim' and 'kesik'?

OUESTION:	Percent (%)	OUESTION	Percent (%)	OUESTION	Percent (%)
Dou you know the functions of 'irim' and 'kesik'?	**Year 2006**	**Dou you know the functions of 'irim'?**	**Year 2020**	**Dou you know the functions of 'kesik'?**	**Year 2020**
Yes, he or she knows	82	Yes, he or she knows	74,7	Yes, he or she knows	78,6
No, he or she does not know or know just one	18	No, he or she does not know or know just one	25,3	No, he or she does not know or know just one	21,4
TOTAL	100%	TOTAL	100%	TOTAL	100%

When perceived changes from past to present were asked to the respondents in 2006, different answers each of which defining the main problems experienced in Karabağlar are listed in Table 4. Technological developments (electricity, transportation, vehicles, communication, and hydrological system for wells), construction of showy modern houses, destroyed natural environment and degraded vegetation were the main transformations mentioned by the respondents. In 2020, according to these main perceived changes, respondents were asked if they accept some of these changes as problem or not (Table 5). Respondents identified destroyed irimler and kesikler and their transformation into walls and wire fences as the main problems. In addition, they stated that those who destroyed irimler and kesikler were the newcomers accommodated in the settlement for the purpose of summer residence. Some respondents have identified the destruction of the natural environment and the degradation of vegetation as a problem. While some of the respondents accept that the electricity pylons, which were accepted as one of the infrastructural changes in Karabağlar Yaylası in 2006, harm the natural environment, the majority of the respondents do not see it as a significant problem. The reason of this attitude is awareness of them about the requirement of the electricity for the area and running electricity pylons underground may cause further damage to the natural environment. Some users stated that the existence of flooding and ponding areas, which cover significant part of Karabağlar lands in winter, was considered as a problem, while a large number of users stated that it was not a problem. It is considered that users who stated that there was no problem are aware of the necessity of ponding areas for abundant groundwater. Respondents thinks that the site status of the area is partially effective in terms of preservation. However, they argue that the authorized institutions fail to fulfil their duties and that the work of public institutions in the field is insufficient.

Table 4 Answers to the question: Do you think Karabağlar have changed from past to present? What kind of changes happened?

OUESTION	Percent (%)
Do you think Karabağlar have changed from past to present? What kind of changes happened?	**Year 2006**
Natural environment is destroyed, vegetation is degraded (elm trees)	11
Kesikler and irimler are destroyed. Stonewalls and wire fences are constructed.	4,8
New modern house buildings are constructed.	12,5
There are many new comers from villages and other towns	11
Technological developments (electricity, vehicles, communication, hydrophore system for wells)	14,5
Roads are widened and heightened, made asphalt and buses are on service	9,3
Lifestyle changed, recreational use	8,3
Seasonal migration ended	4,5
Karabağlar accepted conservation site	2,5
Rant value of Karabağlar lands increased	2
Tobacco production and viticulture ended	7,5
Coffee houses and masjids are out of service now and coffee houses became restaurants, there is no cultural activity on coffee house localities	5,8
There is no change or I do not know	6,3
TOTAL	100%

Table 5 Perceptions of the respondents about the main problems in Karabağlar in 2020

	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)	Percent (%)
MAIN PROBLEMS (Year 2020)	**İrimler are destroyed**	**Kesikler are destroyed**	**Natural environment is destroyed, vegetation is degraded**	**Electricity pylons are destroying the natural environment**	**Flooding and ponding are problems**	**Site status is preserving Karabağlar**	**Authorized institution fulfills its duty**	**The work of public institutions is sufficient**
Yes	52	51,4	32	34	42	38,7	15,3	15,3
No	24,7	25,3	43,3	66	58	28	24,7	75,3
Partially	-	-	-	-	-	32,7	56,7	8,7
Have no idea	23,3	23,3	24,7	-	-	0,7	3,3	0,7
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%

When respondents were asked how the perpetuation of Karabağlar is possible against main problems in 2006 (Figure 6), a great majority of them emphasized enhancement of infrastructure such as constructing channels to solve ponding problems, providing water supply, improving roads, reducing the number of uncontrolled artesian wells and solving garbage problems. Secondly, respondents stated that agricultural production should be supported. It is observed that the land use of newcomers in Karabağlar is principally recreational, and they mostly landscape their gardens with ornamental plants instead of agricultural plants. Some respondents are hoping for help from tourism. Some respondents stated that the residents should have consciousness about preservation practices. Others stated that the conservation plan is not sufficient, so the municipality, which is the institution responsible for the area, should take more responsibility for conservation. All these suggestions pointed to fundamental problems in Karabağlar. Respondents in the questionnaire in 2020 were expected to find solutions to the inadequacy of the conservation plan in terms of protecting the area (Figure 7). The majority of them stated that all residents in Karabağlar should be inspected in terms of the appropriateness of their practices to the conservation status of the site. Secondly, they stated that a supervisory mechanism should be developed in local-public partnership.

Table 6 Answers to the question: What does the perpetuation of Karabağlar depend on?

OUESTION	**Percent (%)**
What does the perpetuation of Karabağlar depend on?	**Year 2006**
Coffee houses and masjids should be in service again	7,6
Infrastructure should be enhanced (canalization, water supply, ponding area problems, roads, irimler, artesian wells, garbage problems)	29,9
The residents should have consciousness	7,6
Tourism activities should be fostered	9,4
Restoration of traditional houses	1,8
The natural environment should be preserved and no more house	5,6
Traditional lifestyle should be fostered, people should live in Karabağlar	5
No intervention is needed	4,7
Agricultural production should be fostered (tobacco production and viticulture)	13,3
Municipality should take care	9
Site conservation plan decisions should not be applied	6,1
TOTAL	100%

Table 7 Answers to the question: What should be done if the conservation plan does not preserve the area?

QUESTION	**Percent (%)**
What should be done if the conservation plan does not preserve the area? (* multiple selection question)	**Year 2020**
Penalties should be increased.	16,7
Public scrutiny should be fostered.	33,3
Residents and their practices should be inspected.	12,0
A supervisory mechanism should be developed in the public-local partnership.	25,3
Newcomers should be informed about Karabağlar	1,3

The participants of the questionnaire in 2020 argued that the authorized institutions, other public institutions and NGOs have not hitherto carried out adequate inspection and duty in Karabağlar Yaylası, that inspections and penalties should be increased, that they missed the former state of the settlement and that the main problems in the settlement should be resolved as soon as possible, and that a management approach that includes the demands and suggestions of the local people should be developed.

6. Evaluation

Karabağlar has a distinct socio-spatial pattern consisting of different layers through time, each of which refers to diverse community rituals, experiences and perceptions. Its historic cultural landscape is a result of seasonal migration and socio-economical interdependency to city centre of Muğla. Integrative analysis related to findings of field research and questionnaires is verifying that Karabağlar is transforming spatially and socially with changing socio-economic conditions. Urbanization is one of the main problems that disrupt and fragment the natural environment and wildlife habitats of the cultural landscape of settlements, besides by destroying the productive soils and agricultural production (Pauleit, Breuste, Qureshi & Sauerwein, 2010) it is changing production relations. Threat of urban sprawl and increasing economic development pressures with urbanization have privileged modernisation implementations on historic cultural landscape of Karabağlar and led to loss of traditional communities. Accordingly, transformations in Karabağlar can be explained with three kinds of changing relations: social, economic and environmental.

Changing social relations: The traditional community, which has been carrying out agricultural production that sustain the main characteristic of farmland structure in Karabağlar for centuries, has gave way to the residents who use the land for hobby and secondary housing purposes. With the increase in mobility due to transportation technology, population growth has occurred and Karabağlar has begun to accommodate people from different backgrounds and cultures. Immigrants from nearby villages started to live in both summer and winter. Becoming a place that can be easily reached in the same day with the ease of transportation, the seasonal migration culture has been nearly diminished in Karabağlar over time. Thanks to floods and ponding areas, many people still prefer to live in summer but there is a quiet high demand for permanent inhabitancy. The changing social structure and its interaction with the land have also transformed the character defining features in time.

Changing economic relations: In Karabağlar, traditional community has carried out agricultural production based on vineyard and orchard for centuries. Viticulture and polycultural farming were the main agricultural practices in the settlement. However, the vineyard culture mentioned in Evliya Çelebi's travel book disappeared at the beginning of the 20th century with the dominance of tobacco production. After the 1950s, with the development of transportation networks and the emergence of secondary home ownership as an investment tool, traditional farming was abandoned and hobby farming started to become widespread. Yurtlar in Karabağlar regarded as an investment tool for the high-income group, and the land itself was assumed a source of economic income. The self-sufficient economy of the traditional community was replaced with the amenity-based economy of the high-income group.

Changing environmental relations: Changes in land use, increase in the number of vehicles and road network with transportation technology, increase in the number of secondary housing, abandonment of agricultural production, excessive consumption of natural resources with the overcrowding of the place, unfair sharing of water resources, insufficient water supply for agricultural irrigation in summer with the increase in the number of deep wells, structural changes, changes in the boundaries of ponding and flooding areas as a result of heightened irimler and roads, destruction of kesikler with the construction of stone walls and fences, degradation of biological diversity, deterioration of vegetation and fauna and decrease in scenic values are among the changing environmental relations. Since the integration and interrelatedness of the community

with the environment shaped and structured the settlement; natural ecosystem, landscape pattern and character defining elements started to be corrupted with the changing society relations in the last century.

7. Conclusion

In Karabağlar, preservation efforts depending on conservation plan mainly excluded some cultural values and symbolic meaning of the settlements belong to human such as perception of the residents, collective memory, sense of community and their mutual interaction with the natural environment. Another important issue is that while change over time is inevitable because of the dynamic structure of the settlements, it is difficult to develop an adaptable preservation approach that will keep up with this change. Therefore, as a set of some conclusive remarks, this article proposes some preservation strategies caring the interaction of socio-economic and ecological aspects for preservation and sustainable management of historic cultural landscape of Karabağlar.

- Subjective aspects of the residents such as the sense of place, perception of values and symbolic significance should be regarded as significant facts of formation of historic cultural landscape.
- Preservation of cultural landscape should include immaterial aspects as far as material aspects such as physical setting and elements.
- Overall morphological structure and character of the settlement should be understood and respected.
- Land use character that is the reflection of the practices of initial local inhabitants should be identified and supported.
- Critical monitoring of spatial transformations and association of it with social aspects are required.
- An ecological assessment is required for the biodiversity.
- Inter- and trans-disciplinary researches and involvements in a dialogue are needed.
- A collaborative management strategy should be developed. A cooperation of public, private, academic, non-governmental organizations and the citizens should be fostered.
- Participation and involvement of the residents in the management should be provided. Perspective of the residents should be taken into account.

The rural-urban cultural landscape characteristics of Karabağlar is allowing to draw out some key issues in terms of preservation to set up a research agenda common to all similar cases. The emerging framework of this study for sustainable management that assesses both natural and cultural values co-evolved with human practices have also potentials to be adapted for other geographical settings.

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Resume

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Spatial distribution of construction firms in Istanbul

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Abstract

In the restructuring of the cities today, economic growth and its reflective trend multi-centred, urban development pattern made business enterprises shifted its locational choice in a decentralized way. As the focus of this paper, construction firms expended their market areas as well. The present study investigates the spatial distribution of construction firms according to the variables of socio-economic characteristics of districts and total construction sizes within the concept of multi-centre development in Istanbul. The paper describes the growth of the city and the construction firms through time according to the concentric zones and districts, firstly. Then descriptive figures and results of regression analysis are given by taking the number of construction firms as dependent variable and population, income per capita, average household size and amount of construction activity as the independent variables. Main hypothesis of this paper is that socio-economic indicators and total size of construction in building permits can explain the variance of number of construction firms in Istanbul district. Overall results from the multiple regression model indicate that the role of socio-economic indicators and total size of construction in building permits on the distribution of construction firms is proved on a large scale in the study. The spatial distribution of the construction firms has been figured out that the sub-central, peripheral districts of Istanbul have sustained the significant role in a way that responds to the construction supply, and housing sub-markets. However, the intense construction trends in the periphery reveal a fact that these firms preserve the location of their management offices in the sub-centre with relatively higher economic attraction, in central districts.

Keywords: construction firms, location, Istanbul.

1. Introduction

During the last half-century, rapid population growth resulted in urban sprawl (Terzi and Bolen, 2009), restructuring of the city according to new technology and economic development and multi-centre development (Dokmeci and Berkoz, 1994) and increased construction sector tremendously as well as the number of construction firms. After 1980s, the largest construction companies expanded their market areas even into the Middle Eastern and North African markets (Kaynak and Dalgic, 1992; Duman et al. (2018). The present study investigates the spatial distribution of construction firms according to the variables of socio-economic characteristics of districts and total construction sizes within the concept of multi-centre development in Istanbul.

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In few countries, there are some studies, which investigate the decentralization of sub-sectors from the centre of cities. A pivotal and comprehensive study that was done for central Seoul, Korea by Nahm (1999) illustrates the transformation of business centre as a result of large scale urban renewal projects in the 1990s. According to the results of the study, the ratio of movement of construction firms from CBD to non-CBD (40%) is higher than their movement intra-CBD (36%) and non-CBD to CBD (4%) and non-CBD to non-CBD (8%). 12% of the construction firms did not change their location in central Seoul, Korea.

Another study by Mazzarol and Choo (2003) deals with the factors influencing location decisions of small firms. According to their findings, locations of 34% of small firms were influenced by the proximity to customers. The paper by Maoh and Kanaroglou (2007) provides an empirical framework to illustrate the geographical clustering of firms in the City of Hamilton in Ontario, Canada. According to their results, most of the firms are decentralizing i.e. the number of construction firms decreased from 6% to 4% between 1990 and 1997. By Said et al. (2015) a survey was conducted all over the Peninsula of Malaysia about the construction firms. The results show that the majority of the companies were located in three major cities, i.e. 36 companies (11.3%) were located in Penang (a north-eastern federal state), 60 companies (18.8%) were located in Selangor (neighbouring federal state of Kuala Lumpur), and 92 companies (28.8%) were located in Kuala Lumpur capital city and an individual federal territory of Malaysia. However, the operation offices might be different from the registered address due to the location of projects and other technical reasons. The paper by Adams et al. (2012) argues that UK speculative house builders rely more on networks than markets to source land and that structure those networks to enhance their own competitive positions. In addition, according to the economic study of London by Dunning and Morgan (2013) construction employment is 1.6% in the city of London and 4.9% in other districts of London, which represent decentralization. Thus, despite of the importance of construction sector for economic development (Chia et al., 2014); the review of the literature reveals that there is not much research on the subject at the local level. In order to disclose the case of local level, the present study investigates the spatial distribution of construction companies according to the characteristics of districts such as population, income per capita and amount of construction by the use of multiple regression analysis in Istanbul. Main hypothesis of this paper is that socio-economic indicators and total size of construction in building permits can explain the variance of number of construction firms in Istanbul district.

The organization of the paper is as follows: the growth of the city and the construction companies through time according to the concentric zones and districts are given in the second section. In the third section, aforementioned variables are given with descriptive figures and regression analysis by taking the number of firms as dependent variables and population, income per capita, average household size and amount of construction activity as the independent variables. The final section is devoted to a conclusion and suggestions for further research.

2. Background: Construction Firms in Istanbul

During the last two decades, Istanbul's population increased from 11,08 million in 2000, to 15,62 million in 2019. Globalization, closing down the government factories, and relaxation of restrictions on the agricultural imports fuelled the inter-provincial migration caused the rapid growth of Istanbul (Yazgi et al., 2014). Urban sprawl (Terzi and Bolen, 2009) with squatter development, gated towns in the periphery and multi-centre development (Dokmeci and Berkoz, 1994; Berkoz, 2000; Berkoz and Turk, 2008), government's large urban regeneration projects (Karaman, 2008; Kuyucu, et al., 2010), relaxation of density restrictions increased construction and thus growing construction sector as well as the number of construction companies at city wide. While the location of construction companies were first mostly in the central districts, further they followed the construction activity at the metropolitan level as the city expended. Decentralization of construction firms has gained a similar trend with similar studies in Ontario, Canada (Maoh and Kanaroglou, 2007) and London, England (Dunning and Morgan, 2013).

During the period of 2007-2019, the number of construction companies registered at the Istanbul Chamber of Commerce, increased from 893 to 1,849. In the same period, investigation of the spatial distribution of construction companies according to the concentric rings as already described in Dokmeci and Berkoz (1994) revealed that the ratio of construction companies decreased from 6.4% to 2.3% in the core area, from 45.6% to 33.8% in the intermediate zone and increased from 48% to 63.9% in the periphery. These results strongly illustrate the rapid growth of peripheral districts and thus demand for housing.

In 2007, distribution of construction companies according to the districts illustrate that Sisli which is in European side of intermediate zone and new CBD, had the highest number of construction companies (140) due to need for construction many modern office buildings as a result of globalization. On the other hand, in 2019, in Kadikoy which is in the Asian side of the intermediate zone had the highest number of construction companies (234). The highest demand to live in this district (Hurriyet News, 2018) and the relaxation of density regulations by the Municipal Government fuelled the construction of high-rise housing as well as the number of construction companies. Thus, the urban growth of this district is the result of market forces as well as the Municipal Government policy. There are two reasons for attracting the highest amount of construction activity to this district: The first one, this district is the most preferable one due to quality of life (Dokmeci and Berkoz, 2000): attractive shopping streets, seashore amenities and housing in the gardens, educated people, cultural advantages due to upper class historical background. The second one: the construction of large urban transformation projects in the squatter neighbourhoods of this district to instigate a process of property transfer to stronger actors by up grading and beautification of their environment and increasing real estate values, and displacement of urban poor.

During the study period it is also observed that the concentration of construction companies at the sub-centres was critical due to large amount of construction such as in Atasehir (140) for construction of a business centre in a new town and high-rise housing. In Besiktas (from 70 in 2007 to 108 in 2019), the catalyst for this growth is building modern office buildings in order to answer to the growing demand for offices due to globalization and lately becoming a transportation hub, while in Umraniye (10 to 112 in the same period, given above) for restructuring of its squatter areas due to increased accessibility as a result of being at the intersection of peripheral highways. Similarly, the number of construction companies increased in the centres of the districts along the Marmara Sea shores with restructured large squatter areas such as in Maltepe from 29 to 99, in Kartal from 25-84 and in Pendik from 9 to 41 (Ozus, et al.2007). In the western part of the city, in the centres of the districts with large, restructured squatter areas, the number of construction firms increased such as in Kucukcekmece from 28 to 52, Esenyurt from 4 to 59 and Basaksehir from 1 to 43. The number of construction firms increased in the centres of historical districts, which have locational competitive advantage and seashore amenities, due to revitalization of their old buildings such as in Uskudar from 25 to 99 and in Fatih from 15 to 37. The number of construction firms also increased from 12 to 53 in the centre of Sariyer District, which is located along the Bosphorus seashores due to construction of gated towns with the effect of globalization (Baycan-Levent and Gulumser, 2012).

The results of the analysis of the distribution of construction firms between 2007 and 2019 reveal that the location gravity was switched from the European side to the Asian side due to having larger open spaces and relaxing density requirements, and decentralization toward the peripheral centres of the metropolitan area. This trend is the result of market forces and the Municipal Government policies, which is within the concept of the case in China (Yue et al., 2010), and Seoul, Korea (Nahm, 1999), evidences of which are also highlighted with key economic and construction sector indicators in their correspondences in Turkey case (Alkay, et. all, 2018). Then this study investigates the relationships between the number of construction firms and the characteristics of districts by the use of multiple regression analysis in a more comprehensive way.

3. Data and Results: Multivariate Findings from Spatial Distribution of Construction Firms in Istanbul

In this paper, number of construction firm in district level, in Istanbul is used as the dependent variable, data of which is gathered from Istanbul Chamber of Commerce, Web Portal with the records of 2019. There are a total of 1849 construction companies in the city, which has at least one construction company in 38 districts. Adalar, which has strict construction permissions and registered natural and urban conservation sites, has no construction firm, officially enrolled in Istanbul Chamber of Commerce. Sile, which is supposed to have similar barriers for constructions and conservation status, has the least number of construction firms among districts of Istanbul. Besides, Bayrampasa, Sultanbeyli and Catalca are the districts, which have less than 10 construction companies in-between their jurisdictions. When defining the multi-centred development pattern in the spatial distribution of construction firms, 3.73% of these firms are located in core area (Fatih and Beyoglu); 32.83% are located in the intermediate zone (Bayrampasa, Besiktas, Eyup, Kadikoy, Sisli, Uskudar, and Zeytinburnu); and 63.44% in the periphery. Kadıköy, which is one of the most populated central district in Istanbul and most critical spot for recent urban regeneration programs in Istanbul and even in Turkey, has the highest number of construction firms, as 234. Other districts following Kadikoy in these numbers are Atasehir with 141 firms; Şişli with 115 firms; Umraniye with 112 firms; Besiktas with 108 firms and Uskudar and Maltepe with 99 firms each.

As the most crucial independent variable in this paper, construction permits' size in sqm is assumed to be correlated with number of construction firms. This variable is gathered from National Statistical Office's yearly-published data on construction statistics, which are compiled of entire construction permits submitted to the municipalities. These statistics determine the total number of buildings, quantities on size, and use categories, such as residential, commercial, etc. In the spatial distribution of total construction sizes in building permits, 2.77% of construction permits are registered in core area; 21.14% are registered in the intermediate zone; and 76.09% in the periphery. When associating these figures with spatial distribution of construction firms in Istanbul, differences between operation offices of the construction zones and registered address of headquarters is evident especially in peripheral districts, where total construction size in building permits are higher than the central districts but, fewer construction firms. This finding is entirely in reverse type in intermediate zone, where there is less total construction size in building permits in central district but higher number of construction firms. This bipolar opposition between intermediate and peripheral districts indicate the significance of sub-central districts in the economic pattern of the metropolitan city of Istanbul.

Only one of the three top districts with more construction firms, Kadikoy, as a district in intermediate zone, has relatively higher construction size, submitted in the relevant year. As indicated by Dokmeci and Berkoz (2000), the district of Kadikoy has sustained its economic attraction in real estate market with inhabitants of high socio-economic status. Basaksehir, Arnavutkoy and Pendik districts, also have the highest ranks on construction size in building permits in 2019 more than 700 thousand sqm. These districts are the peripheral districts the first two leading ones are in the European side and the third in Anatolian side. While associating these figures on increasing housing supply for middle and middle-high income households, these districts have a crucial role on urban sprawl of metropolitan development of Istanbul and relatively higher rental return in the periphery (Hepsen and Vatansever, 2012). Besides, Atasehir and Sisli are the districts, which have less construction sizes in building permits, and lower than the median value of the variable. On the contrary, Sultanbeyli district, with only 7 construction firms, official address of which are located in the district, has more construction size in building permits than the median value of the independent variable. Central district as Fatih, neighbouring ones as Bayrampasa,Güngören, and furthest peripheral districts as Sile and Catalca with least number of construction firms have relatively less construction size in the building permits. Peripheral districts where building codes are strictly prohibiting new development with natural conservation status and ecological values (Sile and Catalca); and central and neighbouring districts (Fatih, Gungoren,

and Bayrampasa), which have already fulfilled their development capacity and new construction may not be possible, (Figure 1).

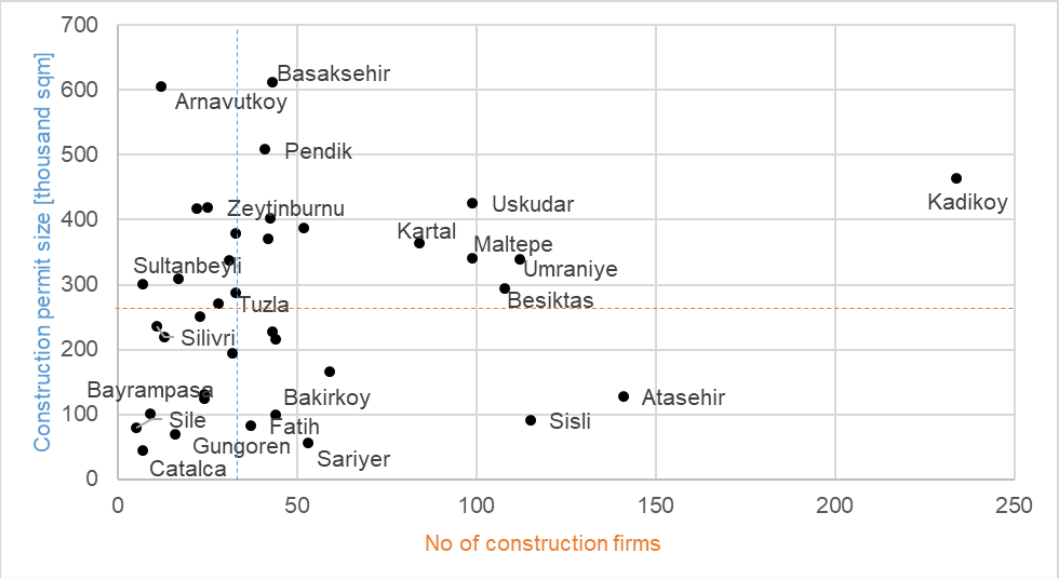

Figure 1 Association between total construction size in building permits and number of construction firms in districts, 2019

Independent variables in this paper are formulated as population size in 2019 (x1), gathered from Address Based Population Registration System, Turkish Statistical Institute (TUIK); annual total construction size in building permit (x2), from building statistics in 2019 (TUIK); average yearly income (x3) from Mahallem Istanbul Project (Seker et. all, 2017); and average household size (x4) from District-Based Average Household Size in 2018 (Istanbul Metropolitan Municipality, Open Data Portal, 2018). Descriptive figures on these variables are given in Table 1, below.

Table 1 Descriptive figures on dependent and independent variables

	Variables	mean	std.dev.	median	min.	max.
	No of construction firms	48.66	46.44	33 Sancaktepe Esenler	5 Sile	234 Kadikoy
x1	Population size [1000 people]	407.99	197.38	412.80	37.69 Sile	954.58 Esenyurt
x2	Construction permit size [1000 sqm]	262.12	156.25	260.69	8.79 Beykoz	613.19 Basaksehir
x3	Average yearly income [1000 TL]	52.49	25.09	43.84	24.36 Arnavutkoy	126.72 Besiktas
x4	Average household size	3.35	0.43	3.34	2.47 Besiktas	4.32 Sultanbeyli

Total population of Istanbul Metropolitan Municipality was 15.62 million in 2019, districts' population of which range from 37,692 (for Sile) and to 954,579 (for Esenyurt). Considering total population per construction firm, central districts like Besiktas, Kadikoy, Sisli and Atasehir has more firms than the rest of districts (respectively with the figures of 1,691.19; 2,062.88; 2,433.19; and 3,014.85 person per a construction firm). This figure is higher than 30,000 person per a construction firm in Sultanbeyli, Sultangazi and Bayrampasa districts.

When considering the total number of construction-based enterprises in Turkey, which comprises of economic activities such as development of entire construction and infrastructure projects, including installation of mechanical, electrical, plumbing services, telecommunication network, maintenance and repair of the buildings, there are more enterprises than construction firms, which are enrolled in Istanbul Chamber of Commerce. Basic indicators by economic activity statistics (2019) reveal that there were 121,494 construction-based enterprises in Turkey. Total population per construction enterprise in Turkey presents the figure as 681.88, which is harshly higher than entire districts of Istanbul. This figure for Istanbul depict that there were 67,795 enterprises and 228.92 person per a construction enterprises (Business Demography, 2019). It is evident from being the leading city in construction sector; Istanbul has nearly five times more construction enterprises than the rest of the country. Since there is a significant disparity between economic enterprises in construction sectors by TUIK and Istanbul Chamber of Commerce, rate of construction firms' enrolment into Istanbul Chamber of Commerce is considerably low as a data limitation of this paper. This rate used in this paper, for Istanbul was gathered by Istanbul Chamber of Commerce as 8,393.33.

As the most critical indicators for social economic development rates, average yearly income and household size are used in the paper, for comprehending this development trend among the districts of Istanbul. Average household size of Turkey was 3.4 and of Istanbul 3.3 in 2019. 22 districts with more than 10 million population in sum, have relatively higher rates for this indicator than the rest of the districts, and these 22 districts holds only the 39.5% of the entire construction firm in Istanbul. Average yearly income for Istanbul was 51,691 TL in 2019. 24 districts with more than 10 million population in sum have relatively higher rates for this indicator as nearly similar as average household size indicator in Istanbul. These 24 districts also hold only 752 construction firms with the rate of 40.7% of the entire construction firm in Istanbul. It is obvious that districts with lower household size and higher income rates have relatively more construction firms, as reflected with the most significant socio-economic development indicators.

Multiple regression model is applied within the set of variables, given above that are assumed to have influence on number and distribution of construction firms, enrolled into Istanbul Chamber of Commerce. For the model, coefficient estimates and their standard errors with statistical diagnosis are reported in Table 2. As the result of ordinary least square (OLS) regression model R2 is 0.707 and adjusted R2 is 0.672, statistics of which is considered high. As the main hypothesis of this paper stated, socio-economic indicators and total size of construction in building permits can explain the variance of number of construction firms in Istanbul districts. This hypothesis is proved within R2 statistics, obtained form the regression model (p = 0.000 and F value = 19.943), where entire variables in the model contribute with significant effect on the variance of number of the construction firms in Istanbul districts.

Table 2 Regression model results on the assumption of spatial distribution of construction firms in Istanbul

Model	unstandardized coefficients		st. coef.	t	Sig.	Collinearity Statistics	
	ß	std. error	Beta			tolerance	VIF
Constant	94.804	59.288		1.599	0.119		
x1 Population size [thousand people]	0.097	0.025	0.41	3.826	0.001	0.771	1.298
x2 Construction permit size [thousand sqm]	0.07	0.031	0.237	2.255	0.031	0.804	1.244
x3 Average yearly income [thousand TL]	0.886	0.25	0.479	3.548	0.001	0.487	2.054
x4 Average household size	-44.839	16.195	-0.417	-2.769	0.009	0.39	2.564

Dependent variable is number of construction firms in districts.

As one of the strongest socio-economic development indicators in the explanation of number of construction firms in Istanbul districts, average yearly income has a coefficient of 0.886 (p =

0.001). Regression model estimates one unit (1,000 TL) rise in income variable to contribute a direct increase in the number of construction firm in 0.886 unit. As the other socio-economic indicator average household size has a coefficient value of - 44.839 (p = 0.009), where one unit (one person) rise in household size variable suggests a decrease in the number of construction firm in 44.8 unit. As depicted in the descriptive figures of the data, socio-economic indicators hold a significant effect on the variance of construction firm numbers in Istanbul.

As total construction sizes in the building permits have a statistically significant effect on the emergence of construction firms in Istanbul, this study reveals the significance of supply on construction sector. As the coefficient of this variable (x2) is 0.07 (p = 0.031), regression model estimates one unit (1,000 sqm) rise in construction size in building permits variable to contribute a direct increase in the number of construction firm in 0.07 unit. This finding proves the internal impact of the construction sector in the establishment of businesses that choose to take an active role in and benefit from the business organizations (Noel and Luckett, 2014), which can be defined as being enrolled within the chamber of commerce.

As identifying the spatial distribution, which reflect the population distribution as well, population size variable is also a significant variable in the contribution of variance of construction firm numbers in the districts. Regression model estimates ten unit (10,000 person) rise in population variable to contribute a direct increase in the number of construction firm in 0.97 unit. In particular, the districts with more population imply the higher rate of urban functions and services in the spatial distribution. This result is significant in the majority of studies, investigating the locational distribution of services or urban uses with population effect (Dokmeci and Berkoz, 2000; Ozus, 2009).

After investigating the estimated variance of the dependent variable, values residuals are tested within the consistency of multiple regression analysis. Difference between the actual number of construction firms in the districts and their estimated values in district level is calculated. Since the data used in this paper has limited number of variables, as a data limitation, surely not all of possible predictors are included in the regression model. A further residual analysis is performed in order to validate performance of the model with the standardized residuals, derived from the regression model. In 31 districts, covering 1,108 construction firms (nearly 60% of the entire firms in Istanbul) have residuals range from -1 to +1, which indicate a validity of the model. Only seven districts are further away from these ranges up to 3.00 for Kadikoy and -1.88 for Bakirkoy.

The districts of Kadikoy, Atasehir, Umraniye, and Esenyurt with positive residuals in the regression model (respectively as +3.00, +2.07, +1.94, and +1.25), actually underestimate the effect of independent variables in the variance of number of construction firms. It can be interpreted that the construction firms in these districts have varying reasons beyond the variables used in the model, the prospective predictors of the location choice. As the most significant case for comprehensive urban regeneration projects by the law of 6306 (Turk, et. all, 2020), Kadikoy, Atasehir and Umraniye share a critical power in both area-based and property-based types of renewal programs in Anatolian side of Istanbul, Esenyurt in European side, particularly in area-based renewal programs. On the contrary, Basaksehir, Besiktas, and Bakirkoy with negative residuals in the regression model (respectively as -1.07, -1.21, and -1.88), overestimate the role of independent variables in the variance of number of construction firms. Besiktas and Bakirkoy, which are central district with high urban density and high housing price values (Koramaz and Dokmeci, 2012), have a common type of regeneration only on property-based renewal, in the last decade, after the law of 6306 (Kisar Koramaz, et. all, 2018). As indicated in Fig. 1, Basaksehir is one of the significant district with highest construction size in building permits in 2019, the district is is one of a leading sub-market associated with increased housing supply for middle and middle-high income households. These findings indicate that recent regeneration programs and urban transformation trends, particularly on area-based renewal programsin district level should be investigated in the further analyses of spatial distribution of construction firms in Istanbul.

4. Conclusion and Evaluation

In this study, overall results from the multiple regression model indicate that the role of socio-economic indicators and total size of construction in building permits is proved on a large scale, with the chosen variables in this paper, combined with population size of the districts. The spatial distribution of the construction firms has been figured out that the sub-central and peripheral districts of Istanbul have sustained the significant role in a way that responds to the construction supply. However, the intense construction demands in the periphery reveal a trend that these companies preserve the location of their management offices in the sub-centre with relatively higher economic attraction. With these concluding remarks, it is obvious that this paper, which examines the distribution of construction firms at the district level in Istanbul, validates the decentralization evidence from the findings of the literature on the housing market in Turkey and in the World.

Particularly urban renewal and construction activities, the intensity of which has increased enormously in the last 10 years, have caused a consecutive increase in the number of construction companies and enlargement of construction-based entrepreneurs. As in the Fikirtepe Urban Renewal Project (Turk et al., 2020) in Kadıköy, the extravagant size of the urban renewal areas has led to the authorization of many construction firms in the redevelopment of the city. However, the involvement of newly founded and unreliable construction firms with limited human and capital resources in the renewal (and construction) operations can make these firms be considered in low reputation in public opinion. In this study, construction firms, enrolled in the Istanbul Chamber of Commerce were selected. It should be noted that just as these firms benefit from the opportunities of being under an organization, they could eliminate such reliability problems in public opinion. While some of the construction companies that take part in construction projects carried out in public-private cooperation can ignore social priorities (Unsal and Turk, 2014), others may misuse their positions in negotiation and communication processes in a way that threatens the community. (Ay, 2019).

The findings of this paper explain the need to examine the spatial distribution of construction permits at a more detailed level. A further paper can highlight the central districts and sub-zones of the city, which are especially densely built, and where this construction has reached its development capacity. However, it should be taken into account that the construction processes mentioned with the urban renewal programs and the development plans for these central districts may enter a new cycle. Therefore, with the evaluation made as to the center, buffer zone, and periphery in this study, both the construction trends and the role of the sector, itself, in the spatial organization can be explained with a robust model in further studies. The findings of this paper, in a descriptive manner, can distinguish centers that are potential renewal areas, fulfilling development capacity, but housing sub-markets can be defined with a detailed model in such further studies. Moreover, this classification, itself, can be associated with the varying urban renewal phase of districts and be subjected to a temporal evaluation.

The findings of this paper can increase the ability of construction businesses to make rational site selection decisions, as well as has contributed, from the perspective of urban planning to the comprehension of urban development and sprawl patterns. The overlapping finding of the decentralization of the construction firms and the rapid urban sprawl is a fact to be taken into account in the future of plan-making decisions. Apart from the companies enrolled in the Istanbul Chamber of Commerce, it would be worthy to carry out further studies to examine the other components of the construction sector serving in the city. The distribution of organized and unorganized firms is thought to be illuminating in the description of the planned growth model of the city.

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Resume

Prof. Dr. Turgay Kerem Koramaz, he has highlighted information and communication technologies, spatial analysis and modelling in urban planning, leading to publications on the subjects of cultural heritage management, spatial determinants of housing property prices, locational pattern of cultural venues, and internal migration patterns, in Turkey. Next to developing evidence-based decision-making processes in urban planning, methodological framing and information system, he has been involved in professional activities and consultancies in planning agencies and institutions. He is member of European Regional Science Association, ICOMOS, International Council on Monuments and Sites, and AESOP, Association of European Schools of Planning.

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Redevelopment of squatting housing in Turkey in the case of Altındağ, Ankara

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Abstract

The focus of this paper is the redevelopment of the squatter settlements in Ankara Turkey. Most of the articles focus on gentrification and changing neighbourhood social structures but the redevelopment of the squatter settlements also aims the production of formal low-income housing as well as the integration of previous non-formal housing into formal urban space. Therefore, this article suggests that the contemporary redevelopment project of squatters in Ankara, Turkey is a part of a broader strategy of integrating low-income into the formal housing system by cooperating with a part of low-income groups. The research was made in Altındağ, Ankara by using a deep semi-structured interview, and document analyses method. The researcher conducted 25 interviews with residents and 2 interviews with officials.

Keywords: redevelopment, informal housing, housing, rescaling state, squatting housing

1. Background Information

In Turkish, the word “gecekondu” literally means ‘built overnight’ but the term has different meanings in different disciplines (Akbulut and Başlik, 2011). For the purpose of this paper, gecekondu will be used in the context of urban studies in Turkey, where the phenomenon involves housing units that are built on public or private land without any legal title and do not meet construction and zoning rules (Keleş, 2014).

The scale of the rebuilding of Turkish cities over the last two decades has been extraordinary. In 2005, around 30% of the urban population of the big cities of Turkey were still living in squatter settlements (Ankara Metropolitan Municipality, 2005). Since then the production of the built environment and especially of housing has increased dramatically, from 202,000 dwellings in 2003 to 1,000,000 dwellings in 2016 (TUIK, 2016). In terms of total floor area, the production of housing increased from 45 million m² in 2003 to 205 million m² in 2016 (TUIK, 2016). The Ministry of Urbanization and Environment estimates that 6-7 million buildings out of 19 million buildings in Turkey - around 37% of the existing building stock - need to be rebuilt or reinforced due to earthquake risk. The approximate cost of redevelopment projects for the next 20 years is to reach $400 billion (Hurriyet, 2011).

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Figure 1 Gecekondus and gardens before the demolition in Baspinar neighbourhood. Sinan Akyuz (2016)

The redevelopment programs in Turkish cities have radically changed not only in the built environment but have also been associated with equally large changes to their economies, their forms of housing, and their social life. Therefore, a comprehensive theorization of housing and wider urban changes, and the role of capital, the state and the low-income groups in these changes was needed. The number and scale of redevelopment projects in the city are very high: the current projects are aiming to reconstruct 40% of the existing city (Akyuz, 2019). The construction of new low-income housing has been and is a major part of these projects. Therefore, it is inaccurate to explain state intervention in squatter areas entirely in terms of gentrification or total displacement.

2. Theoretical Background- The Rescaling of the State in Relation to Low-income housing

2.1. Re-scaling of state intervention to the Built Environment

The rescaling state debate is an academic by-product of the interest in globalisation and the changes it brought, yet the literature about rescaling continues to grow and provides important theoretical background for current work on urban and regional politics, especially in relation to the local development (Cox, 2009).

2.1.1. Strategic Relational approach

Brenner (2004) sets out a theoretical framework for understanding scales of the state based on the strategic relational approach to the state. On this basis, he analyses the rescaling from national to sub-national levels in Western Europe in the period since the 1970s. Since the early 1970s, state activities targeting the regulation of capitalist urbanisation have been an essential mechanism of the geographical and institutional transformation of the national state. But this does not 'imply the erosion, withering or demise' of the nation-state (Brenner, 2004, p. 2). Unlike claims of a decline in state power and an 'erosion of state territoriality' with the intensification of globalisation, Brenner suggests that 'qualitatively new institutions and regulatory forms are currently being produced at both sub- and supranational scales; and, the role of the national scale as a level of governance is itself being radically redefined in response to the current round of capitalist globalisation' (Brenner 1999, p.439). National economic policies for local and regional development do not have a fixed institutional framework; rather, they have been enabled by, 'a fundamental transformation of state scalar configurations.' Brenner suggests that the city region became, 'the key institutional site in which a major rescaling of national state power has been unfolding' (Brenner 2004, p.3).

The geographical arrangements of strategic selectivity are explained with the idea of 'hollowing out' of state power. According to Jessop (1990), this power displacement has been happening in three dimensions. The first one is the upward movement of power towards international state bodies since they begin to have greater function and responsibility compared to the Keynesian period. Secondly, a downward movement in which local states became stronger and more active in terms of economic regeneration. Finally, the power started to move outwards with new international networks of local and regional states (Jones, 1997). Being an essential feature of the transition from Fordism to post-Fordism (or in Jessop's terminology, the Keynesian Welfare State to the Schumpeterian Workfare State), the 'hollowing out' process also involves changes in state spatial relationships.

Following Jessop, Brenner (2004) suggests a process of state downscaling, resulting in an increase in the roles and tasks of local and regional administrative systems, and restructuring of local and regional institutional configurations. Throughout the EU and North America, state rescaling appeared as neo-liberal restructuring of the economy, aiming to support sub-national growth poles (Brenner 2004;1999). However, the role of the national state in terms of formulation, implementation and coordination of urban policies is still important (Brenner, 2004).

Cox (2009) suggests that Brenner's arguments concerning state rescaling are problematic in two respects when applied to the US. Firstly, Brenner argues that the territorial rescaling of the state to achieve and maintain economic growth is an outcome of top-down forces. However, Cox emphasises bottom-up forces in the case of US cities. Secondly, Brenner focuses on the supply-side, 'urban locational policies', but in the US example, Cox suggests the driving force is not building up local productive capacity but redistribution of national investment. States and local governments compete with each other for more investment, such as airports, highways, prisons and central government agencies. Cox emphasises the importance of competition between regions and between localities, arguing that this is reflected in regional secessionist movements in Europe.

2.2. Re-scaling of state intervention to the Built Environment in Turkey

After the 1980s, there has been a radical reordering in the finance and service sectors and further concentration of production in the big cities of Turkey, which leads to an increase of formal and professional workers living in cities as well as overall population growth in cities. These changes required massive restructuring of cities including new public transport systems. This was accomplished through setting up the Metropolitan Municipalities and through interventions by the national government; only these bodies had the large resources and the territorial sweep necessary for city restructuring.

Secondly, governments since the 1990s have sought to end gecekondu living and transform houses of the low-income to formal, capitalist-built housing. This is seen as providing a materially higher standard of living and also providing large contracts for large construction companies. The programmes to build new low-income housing have required a major input from the Mass Housing Agency (MHA), from the Metropolitan Municipalities, as well as some roles for District Municipalities. Again, the enormous scale of the redevelopment of the gecekondus has required higher spatial scales of the state to lead the programmes. The District Municipalities did not have the resources, legal powers or expertise. Therefore, especially after 2002 central state agencies and metropolitan municipalities gained further legal power and economic power in order to implement these bigger scale projects. Whilst the district municipalities did not become irrelevant, there has been an overall shift in power upwards (Section 2.1). Moreover, the MHA made the national state an essential actor in housing production, which is also an upwards movement of power. Note that the wholesale restructuring of cities and low-income housing in Turkey in the last thirty years has no parallel in the More Developed Countries (MDCs). Therefore, state rescaling has been very different in Turkey from the MDCs.

The state scalar change has also been powered by the Justice and Development Party (JDP) government's project to change class relations. We noted that new local policies and interventions may not be only class-disciplinary but may also be class-cooperative and that these class relations may extend across both production and reproduction spheres. This combination of class relations within local politics has been the case in Turkey. Gecekondu housing is outside of normal capitalist relations of land ownership and building. The elimination of the gecekondus was partly aimed at subjecting low-income residents to the rule of money and law (Clarke, 1991; Das, 2006). Since the 1980s, workers in employment have been subjected to greatly increased disciplinary power of capital and the state. The JDP, however, sought to legitimize its rule with at least a portion of the urban low-income by providing a higher material standard of housing combined with new social and cultural facilities in the neighbourhoods, based partly on Islamic notions of charity. At the same time, the demolition of the gecekondus destroyed strongly collective aspects of social life, and the new housing has tended to privatise and isolate residents from each other, thus serving neoliberal ends.

2.2.1. Mass Housing Agency (MHA)

One of the main tools for upscaling of state intervention to the Built Environment in Turkey is Mass Housing Agency. The MHA has gained and increased its power in relation to different duties after 2002. Firstly, the MHA gained the power to establish companies and become a partner of existing companies in relation to housing production. This housing production power can also be used in relation to squatter redevelopment and the prevention of squatter areas, or to restore historical and regional architecture. Secondly, the MHA gained the power to undertake profit-seeking projects similar to the private sector. Third, the MHA was given the power to prepare plans at all scales and change existing plans relating to mass housing development. Moreover, this power also includes the ability to compulsorily purchase land and property to enable mass housing production. Finally, all duties and powers of the Urban Land Office and the Real Estate Bank, along with 64.5 million m^2 of land, was transferred to the MHA in order to integrate housing production, land acquisition and redevelopment (Gündoğdu and Gough, 2009; Yılmaz, 2016; Geray 2007). The MHA, therefore, can prepare and confirm new land-use planning for all private and public land in Turkey.

With this strong institutional power, the MHA can bypass all conventional regulations, other institutions and plans, and create local bodies operating like private companies (Yılmaz, 2016; Batuman, 2013a; Elicin, 2014). This has given rise to a situation whereby public land has been used for private housing production. The MHA also has the authority to solve all kinds of technical details about any kind of construction and can act as a housing credit (mortgage) provider. This has seen the regeneration strategy of MHA become the principal planning tool of the central government in creating attractive urban space for the investment of national and international capital (Elicin, 2014; Güzey, 2009).

The Improvement and Development Plans (IDP) areas do not have adequate social facilities and infrastructure and have a low quality of urban space. A new strategy for redevelopment came onto the agenda in the 2000s Urban Transformation Plans (UTP). The aim of the UTP is neighbourhood level redevelopment rather than the parcel level approach seen in the IDP projects (Dündar, 2001). Ankara Greater Municipality implemented UTP projects which were aimed to redevelop inner-city gecekondu areas into upper-class housing and office districts (Dündar, 2001). During the 2000s UTP became the main strategy of Metropolitan Municipalities in order to intervene in urban space, especially in gecekondu areas. With the new legal framework in the 2000s different state institutions, including the MHA gained the power to implement redevelopment projects as a part of a disaster prevention strategy. In this way redevelopment of squatter, neighbourhoods were legitimised via an earthquake risk reduction strategy; however, the implementation saw the displacement of the population and urban rent transfer to the private sector (Elicin, 2014).

With Article 9 of the Urban Transformation Act 2012, urban transformation projects became a nationwide strategy. The MHA becomes the highest planning authority, overall existing acts and regulations. In other words, if there are any legal obstacles to the implementation of redevelopment projects, the MHA Transformation Act has precedence over all existing acts (Elicin, 2014). In short, with the Disaster Risk Act in 2012 central government gained more powerful tools for implementing large scale redevelopment projects and bypassing all existing acts and policies.

With this administrative and economic power, production of 805,072 housing units in 81 provinces of Turkey has been started at 3,517 construction sites since 2002, and a total of 685,533 housing units have been produced since 2002 by only MHA (MHA, 2017). Moreover, 17% of the total production (135,364 units) is gecekondu redevelopment, and 14% of total production (110,107 units) is for upper-income groups.

2.2.2. Metropolitan Municipalities

At the beginning of the JDP period, the trend of the 1990s continued and the power and revenue of the metropolitan municipalities increased; the boundaries of municipalities were expanded and the number increased. These changes have been legitimised with similar reasoning to the 1980s: making the big cities centres of economic attraction at the international level, providing effective and sufficient services. The revenues and duties of metropolitan municipalities (Act 3030, 1984) increased in 2005 (the new Metropolitan Municipality Law No. 5216). Whilst detailed analysis of the legislation is beyond the scope of this chapter it is important to note that there have been major changes to this act: in 2008 with act 5747 and in 2012 with act no. 6360. In relation to the focus of the study, in 2008 metropolitan municipalities gained the power to prepare and implement urban redevelopment projects at all scales, bypassing the district level of municipalities (Bayırbağ and Penpecioğlu, 2015).

Another change in relation to metropolitan municipalities' power over the production of space was the 5366 'the Regeneration Sites Bill' which was enacted in 2005. Ankara Metropolitan Municipality has used this act as the legal basis for its intervention in gecekondu neighbourhoods, article 73 of this act gives municipalities,

'the opportunity to consider all locations, of all characteristics and almost all sizes, as regeneration sites for the purposes of rebuilding and restoring those worn-out urban sections, in line with the development of the city; they may create housing areas, industrial and commercial areas, technology parks and take precautions against earthquakes, or preserve a city's historical and cultural fabric (Güzey, 2009, p. 30)'.

Although the JDP government supported the increase in the revenues and responsibilities of metropolitan municipalities until 2010, the central government became more active after 2010. Central government agencies such as the MHA and the Ministry of Transport, Maritime Affairs and Communications have become more active as agencies of the central government. With increasing power, the MHA became more active in all parts of Turkey and established partnerships with municipalities. Güzey (2016) states that between 2003 and 2015 the MHA prepared 336 redevelopment projects, which set targets to produce 276,162 housing units in partnership with municipalities in different regions of Turkey.

3. The Redevelopment Process in Altindağ Case

3.1. Case Study Area and the Method of the Research

Altindag is the oldest district of Ankara, with a population of around 365 thousand and an area of 15,847 hectares. The first gecekondu neighbourhoods in Ankara were built here. In 1971 Altindag had the highest percentage of gecekondu residents in Ankara with 49% of its population living in gecekondus (Kongar, 1973). For decades, Altındağ continued to have the highest number of gecekondu, being 25th in the list of the world's 30 mega slums, with around 400,000 people living in slums (Davis, 2007, p. 27). In 2004, only 30% of built-up areas were formally constructed. Since

2004, however, new zoning plans have been prepared, this is an ongoing process and not all the zoning and development plans have been implemented yet. Nevertheless, between 2004 and 2016 the number of formally constructed buildings increased from 30 to 62% per cent. The Başpınar and Alemdağ neighbourhoods were chosen as case study areas for the research, due to the ongoing process of Improvement and Development (IDP) model projects.

Due to the lack of adequate reports and official documents semi-structured was used as a research method. The researcher conducted 25 interviews with residents and 2 interviews with officials. The researcher interviewed 20 men and 5 women, comprising 22 gecekondu owners and three tenants. The interviews were conducted between March 2015 and June 2016 with 2 different field visits, each lasting 5 weeks.

3.2. Redevelopment Plans

Improvement and Development Plans were a national state intervention in order to facilitate redevelopment of informal housing support construction capital and state to provide better housing to the low-income groups. The tools of this intervention were new legal frameworks for city-wide IDPs. This was an upscaling of state intervention. Moreover, this strategy was based on the neoliberal framework of the 1980s, with a market-oriented framework, clear private ownership rights and further strengthening of the relationship between land titling programs.

In order to open the channels for investment in the built environment, municipalities firstly provide the conditions of clear land ownership and zoning. The first IDP plans were prepared in 1984 in Ankara; however, the first IDP improvement and development plans in 1984 did not cover many areas in Altindag. The IDP and legalisation of gecekondus increased the construction of gecekondus in Altindag because it increased people's expectations of legalisation in the future. Therefore, many gecekondu were built after 1984 (Koksal, 2012; Altındağ Belediyesi, 2014). According to the municipality, the construction rights established in 1989 for IDPs were not enough for redevelopment and did not cover all gecekondu areas. Therefore, it did not change the zoning in case study neighbourhoods. The municipality made revision plans in 2007, which increased construction rights in the area. While the first IDP allowed the building of only 1-2 storey houses in the area, after the IDP revision 4-6 storey apartments could be built. In this way, the area became attractive to private developers. By changing zoning, the district municipalities make the area profitable for private developers.

Build-and-sell type housing production is based on agreements between different groups. The actors of these agreements are homebuyers, gecekondu owners after amnesty laws, private developers, small builders, local politicians and city administrators. A private developer starts the production by signing an agreement with each individual landowner in the parcel by offering 30-50 % per cent of the finished apartment units or money for their plots. Due to increasing construction rights, the land of the gecekondu is much more valuable than the gecekondu itself. Therefore, redevelopment became profitable for gecekondu owners too. Based on this agreement the developers pay gecekondu owners not money but flats. After the agreement, the construction process starts.

In the case of the case study area, 22.7 hectares of the site were previously part of the gecekondu preservation zone, these areas have been conducive to the housing development by the Ministry of Resettlement and Housing in order to prevent the construction of gecekondus. Due to the gecekondu Act No: 775 it was not possible to include these areas as a part of the redevelopment project by the district municipality. In order to overcome this problem, the municipality used the administrative power of MHA, which can intervene in urban space above all existing acts (Section 2.1.1). After the land was transferred to MHA, the areas were bought from MHA by the municipality and sold to gecekondu residents in the neighbourhood, in total 1383 gecekondu residents bought their houses from the municipality through this model (Altindag Belediyesi 2016; Koksal 2012).

Despite the plans being prepared in 2007, construction was ongoing in 2016. The fragmented ownership of the plots meant it was not possible to reach an agreement between gecekondu owners, making the redevelopment a long process of negotiation. The long negotiation process created clashes between the neighbours. In many cases, the landowners could not reach an agreement because they wanted to maximise their returns. Therefore, many features of the new flats became negotiation points between developers and landowners. Since some of the owners wanted to join the redevelopment and others wanted to wait, conflict ensued. These were not violent conflicts, but they destroyed the solidarity in the neighbourhoods; for example, Resident 1 indicated that he sold land to the developer and bought another flat, 150 m from his previous house because the neighbours could not reach an agreement. Every feature of the house is a point of negotiation: 'the orientation of the house, the floor area of the house. Since these houses are their biggest investment and, in many cases, their biggest asset, they want to maximise their return.

Due to the long period of construction and negotiations municipalities apply for designation as a disaster risk area. The Disaster Act (2012) aims to overcome these delays and blockages in the redevelopment since the construction of new flats takes a minimum of 1.5 to 2 years. The rent subsidies provided by the Minister of Urbanisation speed up the agreements. The rent subsidy is paid by the Ministry of Urbanisation for 18 months and in 2016 it was 750 Turkish Lira. Therefore, many gecekondu owners made the agreement and apply for rent subsidies under the Disaster Act (2012). If they get the rent subsidies they have to vacate the house. If the gecekondu is officially designated as a disaster risk, the water and electricity service provision stops. Moreover, the Disaster Act also enhances the position of developers and pro-redevelopment shareholders. Based on the Disaster Act, a 2/3 majority is enough for the redevelopment of any building or parcel. If any area, neighbourhood or building is declared as an Area under Disaster Risk, 2/3 of shareholders consensus is enough for starting redevelopment. The general consensus in the neighbourhood is that after the Disaster Risk Act (2012) construction speeded up. This was an upscaling of the state intervention to the build environment in order to speed up the redevelopment (Section 2.2).

3.3. A Chaotic Construction Site

Due to this long negotiation process and the land's complex legal status, the redevelopment has been going on for 10 years. In the Alemdag neighbourhood, the construction mostly finished around 4-5 years ago. In the Baspinar neighbourhood, however, the municipality had to follow a different legal procedure, because a big part of the neighbourhood was a gecekondu prevention zone. In the Baspinar neighbourhood, much construction was ongoing. Lack of agreement between different actors turns all neighbourhoods into construction zones. As Resident 5 illustrates, 'I am 24 years old now when I was a kid people were talking about redevelopment projects. Yet, we still live in gecekondu. We want to make some investment in the house, such as a new roof and PVC windows, but we could not because of redevelopment. It does not make sense to make any investment now of course.

Since the entire neighbourhood became like a construction site (Figure 2), it creates security concerns for the residents. In many street constructions continue, therefore the infrastructure such as street lights are not fully functional. The half-demolished gecekondus create security problems (Figure 2); substance abusers occupy the buildings at night. Since many gecekondus have been demolished, the self-policing nature of gecekondu neighbourhoods has disappeared. Therefore, it creates a transition between informality and illegality. Many interviewees suggested that drug selling became a problem in the neighbourhood.

Additionally, people throw more rubbish in the streets so that all neighbourhoods become like a scrap heap, a problem exacerbated by the remains of the demolished gecekondu and ongoing construction. This creates further problems, such as the rats that come out of demolished buildings.

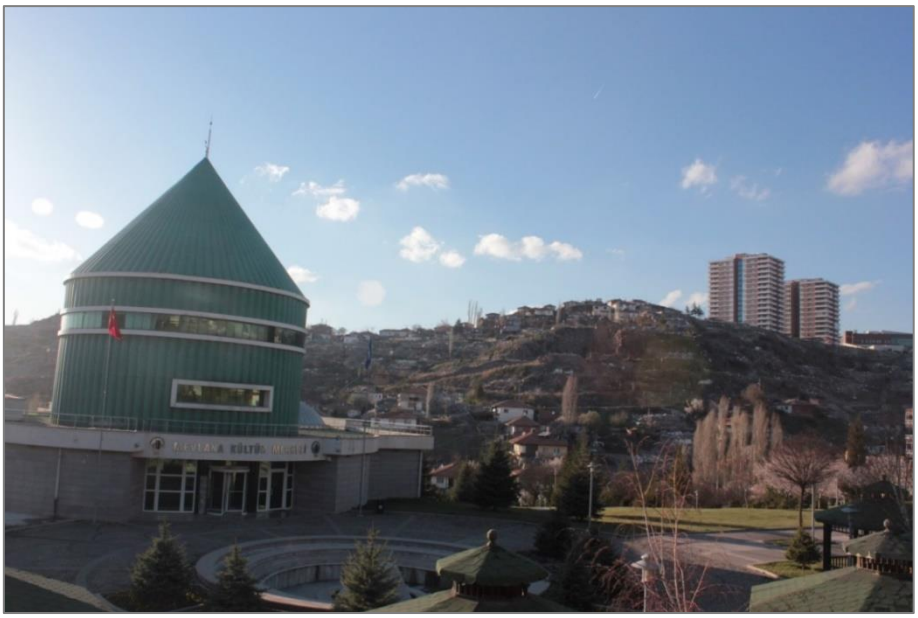

Figure 2 Demolished Gecekondus in the Baspinar Neighbourhoods in the distance, on the hillside. Sinan Akyuz, 2016

Figure 3 Partly demolished gecekondus and newly constructed apartments next to each other. Sinan Akyuz, 2016

Finally, existing gecekondus and even the demolished gecekondus are occupied by the recent rural-urban migrants. This creates social conflicts between the old gecekondu population and the new renters and squatters. The more some of the recent migrants collect recycling materials and store them in the gardens of gecekondus. This further increase the conflicts, since gecekondu owners think their attitudes make the area less safe. The informal nature of the reconstruction zones makes the area convenient for all kinds of informality and illegalities. All of these create neighbour pressure to reach an agreement with developers and finish the reconstruction as soon as possible.

4. Gains and loses of residents

4.1. Improvement of Living Conditions

We noted in section 2.1 that new local policies and interventions may not be only class-disciplinary but may also be class-cooperative and that these class relations may extend across the

spheres of both production and reproduction. This combination of class relations within local politics has been the case in Turkey. Since the 1980s, workers in employment have been subjected to a greatly increased disciplinary power of capital and the state. The governments since 2000 have cooperated with at least a portion of the urban working class by providing a higher material standard of housing combined with new social and cultural facilities in the neighbourhoods. In terms of improved living conditions two main points come with the redevelopment. The first point is the improved living conditions offered by the flats; the second point is the increased public and private investment in neighbourhoods and, therefore, increased economic and social facilities and services.

As many participants suggested, the many basic construction problems with gecekondus, such as leaking roofs, bad plastering, rotten wood, are not problems in the flats. As interviewee 10 said, 'I live in the flat for 4-5 years. I am much more comfortable than before, I don't have the problems of a leaking roof, coal stove, repairing the floor, the garden wall; repairs are not my problem anymore. The infrastructure here is properly underground and it is safer and durable.' In the hometown association, the general idea was that the flats are much more comfortable than the gecekondus. The standard of living is much better in the flats than in gecekondus. Therefore, there is opposition to or conflict against the redevelopment project itself.

All women participants highlighted the advantages of the flats. The coal stove was the biggest problem for the women because their husbands did not help them in its preparation. The women had to clean the oven, set the fire and bring the coal. There was always much work in gecekondu done by women. Therefore, the women that I had a chance to talk to about the gecekondu houses were waiting for the redevelopment and wanted to have new flats. Moreover, the services such as the women's centre became an important part of social life after the redevelopment.

A municipal service, the women's social centre opened in 2008 (Figure 4). The women's social centre in Baspinar Neighbourhood has 1650 members and opens every weekday from 8-5. The provision includes a gym with a fitness teacher, kindergarten and 19 different courses, such as theatre, drama, public speaking and entrepreneurship. The courses open based on demand, so there is no limit to the number of courses that could be run. There is also a theatre group established by women who joined the drama courses at the centre. The cooking classes and competitions are one of the most popular activities. There are also seminars about drug addiction and women's health. There are illiterate women in the neighbourhood; therefore, the municipality also gives writing and reading classes in the centre (Official 1, 11.03.2016).

Figure 4 The Women Social Activity Centre in the Mevlana/Rumi Park in Baspinar Neighbourhood. Akyuz (2016)

Another service provided by the municipality is free domestic trips to historical places of Turkey, such as Çanakkale (Troy), Konya Mevlana/Rumi Museum. The trips, organised and paid for by the municipality, are only open to women who live in neighbourhoods nearby. Each trip is organised for 45 people and if there is too much demand then participants draw lots. During the trips, all the participants receive accommodation in 4-5 stars hotels. All of these expenses, including travel and accommodation, are paid by the municipality. Municipal funding stems from a variety of sources, such as donations and municipality activity funds (Official 1). There are also youth social centres in Altindag. Similarly, the youth centres have courses such as guitar, violin, theatre, chess and Turkish Folk Dance. There are also facilities for wrestling, table tennis, boxing, archery and so on (Interview 13). The programs of the courses are designed based on demand from the neighbourhoods.

The improvement of the services in the neighbourhood was raised many times in the interviews. I would suggest, therefore, that the main difference between the contemporary period and the past was a general neglect of these peripheral locations for decades. Generally, people think the social services such as schools, hospitals, health centres and parks are good enough now.

4.2. Losing Social Connections

Although the redevelopment provides improved infrastructure and urban services, the quality of the buildings varies based on the private developers. Some gecekondu owners complained about the quality of the construction materials of the new flats. Interviewee 10 suggests that:

'The developers use lower-quality materials than they are supposed to use. …We don't trust the developers, they don't respect us. I received a loan with a high-interest rate, I am struggling to pay it, and 10 years is a very long time. The houses are our biggest and only asset. However, even before the first-year finishes, there is a problem with the plumbing; there is no storage in the building. They [the developers] had to make storage units in the building; I don't know how they found a way to bypass that regulation.

Furthermore, the lack of sound and heating insulation in the apartments also creates further conflict amongst the residents. The gecekondu owners have lived for decades in separate houses. As such, it is not easy for them to adapt to the conditions of apartment life. There are many arguments in apartments about sounds from neighbours. Interviewee 7 is the apartment manager and says, 'I have lived in this building for 3.5 years. If I don't yell at people, they don't listen to me. These people get used to the gecekondu life. Here, we live as a community, they have to respect that. This is apartment life; they have to accept the rules.

Even though the neighbours stay in the same neighbourhood the self-produced space gets lost as a result of the redevelopment projects and alongside the space the previous social connections. In gecekondu, residents had an active social life in the gardens and in the houses; the reconstruction demolishes this daily life as well. Despite the material development, such as hot water and heating, the new daily life has been described as very monotonous and boring by nearly all participants. Interviewee 12 explains: 'The gardens and social life in the gardens were very relaxing; it was a hobby and an activity for us. On the weekends we used to have barbeques. We lost those connections, now I had to go 20 km for a barbeque. How can we do that? If you try in the balcony they complain to the building manager.'

4.3. Fragmentation and Atomisation

The long process of negotiation between neighbours and developers creates conflict between neighbours. Many neighbours argued with each other and sometimes it ended in litigation. There was formal land ownership and homeownership before, so whilst ownership is not a new concept, the increasing ground rent and individual legal agreements atomised the gecekondu owners. These conflicts, before and during the redevelopment about reaching an agreement, weaken bonds of solidarity. Individual property ownership logics then make residents work more for their own interests rather than as a collective. One of the main drivers of conflict relates to the gain of the

other gecekondu owners. People were suing their neighbours in order to get more money for their land. The redevelopment atomises and individualises the gecekondu owners. Firstly, during the negotiation process individual ownership rights (land titles) damage the solidarity and neighbours negotiate and compete to maximise their return.

Secondly, the apartments/flats and the reconstruction of the built environment makes people more individualistic/atomised in daily life and alienated in social relationships. The redevelopment achieves this by deconstructing the social networks and the gecekondu space. There is a common opinion about the loss of neighbourhood relationships as a result of redevelopment. A Participant explained, in the hometown association, 'in the apartments you don't have the previous relationships with neighbours. People live in different conditions and places now. Everybody focuses on their family now; we cannot visit people as we did before. It is not the same as in gecekondu anyway; we were neighbours for 30-40 years in gecekondus.' The formal space of redevelopment destroys the active and productive use of green spaces. Even though the green space has increased in quantity, people don't feel the parks and the green space are very useful. Interviewee 12 says, 'the flats do not fit the traditional Turkish lifestyle. The apartments make us lose the traditional lifestyle. We used to do gardening with our neighbours and chat every so often'. In comparison, it was very common for people to describe flats as "modern prisons", "luxury prisons", "high prisons", and "cages".

The experiences of the gecekondu owners who moved to new apartments are very different to classic examples of gentrification, but it is not a wholly positive process. In short, living in an apartment increased the material quality of living conditions for the former gecekondu residents. Not only the housing conditions but also the urban facilities and economic activities in the neighbourhoods increased with the redevelopment projects. However, there are problems with the IDP redevelopments. The quality of houses varies based on the small-scale developers and living costs increased. New flats have heat and sound insulation problems. The previous social structure and life gets lost in the new flats. The gecekondu resident fragment during the negotiation process, based on private ownership rights. The combination of fragmentation and the monotonous nature of apartment life, then, create further atomisation of working-class people in the Altindag case.

4.4. Economic benefits of redevelopment projects for gecekondu residents

The benefits and disadvantages of the programme varied sharply between different groups of residents. While for gecekondu owners there are many economic benefits, there are also many disadvantages. For the disadvantages of redevelopment projects for gecekondu owners.

The first and the biggest benefit of the redevelopment for gecekondu owners are the flats given for their land. Gecekondus are self-produced spaces and there are strong neighbourhood relationships. As we have seen, however, the standards of life in gecekondu are very low and the infrastructure is not adequate. Therefore, with the redevelopment, the gecekondu owners take advantage of state and private sector investment in the neighbourhood. Although the situation changes based on each construction, on average owners of 150 m² of land get a free house. The first group of people in the legal landowners with 150 m² and above land. They can get at least one flat as a result of the redevelopment. This group is shown in green in Figure 5. The second group of people are without any legal title. In this condition, even if they occupied a large amount of land, historically they could not get any discount or house. They can buy the houses from the developers as any ordinary home buyer. The third group of people live in the gecekondu preservation area in the Baspinar neighbourhood. The Altındağ Municipality takes the initiative for these redevelopments and sells them the land they have occupied since the 1970s. They paid 15,000-20,000 Liras. In this, the municipality subsidises a total of 1383 gecekondu residents. Gecekondu preservation areas were land given to low-income groups in order to prevent illegal gecekondu construction. These people could not have a title to the land but built their houses and occupy the land.

The fourth group of people are the people without any land ownership. These include tenants and anyone who could not get the legal titles of the houses because of different reasons. For these groups of people, the only possibility is buying houses through private credit or MHA credit. Since the zero-tolerance of gecekondus policies and lack of available land, the only possibility is homelessness or temporary slums.

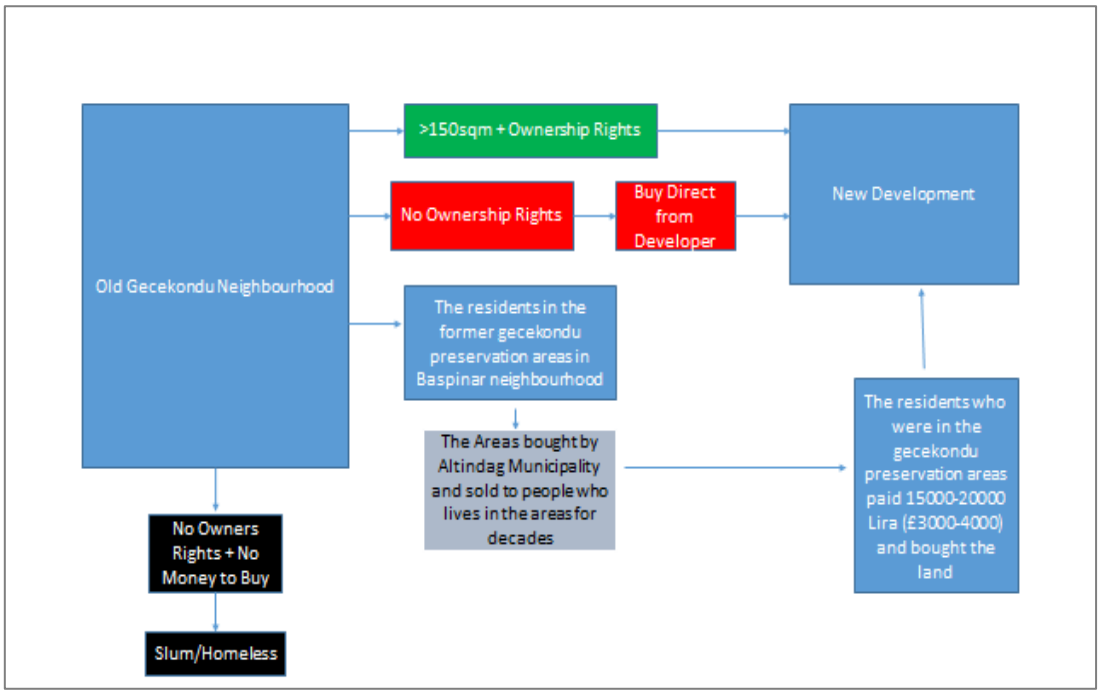

Figure 5 Clearance of land ownership pattern for redevelopment by Municipality. Source: Sinan Akyuz, illustrated from interviews and municipality report, 2016

Another advantage of redevelopment for those who are staying in the area is that it increases urban and public service provision in the neighbourhood. For example, there was not any post office or bank in the neighbourhood before. The number of schools was much lower than currently and there were not any social facilities such as the women's and youth centres. These services and many shops have opened in the area with the increasing population.

The recent Disaster Act is providing 18 months of rent subsidies to gecekondu owners. Therefore, rent during the construction period is subsidised by central government. This act worked as an important catalyst in redevelopment as a result of up-scaling the state intervention to the built environment.

5. Conclusion

The provision of low-income housing and providing basic urban services has been always problematic in Turkey. Due to inadequate housing supply migrants built their gecekondus. The migrants not only built their gecekondus, but they also built a social life and support mechanisms within the neighbourhood. Although having these positive features gecekondu, for many dwellers, meant a lack of material comfort, inadequate infrastructure and poverty. The inadequate infrastructure and the lack of material conditions for human dignity saw people suffer for decades in gecekondu houses. Although the government legalised the gecekondus and provided basic services, such as water and electricity, the absence of conditions for modern human standards continued.

After the restructuring of the banking system in 2002, the city restructuring programs entered a new stage. Due to the upward-scaling of the state intervention in the built environment post-2002, we have witnessed a dramatic increase in investment in infrastructure and mega projects from both

central and local governments. Higher capital and administrative power allowed intervention in previously non-intervened areas such as Altindag. Therefore, it was possible to redevelop these areas after 2002.

Gecekondu housing is outside of normal capitalist relations of land ownership and building. The elimination of the gecekondus was partly aimed at subjecting low-income residents to the rule of money and law. Since the 1980s workers in employment have been subjected to greatly increased disciplinary power of capital and the state. However, governments since 2000, have also cooperated with at least a portion of the urban working class by providing a higher material standard of housing combined with new social and cultural facilities in the neighbourhoods.

Although providing basic services and housing for titleholders, the major problem with the redevelopment is a formalisation of housing provision that excludes tenants and people without a title for their informal houses. As a result, the people without title deeds have to live in even worse conditions than before. Conditions they share with new migrants, without formal employment relationships who are also excluded as a result of the redevelopment.

The redevelopment projects, on the one hand, provide better housing conditions for established migrants and the urban poor, on the other hand, they take away the opportunities that the previous migrants had in being able to access such as cheap housing. The only route to cheap housing after these projects is the formal private and state credit systems. In this way, redevelopment integrates the urban poor into the formal credit system or totally excludes them from social and economic life, as in the case of recent rural-urban migrants.

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Resume

My name is Sinan Akyuz and I am a lecturer at Abdullah Gül University. After studying Town and Regional Planning at Ankara Gazi University, I worked in the private sector as an urban planner for a year. Afterwards, I studied MSc in International Planning and Development at Cardiff University. I had my PhD in the University of Sheffield in the Urban Studies Department, and the title of my thesis is "Redevelopment of squatter settlements in Ankara, Turkey" and finished in January 2019. Currently, I work at Abdullah Gül University in the Architecture Department as Lecturer. In harmony with the UN 2030 Agenda for Sustainable Development Goal 11 which focuses on making cities and human settlements inclusive safe resilient and sustainable, my current research agenda focuses on urban redevelopment projects through integrating the finance sector into housing and the effects of these projects on the historical squatter settlements neighbourhoods in Ankara, Turkey.

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Naval museum spaces a study on accessibility and visibility based on the relationship between the sea and land

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Abstract

The relationship between location and context, design, and usage gains importance in architectural structures. The interrelated patterns of different syntactic and semantic layers compose the built space especially museums or exhibition spaces. The museum spaces have a considerable part of everyday life in terms of social interaction. The accessibility, visibility, and circularity of the museum spaces are affecting the integration of the human-space activity. The museums by the sea are recognized with the silhouette of the city. These museums are accessible from the seaway and overland routes. It is important that the museums as an exhibition space in the city are visible from both the sea and the land and provide two different accesses. For this reason, the study investigates two naval museums which emphasize the importance of location belonging and the type of the museum. Within the scope of the study, Genova Galata Museo Del Mare in Italy and the Istanbul Deniz Müzesi in Turkey with a similar location and function are examined. The museums are close to the seaway and visible from the sea. However, Istanbul Deniz Müzesi's access is provided from the motorway due to the actual usage. On the other hand, in the case of Galata, the situation is the opposite. Thus, the museum structure is passed through in it and creates the connection space between the sea and land. The aim of the study is not only a representation of the maritime structure of the museum in a city that is the sea but also to highlight the importance of access from both sides. Furthermore, with the examination of the visibility, accessibility and circularity affect, the usage and time-related changes in the museum to be focused. For this purpose, use from the sea and the land, the relationship between the land and the sea will be evaluated as a bridge of the ground floor. In this study, the space syntax analysis method is applied. Space syntax provides an analytical analysis of human-environment relations, accessibility, and movement values. (Hillier et al., 1987). The relevant results will create a research base for further use and change over time. In conclusion, in two different sea countries' naval museums are evaluated with the context of location and usage comparatively. The accesses of the museums and exhibitions areas are also evaluated by the visibility, accessibility, circularity analyses. A scientific base has been created to examine past, present, and future usage.

Keywords: naval museum, sea architecture, space syntax analysis, urban bridge

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1. Introduction

1.1. Galata Museo del Mare-Italy

The Galata Museo del Mare was designed by Spanish architect Guillermo Vázquez Consuegra and opened in 2004. The project was selected with an international idea contest which was built within the scope of architectural renovation and the historical protection of the Genovese shipyard. The museum uses the ruins of the shipyard. The museum is located on the grounds of the Porto Antico, in the Palazzo Galata, in the Darsena district. The museum consists of four floors with exhibition areas. Having the 10 000 m2 area makes the museum the largest one in the Mediterranean. Maritime Museums Design Office of the city of Genoa organizes the installation of the exhibitions. The museum's light glass structure, aluminum joinery create the new frame of the vaulted structure. This allows creating a gap between the new façade and the historical façade. The museum building gives the opportunity to historical shipyard façade seen completely from outside (Figure 1). Therefore, the museum reflects the maritime history of the city of Genoa with all its aspects. The 100 years old building shows itself with its new structure. The building welcomes visitors with a large entrance hall on a scale sufficient for new public use and allows a view of the historical facade from the road (URL-1). The museum is placed at the center of the port of Genoa with its spatial organization.

On the ground floor, the entrance is provided from the seaside a large foyer meets the users. The foyer consists of the information desk, cafe, bookshop and offices where four historic boats, diver diorama is exhibited. The lighthouse guides the users to the exhibition areas with the narrow corridor and this narrow corridor links the four separated units. The first part is devoted to the auditorium and service area. The second part is located to the lighthouse axis that reveals the Fresco" by Renzo Piano and Genoa: the port after the middle ages. The third part exposes Andrea Doria and the Genoese galleys, the weapons of the republic. Finally, the fourth part is devoted to the large galley that Arsenal: the galley on the airport. After the galley part, the space formed between the historical building and the new façade displays Galeotti: Life on Board and includes the stairs which enable users to go up (Beydiz,2018).

Figure 1 The location and the seaside facade Genova Galata Museo Del Mare, Italy. (URL-2)

1.2. İstanbul Deniz Müzesi-Turkey

The museum received the first prize in the Istanbul Deniz Müzesi national architecture competition opened in 2005. The museum was designed by Teğet Architecture as both the first example of a contemporary museum for the historical collection in Istanbul and the first public building built on the Bosphorus coast since the Bosphorus bridges. Located in the Beşiktaş district of İstanbul, the main exhibition building has three floors and sits on a 15.000 m2 area. The museum consists of 4 large halls and 17 rooms that are used as exhibition areas and the name of the directions of wind are given to the halls. In the museum, reign boats, navy clothes, manuscripts,

ship models, banners, maps and portolan, paintings, tughras and crests, galleys, navigational instruments, ship head figures and weapons are exhibited. In the entrance section, there is an educational playground and a souvenir section for younger age groups. The museum was built adjacent to the historical structure (URL-3).

When the visitors enter the museum from the retreat zone on the Barbaros Street front, they find themselves in the boat gallery where is the main venue of the museum (Figure 2). On the ground floor, the historical most important galley welcomes the visitors in the large space with high ceilings and without columns. After that, the boats are proceeding chronologically by getting smaller in size. The tour ends with the boat used by Atatürk. At this point, users reach the mezzanine floor from the ground floor with a ramp. While the sultan boats on the 7 bridges are displayed, the boats on the ground floor are also given the opportunity to view from here. The bridges, whose lengths range from 25 meters to 55 meters, are carried by a 6-meter-high steel cage beam structure that creates a strong impact in the interior. The glass bridge encountered after walking upstairs takes the visitor to the historical building. When you go down the stairs of the historical building, visitors return to the entrance on the boulevard side (Gülhan,2014).

Figure 2 The location (URL-2) and entrance façade (URL-3) of İstanbul Deniz Müzesi, İstanbul

2. The Conceptual Framework of The Study on Relation with Naval Museums

2.1. The Concept of the Space as a Social and Cultural Structure

The space affects its users and can control their mood. A large part of the satisfaction is obtained from architecture arising from space. Architect models the space like a sculptor shaping the clay (Benedikt, 1979). According to Frank Llyod Wright, the reality of a building is not the physical frameworks that form it, it is the space that is created and lived by them (Benedikt, 1993). In Lefebvre's description, space is a product. The social space is also a product. The space is replaced by social relationships; it is not only supported by social relations but also produced by social relations (Lefebvre, 1991). The space contains varied meanings depending on the cultures, lifestyles, and changes in their social structures. Hillier and Hanson define human societies as spatial events. A society does more than exist in a place. It also takes a certain spatial form. Society organizes people first (Hillier at all, 1987).

Historically, architects and psychologists have great attention to nature with the perception of space. Coming up with the beginning of modern experimental psychology, space was first introduced as being of the principle in the practice of architecture (Van de Ven,1974). By that time, the concept of space has improved and reached different dimensions with different variations. Nevertheless, the most significant property of space is that it is organized for human actions for a particular goal. Therefore, it can be designed in a variety of forms and sizes depending on the function and technological data. The architect's experience copes with many issues in design. However, 'experience' is vague, particularly in design practicality worries. Unlike this situation, the

theory of space syntax creates a new negotiation in concerns of architectural practicality (Ünlü and Edgü, 2007).

2.2. The Theory of Space Syntax

The space syntax is a method that focuses on the external features of buildings such as their connections, their positions, on the whole, their relations with all the spaces in the system, rather than their internal features such as shape, scale and texture in the numbering of the properties of the buildings. With the space syntax, the spaces are perceived as voids that square, street, cell and the area between the walls or other things that limit pedestrian movement or their visual field. According to the theory, there is a link between the forms and social forces. Therefore, space syntax contributes to the understanding of the interaction between social restrictions and design goals. The concept supposes that heaps of times, most people, will use the most basic path for their target. The path bears to contain the fewest alteration of way. When there is more variation of direction, there will be a more complicated system. Thus, network design becomes more insufficient (Hiller, 1984).

The theory was created by Bill Hillier, a professor at The Bartlett School of Architecture, University College London (UCL), who, willing to catch out on why social housing of the 1960s and 70s in the United Kingdom was not processing; why a sense of community had not evolved. Therefore, he wanted to obtain the instruments of defining and analyzing how the housing layouts interacted with the space available. Then, he published a book with Julienne Hanson, called "The Social Logic of Space" (1984).

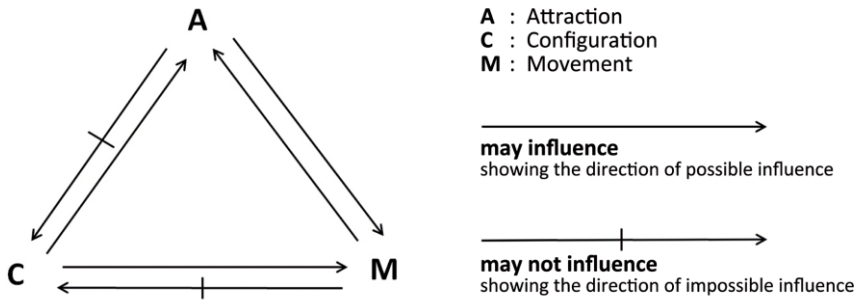


Figure 3 Attraction, configuration, and movement (Hillier, et. all., 1993).

Hillers' studies answer many questions of perception of city structures with various urban and spatial dimensions that influence the conception of pedestrian movements in the city. Furthermore, he figured out a vigorous relationship between the pedestrian and spatial integration of the built environment (Hiller and Hanson, 1984).

The built environment is generated by patterns that are interconnected with distinct syntactic and semantic layers, museums or exhibition spaces are a part of this crucial organization. Space syntax analysis is based on isovists (Benedikt, 1979; Hillier and Hanson, 1984); and provides analytical analysis of human-environment relations, accessibility, and movement values. Isovists and convex spaces for space syntax research are significant for the analysis (Hillier et al., 1987).

As Hillers points out in Figure 3, there is an asymmetrical relationship between attraction, configuration and movement. The configuration of the space has an impact on both visitors' behavior and their movement. The configuration may affect the location of the position of attractors; on the other hand, the position of attractors cannot affect the configuration. Similarly, the movement has no impact on the configuration. Only, movement and attractors are influencing each other (Hillier et al., 1993).

Movement becomes a factor that creates relationships between the user and space, creates different spatial experiences. It enables the venue to communicate more with the user. Therefore, in this research, movement and perception topics must be clutched to figure out the morphology of museum layouts with their syntactic and semantic dimensions. According to Kuipers et al.'s (2003) work, visual perception and cognition have an important role in the movement, wayfinding and process of navigation by using the cognitive maps of the users' movement (Şalgamcıoğlu et. all., 2015).

The movement is a linear activity that people interact with others in space, see the environment from a point in it have a natural and require spatial geometry. The interaction needs a convex space where all points can see all others. From any point in space can be seen a changeable shape of the visual field which is isovist. The accumulation of these complex patterns enables users to perceive the built environment as a whole while moving (Figure 4). Hereby, each of these geometric ideas defines some perspective that uses or experiences the space. Accordingly, it can be said that they are vital aspects that provide organizing the buildings and their environment and grasp them. For instance, in the city, streets, avenues and alleys form the linear concept and the squares or public open spaces create the convex elements of the city. Their isovist features strongly affect the users in the spaces. Therefore, the pattern of the city created by these geometric aspects reflects human behaviors and experiences (Hillier, 2005).

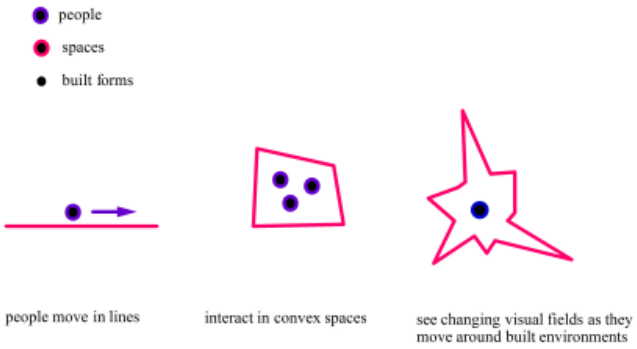


Figure 4 Space is not a background to the activity, but an intrinsic aspect of it (Hillier, 2005)

It can be said that these patterns are seen to be familiar for the visitor's discovery in museum spaces. While discovering the museum, start with following a skeleton of primary paths that connect to various perimeters of destinations and can be described in a syntactic term that more integrated paths of visibility and accessibility which are related to museum's spatial characteristics. These routes orient the local exhibition spaces where the movement is based on the local properties of exhibit accessibility and visibility (Wineman and Peponis, 2010).

By breaking down the subject and clarifying the basic terms used in Space Syntax it becomes easier to understand the different variables and its approach. The three basic conceptions in Space Syntax Analysis (Klarqvist,1993):

• **Convex space**, or convex polygon as some analyst calls it, is a polygon that no line drawn between any pair of points within that polygon goes outside of the polygon. In other words, no line crosses its perimeter.

• **Axial space** or an axial line is the longest line that chains convex polygons. It's a straight line linked to the notion of visibility and that can be followed by foot.

• **Isovist space** is the total area that can be viewed from a point, in three dimensions.

The measured spatial structure is demonstrated by using syntactic maps, with the same terminology:

• **Convex map** depicts the least number of convex spaces that fully cover a layout and the connections between them. The interface map is a special kind of convex map showing the permeable relations between the outdoor convex spaces to the adjacent building entrances.

• **Axial map** depicts the least number of axial lines covering all convex spaces of a layout and their connections.

• **Isovist map** presents the areas that are visible from convex spaces or axial lines.

The four syntactic measures that can be calculated for using a quantitative representation of a building or urban layout:

• **Connectivity** measures the number of depths that are directly connected to a space. This is called a local measure.

• **Integration** is a static global measure. It indicates the degree to which a line is more integrated, or segregated, from a system as a whole.

• **Mean Depth** is the number of point depths is calculated for the average depth and the shortest path is determined for each grid. This measurement is useful in understanding human movement in building environments.

• **Circularity** is a measurement of compactness, which is the ratio of the square of the perimeter to the area. It is not only related to the space which is approximate to the circle but also related to the center of the viewpoint in the space. Therefore, circularity measurement gives the shape of space and centrality of the viewpoint within that space. It is a crucial parameter to discuss the geometry of the structure and spatial relation (Şalgamcığolu, 2013).

The accumulations of visible real surfaces in space generate the environment. Benedikt (1979) defines an isovist as the set of all points seen from a certain point in space and relating to an environment. When the position is changed, the shape and size of the visible field are changed respectively. The amount of evident size and shape properties requires numerical measurements. The accumulation of the scalar isovist field is composed of these measures. Thus, the environment can be defined with groups of isovists and isovist fields alternatively. This technique is appropriate for perceptual and behavioral studies in architecture, such as privacy, view control and spaciousness judgments. Hence, the isovists and isovist fields contribute to the significance of general architectural concepts about space. Furthermore, it is expected that the theory of knowledge-space can help provide efficient common ground for designers and researchers (Benedikt, 1979).

The profile of route vision is a technique for decisive how individual features of isovists alter through the route. Lynch (1965) tries to describe the visual experience through an annular route by fixing graphically the route and demonstrating it as a one-line with especially attractive views that are indicated by arrows (Dalton and Dalton, 2001). According to Hillier et. Al (1982) museum study suggested that reviewing the designs could create a fairly distinct pedagogic potential and social experience to a detailed layout. It can be said that permitting the variety of routes, stimulates a more investigative visiting style, and at the same time decrease the recognition of the other visitors, and guides to less organized and shorter encounters between them. Different schemes proposed different results in terms of the spatial culture; which could be more public, ceremonial or more experimental and specific (Hillier and Tzortzi, 2016).

3. Methodology Regarding the Case Study and Analysis

3.1 Introduction of the Case Studies

In this study, respecting the syntactic analysis, a comparative study is made at selected two naval museums. These two chosen naval museum structures are located on the seafront, which is the

same as a similar function in place and context, added to the historic structure and built on the same years. The relationship of the museums with these sea cities is provided by the main entrance and emergency exit gates located on the land side and the seaside (Figure 5-6). The aim of the study is to evaluate its examinability by both sea and land. It demonstrates that these structures with seafront are used as a bridge that also provides land-sea transition and they can be used actively in both entrances.

In this investigation, quantitative methods that are involved in the space syntax methodology are used. Syntax 2D software that is developed by the University of Michigan is applied in this study. The software provides to examine relationships among the two naval museum compositions (Figure 8), Galata Museo del Mare and İstanbul Deniz Müzesi relying on their convex spaces (Figure 9), the shortest route between the entrance and vertical circulation.

Demonstrating the active usage of both the land and sea entrance of the naval museums located on the seashore to provide the land and sea relationship (Figure 7), increasing accessibility and reinforcing the connection are the key goals of this study. For this purpose, it was studied with visibility and accessibility analyzes used as data that led the discussion. Therefore, connectivity, circularity, mean depth, integration measures and isovist analyses were performed on the ground floor plans (Figure 8) of both museum structures. The visibility of the spaces was analyzed by conducting isovist analysis on a certain route between the main entrance, exhibition spaces, and the emergency exit.

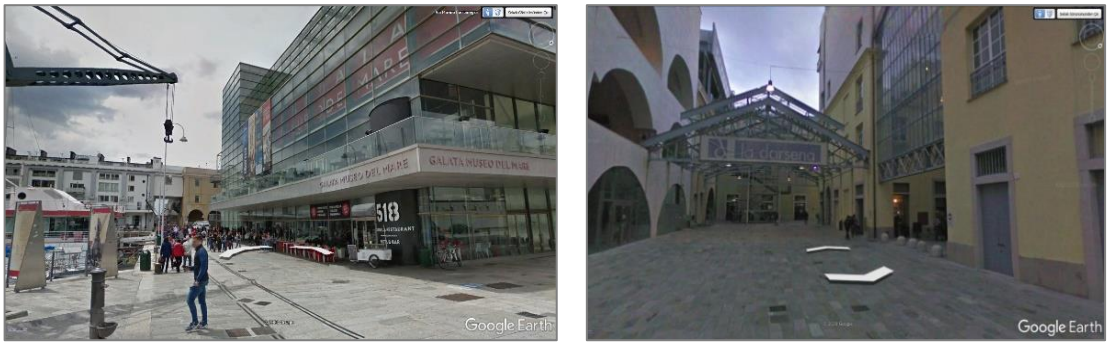


Figure 5 Galata Museo Del Mare Views from the seaside used as the main entrance and from the land used as an emergency exit (URL-3)

Figure 6 İstanbul Deniz Müzesi Views from the seaside used as an emergency exit and from the land used as the main entrance (URL-3)

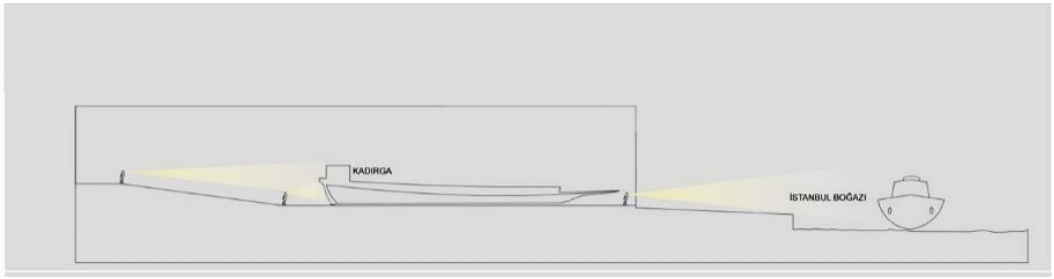


Figure 7 The section of the İstanbul Deniz Müzesi regarding the bridge between sea and land (URL-3)

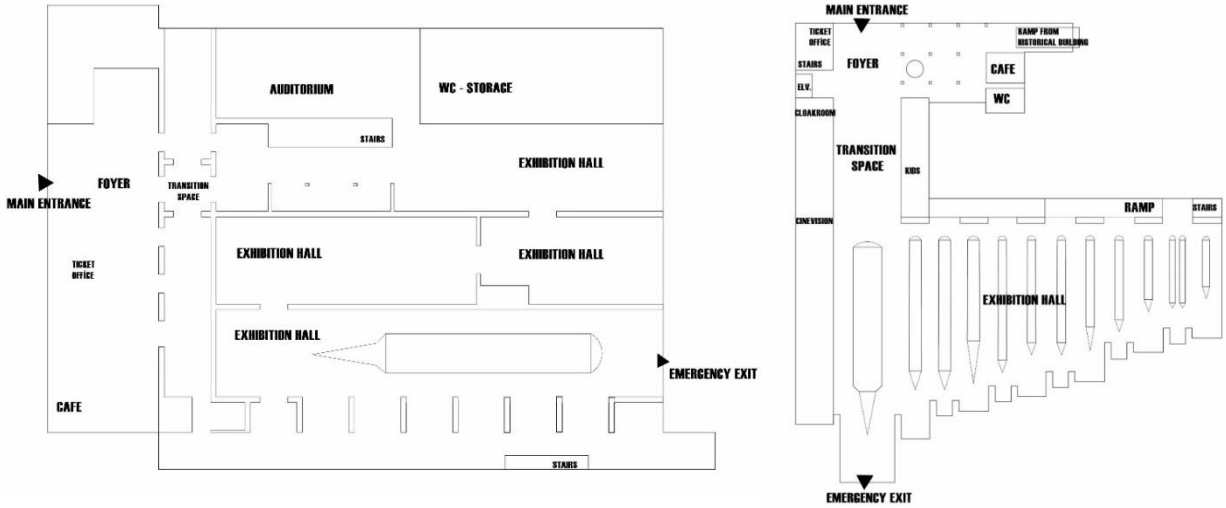


Figure 8 Ground floor plan of Genova Galata Museo Del Mare (left), Ground floor plan of İstanbul Deniz Müzesi (right)

3.2. Analyses of the Case Studies

In the study, two naval museums which are located at the seaside are selected. Both seaside and landside have interacted with the museum user actively. In order to represent the continuity of the urban-human relationship in the museum structure, the importance of the entrance from the urban areas and the circulation of the exhibited space; the circularity, connectivity and integration analyzes were applied to the ground floors (Figure 8). For understanding the human movement in the buildings through the exhibition space to the vertical circulation spaces, the mean depth analysis was used. To evaluate the visibility and accessibility of both two entrances and exhibition spaces, isovist analyses were performed regarding the nodes specified on the route.

The data obtained for every node of convex spaces are circularity, connectivity integration and mean depth (Figure 11). These four data subjects are the main concepts discussed in space syntax theory. In addition to that, these data were calculated one by one for every node (Table 1). Since homogenous colors are obtained, each node selected the center of the convex spaces. The isovist point maps (Table 2-3) were generated for each node that defines the route from the entrance to the vertical circulation point. Due to the size of galleys that obstacle the accessibility and visibility, the exhibited elements were identified as a wall to the software. The configurations of both museums are different. Galata Museo del Mare is composed of a sequence of spaces and the exhibition spaces separated by the walls. İstanbul Deniz Müzesi is an open plan, and the galleys direct the movement.

Figure 9 Genova Galata Museo Del Mare the path points of isovist analysis and convex spaces (left), İstanbul Deniz Müzesi the path points of isovist analys and convex spaces (right)

Both of the museum circulation paths have been drowned by two paths. One of them is the present route from the main entrance to the vertical circulation space (red line). The red line starts with the existing entrances hall, passes through the galleries, and ends with the upper circulation core. The second route is from the emergency exit to the vertical circulation space (green line) (Figure 10). The green line starts with the emergency exit, passes through the galleries, and ends with the upper circulation core. The main objective of the paths is the making shortest way to reach the second floor by seeing the main gallery.

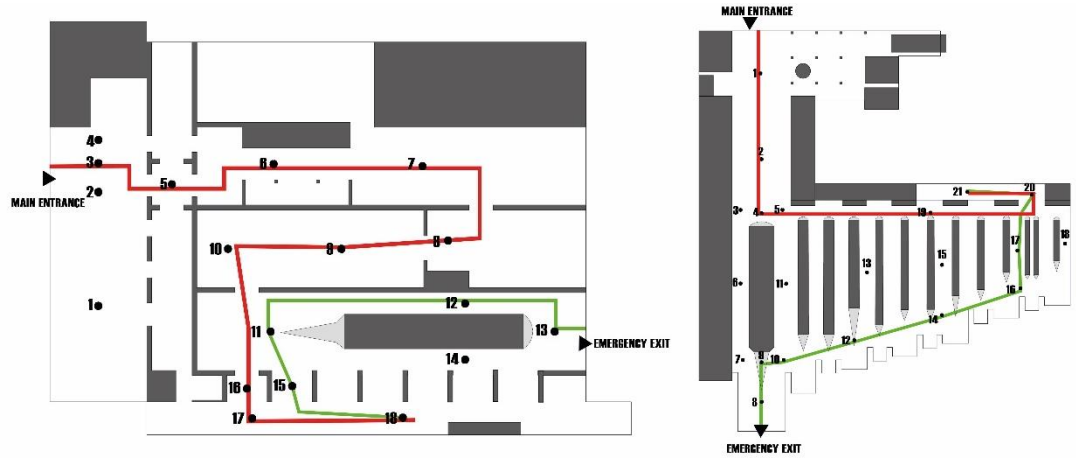
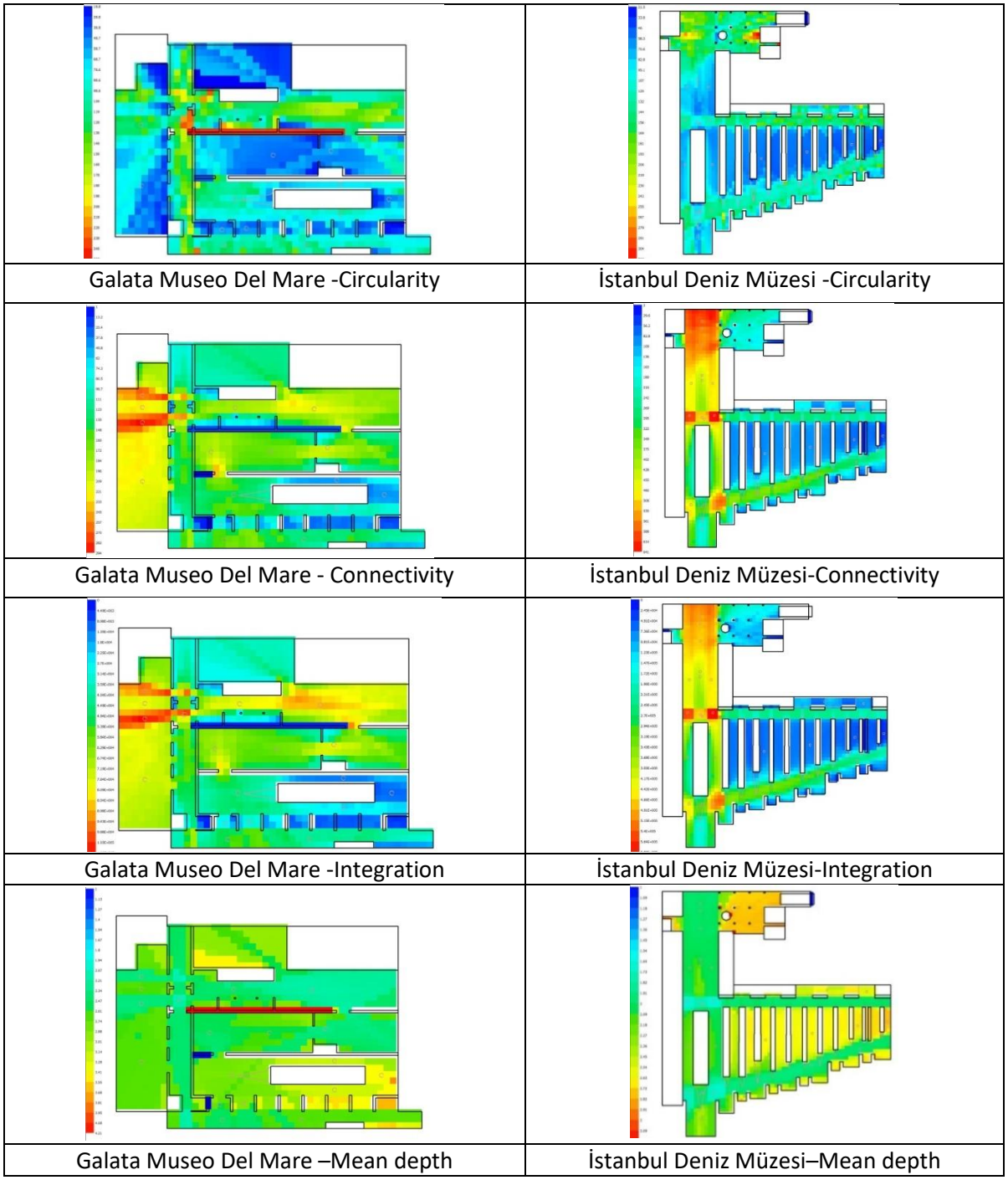


Figure 10 Genova Galata Museo Del Mare's Character of the Routes (left) İstanbul Deniz Müzesi Character of the Routes (right)

Respecting the purpose of the study, the convex spaces were defined in order to show the relationship between the spaces. The main entrances, entrance to the exhibition areas, the movement zones and emergency exits, which are proposed secondary entrances were described as convex spaces at both museums. The routes starting from the main entrances and combining the convex spaces are shown in Figure 9 and routes in Figure 10. The relationship between main entrance-emergency exit and exhibition fields in each museum is achieved by the isovist analysis (Table 2 -3).

In Figure 11, In Galata Museo del Mare, it is seen that the general layout of the museum had moderate circularity value which is homogenous. While the entrance hall's connectivity value is high, the general layout has an average value, and the emergency exit has a low connectivity value. The integration value has a similar tendency to the connectivity value. In addition to that, while the mean depth value is low at the emergency exit, in general, it is an average value.

Similarly, In Figure 11, in the İstanbul Deniz Müzesi, the entrance hall and the overall of the museum have average circularity value, but between the galleys which are indicated as walls, the value of circularity is low. The connectivity and integration values are compatible with each other. At the entrance and entrance to the main exhibition hall values are high, but between the galleys has low integration and circularity values. Unlike the Galata Museo del Mare, the mean depth value has similarities at the main entrance and emergency exit in İstanbul Deniz Müzesi. The mean depth throughout the museum is average, but it is low among the galleys. In Table 1, the numerical values of circulation, connectivity, integration, and mean depth analyses have been given according to the coordinates of nodes indicated in Figure 9.



Galata Museo Del Mare -Circularity	İstanbul Deniz Müzesi -Circularity
Galata Museo Del Mare - Connectivity	İstanbul Deniz Müzesi-Connectivity
Galata Museo Del Mare -Integration	İstanbul Deniz Müzesi-Integration
Galata Museo Del Mare –Mean depth	İstanbul Deniz Müzesi–Mean depth

Figure 11 The circularity, connectivity, integration, and mean depth map

Table 1 The syntactic value of each node- Genova Galata Museo Del Mare(up), İstanbul Deniz Müzesi(down) (Nodes isovist fields are indicated in Table 2-3).

Galata Museo Del Mare				
NODE	Circularity	Connectivity	Mean Depth	Integration
1	**48**	**218**	**2.688**	**75267**
2	122	286	2.373	104486
3	**79**	**226**	**2.640**	**78339**
4	152	259	2.371	933538
5	**240**	**204**	**2.201**	**77939**
6	**96**	**187**	**2.433**	**79040**
7	168	212	2.195	88152
8	57	203	2.329	76732
9	45	164	2.612	59888
10	75	192	2.456	68057
11	998	143	2.856	45788
12	**75**	**46**	**3.191**	**13159**
13	**47**	**45**	**3.409**	**11424**
14	**82**	**84**	**3.236**	**22912**
15	54	100	2.902	33033
16	57	78	2.594	26691
17	107	150	2.485	51650
18	116	129	2.694	42782

İstanbul Deniz Müzesi				
NODE	Circularity	Connectivity	Mean Depth	Integration
1	**189**	**567**	**1.989**	**47144**
2	98	437	2.090	392400
3	**131**	**602**	**1.673**	**547999**
4	94	509	1.757	468438
5	**118**	**636**	**1.655**	**585856**
6	**82**	**271**	**2.186**	**242066**
7	**148**	**472**	**1.750**	**430539**
8	66	188	2.386	169265
9	87	317	1.971	296350
10	**138**	**542**	**1.711**	**497967**
11	**72**	**394**	**2.085**	**357758**
12	131	357	1.924	319764
13	57	96	2.644	68435
14	114	351	1.921	310426
15	53	98	2.633	68497
16	124	291	1.957	250703
17	56	76	2.689	52137
18	39	51	2.765	35265
19	130	217	2.010	201356
20	162	138	2.569	88561
21	101	157	2.537	104254

The routes of the museums are shown in Figure 10. The visibility of the route is indicated node of specific intervals depending on the spatial configuration. The visual perception of spaces and their spatial relations are represented with isovist maps which are shown in Table 2 and Table 3.

The entrance of Galata Museo del Mare and isovist values of the route are demonstrated in Table 2. As stated in the table, 1,3,5 and 6 nodes generate the visual perception from the main entrance. The 12,13,14 nodes demonstrate the isovists between the emergency exit and exhibition venue. It is understood that both the main entrance and emergency exit have a visual relationship with exhibition fields.

Table 2 represents the isovist values of the route and the entrance of İstanbul Deniz Müzesi. According to nodes 1,3,5,6,7,10 and 11 isovists, both the main entrance and emergency exit perceive each other visually. It is determined that the main goal of the study is the landside and seaside entrances to provide both accessibility and visibility. Moreover, nodes 3 and 5 have high integration values. Therefore, the isovist maps support the route and organization of convex space. Both doors are visually related to the museum's exhibition hall (Figure 12 and 13).

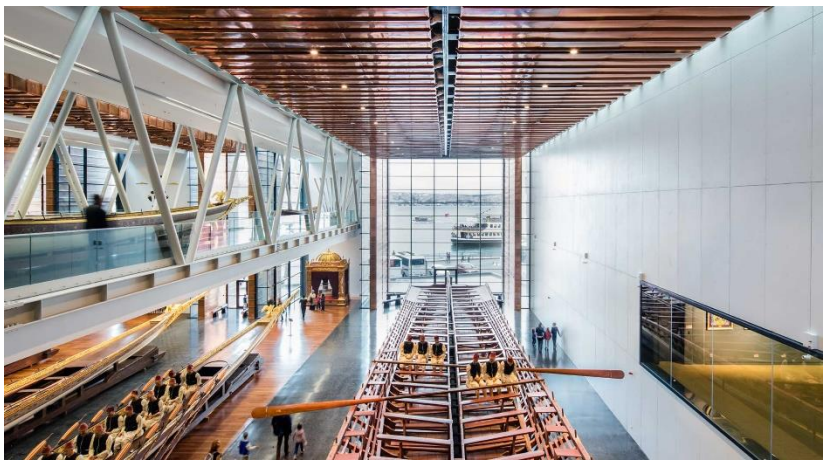


Figure 12 (left) Genova Galata Museo Del Mare's view from the emergency exit (URL-4), **Figure 13 (right)** İstanbul Deniz Müzesi's view from main entrance hall to emergency exit (URL-3)

Table 2 Isovist graphs of each node- Genova Galata Museo Del Mare (Nodes from Figure 10)

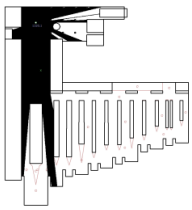
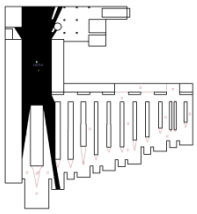
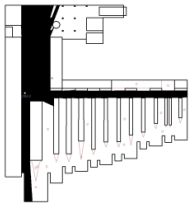
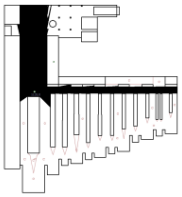
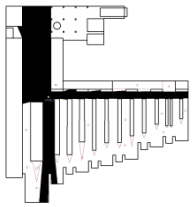
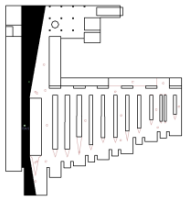
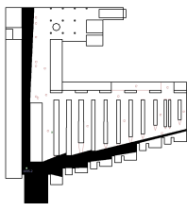
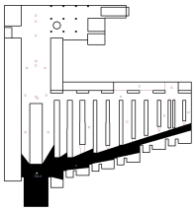
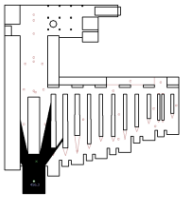
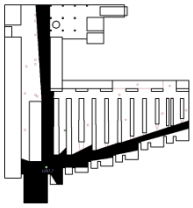
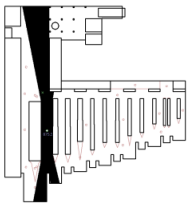
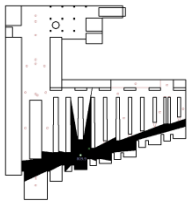
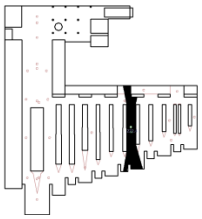
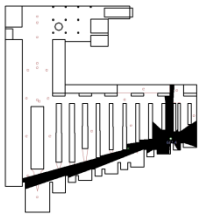
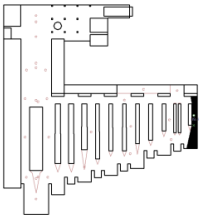
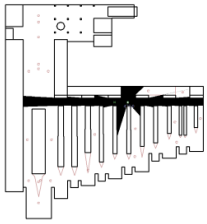
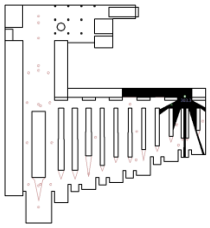
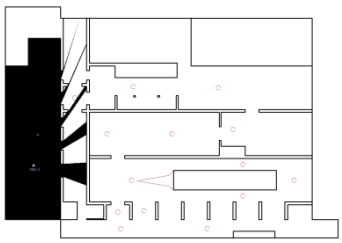
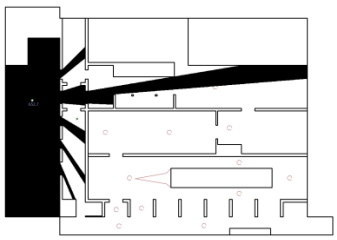
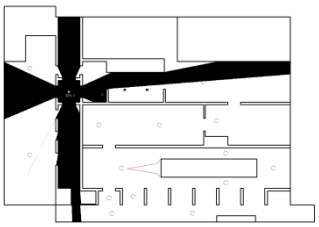
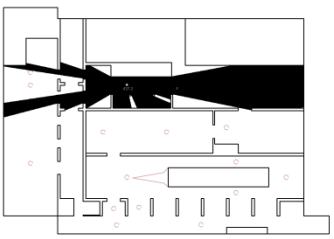
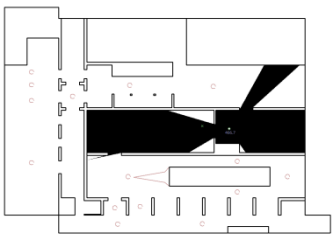
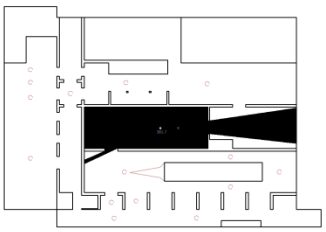
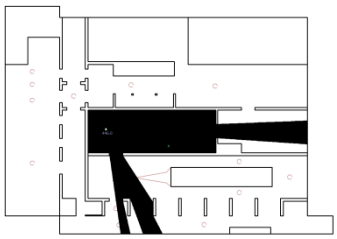
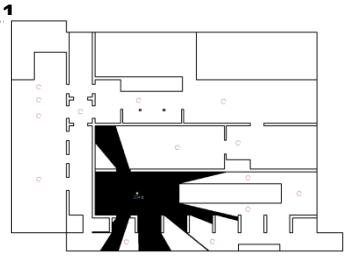
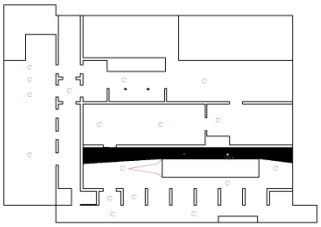
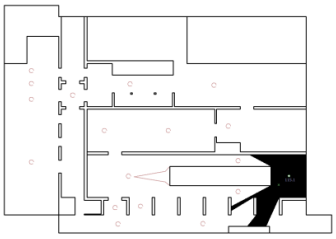
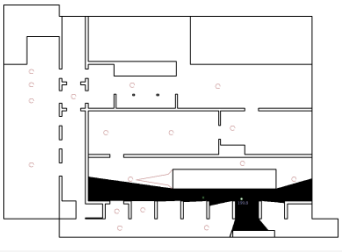
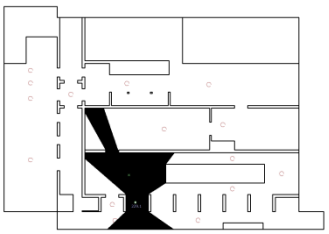
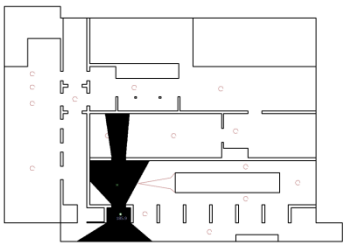
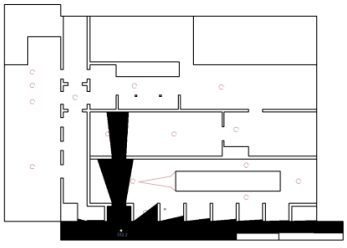
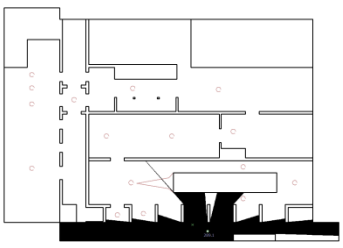
1 	2 	3 
4 	5 	6 
7 	8 	9 
10 	11 	12 
13 	14 	15 
16 	17 	18 
19 	20 	21 

Table 3 Isovist graphs of each node- İstanbul Deniz Müzesi (Nodes from Figure 10)

1 	3 	5 
6 	8 	9 
10 	11 	12 
13 	14 	15 
16 	17 	18 

4. Conclusion

The study examines the two different naval museums between the sea and the land. In the Genova case, the seaside entrance is actively used, but the land side is used as an emergency exit. On the contrary, in the İstanbul case, the situation is the opposite. Although they are visible from both sides, İstanbul Deniz Müzesi is accessible from the landside and the Galata Museo del Mare is accessible from the seaside. Thus, the relationship between both sides and exhibition venues is evaluated in Table 4 by applying the Space Syntax 2D tool.

Table 4 Evaluation of space syntax measurements

	Galata Museo Del Mare		İstanbul Deniz Müzesi	
	Main Entrance	**Emergency Exit**	**Main Entrance**	**Emergency Exit**
Circularity	Average	Low	Average	Low
Connectivity	High	Low	High	Average
Integration	High	Low	High	Average
Mean depth	Low	Average	Low	Average

According to the data obtained, while the main entrance of the Galata Museo del Mare on the seaside is average in terms of circularity and mean depth, it is highly dense in connectivity and integration value. In the analyses made for the emergency exit door on the land side of Galata, circularity, connectivity and integration value are found in low intensity and medium depth. In the Istanbul museum; the main entrance circularity value on the land side is average, the connectivity and integration value is seen as intense. Moreover, the emergency exit door on the seaside has a low circularity value and the connectivity, integration and means depth value is average (Table 4).

While the İstanbul Deniz Müzesi faces to square that the active vehicle and pedestrian traffic on the mainland side, the emergency exits face to the public square that ferry port and pedestrian flow on the seaside. The museum is located that separates these two public open spaces. The main purpose of this study is to make a connection between two axes by applying the circulation, connection, integration analysis to the interior space of the museum. According to analysis, if active usage and permission will be provided between the main entrance and emergency exit in the interior space, the museum will become a more permeable urban transition bridge.

Unlike İstanbul Deniz Müzesi, Galata Museo Del Mare's main entrance faces the square at the seaside, while the emergency exit opens to public areas and pedestrian flow on the mainland side.

The circulation, connection, integration analysis demonstrates that similarly Istanbul Deniz Müzesi if the active usage and the transition are provided between the main entrance and emergency exit, the museum's interior space will gain permeability features.

The naval museums are urban bridges that provide fluidity among the land and sea, make connections. It is necessary not only to be visible from sea and land but also to be accessible from both sides. Using the emergency exit as a secondary entrance to provide social space and urban relations on the land side of the Galata museum will increase the land-sea relationship, circulation, connection, integration, and visibility.

With the same approach, the use of the emergency exit overlooking the sea transportation piers and urban open areas of the Istanbul Deniz Müzesi will increase the land-sea relationship, circulation, connection, integration, and visibility. For this purpose, having similar location features, Istanbul Deniz Müzesi where is at the Marmara Sea and Galata Museo del Mare where is at the Mediterranean Sea, the sea-land relationship will support accessibility and visibility in future use.

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