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Article

Rethinking the third place: Could the book cafe be the social interaction catalyst for today's people?

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ABSTRACT

Third places are gathering places where people spend time in their daily lives between home (first place) and work (second place) and have social interaction with people in the community. As a result of socioeconomic change and technological development over time, third places have changed spatially and socially. This study addresses the types of third places in the literature, focusing on the so-called book cafes, which exhibit both social and functional diversity. The study argues that these places can be called "hybrid third place" based on the concept of hybrid, which is a biological concept. The study is based on the literature review on third places and the observations made in book cafes, which are places where different functions such as café, library, and exhibition space coexist. According to the results of the study, nowadays, new types of third places as well as in-between spaces have emerged. The hybrid third place, designed according to changing needs and socialization practices, is one of them. Considering that today's people's only expectation from the third place is not to have active social interaction with other people, the hybrid third place provides the necessary space for an experience that resembles public space and meets this need. In this context, the characteristics of the hybrid third place as a catalyst for social interaction that brings together people with different social roles were identified. Functional diversity, physical and social accessibility, flexible space design, and historical value of the building are some of them.

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INTRODUCTION

Third places are informal gathering places such as cafes, restaurants, stores, shops, and post offices where people gather and have the opportunity to interact with other members of the society in which they live (Oldenburg, 1989). Third places are important for community life. This is because socialization and the formation of a sense of community take place in these places where conversation, information exchange, and social interactions are encouraged at various levels in daily life (Habermas, 1989, Oldenburg, 1989, Putnam, 2000). Third places provide social connections with opportunities for social interaction, community building, and social support. These social

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spaces are places where people can go regularly and meet with friends, neighbors, colleagues, and even strangers they do not know (Mehta and Bosson, 2010). As living conditions have changed, so have people's expectations of the third place and the activities they engage in in these places over time. Although the need for socialization and social interaction has remained the same, the practices of daily life and the physical characteristics of the third place where these actions are performed have changed. With the Industrial Revolution, the separation of home and workplace, natural disasters and epidemics, the advent of the modern work order, and finally the development of communication technologies through the Internet, the elimination of the need for third places to be temporally-spatially bounded, the spatial characteristics of third places and their places in daily life have also changed. While the coronavirus epidemic we have recently experienced shows how important third places are in our social lives, remote work practices have increased in the process and have become even more common after the epidemic. This situation has increased the need for third places where people can both socialize and do the work they need to do. As a result, the relationship of third places to places such as home, workplace, private and public spaces have changed, and new types of third places have emerged. To shape the areas where today's people will spend time, it is necessary to create a conceptual infrastructure and rethink the literature on third places. This study aims to look at the types of third places mentioned in the literature from a holistic perspective and compare the characteristics of the existing types of third places with the characteristics of the newly emerged third places so that the "hybrid third place" is defined and its characteristics are determined based on the actions taken there. The study is based on a literature review of third places and focused observations in new-generation book cafes and survey data applied to cafe users. As a result of the analysis of the data obtained through the literature review, a definition of hybrid third place was made and the characteristics of these places were determined. Then, the "book café" chosen as a hybrid third place was read based on this definition. Observations focused on the relationship between user behavior and social roles and the physical characteristics of the space. As a result of the observations, the characteristics of the hybrid third place were determined. In the study, a questionnaire with open-ended questions was sent to 32 coffee shop users over the age of 18 years. To understand their social role in the café, participants were asked questions about the purpose of their café visit, the frequency of their visits, the spatial characteristics such as location and management that determine their choice of café, and the people with whom they go to the café. The characteristics of the hybrid third place were updated based on the data obtained. The scope of the study is limited to the book cafes in Üsküdar. In this context, observations were made in Nevmekan Bağlarbaşı Book Café, which is operated by Üsküdar Municipality.

LITERATURE REVIEW

The concept of third place was first defined by Oldenburg (1989) as "public places that host regular, voluntary, informal, and joyful gatherings of individuals outside the home (first place) and workplace (second place)." This definition refers to a range of spaces with different characteristics. Outdoor markets, taverns, bookstores, community gardens, and gyms are some of them. The popularity of the concept has gradually increased from its inception to the present day, and the existing literature has been produced with contributions from researchers in different fields. There is a general belief that third places are important for individual lives and the sustainability of community life. In recent years, researchers from various academic disciplines have questioned whether Oldenburg's (1989) findings apply to typical "third places" such as cafés or bookstores.

On the other hand, some researchers have critically examined the concept to understand new third places, where they might be and what the characteristics of contemporary third places are, and to identify new types of third places. In this way, the literature on the third place has become of interest to a variety of disciplines. The concept of third place has been the subject of research by researchers in fields such as marketing, accommodation, health, leisure studies, architecture, and urban planning (Camp, 2015). Studies on third places have been divided into three categories based on their scope (Table 1). Researchers studied third places from different aspects (Table 2).

THIRD PLACE TYPES AND CHARACTERISTICS

Oldenburg (1989) noted that various physical locations, particularly cafes, coffee shops, barbershops, and pubs, are meeting places that form the heart of the community, and defined these as third places. There are several characteristics that contribute to a place being a third place and to people gathering and come together in that place. Oldenburg (1989) identified these characteristics based on his personal observations. The characteristics of third places are listed below. (Crick, 2011, Oldenburg, 1989) (Table 3).

Few of these features noted by Oldenburg (1989), which indicate the conditions for the act of coming together that takes place in third places, are directly related to the physical features of space. For this reason, Oldenburg (1989) stated that it is the users that give the third place its main character. Crick (2011) defines the third place that Oldenburg (1989) refers to in his study as "traditional third places" He noted that chain coffee shops that capitalize on people's needs for

Table 1. Classification of studies on third places

Type of study	Scope of the studies
Those who explore new types of third place.	Studies that advocate the existence of new types of third places by arguing that emerging social spaces are third places but have different characteristics than the existing definition of third place (Crick [2011], Mikunda, [2007], Besson [2022], Memarovic et al. [2013])
Those who question the characteristics of the third place	Studies of third places that assume that the characteristics of third places have changed over time, defining new characteristics of places such as cafes and restaurants. Çakı and Kızıltepe (2017), Catherine (2016), Anlı and Yaman (2019), Rosenbaum et al. (2009), Oldenburg (2013), Kutlay (2019), Dibazar et al. (2020), Lukito and Xenia (2017), Broadway et al. (2018), Bookman (2014)
Those who research different places that can be a third place	Studies that examine various spaces that can be third places, such as libraries, museums and community gardens in terms of their characteristics Tieman (2008), Mair (2009), Dolley (2020), Houghton et al. (2013), Hawkins and Ryan (2013), Purnell and Breede (2018), Tate (2012) Pajouh (2014), Purnell (2015), Soukup (2006), Markoç (2019), Mcarthur and White (2016), Steinkuehler and Williams (2006), Ducheneut et al. (2004)

Table 2. Studies on third places

Place	Researcher	Scope of the study
Farmers markets	Tieman (2008)	It focuses on the characteristics of farmer's markets that make them the third place for farmers and customers.
Book cafes	Laing and Rolye (2013)	They investigated the effect of having a cafe integrated into the chain bookstore on the sociality of the place.
Sports Clubs	Mair (2009)	She examined curling clubs in rural areas as third places.
Community Gardens	Dolley (2020)	She studied community gardens as third places.
Libraries	Houghton et al. (2013)	They examined libraries as third places.
Festivals	Hawkins and Ryan (2013)	They have studied festivals as emerging third places.
Conferences	Purnell and Breede (2018)	They have studied the conferences as third places.
Museums	Tate (2012)	They examined the museums in the context of the characteristics of the third place.
Retirement homes	Campbell (2014,2015)	She examined the designs of third places in nursing homes.
Social Spaces	Pajouh (2014)	She stated that social spaces such as libraries, student dormitories, computer laboratories, and study rooms could be the third place.
Homes	Purnell (2015)	He stated that the houses can be third places according to the way they are used.
Virtual Third Places	Soukup (2006)	He examined virtual third places and computer-mediated social interaction in the third-place context.
	Markoç (2019)	She discussed Twitter in the context of the third place
	Mcarthur and White (2016)	They explored social interactions on Twitter in a third-place context.
	Steinkuehler and Williams (2006)	They examined online computer games as virtual third places.
	Ducheneut, et al. (2004)	They examined online computer games as virtual third places.
Cafes	Çakı and Kızıltepe (2017)	They examined cafes as third places.
	Catherine (2016)	She discussed cafe culture in the context of the third place.
	Anlı and Yaman (2019)	They examined chain coffee shops in the context of creating a third-place experience.
	Rosenbaum et al. (2009)	They examined activity-based cafes as third places.
	Oldenburg (2013)	He took the cafe as the third place.
	Kutlay (2019)	They researched different wave coffee shops as a third place.
	Dibazar, et al. (2020)	They investigated cafes in the context of third place characteristics.
	Lukito and Xenia (2017)	They examined the cafes on the university campus as third places.
	Broadway et al. (2018)	They investigated the relationship between technology and sociability in cafes in the context of the third place.
	Bookman (2014)	She discussed the relationship of sociability and third-place experience with chain coffee shop brands.

Table 3. Characteristics of third places

Characteristic	Definition
Neutral ground	It is a neutral place where everyone is accepted. No one plays the host role.
Leveler	There are no official criteria for participation. They are places where social inequalities disappear.
Conversation is the main activity	Conversation is the main activity.
Accessible	They are physically and socially accessible places.
Regulars	There are people who regularly visit these places. The regulars shape the social texture of the space.
Low profile	They are places with a simple and low-profile design.
Cheerful mood	Conversation and games create a fun environment. They are places with a cheerful mood.
Homes Away from Home	People experience a feeling of comfort and warmth. They feel cozy and comfortable just like at home.

third places are also "commercial third places." Commercial third places modify space according to the needs of people today and their own commercial interests with different design arrangements. Commercial third places can satisfy people's need for solitude and isolation while giving their customers the opportunity to connect with others.

Mikunda (2007) developed a concept of third place that is very different from the shabby and low-profile place described by Oldenburg (1989). Third places, which Mikunda (2007) refers to as "spectacular third places," are dramatic and impressive places that encourage people to spend time there. Spectacular third places are not only places of interaction but also places where people go to see and perhaps be seen. Museums, concept stores, and trade shows are the spectacular third places where the new generation can engage in leisure activities that meet their needs. In the years when Oldenburg (1989) introduced the concept of the third place, communication technologies were not as advanced as they are today. Technological developments over the years, the widespread use of the Internet, and social networks have allowed people to come together virtually, and the concept of the virtual third place has emerged. Internet communication is a potential for social interaction between people around the world (Soukup, 2006). Media such as Facebook, Instagram, and Twitter allow people to be in constant communication with each other through the Internet in a virtual third place. This eliminates the need for the third place to be a physical place. Other types of third places in the literature are cultural third places and thematic third places. The cultural third place is defined as the realm of cultural participation where the user (visitor, reader, student, and spectator), cultures, and knowledge are central to the processes of learning, production, and dissemination. Libraries, defined as places of socialization and encounter rather than reading and learning spaces, are cultural third places. These places provide utilities, workspaces, and even recreational activities-additional uses not directly related to knowledge, such as knitting, yoga, and cooking (Besson, 2022). Cultural third places include multiple spaces with different social and functional dimensions, such as interactive exhibition spaces, information cafes, and workshops. And finally, thematic third places provide entertainment and services specific to a particular community. The decoration and spatial features of these places are designed according to a specific theme (Memarovic et al., 2013). Thematic third places are places where people interested in a particular theme gather, such as bicycle cafes and cat cafes (Table 4).

HYBRIDITY AND HYBRID THIRD PLACE

Most socialization areas of daily life are described in the literature on third-place types (Table 4). However, book cafés, where various functions are combined with the cafeteria function, are different places from these, although they share several common characteristics with

Table 4. Types of third place

Researcher	Third place type	Spatial example
Oldenburg (1989)	Third Place (Traditional)	Tea houses, coffee shops, pubs
Crick (2011)	Commercial Third Place	Starbucks, Kahve dünyası (Chain coffee houses)
Mikunda (2007)	Spectacular Third Place	Museums, Concept stores, and fairs
Crick (2011)	Virtual Third Place	Social Media, Facebook, Twitter, Instagram
Besson (2022)	Cultural Third Place	Third place libraries
Memarovic et al., (2013)	Thematic Third Place	Cat Cafe, Bike Cafe

existing third-place types. The prominent characteristics of book cafes are that they have a hybrid atmosphere that includes a variety of functions and social roles. This study argues that third places should be considered not only as physical spaces but also as social spaces. In this context, social spaces that are not only functional but also hybrid in terms of social roles, relationships, and levels of social interaction are defined as "hybrid third places." The biological term hybrid refers to a new species resulting from the union of two different plant or animal species. The hybrid species has characteristics of both species but also differs from both species. In this study, defining the hybrid third place, the concept of hybridity used in biology is conceptualized. The different functions (library, exhibition hall, café) of the hybrid third place and the different levels of social interactions of the users of the space come together, as in biology, and a new space is created that is similar to them and at the same time unique in different aspects. The social atmosphere of the hybrid third place is the result of this spatial, functional, and behavioral diversity. Among the studies in the third place, the number of studies on the concept of hybridity is quite limited. Crick (2011) defined the concept of hybridity through physical space and referred to the combination of physical and virtual third place as hybrid third place. Crick (2011) stated that with the use of Internet technologies in traditional, commercial, or spectacular third places, overlaps with virtual third places occur, making these places hybrid third places. However, today, it is almost impossible to imagine a moment when virtual space is separated from physical space. Rosenbaum et al. (2009), on the other hand, stated that places, where customers have the opportunity to participate in various social activities in addition to food and beverage offerings, are hybrid third places because they include both cafeteria functions and activities. Rosenbaum et al.'s (2009) definition of a hybrid third place is based on functional diversity and the coexistence of different functions (Table 5).

ÜSKÜDAR'S BOOK CAFES AS A HYBRID THIRD PLACE: AN EXPERIMENTAL STUDY

The transformation of daily life in recent years has led to an increased need for third places with different opportunities. In Istanbul, where many college students live, there has been an increased demand for places where students can both pursue their academic studies and socialize, as an alternative to the sterile library environment. Book cafes and coffee house chains in the city meet this need for those seeking a place to socialize and work away from the sterile library environment. New-generation book cafés, defined as versions of coffeehouses adapted to modern urban life that combine cafeteria, event, and exhibition spaces with library functions, are hybrid third places with their functional diversity and other characteristics. In this study, observations were made in the book café called NevMekan Bağlarbaşı in Üsküdar (Figure 1). Üsküdar, one of the oldest settlements in Istanbul, is a neighborhood where people from different socio-cultural backgrounds live together and which is visited by local and foreign tourists. The cultural and economic diversity of the neighborhood is also reflected in its third squares. In one and the same street there are traditional cafes, chain cafe shops, various local tea houses, second and third-wave coffee shops, and modern book cafes. Nevmekan Bağlarbaşı was opened by Üsküdar municipality in 2015 with the aim of creating a new, exceptional meeting place. The word "Nev," which means "new" in Persian, was chosen to draw attention to this special feature of the space, which offers inclusive, social content and a different concept. In the following years, Nevmekan Sahil and Nevmekan Selimiye were put into operation with a similar concept in different parts of the district. These places where socialization through consumption takes place are different from other third places in the city.

The fact that they are run by local authorities, have larger spaces, offer different cultural events, have seating for different needs, and serve different social classes makes these book cafes a hybrid third place. Nevmekan Bağlarbaşı, the hybrid third place, obtains this characteristic through its functional diversity and its social atmosphere, where social interactions take place at different levels. The historical building, whose original function was a streetcar depot and an electricity factory, was transformed into a book café. The building is located in the same courtyard as the Bağlarbaşı Cultural Center (Figure 2). The building consists of the first floor, the second floor, and the basement, where the exhibition space is located. During the adaptive reuse process, the streetcar car, the electric motor, and the crane on the ceiling, which reminds us of the first function of the building, were preserved (Figure 3).

Table 5. Researchers' definitions of hybrid third place and hybridity

Researcher	Hybrid third place and hybrid definition
Crick (2011)	The intersection of the physical third place and the virtual third place creates the hybrid third place.
Rosenbaum et al. (2009)	The hybrid cafe, which has become a place where various activities are organized as well as the cafeteria function, is called the third place.

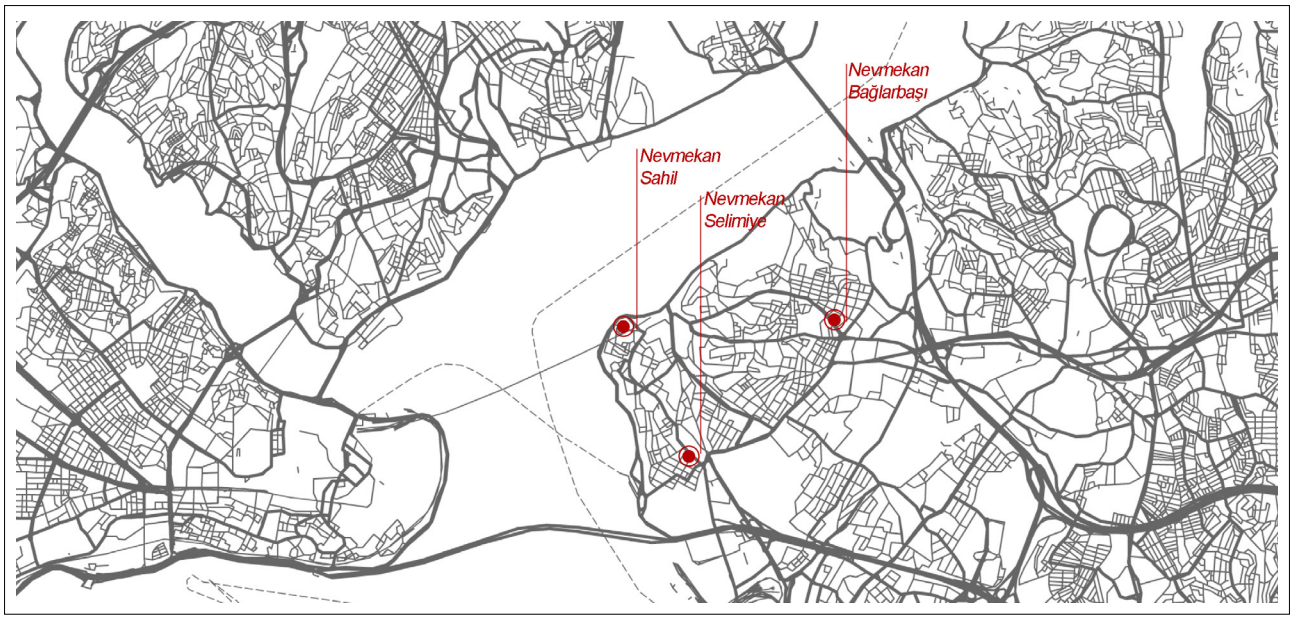

Figure 1. Locations of Nevmekan Book Cafes in Üsküdar (Adapted from snazzy maps).

The venue, which combines the functions of a cafeteria, an exhibition hall (art gallery), and a stage where special events are held, is a place with various seating options and many books, which are also used as decorative objects (Figure 3).

Based on the observations made in the space, five different social roles were defined: the regulars, those who use the space as a productive area, the loners, the social guests, and the explorers. While the regulars refer to those who visit the space regularly, those who use the space as a productivity area are freelancers who want to do their own work and students who are there to study. The loner's group was used for those who use the space alone, and the social guest's group for those who use the space to socialize with their acquaintances. Finally, the group of explorers refers to the group of users who are looking for something new, and who are there to see and be seen. The social atmosphere of the hybrid third place is formed by the gathering of people with

Figure 2. Nevmekan Bağlarbaşı close surroundings, the entrance to the café, and view from inside.

Figure 3. Nevmekan Bağlarbaşı Book Cafe Ground Floor and First Floor Plans and interior views.

these different social roles (Table 6). Nevmekan Bağlarbaşı, as a hybrid third place, provides the opportunity for people with different social roles and needs to come together, and the social atmosphere is created by its spatial features. While the flexible seating arrangement, reading materials, electrical outlets, and internet access that allow the place to be used alone or in large groups allow the place to be used in different ways, the art gallery, organized events, and historical value of the building allow people who are looking for innovation to visit the place.

Table 6. The social roles of Nevmekan Bağlarbaşı users and their effects on the space's sociality

Social role	Social interaction/effect on sociality of space
Regulars	The regulars help the newcomers socialize (Oldenburg, 1989). They act as "familiar strangers" and may actively participate in social interaction by chatting, or they may avoid social interaction by creating their own private space.
Those who use the space as a productivity area:	This group consists of freelancers or students who are isolated from their environment and do their work in the space with their "protective shields." They can be individual or in groups. It is believed that this group, staying in one place for a long period, affects the sociality of the place. However, groups that produce together interact socially with each other.
Loners:	Loners may create their own private spaces and use the café as a productivity area, or they may be an expression of the group of users who maintain passive social interaction by observing the street or other café residents. They prefer to spend their time alone in the space.
Social Guests:	It refers to groups that meet to talk. They engage in active social interaction. They are usually people who know each other beforehand or who come to the place for a pre-planned meeting.
Explorers:	It refers to the group that is looking for something new and comes to the place to see and be seen. They can inter act on different levels and be in the space alone or groups

Table 7. The effects of Nevmekan Bağlarbaşı's characteristics on the sociality of the space

Characteristic	The effect on the sociality of the space
Governance	The operation of the building by the local government increases its inclusivity and accessibility. Individuals can use the space at will without paying a fee. In addition, the fact that the place is open for long periods increases its sociability.
Location	The building is located in a central place where people can participate in their daily routines.
Historical value	The fact that the site is located in a historical structure ensures that it represents a common value for the community and is visited more often.
Spatial diversity	The presence of an atrium, open, semi-open, and closed areas make it a social space that responds to different needs.
Flexible seating units	The presence of flexible seating that allows for different uses increases the sociality of the space.
Amenities	The presence of amenities such as exhibits, piano, books, electrical outlets, and wireless internet enhances the sociability of the space by creating opportunities for social interaction.
Activities	Organized events such as workshops, exhibitions and talks increase the sociability of the space by bringing more people together.

Serving users with different social roles, NevMekan Bağlarbaşı encourages social interaction with some of its features and functions as an inclusive social space (Table 7). The social atmosphere of the space is formed by the interaction of the users and the physical features of the space in harmony. This is because the presence of the user occupying a social role in the space is related to the physical features and capabilities of the space.

EVALUATION: DEFINITION AND CHARACTERISTICS OF HYBRID THIRD PLACES

This study discusses the third-place types in the literature. Following human behavior and social interactions in third places, a new type of third place is defined as a "hybrid third place." Most of the assumptions made by Oldenburg (1989) in defining the third place have lost their validity for the places used by contemporary people as third places. For example, with technologies making it easier to work when and where one wants, the distinction between workplace and home has disappeared. Today, the boundaries between home, school, work, and third place are blurred. As living conditions have changed, new social spheres such as co-living and co-working have emerged. In this context, Morisson (2019) notes that there are various intersections and the fourth place between home, workplace, and third place (Figure 4).

According to Morisson (2019), coliving, which consists of combining the first and second places, includes common living and working areas. Combining second place and third place creates co-working spaces. Comingling, which is a combination of first and third place, consists of shared living and social spaces. Fourth place is a combination of first, second, and third places. Morisson (2019) cites the

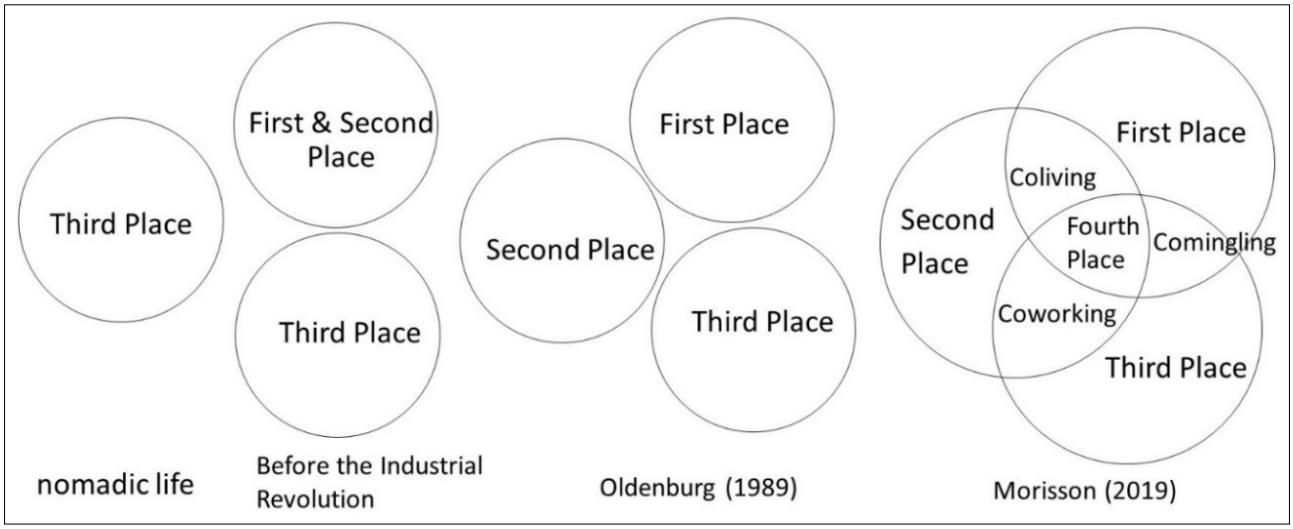

Figure 4. The third place in today's urban life and its relationship with other places (created by the Author).

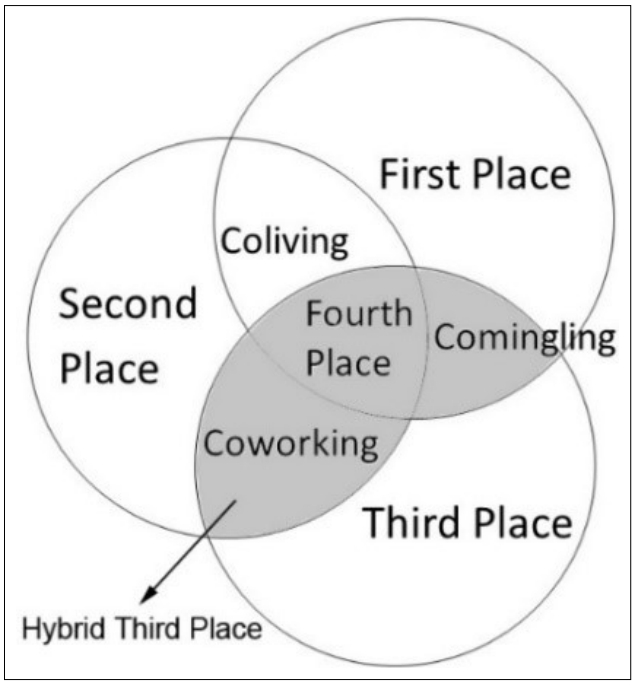

Figure 5. The relationship of the hybrid third place with other places.

"Station F" innovation center as an example of fourth place. The center consists of apartments, offices, restaurants, and social spaces. The hybrid third place identified in this study represents an intersection between the third place defined by Oldenburg (1989) and the places defined by Morisson (2019) (fourth place, co-working, commingling). The hybrid third place has characteristics of all of these places but also differs from them (Figure 5).

The transformation of social spaces is evident in the relationships between private spaces, public spaces, and all living environments with each other, as well as third places. The boundaries between third places and public spaces are not very clear. The simplest example of this is the existence of tables and chairs that extend to the sidewalks of cafes in cities (Memarovic et al., 2013) (Figure 6). The hybrid third place contains some degree of hybridity. This hybridity refers to human behavior, social interactions, activities, and blurring boundaries in third places. In this study, book cafes that combine activities such as eating and drinking (café) - reading (library) - working - leisure activities - cultural activities (exhibition - workshop) are discussed as a typical examples of a hybrid third place. Technology and the virtual third place are part of the hybrid third place, the modern third place that meets the needs of people today. Hybrid third places are more similar to public spaces than traditional third places because of their diversity, but their features such as ensuring privacy and offering various options in an enclosed space make them superior to public spaces. The hybrid third place in contemporary urban life is the socialization in space, the encounter with the stranger,

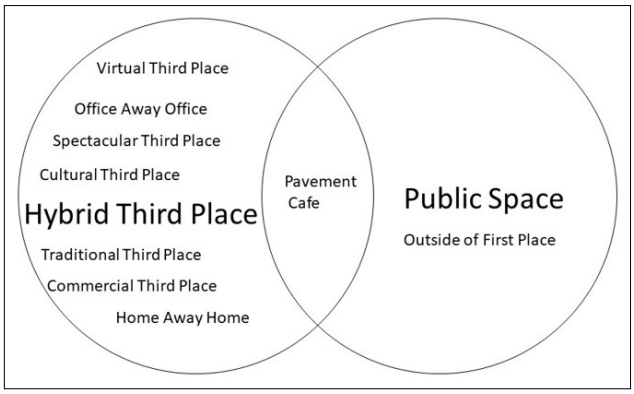

Figure 6. The relationship between the third place and the public space.

the socialization with the known, and the areas where social capital is created.

The characteristic features of the hybrid third place can be listed as follows;

- The hybrid third place is located at the interface between public and private spaces. It allows the creation of private spaces in the public space.
- The hybrid third place can be a home away from home, an office away from home, or a place where recreational activities take place. In addition to home comforts, they can be used for socializing as well as productivity.
- Conversation is not the main activity in a hybrid third place. Other activities are carried out in addition to the conversation. The hybrid third place consists of a mix of activities, with the physical characteristics of the space and its users determining which activity dominates.
- The hybrid third place includes various levels of social interaction and contact with the community. This conversation provides a social atmosphere in which the interactions seen in all other types of public spaces, private spaces, and third places, such as seeing, being seen, being alone, receiving social support, being in the position of a spectator, creating their own private space, can be observed together.
- Hybrid third places may not be as plain and unpretentious as traditional third places. They may have a certain appeal, interior design, or special amenities to attract the attention of different segments of society.
- Hybrid third places are places that are flexible, that make different users want to revisit them, that can be reconfigured as needed, that offer something new, that arouse curiosity, and that attracts attention.
- Hybrid third places are designed around the function of the café, where people socialize while consuming. The café, which is a place of consumption, acts as a catalyst that attracts new users and creates a social environment.

CONCLUSION

Social spaces, such as third places where the individuals who make up the community gather, play an important role in the construction of the community. To speak of a socially sustainable society, spaces are needed that support the formation of positive emotions such as a sense of belonging and security in the individual. In this context, third places that promote social interaction need to be defined and designed. This study examined the existing types of third places, defined a new type of third place, the "hybrid third place," and analyzed the characteristics that make it a catalyst for social interaction. The "hybrid third place" is a multifunctional social place that responds to different needs, resembles a public space but is more controlled, brings different people together, and includes differences in terms of both functionality and sociability (Table 8). The hybrid third place acquires these characteristics not only through the behavior of the people who use it but also through its physical features, which shape the social atmosphere of the place. In this context, it is important to develop spatial proposals that promote social interactions in the space. As a result of the observations in NevMekan Bağlarbaşı Book Café, it was found that this place, which is a hybrid third place, is located in a historical structure, is operated by the local government, and people can spend time without paying a fee or ordering anything, which increases the inclusivity and accessibility of the place.

Some of the characteristics of the hybrid third place that

Table 8. Third place types and descriptive characteristics

Third place type	Descriptive characteristics
Traditional Third Place (Oldenburg, 1989)	They are neutral, leveler, accessible, low profile, fun, homes away from home where conversation is the main activity. They are places where people interact socially with acquaintances or strangers.
Commercial Third Place (Crick, 2011)	In addition to connecting with others, it also gives people the opportunity to create their own private space and be alone.
Spectacular Third Place (Mikunda, 2007)	It is not social interaction oriented. It is a place where one goes to see and perhaps be seen. They are attractive, designed to get people to shop and spend as much time as possible.
Virtual Third Place (Crick, 2011)	It is independent of physical space and time. It is exclusionary because people can be selected to interact with. Unlike other third places, it provides the opportunity to remain anonymous.
Cultural Third Place (Besson, 2022)	They are areas where culture and knowledge are experienced, staged, and produced together. Workshops, interactive exhibitions, co-working spaces, and leisure activities that help create collaborations between users offer opportunities that are not directly related to knowledge.
Thematic Third Place (Memarovic et al., 2013)	They are third places that are differentiated by their designs that appeal to a particular community. They enable people with common interests to come together and socialize.
Hybrid Third Place (created by author, 2023)	It includes hybridity functionally and socially. It responds to different social and cultural needs such as seeing, being seen, co-producing, socializing, or being alone. They are inclusive and flexible spaces.

Table 9. Features of the hybrid third place that make it a catalyst for social interaction

Concept	Features of the hybrid third place that make it a catalyst for social interaction
Functional diversity	Functional diversity makes it possible to engage in different activities at the same time, such as eating, drinking, working, conversing, observing others, spending time alone, participating in activities, reading a book, and experiencing a historical site or exhibit. Functional diversity makes it easy to create a place where extensive and intense social interaction takes place.
Spatial diversity	The space divided into different sections and units creates a micro-public space for the user to experience. The combination of subsections with different levels of privacy and spaces with different decorations such as exhibitions, readings, or piano playing/listening around the café function increases social interaction by making the hybrid third place an interesting and lively space.
Social diversity	Functional and spatial diversity creates social diversity. This allows people with different views to come together in the community. The fact that the hybrid third place is an inclusive and neutral host and the historical and cultural value of the building increase social diversity and create opportunities for social interaction.

promote social interaction are that they are socially and physically accessible, are inclusive places, and provide opportunities for the coexistence of different social roles. These opportunities can be summarized as various seating options, availability of internet access and reading materials, and flexible spaces where group work and regular activities can be conducted (Table 9).

Third places must be designed to be inclusive and promote social interaction. This shows that it is necessary to implement a process of place design in collaboration with disciplines such as sociology and psychology to respond to social needs as well as the physical needs of users with architectural and urban planning disciplines such as functionality, accessibility, and spatial design. Consequently, hybrid third places are the socialization spaces of people today, and determining the physical design of these places and the social activities that should take place in these places requires an interdisciplinary study.

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Article

19th Century (1839-1923) non-Muslim educational buildings in Çatalca province and their current conservation conditions

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ABSTRACT

In the 19th century, significant developments took place in the Ottoman State education system as a part of the modernization process. One aspect of the modernization of education can be found in non-Muslim communities, which were already modernizing education due to the various ideological influences. The number of non-Muslim schools increased rapidly and educational buildings became more visible, especially in Çatalca, Edirne, and Istanbul provinces. As a result of wars, migrations, and population exchanges that occurred in the region during early 20th century, these schools generally lost their original functions as the communities using them were no longer present. The article focuses on the development process, statistical information, and architectural features of 19th and early 20th century non-Muslim school buildings in Çatalca Province, where non-Muslims were densely populated. The study revealed that there were roughly 70 Greek Schools, one Armenian School, and one Bulgarian School in Çatalca Province in the 19th century, and only nine of them still exist. This article aims to shed light on the historical memory of the non-Muslim educational buildings in Çatalca Province, both extant and lost, with the aim of better understanding the shared heritage of the area. The conservation status and transformation process of these nine extant structures have been analyzed according to the holistic evaluation of the international charters. In conclusion, this article presents an evaluation and potential for the conservation of the extant school buildings with respect to their original architectural identities and cultural significance.

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INTRODUCTION

The Ottoman Empire began efforts to modernize education during the 19th century, which were initiated by key reforms such as the Tanzimat Edict (1839) and the Reform (*Islahat*) Edict (1856). These reforms marked major turning points in Ottoman political and social history. During this modernization process, non-Muslim communities in the empire, including Greeks, Armenians, Bulgarians, and Jews, established new schools at various levels to develop and maintain their own educational systems, particularly in Çatalca, Edirne, and Istanbul provinces. Non-Muslim

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educational institutions served as reflections of the Ottoman political and social spheres in the 19th century. Following the establishment of the Republic of Turkey in 1923, numerous interventions transformed these educational buildings in response to social changes, such as population exchanges and migrations.

This study examines the establishment and transformation of non-Muslim Christian educational buildings in Çatalca Province during the 19th century when it was predominantly populated by Christian[1] communities. By recalling the shared past of the Ottoman State, this research aims to contribute to future studies on the significant non-Muslim architectural heritage of the Ottoman Empire, which has received little attention so far. Specifically, this study seeks to analyze and document architectural features and current conservation conditions of 19th century non-Muslim educational buildings in Çatalca Province. The originality of this study is based on the use of Greek literature and Ottoman archival documents, many of which are referenced for the 1st time[2], to reveal the architectural development process of non-Muslim educational buildings. In addition, in-depth archival research was conducted in Çatalca, Silivri, and Büyükçekmece municipalities and Conservation Councils, which has not been carried out in the region before, provides valuable original information and documents about the surviving non-Muslim educational buildings. Furthermore, field trips made significant contributions to the literature by determining and evaluating the current conditions of the surviving educational structures.

A total of 56 documents related to non-Muslim educational buildings located within the borders of Çatalca Province were examined in the Presidential State Archives (Table 1). The archive contained documents related to two educational complexes and 16 single-school structures built between 1839 and 1923 in the province. Based on the visual documents found in the archives, educational buildings were analyzed according to their year of construction, layout and spatial organization, dimensions, facade characteristics, architectural styles, structural systems, construction materials, and their architect/foreman.

Publications in the Fener Greek Patriarchate Library providing information about the educational system and the Greek schools in 19th century Çatalca Province were reviewed. 71 Greek schools, one Armenian school, and one Bulgarian school providing education at different levels to the province have been examined. Only nine of the identified non-Muslim educational buildings survive at the time of writing. The archives of Regional Conservation Councils contain documentation for these nine structures that were evaluated to gather information about their alterations and conservation processes. The evaluation has been made based on international charters and represented through six key concepts, which were selected as a result of a holistic approach; compatible re-use, distinguishability, reversibility, addition/annex, integrity, and authenticity.

NASCENCY AND CONSTRUCTION OF NON-MUSLIM EDUCATIONAL BUILDINGS IN ÇATALCA PROVINCE IN THE 19TH CENTURY (1839-1923)

Nascency of the Non-Muslim School System in the 19th Century

The Ottoman State regulated the religious and administrative organizations of non-Muslims under the framework of the *millet* system following the conquest of Istanbul in 1453. This system divided subjects into *millets* (communities) based on their beliefs (Braude, 1982). Non-Muslim community schools originally followed a religion-centric education approach as they were managed by religious councils and churches (Somel, 2010). The modernization processes of Greek educational institutions in the 18th century and Armenian institutions in the 19th century began with the influence of ideological factors that became widespread in non-Muslim communities. Secular and Hellenic notions were the main fundamentals of the modernization process of the Greek education system (Somel, 2010; Tekeli, 1993).[3] The Ottoman administration also played a crucial role in the process through the regulations that introduced the Ottomanist ideology of the Tanzimat period (1839-1876), which were meant to regulate the nationalist movements that threatened the unity of the state (Fortna, 2002). The Tanzimat Edict (1839) was the first attempt to strengthen the social integrity and central authority of the Ottoman state by providing equal rights to all citizens regardless of their ethnicity or religion (Ortaylı, 2005; Kasaba, 2011). Nonetheless, the Ottoman State could not fully realize the extent of the Edict's promise of equality for all non-Muslim Communities (Shaw, 1985). Therefore, the Reform Edict (1856) followed by the Paris Treaty was promulgated under the influence of foreign states following the Ottoman Defeat in the Russo-Ottoman War (1853-1856) (Davison, 1963). The edict specifically let non-Muslim subject rights be re-considered and re-shaped in a modernizing, secularizing, and nationalizing process (Ozil, 2021). It specified that all non-Muslim communities were allowed to establish and (re)construct their own educational institutions for the 1st time, under the supervision of the State (Ergin, 1977). The Greek Society of Literature (*Elinikos Filolopikos Sillogos*) was founded in 1861 and recognized as one of the first organizations which pioneered the expansion of the schools (Somel, 2005). Greek Patriarchate Regulation (1862) and Armenian Patriarchate Regulation (1863) separated education and religion administrations with the secular and modern notions of this period (Clogg, 1982).

The first comprehensive law on education, the Regulation on Public Education (*Maarif-i Umumiye Nizamnamesi, 1869*), published by the Ottomans included the legal framework for the establishment of non-Muslim and foreign schools as private institutions. Article 18 specified the Ottoman State to open schools at the elementary level of *Sıbyan and Rüşdiye* for both Muslim and non-Muslim communities separately; however, it maintained both communities to receive mixed education at *Idadi and Sultani* levels (Koçak, 1985). The Ottoman Constitution (*Kanun-i Esasi*, 1876) made primary education mandatory for all girls and boys. Additionally, Articles 15 and 16 guaranteed the right to an education for non-Muslim communities, as long as it was monitored by the State (Akyüz, 2016). Whether these regulations on non-Muslims rights demonstrated the ideology of Ottomanism, it was affected by the Berlin Treaty signed after the Ottoman-Russian War (1877-78) which led to an increase of Islamism during the Hamidian Period (1876-1908) (Fortna, 2002; Somel, 2010). The Second Constitutional revolution (1908), which was begun by the Committee of Union and Progress (*İttihat ve Terakki*) administration, provided a more liberal education policy against non-Muslim communities similar to the 1839 and 1856 regulations that mainly aimed at bringing social equality to the society (Bozkurt, 1989). The noticeable increase in the number of reconstruction permits of the non-Muslim schools after 1908 can be considered as a reflection of this revolution (Table 1).

With the expansion of non-Muslim and foreign schools, particularly in Istanbul and Rumelia, notable regulations were issued since these schools were considered to spread nationalist ideas to non-Muslim communities (Sakaoğlu, 2003; Somel, 2005). Eventually, non-Muslim schools were placed under the authority of the Ministry of Public Education authorization according to the regulation of *Mekatib-Hususiye Talimatnamesi* (1915); however, it could not be implemented due to the emerged World War I (1914) (Kodaman, 1991; Somel, 2010). The Balkan Wars, World War I, the Turkish Independence War, compulsory population exchange, and migrations led to the non-Muslim educational buildings losing their original users and functions.

Table 1. Analysis of construction activities of non-Muslim educational buildings between 1839 and 1923, based on archival documents (Authors, 2023)

Çatalca Province	**1850**		**1860-1880**				**1890**				**1900**					**1910-1923**				
	1856	**1857**	**1861**	**1866**	***1869***	***1876***	**1885**	**1893**	**1894**	**1895**	**1896**	**1901**	**1905**	**1906**	**1907**	***1908***	**1909**	**1911**	***1912***	**1915**	**1917**	***1923***
Repair/Expansion Permits		I		I														I			I	
Requests for Construction		I									I		I				I					
Reconstruction Permits								I	I					I	II		III	IIIII				
Construction Permits							I				I	I	I	I	III		I		III			
Construction Implementations								I			I	I	I	I	II			I	I			

Notes: Each line depicts one archival document about construction activities. Bold italic dates indicate milestones in the development of the non-Muslim educational system.

Establishment of the non-Muslim Schools in Çatalca Province

Çatalca Province was selected as the study area for three major reasons. First, it was dominantly populated by the Christian non-Muslim communities[4], especially the Greeks, but also a small number of Armenians and Bulgarians, and surrounded by their religious and educational buildings until the population exchange and migrations (Figures 1 and 2). Second, Çatalca was an independent sanjak that the town included Çatalca,

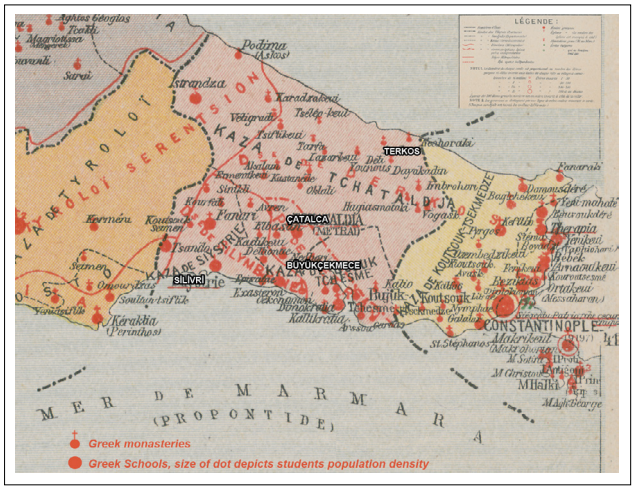


Figure 1. Greek religious and educational buildings in Çatalca Province in 1908 (Anonymous, 1908).

Figure 2. Locations of educational buildings that have survived to date (Google Earth, 2023).

Büyükçekmece, Silivri, and Terkos in the western hinterland of Istanbul from 1888 to 1920 (Sezen, 2006), but was part of Istanbul from 1920 to 1923. Then it was purposely separated from Istanbul Province between 1923 and 1926 again to include Çatalca's Greek community in the scope of population exchange of the Treaty of Lausanne (1923). Third, Çatalca was one of the settlements where the Greek community left Eastern Thrace at a late stage of the population exchange period (Valsamidis, 2022).

The non-Muslim education system in Çatalca[5] was based on religious principles until the 1830s, except for a Greek School (1796) in Selimpaşa, two schools (1799) in Silivri, and another Greek School (1817) in Çatalca. After the 1830s, five schools were built in central Çatalca; (1) Greek Boys' School, (2) a Primary School, (3) Greek Girls' Primary School, (4) Fotakios School, and (5) a nursery school. The number of schools in Çatalca and its villages was documented in the reports of *Trakya Eğitim Sevdalıları Derneği* (Thrakika Filologikos Syllogos/1872) in 1872/1873, 1892, 1902, and 1910 (Valsamidis, 2007). The educational infrastructure in all of the villages of Büyükçekmece was significantly expanded with the establishment of modern school buildings, such as nursery schools, girls' and boys' primary schools, and mixed schools (Table 2).

The 1872-1873 report documents four Greek schools located in central Silivri; the exact year of construction is unknown for (1) the oldest building, while (2) a mixed school was built in 1838, (3) boys' school in 1858, and (4) girls' school in 1863 (Drakou, 1892). Ottoman archival documents also state that reconstruction permits were granted for a Mixed Armenian School (1909) and a Greek Secondary School (1912) in central Silivri (BOA, DH.MKT. 2811/53, 1327; İ.MF. 20/19, 1327). Selimpaşa (Epivati/Bigados) was one of the most important villages of Silivri and even Eastern Thrace in terms of education infrastructure. The Archigeneion Girls' School Complex of Selimpaşa was established in 1857 with the efforts of Sarandis Archigeneion (BOA, A.AMD. 80/28, 1273). Another school in Selimpaşa was the Greek Boys' Primary School, which was reconstructed in 1866 in the same place (BOA, C.ADL. 93/5536, 1283). The village of Celaliye in Silivri (Eksastron/Şastroz) had two school buildings in the 19th century (Çokona, 2016). In addition, a reconstruction permit was granted for a new Greek Mixed School in 1905 (BOA, I.AZN. 60/37, 1323). A mixed school was in the village of Kamiloba (Yaloz, Eyiali), while another school was constructed in 1872-1873 by Sarandis Archigeneion in Kumburgaz (Ikonomion) village (Drougka, 2011). One mixed school was in Ortaköy (Sürgünköy, Delliones) village and three were in the village of Fener (Fanari) in 1892. One of the schools in Fener was perhaps established in conjunction with the Church of St. Mary (BOA, I.AZN. 22/29). There was one school in each village of Terkos in the district of Çatalca (Celepköy, Yazlık (Lazarköy), Çanakça, Dayakadın, Boyalık, and Yeniköy) as well as a mixed school in Örencik (Tarfa) (Çokona, 2016). Permits were given for the construction of a Greek School (1896) in Oklalı and the reconstructions of Greek Schools in Çiftlik (1893), Karacaköy (1907), and Arnavutköy (1909) (BOA, I.AZN. 20/15, 1314; I.AZN. 5/30, 1311; MF.MKT. 1008/48, 1325; DH. MUİ. 49/7, 1325).

The Architectural Characteristics of non-Muslim Schools in Çatalca Province

The construction of school buildings increasingly took place apart from the churches as a sign of the separation between secular and religious spheres throughout the 19th century (Colonas, 2005; Ozil, 2021). The Selimpaşa Archigeneion Institute (1857) was one of the earliest

Table 2. Statistical information on the schools established in Büyükçekmece and its villages (Valsamidis, 2007)

Settlement	1872/1873	1892	1902	1910
Büyükçekmece (Athyra)	Mixed-school (1) Girls' school (1)	Mixed-school (1)	Nursery school (1) Primary school (1)	Boys' primary school (1) (4 classrooms) Girls' school (1) (3 classrooms)
Gürpınar (Aresu/Anarşa)	School (1)	School (1)	School (1) (literacy education) Nursery school (1) Girls' school (1)	Mixed-school (1)
Kavaklı (Gardes)	Mixed-school (1)	School (1)	School (1) (literacy education) (γραμματοδιδασκαλειο)	Mixed-school (1) (3 classrooms)
Güzelce (Çöplüce/ Demokrania)	School (1) (literacy education) (γραμματοδιδασκαλειο)	School (1)	School (1) (literacy education) (γραμματοδιδασκαλειο)	Boys' primary school (1) (3 classrooms) Girls' school (1) (2 classrooms)
Elbasan (İlbasan)	-	School (1)	School (1)	Primary school (1) (4 classrooms) Girls' school (1) (3 classrooms)
Mimarsinan (Kalikratya)	Mixed-school (1)	Nursery school (1) Mixed school (1) Girls' school (1)	Nursery school (1) Girls' school (1) Primary school (1)	Boys' school (1) (7 classrooms) Girls' school (1) (5 classrooms)
Türkoba (Lagothira)	Literacy education in the church	School (1)	School (1)	Primary school (1) (3 classrooms)
Ovayenice (Neohori)	Primary school (1)	School (1)	Nursery school (2) School (1) (literacy education) (γραμματοδιδασκαλειο)	Boys' primary school (1) (4 classrooms) Girls' state primary school (1) (3 classrooms)
Tepecik (Playa)	Mixed-school (1)	School (1)	Nursery school (1) School (1) (literacy education) (γραμματοδιδασκαλειο)	Primary school (2)
Çakıl	Literacy education in the church	School (1)	Nursery school (1) School (1) (literacy education) (γραμματοδιδασκαλειο)	Mixed-school (1) (4 classrooms)

planned educational complexes (*külliye*) built in the Tanzimat Period in Eastern Thrace (Palazi, 2017). The education system became more organized through the diversification of education levels. The original girls' primary, secondary, and teacher training school blocks were built in 1857 and the Church of the Forty Martyrs' and the Chapel of Saints Constantine and Helena were added in 1863. Elenion Boys' High School and Orphanage-

Boarding School (1863), Archigeneion Family Residence (Teacher's Residence), Girls' Orphanage-Boarding School (1872), and the Girls' and Boys' Nursery School (1873) were also added to the complex during the period (Figures 3 and 4). The author Aka Gündüz (1886-1958) praised the educational methods provided to the female students and the impressiveness of the complex's architecture in his article penned for the Tanin Newspaper (Gündüz, 1913).

Celaliye Greek Mixed School (1905) (Figure 5a), Çatalca Greek Boys' School (1906), Fotakios Greek School (1910) (Figure 6), and Mimarsinan Greek School (1911) (Figure 7)[6] had similar plans and can be considered as examples of the most elaborate plan layout-a central-sofa type with a rectangular plan. Their spatial organization differed from other schools due to being larger in scale and having multi-purpose hall additions. The reason that these villages had such large-scale schools is related to their central locations, along with the population density and wealth of their Greek communities. The most common type of plan consisted of a square plan with an inner sofa. Examples of this type were Selimpaşa Greek Boys' Primary School (1866), Çiftlik Greek School (1893) (Figure 5b), Karacaköy Greek Boys' School (1907), Arnavutköy Greek School (1909), and Güzelce Greek Mixed School (1909). Çiftlik Greek School, Karacaköy Greek Boys' School, and Güzelce Greek Mixed School in particular were quite similar, each having two-

Figure 3. Digital reconstruction of Archigeneion Girls' School and Elenion Boys' School Complex (Palazi et al., 2015).

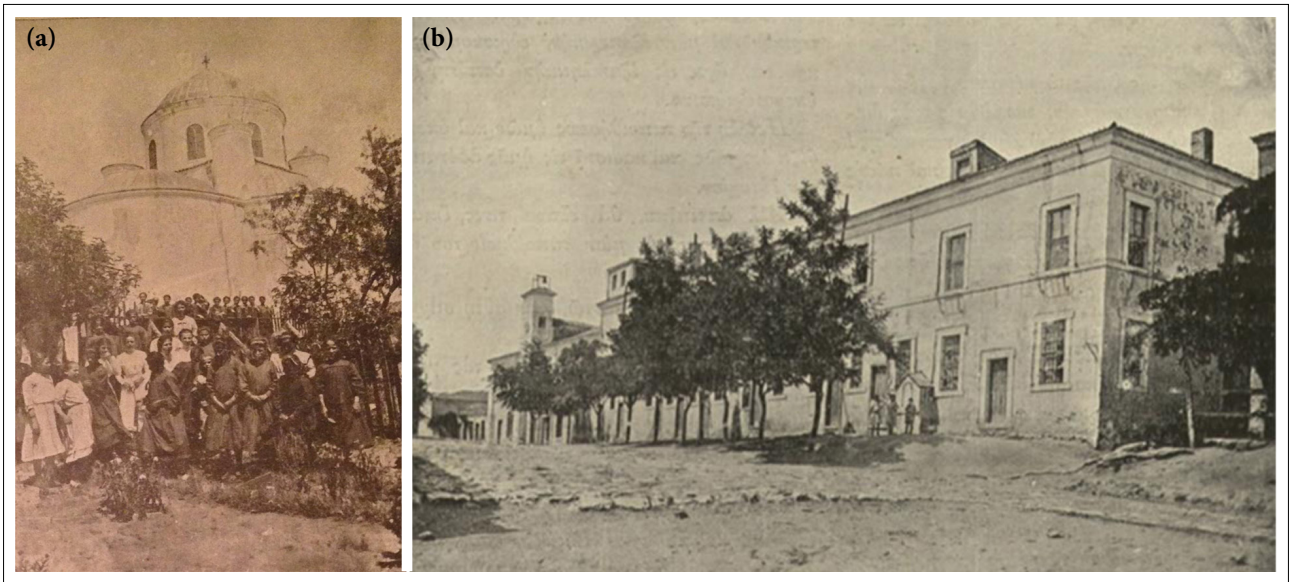


Figure 4. **(a)** Archigeneion Institute Girls' School blocks 1 and 2 (1909); **(b)** Church of the Forty Martyrs (1909) (Palazi, 2017).

Figure 5. **(a)** Celaliye Greek Primary School (Demirkan, 1941) **(b)** Çiftlikköy Greek School, before it was demolished (Kazautzakis, 1998).

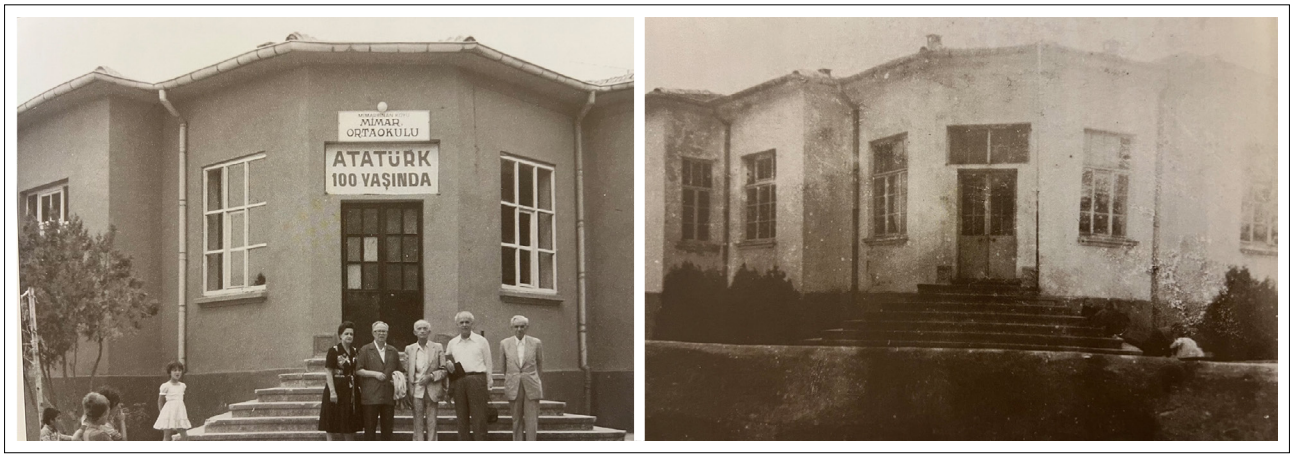


Figure 7. Mimarsinan Greek School in the 1980s, which functioned as Mimar Secondary School in the Republican period (Vasiliu and Çelyos, 2000).

Figure 6. Çatalca Fotakios Greek School on postcards and map of Çatalca Province (Kayacan, 1925).

rooms, two-classrooms, and a plan centered on the entrance hall. They lacked interior stairs connecting the lower and upper levels, and access to the lower level was only possible from the exterior. This organization suggests that the lower level was likely used for storage rather than educational purposes.

There were schools which had a rectangular plan with an inner sofa, examples of which were Elbasan Greek School (1901), Silivri Armenian Mixed School (1909), and Silivri Secondary Greek School (1912). Oklalı Greek School (1896) also had a rectangular plan, but unlike the others, it did not have a sofa. Silivri Armenian Mixed School and Silivri Secondary Greek School had more elaborate plans when compared with Oklalı and Elbasan Greek Schools, which were located in rural areas and had modest planar organizations (Table 3, Figure 8).

The facades of the non-Muslim school buildings in Çatalca Province typically featured triangular pediments, monumental stairs, moldings, jambs, plasters, cornices, and inscriptions in the neoclassical style, which gradually became more elaborate in the late 19th century. Thus, as the Greek community developed a strong sense of a distinct Hellenic identity through the modern education process, the architecture of the school buildings of the Greek community also became Hellenized through the adoption of the neoclassical style (Colonas, 2022). Outstanding examples of neo-classical architecture include the Selimpaşa Archigeneion Institute Girls' School and Çatalca Fotakios Greek School with a clock tower and cut-stone facades, Celaliye Greek School with stone and brick facades, and Selimpaşa Greek Boys' Primary School with rubble facades (Table 3, Figure 8).

The architect of Selimpaşa Girls' School and the Church, Nikolakis Tzelepis (*Nikolokis Kalfa*), also took part in the repair of many palaces including Yıldız Palace, state buildings in Istanbul and was the designer of the Hamidiye Mosque (Şenyurt, 2002; Ersoy, 2011). The architects of the Fotakios Greek School, Kotopoulos Georgios and Mr. Theoklis Anastasios Kalfas, actively worked in Istanbul (Şenyurt, 2002). Periklis D. Fotiadis, who is thought to be the architect of the *Çiftlikköy* Greek School according to a construction permit document that has his signature, also designed significant Greek community schools, such as Beyoğlu Zografeion High School and Heybeliada Theological School (Şenyurt, 2002).

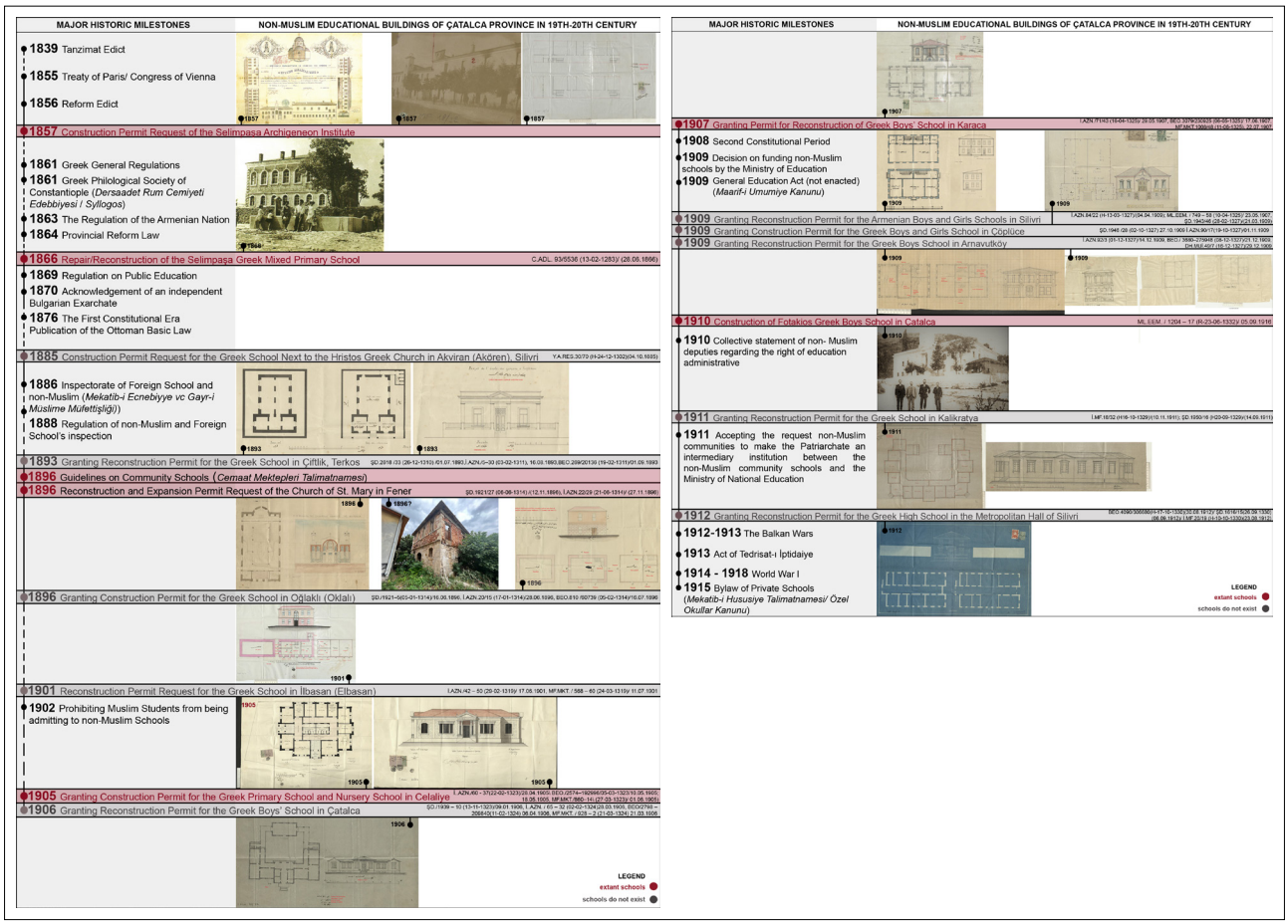


Figure 8. Historic milestones related to the development of non-Muslim communities' educational system in conjunction with their effects on the non-Muslim institutions in Çatalca Province.

Table 3. Evaluation of the general attributes and architectural features of non-Muslim educational buildings in Çatalca Province (Authors, 2023)

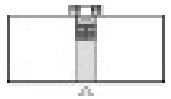
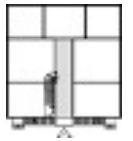
General Attributes		Architectural Features (Colored depict buildings that do not survive to date, gray hatch on the drawings indicates sofa)						
	Buildings (Original Status)-Const. Date	Spatial Organizations	Structural Dimensions (m)	Facade Characteristic	Arch. Styles	Structural Systems and Construction Materials	Architect/ Foreman	Planar Organization
Selimpaşa Silivri	Archigeneion Institute Girls' School (2 Blocks) (1857)	2 Independent structures, 6 rooms on each floor	width: 11.60 length: 41.20 height: 8.45 width:9 length: 26.30 height: 6.85	Eave and band molding, cut-stone covered, with elevated clock tower	Neoclassical	Rubble masonry construction, masonry ground floor slab, wooden first floor slab (1st block), Jack-arched first floor slab (2nd block), traditional barrel tile roof covering	Nikolakis Tzelepis	 Side sofa (rectangular)
	Archigeneion Institute Girls' School (3rd Block) (1872)	2 Rooms on each floor	width: 10.50 length: ~ 24.50 height: 7.90	Eave and band molding, cut-stone covered	Neoclassical	Masonry construction, masonry ground floor slab, wooden first floor slab, traditional barrel tile roof covering	Unknown	 Inner sofa (rectangular)
	Archigeneion Institute Nursery School-(1873)	Unknown	Unknown	Eave and band molding, cut-stone covered	Neoclassical	Masonry construction, traditional barrel tile roof covering	Unknown	Rectangular
	Eleni Boys' High School (1868)	Unknown	Unknown	Eave and band molding, cut-stone covered	Neoclassical	Masonry construction, traditional barrel tile roof covering	Unknown	Rectangular
	Teachers' Residence (1863)	Unknown	Unknown	Eave and band molding, cut-stone covered	Neoclassical	Masonry construction, traditional barrel tile roof covering	Unknown	Rectangular
	Greek Boy's Primary School (1866)	4 Classrooms on each floor, 2 teacher rooms, 2 rooms	width: 16 length: 16 height: 11.50	Profiled-eave molding, band molding, facade without plaster, staggered quoins, balcony on the middle axis of the facade	Neoclassical	Masonry construction, masonry ground floor slab, wooden first floor slab, traditional barrel tile roof covering	Unknown	 Inner sofa (square)

Table 3. CONT.

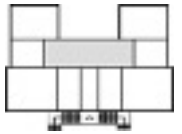
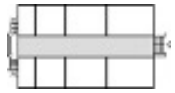
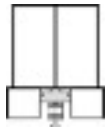
General Attributes		Architectural Features (Colored depict buildings that do not survive to date, gray hatch on the drawings indicates sofa)						
	Buildings (Original Status)-Const. Date	**Spatial Organizations**	**Structural Dimensions (m)**	**Facade Characteristic**	**Arch. Styles**	**Structural Systems and Construction Materials**	**Architect/ Foreman**	**Planar Organization**
Fener Silivri	Greek School (affiliated with Fener Church) (unknown)	Unknown	Unknown	Band molding, staggered quoins	Neoclassical	Rubble and brick masonry construction	Unknown	Rectangular
Çatalca	Fotakios Greek Boys' School (1910)	6 Rooms on each floor, hall	width: 19 length: 30 height: 10.95	Triangular main entrance pediments, elevated clock tower, profiled eave and band molding, staggered quoins, stone ornaments	Neoclassical	Masonry construction, masonry ground floor slab, wooden first floor slab, traditional barrel tile roof covering	Georgios Kotopoulos, Theoklis Anastasios Kalfas	 Central sofa (U- shaped)
Karacaköy Terkos	Greek Boy's School (reconstruction) (1907)	7 Rooms	width: 13 length: 15 height: 6.25	Profiled eave and band molding, staggered quoins, double entrance stairs	Neoclassical	Masonry construction, masonry ground floor slab, wooden first floor slab	Unknown	 Central sofa (Square)
Silivri	Greek High School in the courtyard of Metropolitan See (1912)	Unknown	width: 14,75 length: 27 height: 10.5	Main entrance linear stairs, eave and band molding	Neoclassical	Masonry construction, traditional barrel tile roof covering		 Inner sofa (rectangular)
Silivri	Armenian School for Girls and Boys (reconstruction) (1909)	2 Classrooms 2 teacher's rooms, 2 meeting rooms, 2 dining halls	width: 10,60 length: 19,70 height: 9	Profiled eave and band molding, cut-stone-covered slab on grade, Plastered-corners	Neoclassical	Mixed construction (masonry & timber)	Unknown	 Side sofa (rectangular)
Çöplüce B.Çekmece	Greek School for Girls and Boys in the church courtyard (reconstruction) (1909)	2 Classrooms *(dershane)* 2 teacher's rooms	width: 14,70 length: 17 height: 6	Main entrance linear stairs, profiled eave and band moldings, cut-stone-covered slab on grade, metal ornaments	Art-nouveau	Timber construction, marseilles tile roof covering	Çatalcalı Dimitri Yani Kalfapulos	 Sofa (ent. hall) (rect.)

Table 3. CONT.

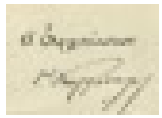
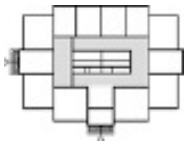
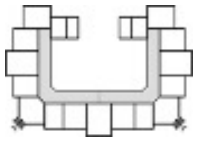
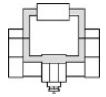
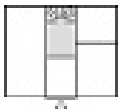
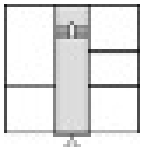
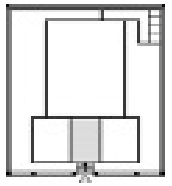
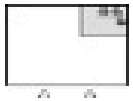
General Attributes		Architectural Features (Colored depict buildings that do not survive to date, gray hatch on the drawings indicates sofa)						
	Buildings (Original Status)-Const. Date	**Spatial Organizations**	**Structural Dimensions (m)**	**Facade Characteristic**	**Arch. Styles**	**Structural Systems and Construction Materials**	**Architect/ Foreman**	**Planar Organization**
Celaliye B.Çekmece	Greek Mixed Primary School and Nursery School (reconstruction) (1904)	9 Classrooms (dershane), 2 Break rooms, 2 Restrooms	width: 21 length: 28.75 height: 8.25	Entrances with triangular pediments, rubble stone covering, profiled eave and band moldings, plastered-corners	Neoclassical	Masonry construction		 Central sofa (U-shaped)
Mimarsinan B.Çekmece	Greek School (reconstruction) (1911)	11 classrooms, 2 Restrooms, 2 Management rooms	width: 27.75 length: 37.5 height: 6.75	Profiled eave and band molding, cascaded blocks	Neoclassical	Masonry construction		 Central sofa (courtyard) (U-shaped)
Çatalca	Greek Boy's School (reconstruction) (1906)	8 Rooms, 2 Restrooms, hall	width: 22 length: 41 height: 7	Linear main entrance stairs, profiled-eave molding and band molding, cascaded blocks	Neoclassical	Masonry construction	Unknown	 Central sofa (courtyard) (U-shaped)
Arnavudköy Terkos	Greek School for Girls and Boys (new construction) 1st proposal (1909)	2 Classrooms (dershane) 2 Teacher's rooms	width: 9.75 length: 12 height: 7.5	Profiled eave molding and band molding, plastered entrance and corners	Neoclassical	Mixed construction (masonry & timber) traditional barrel tile roof covering	Unknown	 Inner sofa (square)
	Greek School for Girls and Boys (new construction) 2nd proposal (1909)	4 Classrooms, (dershane) restroom	width: 9.75 length: 12 height: 7.5	Profiled-eave molding and band molding, cut-stone-covered slab on grade, plastered-entrance and corners, wooden ornaments	Neoclassical	Mixed construction (Masonry + Timber)	Unknown	 Inner sofa (square)

Table 3. CONT.

General Attributes		Architectural Features (Colored depict buildings that do not survive to date, gray hatch on the drawings indicates sofa)						
	Buildings (Original Status)-Const. Date	**Spatial Organizations**	**Structural Dimensions (m)**	**Facade Characteristic**	**Arch. Styles**	**Structural Systems and Construction Materials**	**Architect/ Foreman**	**Planar Organization**
Çiftlikköy Terkos	Greek School (reconstruction) (1893)	Classroom, Teacher's room, dining hall (taamhane), restroom	width: 11.25 length:15 height: 9	Linear entrance staircase main entrance with triangular pediment on the level of parapet, profiled eave molding, plastered-entrance and corners	Neoclassical	Masonry construction	P.D. Photiades (Fotiyadis kalfa)	 Without sofa (inverted T-shaped)
Oklalı Terkos	Greek School (reconstruction) (1896)	Dershane (classroom) teacher's room	width:7,5 length:12 height: 7.5	Eave and band molding	Without any concept of an architectural style	Masonry foundation, Mixed Buildings (Masonry + Timber)	Unknown	 Without sofa (rectangular)
Elbasan B.Çekmece	Greek School (reconstruction) (1901)	Dershane (classroom) 5 rooms, Restroom	width: 7 length:12 height: 6	Eave and band molding	Without any concept of an architectural style	Masonry foundation, mixed construction, (masonry + timber) tile roof covering	Unknown	 Inner sofa (rectangular)
Akören Terkos	Greek School (reconstruction) (1885)	Unknown	width: 13.5 length:18.75 height: 6	Unknown	Unknown	Unknown	Unknown	Unknown

THE ARCHITECTURAL USES AND TRANSFORMATIONS OF EXTANT NON-MUSLIM EDUCATIONAL BUILDINGS (AFTER 1923)

The population exchange agreement of the Lausanne Treaty (1923), which was signed by Turkey and Greece, was one of the largest "compulsory" population exchange movements of the 20th century (Arı, 2000). The Lausanne Treaty defined non-Muslims as "minority," while non-Muslim schools were defined as "minority schools." The right to education was given only to the minorities concentrated in regions such as Istanbul, Gökçeada (Imroz), and Bozcaada (Tenedos), which were outside of the scope of exchange (Somel, 2010). On the other hand, regions included in the scope of exchange lost their non-Muslim communities and they had to abandon their educational buildings. Especially in small and medium-size regions, non-Muslim school buildings were demolished, reallocated, handed over to the State Treasury, reused, and or underwent various interventions without central regulation (Ozil, 2019). Conversely, some cases were handled and managed according to local needs.[7]

The compulsory population exchange had a dramatic effect on the Greek population of Çatalca Province and this can be associated with the decision of excluding Çatalca Province from Istanbul before the agreement (Tevfik, 2023). The Bulgarian and Armenian populations, which were considerably less than Greeks, had to leave the region during the Balkan Wars as well as World War I. 50,611 non-Muslim (Greeks: 43,925, Armenians: 993, Bulgarians: 5,693) lived in Çatalca Province according to the state census of 1915 and it was reported as only 940 as per the 1927 census (Tevfik, 2023). The number of non-Muslim schools in Çatalca drastically decreased at the same time and out of nearly 70 known schools, only nine of them survived to date. These nine extant school buildings consist of four educational complexes, one partial complex affiliated with the church, and four separate schools. According to the title-deed registry records that date back to the 1970s, the Archigeneion Institute Complex, Fener Greek School, and Karacaköy Greek Boys' School are owned by local administrations, Selimpaşa Greek Primary School, Çatalca Fotakios Greek School, and Celaliye Greek School are owned by the State Treasury and currently allocated to other state institutions. All of these buildings have been registered by the Regional Conservation Councils and are protected by the state under law no.2863 (Table 4).

Archigeneion Institute Complex

The complex maintained its function as a whole until 1922, after which different sections of the building underwent changes, in terms of function and condition. Aerial photographs from 1942 indicate that the teachers' residence was destroyed and the Elenion Boys' School lost its spatial integrity due to reductions from the west and south before World War II (Figure 9). Today, the structure is in ruins while it is disconnected from its historical context due to the transformation of its surroundings (Figure 10).

The Girls' School (Block 1–2) was used as barracks during World War II when the first structural alterations occurred (Conservation Council Archive, 04.07.2002-6407). In the 1980s, the Girls' School was used for commercial purposes and the blocks were extensively altered and damaged, as its walls were demolished to create larger interiors and sizeable exterior openings. (Conservation Council Archive, Survey

Figure 9. Alterations of the Archigeneion Institute Complex between 1942 and 2004 (Archive of the General Directorate of Mapping).

Table 4. Comparison of general attributes, functions, ownership, and registration status of the extant non-Muslim educational buildings (Authors, 2023)

Buildings/Original Functions	Location, Block/Parcel	Construction Date/Period	Former/Previous Functions	Current Functions	Property Owners	Registration Number/Date
Archigeneion Institute Girls' School (1st block) Archigeneion Institute Girls' School (2nd block) Archigeneion Institute Girls' School (3rd block)	Selimpaşa -/6286– 6287	1857 1857 1872	Dâru'l-eytâm Military barracks, Machine shop, Carpenter´s shop, Boathouse, Silivri Municipality Supplementary Service Building	Nişantaşı University and Silivri Municipality Fine Arts Academy	Silivri Municipality	Istanbul No.2 Regional Council for the Conservation of Cultural Properties decision no.2773 dated 10.12.1991
Elenion Boys' High School	Silivri/Selimpaşa 6963/1	1868	Storage	empty		
Fener Greek School (Affiliated with Fener Church)	Silivri/Fener 3430/1	unknown	Primary school	empty	Silivri Municipality	Istanbul No.1 Regional Council for the Conservation of Cultural Properties Greek Boys' decision no.6310 dated 21.03.2002
Primary School	Silivri/Selimpaşa 322/3	1866-1870	Primary school	Selimpaşa Nursery School	State Treasury (allocated to Ministry of Education)	Istanbul No.2 Regional Council for the Conservation of Cultural Properties decision no.2773 dated 10.12.1991
Fotakios Greek Boys' School	Çatalca 306/12 (66/133)	1910	Government Building, İmam Hatip School, Prison (on the basement floor)	Çatalca District Gendarmerie Headquarters	State Treasury (allocated to Gendarmerie Headquarters)	Supreme Council for Immovable Antiquities and Monuments (GEEAYK) decision no.13723 dated 09.04.1982
Greek Boys' School	Çatalca/Karacaköy -/1636	1907	Primary school Police station Government Building Municipality Supplementary Service Building	Karacaköy Municipality Supplementary Service Building	Karacaköy Municipality	Istanbul No.2 Regional Council for the Conservation of Cultural Properties decision no.4243 dated 05.09.1996
Greek Mixed Primary School/ Nursery School	B.çekmece/Celaliye -/118	1904	Primary school	İsmail Çile Special Education and Application Center	State Treasury (allocated to the Ministry of Education)	Istanbul No.2 Regional Council for the Conservation of Cultural Properties decision no.1557 dated 05.09.1989

Figure 10. Surviving northwestern section of the Elenion Boys' School; kitchen and library.

Report). In 1997, Silivri Municipality decided to utilize Block 2 as the Municipal Supplementary Service Building. The restoration of Block 2 involved reconstructing the roof by using a steel structure, repairing the jack-arched flooring system with reinforced concrete supports and steel beams, and reinforcing the original brick walls (Figures 11 and 12). The restoration process of Blocks 1 and 3 began in 2005 and involved the reconstruction of the destroyed clock tower and roof by using steel construction and the replacement of the wooden flooring with reinforced concrete. Sidewalks neighboring Block 3 were raised during the adjustment of the ground level of the complex and the original staircase was converted into a balcony (Figure 13 and Table 5). Once the Municipal Services left, private universities applied to include the blocks as part of their campuses (Conservation Council Archive, report dated November 20, 2017). The blocks remained empty until 2021, and have been used by Nişantaşı University and Silivri Municipality since then.

Selimpaşa Greek Boys' Primary School

The other extant school in Selimpaşa is the Greek Boys' Primary School has continued to function as a school since the population exchange. Its northern facade was

Figure 11. The original south facade of Blocks 1 and 2 of the Girls' School, before and after the restoration (Sakkidu, 1938; Silivri Municipality Archive).

Figure 12. Reconstruction of the roof and floor systems during the repair of Block 2, consolidation of the brick walls, and the present state of the conserved marble inscription (Hanart Architecture Archive).

Figure 13. Block 3 entrance facade: the original and after restoration conditions, conserved marble inscription (Sakkidu, 1938).

completely blocked by a two-story, reinforced concrete building that was built after 1970 adjacent to it. The structure underwent a restoration process between 2003 and 2007 and serves as Selimpaşa Elementary School and Nursery School since then. The building's original features, such as a load-bearing system made of masonry walls and wooden slabs, still exist. Its original interior layout, featuring classrooms that open to an inner *sofa*, and the wooden interior staircase were mostly preserved (Figure 15). The most distinctive exterior alteration was the replacement of the original balcony with a reinforced concrete staircase providing access to the upper floor, while the door on the ground floor was walled up. This staircase was replaced with a monumental double staircase during the recent restoration process (Figure 14 and Table 5). Furthermore, the inscription above the upper-floor entrance has been covered, and the Greek text on the interior wall above the entrance was plastered over during the restoration process (Figure 16).

Figure 14. South facade of the building before and after the restoration (Hanart Architecture Archive, 2003).

Figure 15. Upper-floor plan survey drawing, interior sofa before and after the restoration (Hanart Architecture Archive, 2003).

Table 5. Analysis of the early and recent period interventions on the extant structures (Authors, 2023)

Settlement	Extant Structures	Early Interventions (After 1923)	Recent Interventions (2003-2018)								
			Consolidation	Steel Reinforcement	Integration	Reinforced Concrete Additions	Removal of Improper Additions	Repair & Maintenance & Replacement of Building Elements	Additions/ Annexes	Renovation	Restoration Date/Period
Silivri	Selimpaşa Archigeneion Institute Girls' School (1st block)	alterations to the original plan layout	√	√	√	√	–	–	–	√	2005-2011
	Selimpaşa Archigeneion Institute Girls' School (2nd block)	additional concrete interior stairs	√	√	√	√	–	–	–	√	2003-2005
	Selimpaşa Archigeneion Institute Girls' School (3rd block)	alterations to the original plan layout	√	–	√	√	–	–	–	√	2005-2011
	Selimpaşa Elenion Boys' High School	unknown					in ruins				No recent restoration
	Selimpaşa Greek Boys' Primary School	unknown	√	–	–	–	√	√	√	–	2003-2007
	Fener Greek School (Affiliated with Fener Church)	unknown					in ruins				No recent restoration
Çatalca	Fotakios Greek Boys' School	alterations to the original plan layout additional spaces additional concrete interior stairs	-	-	-	-	-	√	–	–	2018 (simple repair)
	Karacaköy Greek Boys' School	alterations to the original plan layout additional concrete interior stairs alterations to the roof structure	√	√	√	–	√	√	√	√	2018-ongoing
B.Çekmece	Celaliye Greek Mixed Primary School and Nursery School	additional interior concrete walls and stairs, alterations to the roof structure	√	–	–	–	–	√	–	–	2009-2012

Figure 16. Greek text on the wall, presently plastered (Hanart Architecture Archive, 2003).

Çatalca Fotakios Greek Boys' School

Çatalca Fotakios Greek Boys' School is the only example of an extant school structure in central Çatalca. It sustained damage during the Balkan Wars and underwent repair in 1914, then became the Town Hall until 1940 (BOA, ML.EEM. 1204/17). It appears that it was also used as an *Imam Hatip* (religious vocational) high school and a prison until 1982 (Conservation Council Archive, 26.03.1982-905). Reports dated 1985 mention the demolition of the building's interior to transform it into gendarmerie housing and barracks (Conservation Council Archive, 27.09.1985–1383). Despite this process was halted by the Town Council, the original interior walls and floor slabs were demolished according to the document of 11.10.1985-7622. The issue was brought to the attention of the High Council, which determined the building's registration status as Grade II and required the preparation of an architectural survey and restoration project (Conservation Council Archive, 18.10.1985-1523). The restoration project prepared between 1985 and 1988 determined that only the external facades would be conserved and separation walls and flooring should be reconstructed with reinforced concrete, and the building was opened as the Gendarmerie Headquarters in 1988 accordingly (Table 5). Another restoration project was prepared between 2012 and 2018 in response to the need for repairs but was never implemented. A comparison between the two projects revealed several conditions: (1) the original masonry east and west facade walls and cut-stone cladded north facade wall have mostly been preserved (Figure 17). (2) The addition to the south facade altered the original design. (3) The reconstruction of the new interior walls to create small office spaces destroyed the original plan organization (Figure 18). (4) All wooden-joisted flooring was replaced with reinforced concrete (Figure 19), with the exception of the jack-arched flooring at the north of the clock tower.

Karacaköy Greek Boys' School

Karacaköy Greek Boys' School is an extant school structure in Karacaköy village, and it has been undergoing restoration since 2018 at the time of writing and will serve as the Karacaköy Municipality Supplementary Service Building after its completion. The building was previously used as an elementary school as well as a town hall after the population exchange. The registration document mentions that the building was being used as the Town Hall at the time of writing, and it was repaired during its transformation from a school building (Registration slip, 1996, Conservation Council Archive). Reports included in the restoration projects indicate that two fires destroyed the building's wooden flooring and roof, which were replaced by reinforced-concrete roofing and flooring in addition to the interior being rebuilt (Restitution Report, Conservation Council Archive).

One of the Ottoman reconstruction permit documents contains a drawing of the school, which features a receded double staircase in the middle of the main facade that leads to the entrance to the upper floor (Figure 20a). Therefore, it is assumed that the present double stairs and the soffit

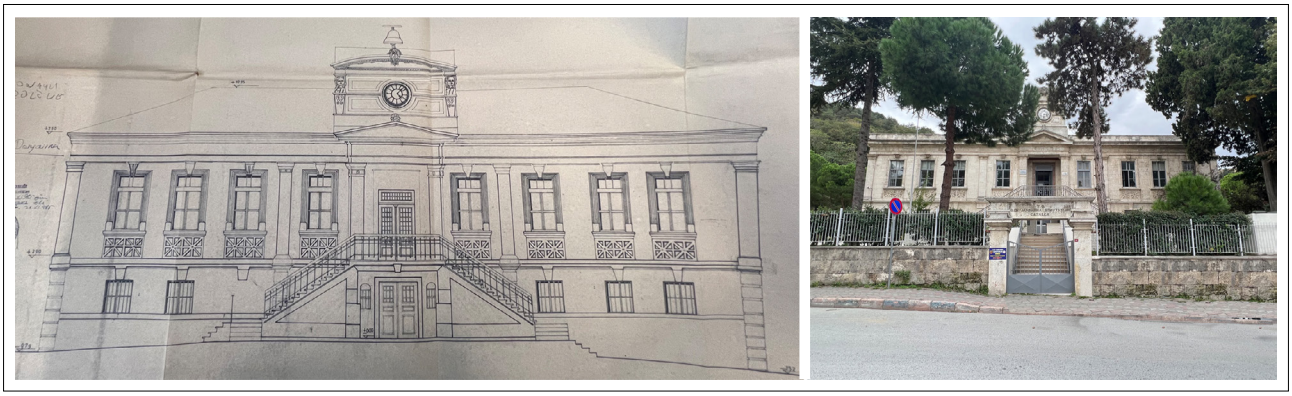


Figure 17. South facade in the survey drawing dated 1985, Architect: Hamdi Göytan (Conservation Council Archive), South facade.

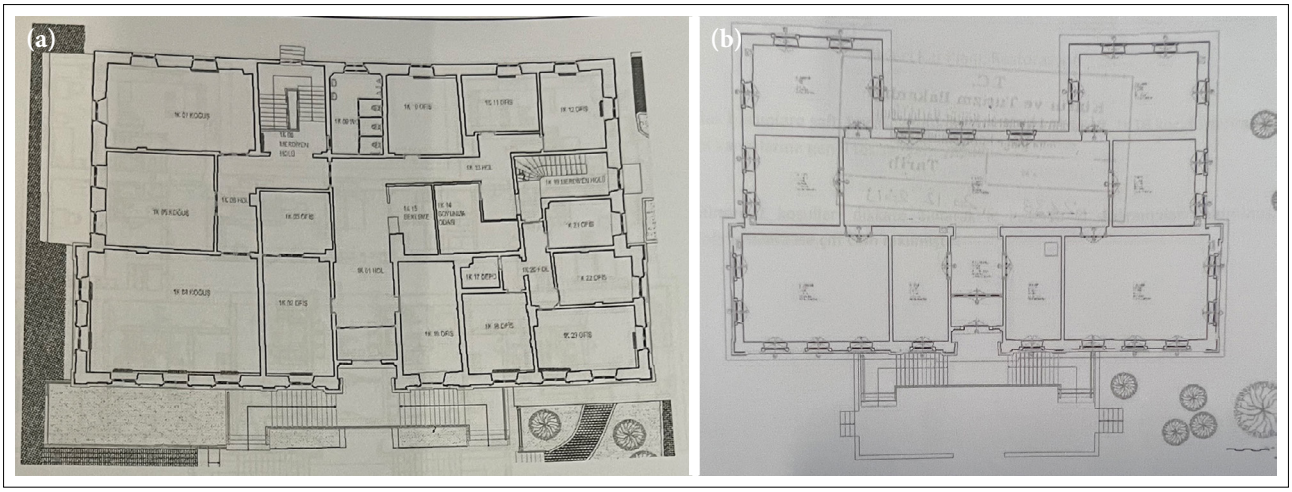


Figure 18. **(a)** Ground floor plan survey, 1985; Architect: Hamdi Göytan; **(b)** Ground floor plan restitution drawing, 2013, Detay Architecture (Conservation Council Archive).

Figure 19. Dismantled wooden slab of the upper floor (Conservation Council Archive), Interior was reconstructed using reinforced concrete.

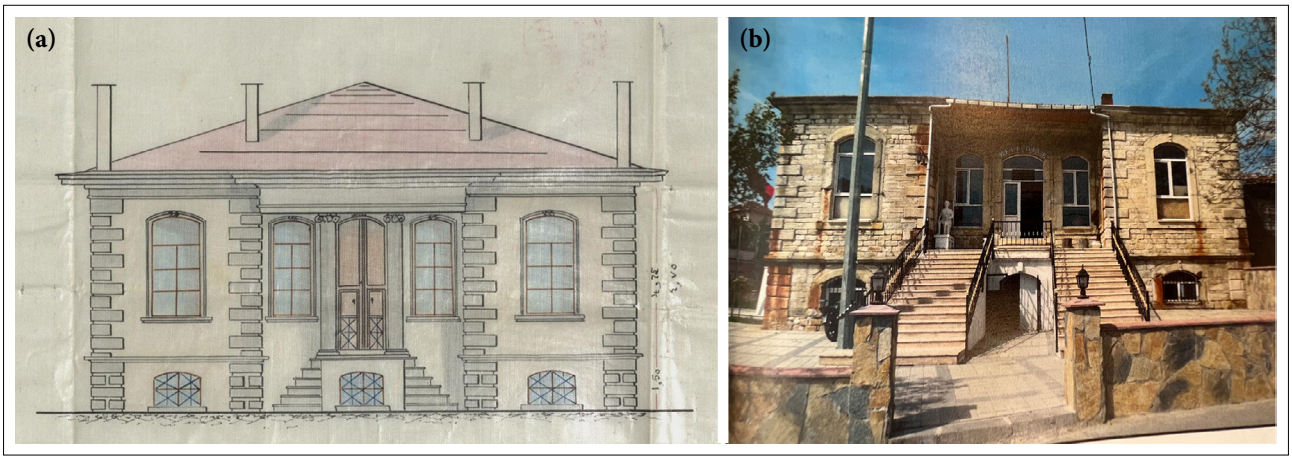


Figure 20. **(a)** Karacaköy Greek School facade drawing (BOA, I.AZN. 71/43), **(b)** Facade before the restoration; Detay Architecture, 2013 (Conservation Council Archive).

above them are later additions (Figure 20b and Table 5). The original planar organization was also considerably affected by the additional interior walls (Figures 21a and 21b). The ongoing restoration project involved the removal of all reinforced concrete slabs, stairs, and separation walls, which have structural issues with the remaining original building components.

Celaliye Greek Mixed Primary School and Nursery School

It is the only extant school structure in Büyükçekmece, which was able to remain as a school after the population exchange (Demirkıran, 1994). It was abandoned from the 1990s to 2008, reopened as the Special Education and Application Center following the restoration implementation (2009-2012) (Conservation Council Archive, May 03, 2012/23463). It is noteworthy that Ottoman archival documents and the present plan have similarities (Figures 22a and 22b). The layout of the central sofa was slightly altered following the expansion of the southeastern room and the addition of an internal staircase, which was covered by a skylight right after the population exchange (Figure 23a). Simultaneously, the roofing system was also repaired. The load-bearing system, original masonry exterior and interior walls, and wooden flooring have been consolidated and preserved. The northern and western exterior staircases were previously altered, which are the only observed interventions to the well-preserved original building facades (Figure 23b and Table 5).

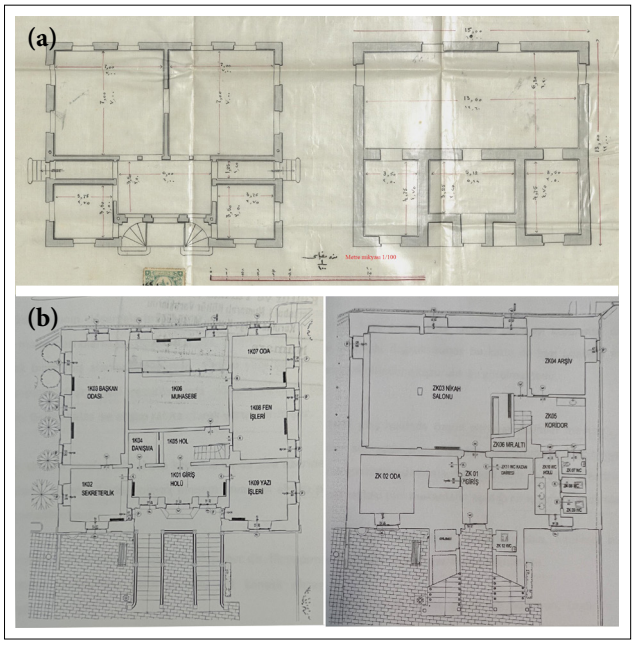


Figure 21. **(a)** Karacaköy Greek School original plan drawing (I.AZN. 71/43); **(b)** Floor plans before and after the restoration (Detay Architecture, 2013, Conservation Council Archive).

EVALUATION

The conservation status and transformation process of these nine remaining non-Muslim educational structures have been evaluated based on the international charters and presented through six key concepts: The concept of "**compatible re-use**" emphasizes the impact of the re-use on the building's original architectural identity (ICOMOS Charter-Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage, 2003, Article 1.4, The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013, Articles 1.10, 1.11, 7.1, 23). It is noticeable that the schools that maintained their educational function could retain their architectural identities, unlike those that were repurposed and lost their original identities.

The concept of "**distinguishability**" (explicitness of alterations) underlines that any new intervention should be identifiable and should not harm the originality of the building (ICOMOS The Venice Charter, 1964, Article 9-12, ICOMOS Charter-Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage, 2003, Article 3.11). For example, the Archigeneion Institute Girls' School buildings were extensively restored due to their dilapidated condition. The replacement of missing parts of the original plan layout and facade were re-integrated based on earlier documents. Since the applications were not supported by the contemporary design approaches or the information panels, the interventions made were not clearly distinguishable from the original features (Figure 24).

The concept of "**reversibility**" emphasizes that any intervention should be reversible, allowing for future developments, and that it can be removed and replaced (ICOMOS Charter- Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage, 2003, Article 3.9; The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance, 2013, Article 15.2). It is observed that due to the use of non-reversible intervention techniques and materials, such as the use of reinforced concrete, the original structural systems were severely affected in all of the extant structures.

The concept of "**addition/annex**" states that any new intervention should respect the cultural significance, authenticity, and architectural identity of the structure (ICOMOS The Venice Charter, 1964, Article 13; ICOMOS The Washington Charter, 1987, Article 8). The original entrance stairs, which can be considered a typological facade element, were demolished and replaced with additional larger-scale stairs in all of the extant structures, resulting in significant negative effects on the originality of the facades (Figure 25).

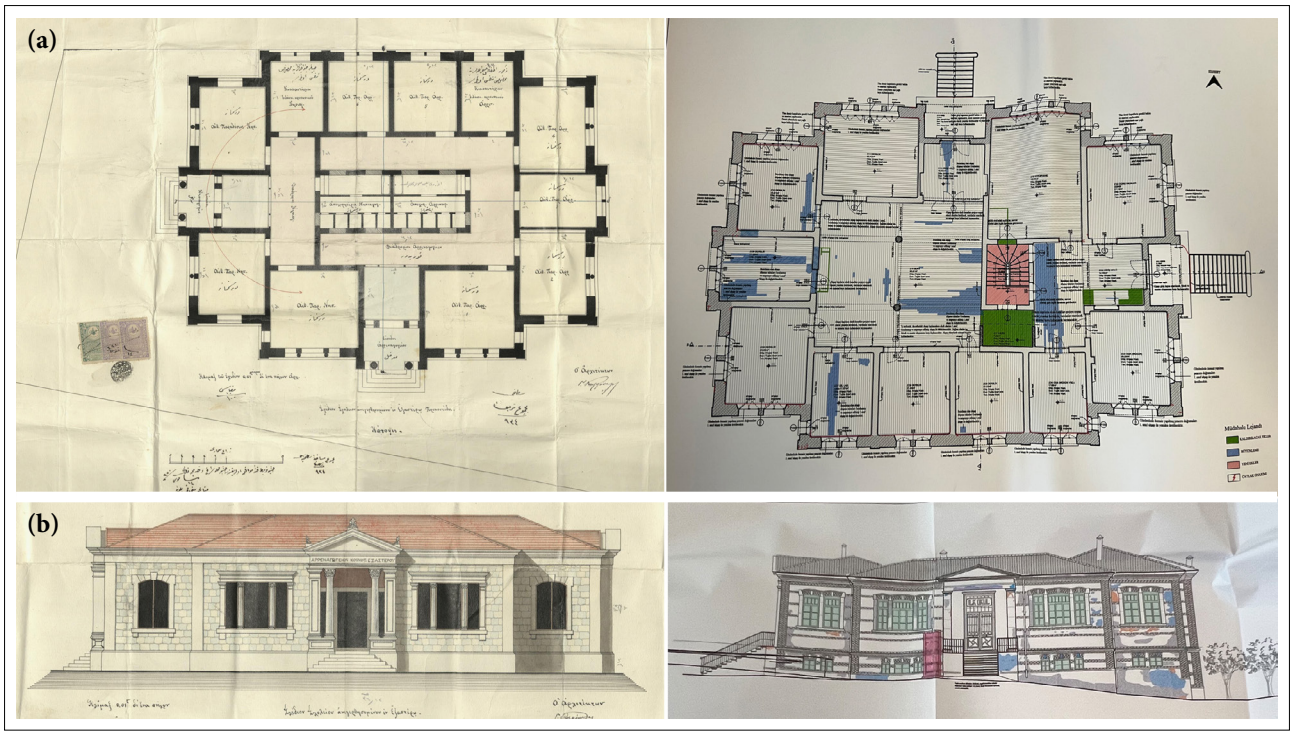


Figure 22. **(a)** Celaliye Greek School plan and front elevation archival drawing (BOA, I.AZN. 60/37); **(b)** Floor plan and elevation survey drawing, Anfora Architecture, 2009 (Conservation Council Archive).

The concept of "**integrity**" defines architectural heritage as a complete entity and considers the continuity of buildings in terms of their architecture, structure, and relationship with their surroundings (ICOMOS The Venice Charter, 1964, Article 6; ICOMOS Charter- Principles for the Analysis, Conservation and Structural Restoration of Architectural Heritage, 2003; UNESCO World Heritage Operational Guidelines for the Implementation of the World Heritage Convention, 2021). For instance, the Selimpaşa Elenion Boys' High School and Fener Greek School lost their structural integrity since they were partially destroyed and disconnected from their historical context (Figure 26).

In addition to all of these concepts, "**authenticity**" is defined as a characteristic that an architectural property must truthfully represent and embody cultural heritage values as a whole (Rössler, 2008). It considers the attributes of "form and design," "material and substance," "use and function," "traditions and techniques," "location and setting," "spirit and feeling," and other internal and external factors (UNESCO World Heritage Operational Guidelines for the Implementation of the World Heritage Convention, 2021, ICOMOS The Nara Document on Authenticity, 1994). It can be clearly stated that functional changes have a significant impact on buildings' planar organizations, structural systems, and facade characteristics, as well as their intangible features. The Selimpaşa Archigeneion Institute Girls' School Complex, Çatalca Fotakios Greek School and Karacaköy Greek Boys' School buildings lost their original plan layouts and inner structures, and could

Figure 23. **(a)** Views from the east; **(b)** Timber structure of the *Sofa*, Additional staircase covered with skylight, wooden ceiling at basement floor.

Figure 24. The clock tower of the Archigeneion Institute Girls' School buildings before and after the restoration.

only sustain their facade. On the other hand, the Selimpaşa Greek Mixed State School and Celaliye Greek Mixed School could remain their inner sofa/centered sofa plan layouts and facades. Today, none of the extant buildings can represent the attributes of "spirit and feeling" or recall their original users as well as the potential of a place to witness past human activity, therefore, the past and the present are not connected to each other.

CONCLUSION

This article is predominantly based on archival documents, literature review, and field studies conducted in Çatalca Province. The study revealed that there were nearly 70 Greek Schools, one Armenian School, and one Bulgarian School in Çatalca Province in the 19th century. As a result of the wars and migrations that occurred in the region at the beginning of the 20th century, these school buildings have mostly lost their users and original functions. Though, the conservation issue of these non-Muslim educational buildings is crucial for preserving the cultural heritage and architectural legacy of the region. These buildings not only provide insights into the educational and social history of the area but also serve as a tangible reminder of the multicultural past of the province.

Since the end of the 20th century, there have been debates about how society interacts with the past and how this/it can shape future issues. Within the current conservation paradigm, it is widely acknowledged that preservation efforts are fundamentally concerned with the human experience and that any conservation endeavor constitutes an integral component of our collective history (Loulanski, 2006). In this manner, cultural heritage serves as a repository of the collective memory, preserving the legacies of the past generations and transmitting them to the future ones. Whether it is about demolition or destruction, these structures should still be considered objects of conservation, even if they have lost their integrity or originality. These buildings can transfer memories to the new users by being repurposed and transformed (Holtorf, 2014).

This article aims to shed light on the historical memory of the Christian non-Muslim educational buildings, both extant and lost, with the aim of better understanding the shared heritage of the area. Ottoman non-Muslim community educational buildings are to be considered a part of modern Turkey's cultural wealth and significant historical assets. It is important to take into consideration the key factors mentioned in the international charters for heritage conservation, such as reversibility, integrity, and authenticity when developing conservation strategies. Adherence to these principles ensures that any intervention made to these buildings should be done in a way that respects their historical and cultural significance and that their essential qualities should be preserved for future generations. One of the key challenges facing heritage conservation professionals is balancing the need to preserve the past with the demands of the present and the future. In this case, it may be solved by finding sustainable and creative ways to adapt these structures for new purposes, while still retaining their architectural and cultural identities. By integrating these key principles into a holistic approach to heritage conservation, the non-Muslim school buildings in Çatalca Province can be protected and sustained for future use and appreciation.

The surviving late-Ottoman period educational structures may become symbols of international tolerance and peace. At the same time, they can also be considered as

Figure 25. Additional exterior stair examples; Karacaköy Greek School, Celaliye Greek School, and Selimpaşa Greek School.

Figure 26. Abandoned school buildings; Fener Greek School, Selimpaşa Elenion Greek School.

"Transboundary Serial Heritage" under the "Building Types" category since they reflect continuity beyond today's political borders (UNESCO World Heritage Operational Guidelines for the Implementation of the World Heritage Convention, 2005)[8]. Even if they are not defined as a World Heritage Property, they can still promote collaborative preservation practices between the neighboring countries due to their Transboundary Serial Heritage potential. To have a comprehensive understanding of shared heritage, it is also essential to continue such studies in Thrace and the Balkans beyond Çatalca that they were once part of the Ottoman Empire, even though they now belong to different nations today. This article also emphasizes the necessity of utilizing archival documents from the Late Ottoman period as a crucial resource in preparation of any architectural survey, restitution, or restoration project. By presenting innovative methods in conserving the authentic values of the region, this study will undoubtedly serve as a valuable resource for future academic research and restoration projects.

NOTES

[1]Ottoman Jewish community education buildings are not included in this study as they did not experience a modernization process similar to the Ottoman Christian community during the late Ottoman period (Somel, 2010).

[2]Arama (2019) conducted a classification of a portion of the archival documents in a master's thesis.

[3]Regarding the Armenians, American missionaries who appeared throughout the Ottoman Empire began to influence the modernization process of the Anatolian Armenian education system at the beginning of the 19th century (Somel, 2010). Bulgarian schools received a legal and institutional framework by the official foundation of the Bulgarian Exarchate in 1870 (Somel, 2005).

[4]According to the census of 1881/1882, the Muslim population in Çatalca Province was 15,091, the non-Muslim population (Greek: 35,848, Armenian: 889, Bulgarian: 5,586) was 43,299 and in the 1906/1907 census, the total population was 97,072 including 59,304 Greeks, 17.028 Muslims, 8,058 Bulgarians, and 929 Armenians (Karpat, 2003).

[5]It is noted that the Muslim education system in Çatalca was carried out in mosques until 1878; however an Idadi Mektebi, a Girls' Rüştiye Mektebi and a Mekteb-i Iptidai were built during the modernization process of the Hamidian Period (Gökçen, 1994).

[6]In the 1980s, the building could not meet the educational demands of the local community and was demolished accordingly (Vasiliu and Çelyos, 2000).

[7]The decision to allocate the Archigeneion Institute Complex to the immigrants who arrived at Çatalca during the population exchange or reuse the Çatalca Fotakios Greek Boys' School as the Government Building after the Balkan Wars (1913) are the two cases made to meet the local needs (BCA, 272-0-0-11, 17-75-10, 1924; BOA, DH. MB.HPS. 28/69, 1333).

[8]In this context, there is a wide variety of cultural assets between Turkey and neighboring countries, such as caravanserais along historic routes, clock towers, churches, and monasteries that also have the potential to be transboundary serial heritage (Akçabozan Taşkıran and Binan, 2020).

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Article

Simplified structural analysis method for traditional timber buildings with cross frame

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ABSTRACT

The purpose of this article is to develop a simplified structural analysis method for determining the load-bearing capacity of traditional buildings with timber frames and infill adobe walls, which have a very important architectural value in our cultural heritage, against various loads and environmental effects. Numerical models of the existing building are prepared and structural analyzes are performed before the repair and strengthening works of historical buildings. The structural analysis of traditional timber buildings differs from the analysis approaches of today's modern structures. In the structural analysis of such a building, criteria such as member sizes of structural frames, connection details, and material properties of unit elements may not be analyzed with a simple approach as the methods used in modern structures. For that reason, it is necessary to develop a simplified structural analysis method to reach the closest results in the conservation and strengthening studies of traditional timber buildings. The simplified structural analysis method developed in this article is applied in Boyabat Mehmet Kaya's House. The building is analyzed in three different scenarios with the proposed structural analysis method. The compression stiffness of the T/C (Tension/Compression) friction isolator element is estimated in a different way, in the first scenario, there are no windows and door openings or deterioration in the adobe walls of the building. In the second scenario, there are door and window openings in the infill adobe walls. In the third analysis case, there are infill adobe walls where material deterioration is effective and damage is observed in certain parts of the building. In the calculations attained, the displacements at the specified points of the building indicate significant findings about the structural behavior of the building according to the compressive stiffness.

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INTRODUCTION

All the necessary actions for the conservation of historical buildings bring together many interdisciplinary sciences such as architecture, engineering, archeology, art, and history. The engineering calculations of a historical building that requires repair and strengthening are quite complex. Due to its uncommon material characteristics and geometry, it is difficult to comment on its structural behavior without performing certain structural analyses.

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For this reason, structural analyses should be carried out by considering the specific material properties and geometry. However, deformations and displacements that may occur in the structure can be estimated within the framework of the basic principles of engineering and general physics rules by simplifying the load-bearing structure during the planning phase. Today, many engineering software have been developed that can perform these analyzes in line with the needs. Modeling and structural analysis have been developed and accelerated. It is of great importance to interpret these results of analysis of software packages, which provide a great convenience for the user. In this study, it is aimed that the analytical evaluation of a historical structure with a timber frame through a simplified model that can be easily evaluated by all related disciplines.

The increasing level of income and welfare in societies increases the awareness of the importance of preserving structures with historical and cultural value and passing them to future generations. The conservation of buildings with historical and cultural value is a process that requires the cooperation of different disciplines and requires a comprehensive evaluation of many parameters. However, the general condition of the structural system is slightly more prominent among these parameters for the structure to survive robustly. While the conservation of monumental structures representing the history and culture of countries requires institutional interventions, there are individual interventions for traditional buildings (Dutu et al., 2018; Li, 2022). It is almost impossible to implement a common structural analysis method for traditional timber buildings, each with different materials and structural members. In the planning phase of the strengthening and conservation process, the current structural performance of the building must first be determined. A simplified calculation method that accurately reflects the structural condition of the building facilitates an orderly start to conservation planning.

Timber-framed and adobe-filled traditional buildings are found in many parts of the world, many of which were built in earthquake-prone areas. They are widely preferred according to geographical location and flora since they can be built at low costs thanks to the use of easily available materials such as wood, stone, and soil. Most of the masonry and timber buildings made using these materials have survived to the present day and continue to be used. It is known that traditional timber-framed buildings are earthquake-resistant structures and suffer very little damage during seismic movements. For this reason, their survival has increased the reliability of the building system (Güçhan, 2018; Kalkan Okur et al., 2021).

In recent years, there has been an increasing momentum in scientific research on structural analysis and numerical modeling of traditional timber buildings. Experimental and analytical calculations have gained importance by supporting timber frame systems with intermediate elements such as natural masonry stone, brick, and adobe. Frame wall units formed in different materials, frame systems, and binding types were manufactured and subjected to structural analysis under various loadings. Analysis results such as displacements, forces, and failure mechanisms of the system shed light on how the structure will behave (Aktaş, 2017; Vieux-Champagne et al., 2014; Sandak et al., 2019; Chand et al., 2020; Yazgan and Unay, 2020; Lukic et al., 2018; Huang et al., 2018; Liang et al. 2022). However, the lack of experimental data on the structural systems and joint details of traditional buildings with timber frames and infill adobe walls makes it difficult to prepare and measure numerical models for structural analysis of existing buildings (Fritsch et al., 2019). Since each structure has its significant properties regarding materials, structural system, details, the laboratory experiments or the numerical modelling techniques do not provide a general structural analysis method. Although the assumptions made for the estimation of material properties and joint details of the adobe, which require a non-linear analysis method due to its characteristics, show mathematical results compatible with the experimental sets prepared for the selected unit elements. Many different results can be obtained from the numerical models to be prepared for the entire building. This increases the importance of a simplified numerical modeling and structural analysis method, especially during the protection and strengthening planning phase (Bağbancı, 2013; Günaydın et al., 2023).

With the diversification of numerical modeling methods, the analysis of masonry structures has become prominent. Aguilar et al. (2019) performed modal analysis, experimental modal analysis, seismic capacity assessment and pushover analysis, and limit analysis by applying accurate geometric modeling and simplified analytical methodology to a historic adobe structure using a laser scanner and photogrammetry. The application of this methodology allowed us to determine the performance levels of an adobe church against different seismic scenarios. The results showed that the church can remain intact until occasional earthquakes with a return period of 72 years. However, the results emphasized that rare earthquakes (return period of 475 years) can create an unsafe structural condition with partial collapse of structural elements. Sandak et al. (2019) used LVDTs to investigate a timber-framed stone infill wall structure within the ductile elastic limit and to determine its behavior under static-seismic loads. In his study, Dutu (2021) focused on timber framed infill walls in three different contries in detail. He emphasized the importance of this type of structure and conducted experimental studies to explain its structural behavior. As a result, he explained the resisting mechanisms of structures that have survived against seismic effects for many years. He experimentally demonstrated that timber frames with infill

walls and diagonal members resist earthquake effects to a significant degree (REF Conclusion). Referring to Dutu's (2021) study, Gülkan and Langenbach (2021) emphasized the importance of hımış structures, which are frequently encountered in rural areas in Türkiye.

In Meybodian et al.'s (2020) study, various walls were designed and analyzed using adobe which is known as a sustainable material. Locally available, sustainable reinforcing materials such as palm fibers and reeds were preferred as natural reinforcing materials and one wall panel was reinforced with a special type of plastic mesh for comparison. The results are described in terms of lateral load displacement, ultimate strength, displacement capacity, ductility factor, energy dissipation, and equivalent viscous damping. The experimental findings revealed that the structural response of adobe walls can be significantly improved using natural reinforcing materials. Jiménez et al. (2021) classified the Damage Vulnerability Index Method for the seismic evaluation of hybrid timber-masonry buildings. Their method is based on the execution of a detailed numerical study of this specific structural typology to calibrate the scores assigned to the irregularities of the structural system, the type of storey, and the state of preservation of the building. A sensitivity analysis of the seismic capacity was developed by performing pushover analyses with several models corresponding to realistic variations of each structural or material parameter Jiménez et al. (2021) and Vieux-Champagne et al. (2014) analyzed the seismic performance of timber-framed structures filled with natural stone and earth mortar using three-scale experiments in which both cyclic and monotonic loading were considered. The first scale was to determine the local effect of the number of nails under two loading directions, the second scale was based on the foundation cell detail and the third scale was based on the shear wall size analysis. The specimens were analyzed as a whole wall without any openings (doors or windows). The effect of infill on stiffness, maximum load, or equivalent viscous damping was analyzed. This study was then compared with three other experimental studies on the same type of traditional structures to obtain answers regarding the seismic-resistance behavior of these structures.

Literature review shows that there are few studies in which timber-framed natural adobe walls are applied together as a hybrid system, the existing studies have contributions to primarily experimental approaches, while numerical studies require intensive engineering knowledge. For this reason, this study aims to simplify the prediction of the behavior of timber frame system filled with adobe walls numerically.

Especially in Türkiye, there is no structural studies on timber framed adobe infill walls. For this purpose, it is necessary to develop a structural calculation method that can be easily interpreted (displacements, internal forces, and stresses in the structural system elements) by all related professionals working in various stages of conservation and restoration field to protect the historical architectural heritage in earthquake prone zones. In this study, the displacements of timber framed adobe fill walls under structural loads are presented with different scenarios to be more easily understood. Timber-framed adobe fill walls, which are experimentally specified in the literature studies, are defined as T/C isolators (tensile/compression isolators) at the connection points in numerical modeling. The scenarios (TFwAF-01, TFwAF-02, TFwAF-03, and TFwAF-04) were explained, TFwAF-02 and TFwAF-03 were applied by modeling the structure selected as a case study with the finite element method. With the use of simplified calculation method, the analyses performed on the numerical model, which has been prepared with the information obtained from the building survey, give results that help to determine the behavior of the structure, especially in terms of displacements.

CHARACTERISTICS OF STRUCTURAL SYSTEMS OF CONVENTIONAL TIMBER BUILDINGS

Timber is one of the oldest building materials used in construction in many parts of the world. The construction of timber structures dates back to the 15th century and is known to have continued until the 1960s (Doğangün et al., 2006).

Although timber is widely used in the world, its use in Türkiye has remained at a very low level compared to other construction systems. The use of wood as the main structural frame of buildings in Türkiye has decreased significantly since the 1940s with the use of reinforced concrete, stone, and steel in the construction industry. Wood is used much more in buildings, especially in the northern countries of Sweden, Norway, Finland, Canada, and the USA, as well as in Japan, New Zealand, and Australia, than in Turkey (Özdemir et al., 2008).

It is known that, wooden structures have been replaced with other materials such as stone, brick and reinforced concrete due to the damages of various natural disasters. In recent years, timber materials have become prominent one more time with the popularized sustainability paradigm and this has led to a renewed focus on traditional timber construction systems. The use of new types of building materials as hybrids with timber building systems in contemporary construction is becoming more widespread.

As in many regions of the world, it is possible to encounter various timber construction systems in Türkiye which are used to be preffered extensively in the past. Due to the high seismic risk, the availability of materials, and the climatic conditions, traditional timber construction techniques have been applied, especially in Western Anatolia.

Timber Building Construction Systems Used in Türkiye

Timber structures can be considered among the cultural heritage of people living in this region. Traditional architecture in Turkey has many unique styles (Doğangün et al., 2006; Özdemir et al., 2008; Aras, 2013). Turkish-Ottoman Houses, which have been shaped by the cultural, social and climatic factors, are the most important examples of timber buildings recognized worldwide (Özdemir et al., 2008; Saatçi, 2020).

In timber buildings, the loads are encountered by posts, beams, purlins, bases, and diagonal elements and they transferred to the building foundation. In addition, in these structural systems, there are there can be other components which do not present any bearing properties such as flooring and cladding elements. Walls, made out of adobe or other infill materials and placed between timber members, are among the common examples (Saatçi, 2020).

Traditional timber buildings in Turkey can be classified as houses consisting of logs or planks, unfilled frame systems (bağdadi/wood veneer), and infilled frame systems (hımış/dizeme/muska dolma).

Log Houses

It is called "canti" (log house), where lightly processed logs or planks are superimposed and fixed in both ends. The walls, formed with logs or planks, function as both carriers and dividers (Figure 1a and b). In traditional Turkish log houses, members lying horizontally transfer vertical loads from top to bottom to the foundation. Even if such a structural system is sufficient for vertical loads, it may not be able to withstand the lateral loads due to loosened ends by the effects of shear forces during a destructive earthquakes (Doğangün et al., 2006; Yağcı Ergun et al., 2021).

Unfilled Frame Systems (Bağdadi/Wooden Coating)

Bağdadi is a type of plaster which is often applied with slats over the frame. When plastering the front and back parts of the walls, the spaces in between are ventilated with inlet-outlet holes. This provides insulation. Bağdadi is made with thick or thin slats. Wood coating, on the other hand, is a type of wall formed by hitting wooden coating boards on the structural system elements. These cladding boards can be overlapped or flat. (Yağcı Ergun et al., 2021; Aktaş Erdem et al, 2011; Silveira et al., 2012). In Turkey, timber houses are generally one, two, or three storey buildings. The ground floor of these buildings was usually built with stone or adobe walls. Hımış and bağdadi construction techniques can usually be used together for different levels. Figure 2a shows the plaster of bağdadi, while Figure 2b shows an example of the ground floor bağdadi, a construction using hımış.

Infilled Frame Systems (Hımış/Dizeme/Muska Dolma)

The walls formed by filling he gaps between the frame elements with masonry (brick, adobe, briquette etc.) materials are called Hımış, which is one of the most common systems used in Anatolia. The masonry infill materials differ according to the climate and characteristics of the region. The mortared or unmortared stone infill placed in the triangular gaps created with diagonal elements is called Muska Dolma. The meshing consists of timber elements placed horizontally or vertically between the roof systems. There are examples of applications between timber elements with or without mortar. In Figure 3a, adobe filled hımış structures, in Figure 3b, a 3 storey adobe filled structure with a stone foundation from the west part of the Black Sea Region are shown.

A SIMPLIFIED STRUCTURAL ANALYSIS METHOD FOR TRADITIONAL TIMBER BUILDINGS

Structural analysis of historical and traditional timber structures is different from the analysis of contemporary structures. Each of the elements that make up the structural system of a traditional timber building has unique details and material properties according to their sizes and connection

Figure 1. **(a, b)** Examples of timber structural systems created by sequential alignment of planks and logs Artvin/Türkiye.

Figure 2. **(a)** Bağdadi system technique (Sinop) **(b)** Bağdadi and half-timbered system technique (Sinop).

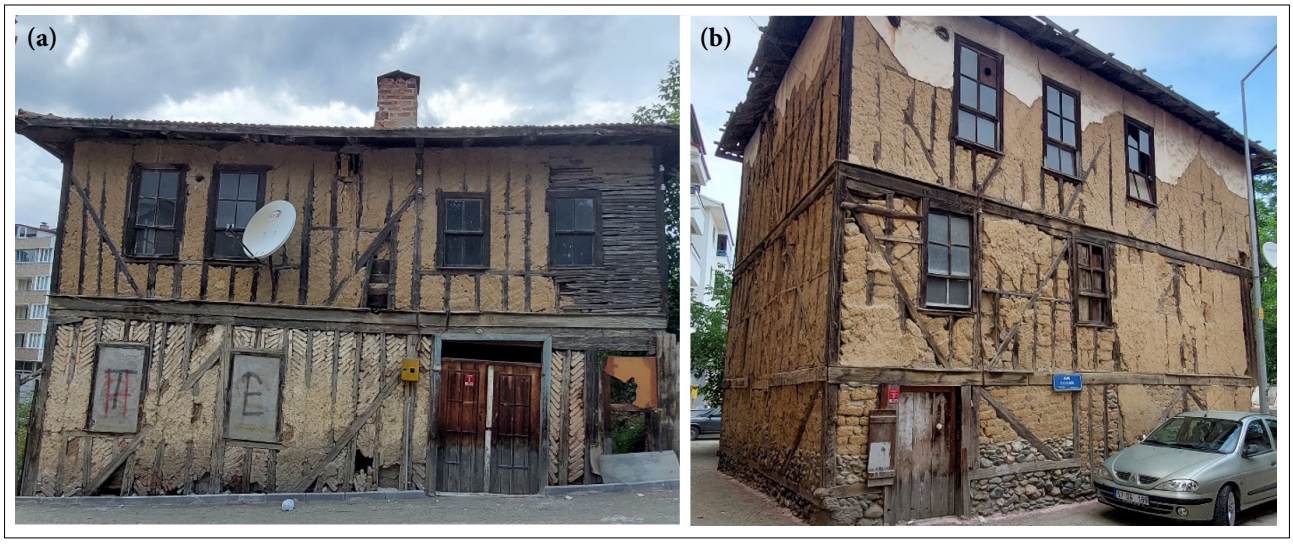

Figure 3. **(a)** Example of Hımış and partial bağdadi structure, **(b)** Basic stone filling hımış system structure.

types. Due to these features, it is not always possible to apply the general engineering analysis practice directly, as in the engineering calculations of reinforced concrete and steel structures. Defining the material properties of wood and adobe together, requires laboratory experiments and highly complex numerical modeling techniques (Aktaş Erdem et al., 2011).

It is necessary to develop a simplified analysis method to reach the most accurate results in the planning phase of the conservation and strengthening works of traditional timber buildings. First of all, a plane frame analysis model is prepared for this approach. As shown in Figure 4, to examine the structural interaction of timber frames with adobe blocks, a numerical model of a 3 m high plane frame with a 4 m span, including timber beams and posts as well as adobe blocks is prepared. The cross-sectional dimensions of the timber beams and posts are 200 mm × 200 mm and the thickness of the adobe wall is 200 mm. As summarized

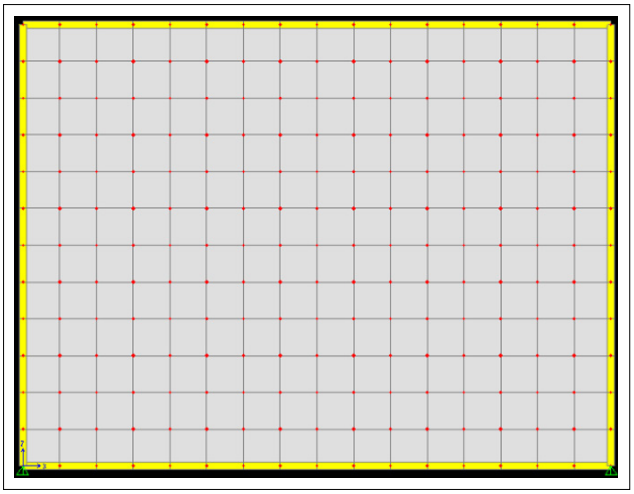

Figure 4. Numerical model for the first analysis (TFwAF-01), Timber frame with infill adobe wall.

in Table 1, the modulus of elasticity for wood is assumed as E=10000 MPa and for adobe as E=225 MPa. These data were taken from the "Guide to Managing Earthquake Risks for Historical Buildings" prepared by the General Directorate of Foundations (Vakıflar Genel Müdürlüğü, 2017; Ahşap Yapıların Hesap ve Yapım Kuralları, 1979; Duman and Ökten, 1988). Since adobe is not produced according to a certain mixing procedure and specification, it can present varying material properties even within the same building. Because of experimental studies conducted to determine the mechanical properties of adobe material used in traditional buildings, approximate values based on observations for the modulus of elasticity of adobe have been adopted. Silveira et al. (2012) estimated the modulus of elasticity for adobe from the stress-unit deformation curve obtained by simple compression experiments. On the other hand, Vicente and Torrealva (2014) proposed the adobe's modulus of elasticity as 300 times the compressive strength in their experimental study of a typical infilled adobe timber building. In the current earthquake specification in Türkiye and some scientific publications about masonry structures for brick masonry walls, the modulus of elasticity is recommended as 300 times the compressive strength of masonry materials (Türkiye Bina Deprem Yönetmeliği, 2018; Bayülke, 2011; Bayülke, 2018). In this study, the modulus of elasticity of the adobe wall is accepted as E=225 MPa, assuming that the compressive strength of a typical adobe masonry wall is 0.75 MPa (Vakıflar Genel Müdürlüğü, 2017).

In the numerical models, four consecutive analyzes were carried out with the SAP2000 finite element analysis software. The most appropriate way to examine the behavior of the timber frame with infill adobe walls is to calculate the displacements in the frame. Therefore, in parametric analysis, the weight of the timber frame and infill adobe walls is not taken into account. To observe the change in the displacements, a point force of 500 kN is applied as a first loading case at the upper left corner of the frame along the positive x-axis (in the horizontal direction) and 500 kN in the negative x-axis direction at the same point as a second loading case. As shown in Figure 4, in the first analysis (TFwAF-01), the timber frame defined by FRAME elements and the infill adobe walls defined by SHELL elements are modeled as a whole. Although it is known that there can never be a perfect combination between the beams and posts forming the timber frame and the infill adobe walls as in the (TFwAF-01) numerical model. This numerical model has been prepared to observe the alteration in the next modeling options. It is fixed with a simple support from the point at the two corners of the base assuming that the examined frame is on any floor of the building, on any surface, or the partition wall.

In the second analysis model (TFwAF-02) as shown in Figure 5, in order to consider a more realistic behavior on the joint surface of the timber frame and the infill adobe, T/C friction isolator elements that do not transmit the tensile forces in a way that corresponds to each SHELL element, but only transmit the compressive forces are applied. There will be no physical bond between the infill adobe and the timber frame in the regions where tensile stresses are applied as a result of the forces in the positive x and positive y directions considering that the tensile strength of the adobe is very small and there is no bond based on tensile stress between the timber frame and the infill adobe wall, (Jiménez & Pelà, et al., 2022). In the numerical model of the analyzes performed with the non-linear static calculation method, the compressive rigidity of the T/C friction isolator element is approximately determined

Table 1. Timber and adobe material properties used in finite element analysis

Materials	Compressive strength MPa	Modulus of Elasticity MPa (kN/m²)	Unit weight (kN(m³)
Timber	*	10000 (10000000)	10
Adobe	0.75	225 (225000)	15

*The tensile and compressive strengths of timber in the direction of the fibers (parallel) and perpendicular to the fibers are different. The safety stresses are 10.5–11.0 MPa in tension parallel to the fibers, 11.0–12.0 MPa in compression parallel to the fibers and 2.0–3.0 MPa in compression perpendicular to the fibers for Class I pine-oak and beech, provided that they are reduced in case of oblique force. Timber is not to be worked perpendicular to the fibers, the safety stress is assumed to be zero.

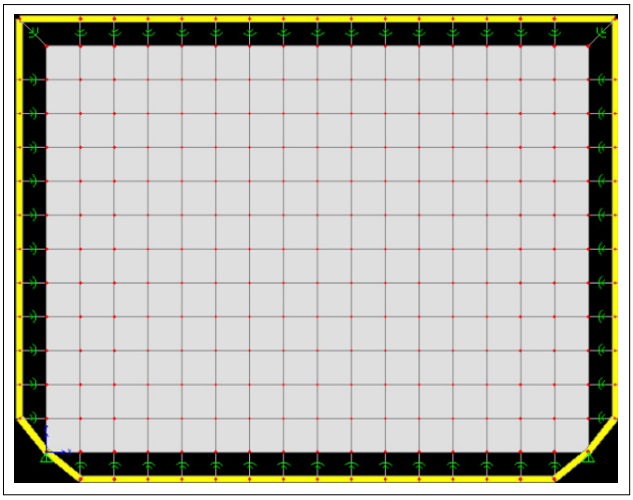

Figure 5. Numerical model for the second analysis (TFwAF-02).

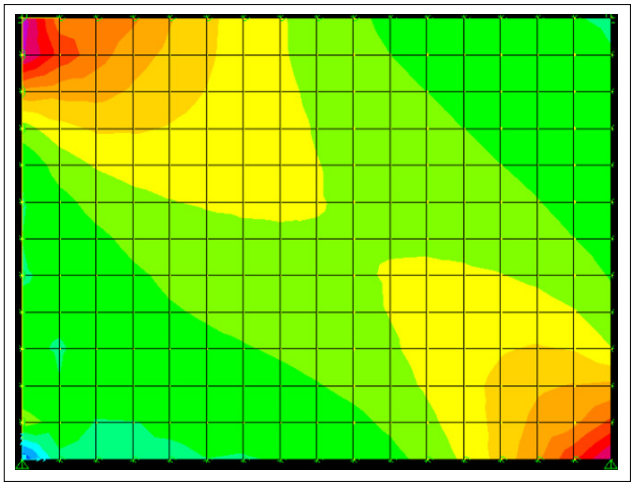

Figure 6. Distribution of compressive stress in adobe by (TFwAF-02) analysis.

due to the accepted compressive strength for the adobe. Although the software can be runned with a single point between the timber frame and the adobe, to better control the behavior of the structure during the structural analysis, T/C friction isolator elements are modeled with two-point LINK elements by leaving a 5 mm gap between the timber frame and the infill adobe wall.

The aim of these two analyzes is to monitor the interaction between the timber frame and the infill adobe wall with non-linear elastic static calculations more realistically with a numerical model using tension-compression controlled T/C friction isolator elements. In the first analysis performed with the (TFwAF-01) model, the largest displacement is calculated as Δx=22.15 mm, in the second analysis carried out with the (TFwAF-02) model, the largest displacement is calculated as Δx = 63.01 mm. According to these results, 3 times larger displacement is calculated with the numerical model, which is thought to reflect the realistic behavior between the timber frame and the adobe filling and uses only link elements that transmit compressive stresses. As can be seen in Figure 6, the diagonal compression block is seen from the upper left corner to the lower right corner of the frame according to the loading direction. According to these results, it can be said that the regions with tensile stress in the infill adobe walls do not contribute to the horizontal stiffness of the timber frame.

Modeling an entire traditional timber building with T/C friction isolator elements in a way that can give necessary accurate results can create some difficulties and problems. These can be listed as errors that may occur during numerical modeling, non-linear elastic static analyzes will not give adequate results due to the use of a large number of connection elements, a discontinuity that cannot be determined in the numerical model, or an error that will affect the analysis results. It can also be added that such analysis takes a very long time depending on the hardware of the computer to be used.

With a simplified structural analysis method and numerical modeling technique to be developed by considering the ratio of the displacements obtained, the results that can give overall information about the structural capacity of the building can be reached while starting the conservation-strengthening planning. Instead of using many non-linear elastic LINK elements to define the infill adobe walls interaction with the timber frame, two T/C friction isolator elements to be diagonally connected from the corners of the frame are prepared (TFwAF-04). However, to define the compressive stiffness of the diagonal T/C friction isolator used in this new model, two separate numerical models have been created.

As shown in Figures 7a and b, as a result of the second analysis, a third analysis is carried out with a new numerical model prepared by taking into account the approximate limits of the compression zone in the infill adobe walls, where only the infill elements are located in the diagonal region (TFwAF-03). In this analysis, the displacements obtained as a result of the second analysis (TFwAF-02) are applied instead of the forces applied to the corner point of the frame. In this way, the stiffness of the two diagonal T/C friction isolator elements to be used in the numerical model with the larger compressive stresses (TFwAF-04) in the infill elements at the diagonal region is approximately determined. Numerical models are shown in Figure 7a (TFwAF-03) and Figure 7b (TFwAF-04).

As summarized in Table 2, the displacements obtained as a result of parametric analyzes, which describe the behavior of the structure in the simplest manner in general, confirm the availability of the proposed simplified structural analysis method. At the connections of the wooden frames, the displacements obtained with the second and

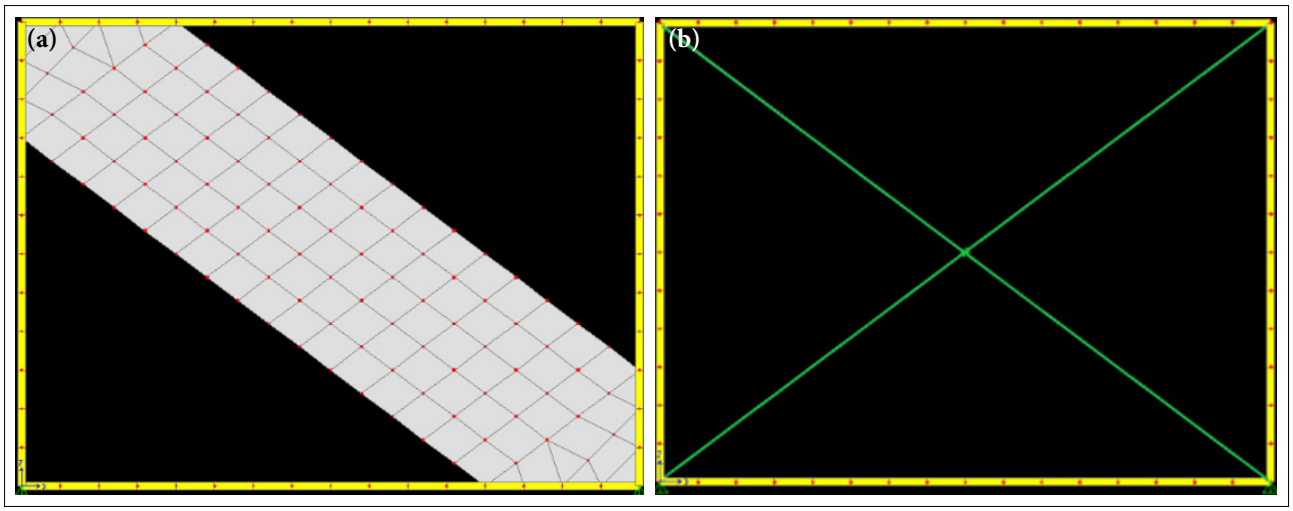

Figure 7. **(a)** (TFwAF-03) numerical model **(b)** (TFwAF-04) numerical model.

third analysis model, which are considered to show more realistic behavior than the applied force, and the fourth analysis model, which is proposed as the simplified analysis method, are quite close to each other. On the other hand, almost 3 times less displacement is calculated in the first analysis model, which is known not to exhibit a true behavior for infill adobe elements. Although it will not fully determine the actual structural behavior of such structures, the moments obtained in the corners where the beam, posts, and infill adobe walls are defined by tensile stress according to the loading direction also provide an idea about the convenience of the simplified analysis method proposed to some extent. As shown in Table 2, the moments found as a result of the second and third analysis and the simplified method, which are thought to be more realistic, are consistent.

APPLICATION OF THE SIMPLIFIED STRUCTURAL ANALYSIS METHOD IN A CASE BUILDING

The simplified structural analysis method is applied to Mehmet Kaya House which is one of the civil architecture examples in the Boyabat district of Sinop province in the Western Black Sea Region. The district has timber-framed masonry houses that are compitable with geographical location, climate, and physical development. The buildings are generally constructed as timber infill adobe or timber bracing frame structures over a masonry stone foundation. Many examples of civil architecture in Boyabat have been inherited from the Ottoman Empire, and some of them were destroyed in the earthquake that occurred in 1943. Today, it is dangerous and forbidden to enter the building. For this reason, floor plans and images could not be taken. The survey of the building was made by Architect Hasan, Gömeç in 2005. In Figure 8, all floor plans of the building are given. Figure 9, 10 and 11 shows the west, north and south facades respectively, nevertheless the east facade cannot be documented due to cuurent condition. It is known that Mehmet Kaya House was built as a timber infill adobe framed structure and is located in the Camikebir neighborhood in Telgrafçı Street (block no: 131, plot no: 2). The building is one of the traditional architectural examples that have survived to the present day.

Since the main purpose of these analyses is to apply the simplified structural analysis method on a traditional timber building, the material, construction, and structural system of the sample building is not taken into account in all details. In the numerical model prepared for simplified analysis, timber

Table 2. Displacements and moments calculated in consecutive analyses

Numerical model used for calculations	Horizontal displacements and position in frames, Δx (mm)				Moments at corner points of the frame (kN·m)
	1	2	3	4	
TFwAF-01	22.15	19.82	10.35	10.10	13.15
TFwAF-02	63.01	62.76	20.48	32.02	23.71
TFwAF-03	66.10	65.35	35.23	30.21	23.46
TFwAF-04	60.80	60.65	30.22	30.14	22.17

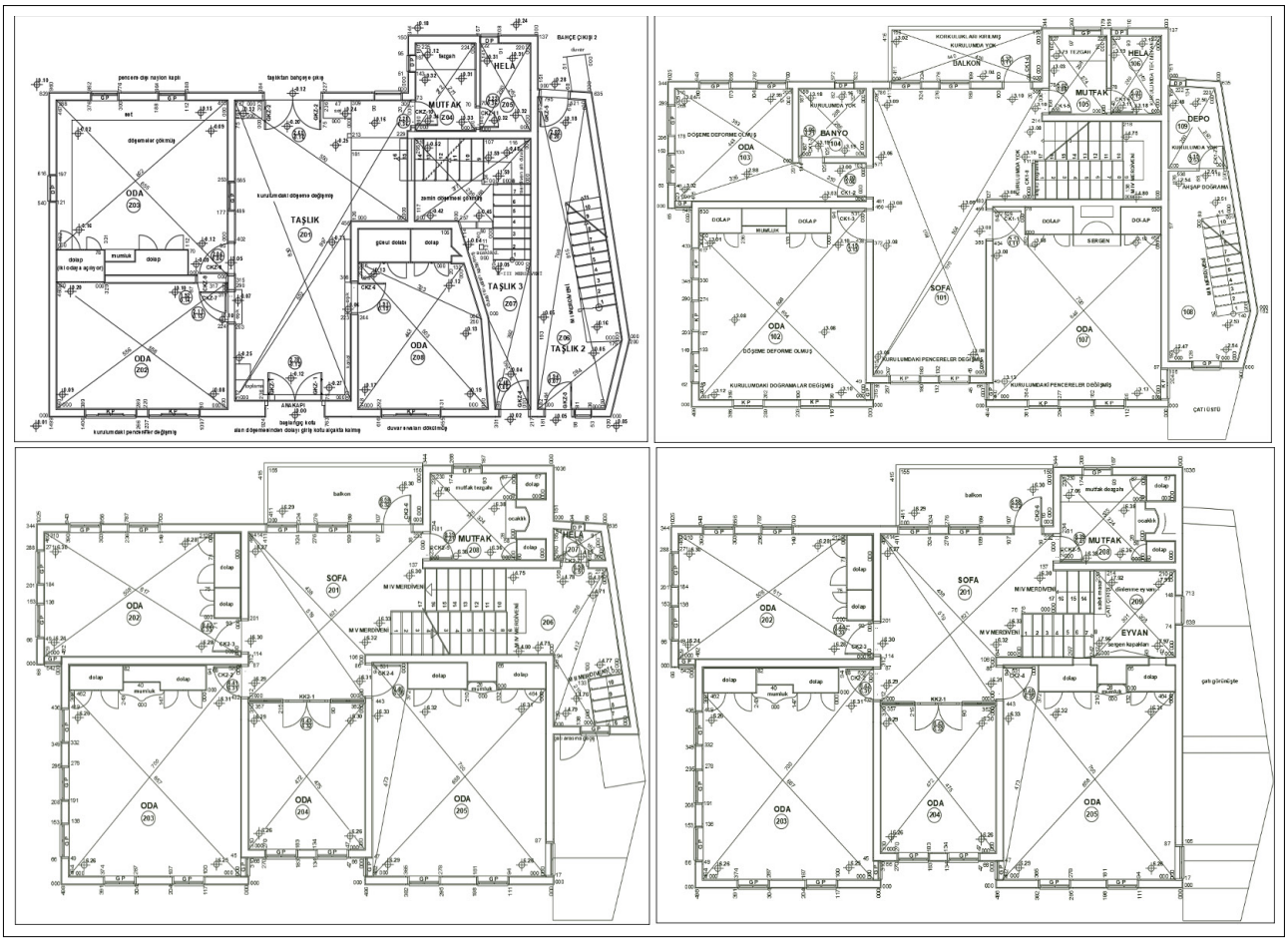

Figure 8. Surveying plans of the ground floor, first floor, second floor, and second iwan floor, respectively.

beams and posts, which constitute the main structural frame of the building, are created. Although the cross-sectional dimensions of the timber posts and timber beams in the existing building are different, in the numerical model, members with an average 200 mm × 200 mm square cross section, are used. As shown in Figure 12, the frame openings between the beams and the posts (infill adobe walls in the existing building) are connected diagonally from the corner joints by T/C friction isolator elements. As explained in the previous section, it is assumed that T/C friction isolator

Figure 9. West facade of Mehmet Kaya House.

Figure 10. North facade of Mehmet Kaya House.

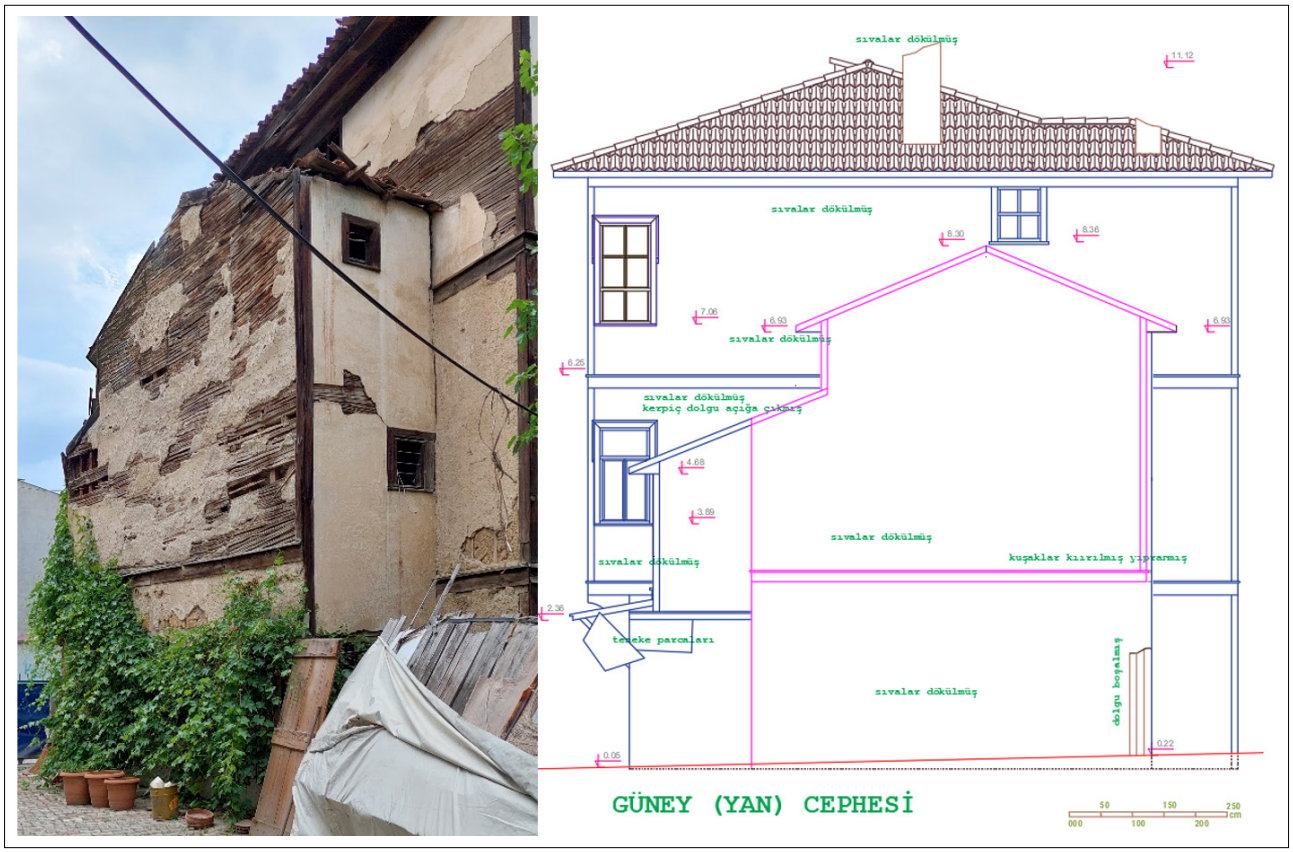

Figure 11. South facade of Mehmet Kaya House.

elements transmit compressive stresses, similar to adobe infill walls, by simply assigning only compression stiffness in their material properties definition.

Since the main purpose of the proposed simplified structural analysis method is to obtain a general idea about the structural behavior of the structure, it should be noted

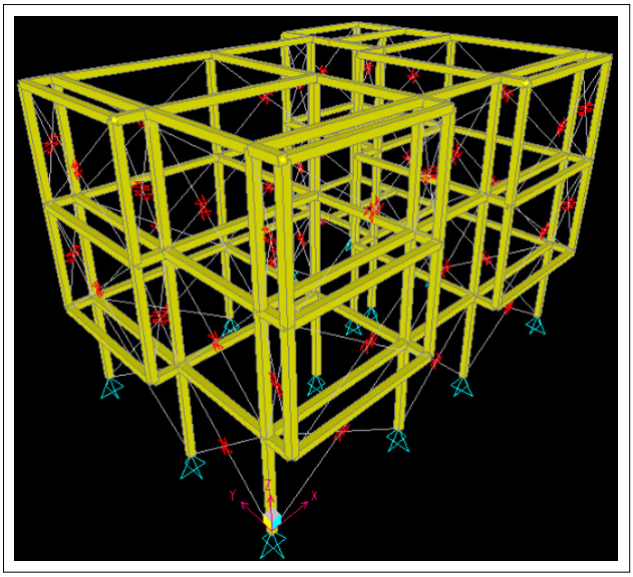

Figure 12. Analytical model of simplified analysis with T/C friction isolator elements.

that the analysis results (displacements, internal forces, and stresses in the structural members) will not serve as an example for the actual structural performance of the building. However, within the scope of the case study, selected support reactions internal forces and bending moments are given in Table 5. Therefore, the compressive rigidity of the T/C isolator elements can be approximately defined according to the position, geometric dimensions, and shape of the infill adobe walls in the numerical model. As in Half Timbered or Bağdadi structures, the effect of cross and horizontal timber members on increasing the strength of infill adobe walls or the effect of window or door openings on reducing the strength of infill adobe walls are some of the factors to be considered when defining the rigidity of T/C isolator elements.

In the previous section, it was stated that the stiffness of T/C friction isolator elements can be approximately determined in the numerical models (TFwAF-03) and (TFwAF-04), which are proposed as simplified structural analysis methods. In the (TFwAF-03) analysis, the stiffness of the diagonal adobe compression block was approximately calculated, and the stiffness of the T/C friction isolator element defined in the (TFwAF-04) analysis is determined. When using the simplified structural analysis method in traditional timber buildings, the dimensions of the infill adobe walls and the stiffness of the T/C friction isolator elements can be expected according to the estimated modulus of elasticity of the infill adobe material. It can be accepted that the compressive rigidity of the T/C friction isolator element is between 10000 kN/m and 15000 kN/m considering the examples based on field observations. As explained earlier, since the purpose of the simplified analysis method is to determine the structural behavior of the building according to the relative displacements under the applied loads, the rigidity of the T/C friction isolator elements can be defined according to the trial and error method.

Traditional timber buildings exhibit stable structural behavior for many years under their weight and other permanent vertical loads. The original structural system of the building is already designed according to the effect of these vertical loads. However, changes in soil conditions due to excavation or drainage works carried out in the vicinity of the building for any reason, deterioration in the main structural elements or infill adobe walls, earthquake, and excessive wind forces are factors that will adversely affect the general structural conditions of the building. In the simplified structural analysis method proposed in this study, instead of defining these loads in detail according to the location and general conditions of the structure, three separate load cases are applied that would determine the overall structural behavior of the building with acceptable accuracy. The first load case is the vertical loads that include the own weight of all the stationary components of the building. The second and third load cases are the gravity loads that consist of 40% of the total weight of the building in the global X and global Y axes, respectively, as the horizontal loads. This is a loading practice generally used in approximate earthquake analysis.

In Boyabat Mehmet Kaya House analysis, according to the window openings, wall thickness and location of the diagonal timber elements of the infill adobe walls, compressive stiffness of T/C friction isolator elements are selected in three different categories, k_{comp1}= 10000 kN/m, k_{comp2}= 12500 kN/m, k_{comp3}= 15000 kN/m, respectively (Vakıflar Genel Müdürlüğü, 2017; Ahşap Yapıların Hesap ve Yapım Kuralları, 1979; Duman and Ökten, 1988). Three successive analyzes are carried out according to a scenario based on the location of the walls and the damage situation.

The numerical models are prepared with the information obtained from the building survey. The simplified structural analysis method, especially the results that help determine the behavior of the building in terms of displacements were obtained. The displacements obtained at different locations of the building according to the different compressive stiffness values of the T/C friction isolator elements assigned at a certain point of the infill adobe walls are shown in Figure 13, Tables 3 and 4.

As a result of the analyses, since the highest forces are observed in the support reactions at the corners of the building, the selected support reactions are shown in Figure 14. As shown in Figure 14, R1 represents the location of the support reaction numbered 1, and red circle number 1 represents the member numbered 1. Support reactions and members are shown, respectively. The support reactions in X and Y directions, shear force, and bending moments

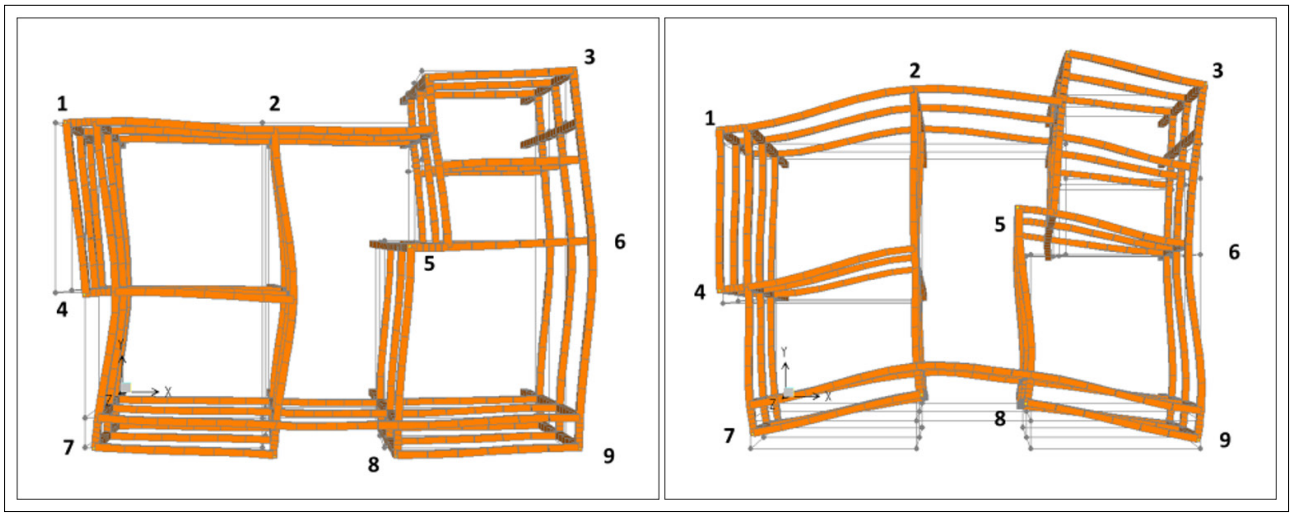

Figure 13. The locations of the points for the measured displacements along X-axis and Y-axis.

Table 3. Displacements at selected locations due to successive analyses

Joint location	Load case	Analysis 1		Analysis 2		Analysis 3	
		Δx (mm)	Δy (mm)	Δx (mm)	Δy (mm)	Δx (mm)	Δy (mm)
1	Case 2 (X)	15.86	−1.18	17.86	−1.22	21.31	−0.87
	Case 3 (Y)	−3.12	15.60	−3.32	15.58	−4.50	20.02
2	Case 2 (X)	12.81	−6.09	17.94	−9.81	21.42	−10.01
	Case 3 (Y)	−4.43	79.06	−4.68	79.16	−4.38	83.41
3	Case 2 (X)	9.69	0.41	10.87	0.47	14.48	0.30
	Case 3 (Y)	4.98	15.29	4.83	15.28	6.46	18.50
4	Case 2 (X)	35.00	−1.32	44.12	−113	45.59	−0.78
	Case 3 (Y)	−5.75	15.35	−3.09	19.67	−3.37	19.96
5	Case 2 (X)	35.62	−9.41	37.88	−9.85	40.40	−970
	Case 3 (Y)	−17.35	66.47	−17.59	66.56	−18.64	73.12
6	Case 2 (X)	35.61	0.36	37.87	0.41	40.38	0.24
	Case 3 (Y)	−17.35	15.17	−17.59	15.16	−15.05	14.57
7	Case 2 (X)	14.50	1.10	16.84	1.08	16.99	1.18
	Case 3 (Y)	5.08	17.39	5.48	23.23	5.48	17.68
8	Case 2 (X)	17.43	−0.94	19.85	−9.80	20.00	−9.66
	Case 3 (Y)	−4.91	54.35	−4.99	54.40	−5.41	73.25
9	Case 2 (X)	17.51	0.26	19.92	0.31	20.07	0.14
	Case 3 (Y)	−4.97	15.06	−5.08	15.05	−5.26	14.10

Table 4. Displacements along the first to third floor levels due to successive analyses

Floor Level	Displacements along in X-axis			Displacements along in Y-axis		
	Analysis 1 Δx (mm)	Analysis 2 Δx (mm)	Analysis 3 Δx (mm)	Analysis 1 Δy (mm)	Analysis 2 Δy (mm)	Analysis 3 Δy (mm)
3	41.87	44.08	45.55	−9.42	−9.81	−10.01
2	35.01	36.76	37.84	−6.08	−6.08	−6.59
1	25.12	25.26	26.85	−3.45	−3.45	−3.83

Table 5. Support reaction, Shear force, and bending moments at selected members on the third floor due to successive analyses

Joint location	Selected Member	Load Case	Analysis 1				Analysis 2				Analysis 3			
			Rx (kN)	Ry (kN)	V (kN)	M (kN·m)	Rx (kN)	Ry (kN)	V (kN)	M (kN·m)	Rx (kN)	Ry (kN)	V (kN)	M (kN·m)
R1	1	LC2 X	−0.47	0.03	0.36	0.18	−0.55	0.04	0.45	0.33	−0.69	0.03	0.54	0.47
		LC3 Y	12.46	−84.9	0.67	1.11	11.25	−84.9	0.68	1.13	8.7	−86.3	0.71	1.18
R2	2	LC2 X	−66.9	0.22	0.76	0.86	−65.5	0.23	0.83	1.0	−65.4	0.25	0.95	1.26
		LC3 Y	0.52	−4.39	0.11	0.21	1.15	−4.39	0.12	0.22	1.68	−4.65	0.13	0.24
R3	3	LC2 X	−32.1	−1.46	0.42	0.28	−36.1	−1.95	0.43	0.29	−35.3	−1.05	0.5	0.44
		LC3 Y	−25.4	−18.1	0.15	0.29	−24.9	−18.1	0.14	0.29	−22.6	−15.5	0.16	0.34
R4	4	LC2 X	−2.57	0.04	0.79	0.92	−2.66	0.04	0.82	0.95	−2.69	0.03	0.85	1.01
		LC3 Y	1.43	−57.7	0.71	1.24	1.44	−57.7	0.71	1.23	1.49	−58.7	0.72	1.26
R5	5	LC2 X	−2.33	0.38	1.42	2.09	−2.41	0.4	1.5	2.24	−2.45	0.42	1.56	2.36
		LC3 Y	0.91	−5.53	0.51	1.01	0.91	−5.53	0.58	1.0	0.95	−5.85	0.51	1.01
R6	6	LC2 X	−2.17	−6.49	0.87	1.15	−2.27	−6.79	0.92	1.26	−2.38	−6.77	0.97	1.37
		LC3 Y	0.69	−59.4	0.59	1.13	0.7	−59.4	0.6	1.14	0.8	−74.1	0.6	1.16
R7	7	LC2 X	−0.33	2.22	0.44	0.34	−0.41	2.55	0.47	0.42	−0.4	1.76	0.47	0.41
		LC3 Y	3.45	−0.22	0.01	0.01	3.39	−0.22	0.01	0.01	3.36	−0.22	0.01	0.01
R8	8	LC2 X	−61.2	0.05	0.47	0.39	−61.5	0.06	0.5	0.49	−62.4	0.08	0.51	0.49
		LC3 Y	3.6	−5.31	0.01	0.02	3.37	−5.31	0.02	0.04	3.34	−5.62	0.02	0.04
R9	9	LC2 X	−72.5	−0.35	0.06	0.39	−71.3	−0.36	0.5	0.48	−71.2	−0.37	0.5	0.48
		LC3 Y	0.03	−0.27	0.05	0.08	0.03	−0.28	0.05	0.1	0.03	−0.35	0.05	0.09

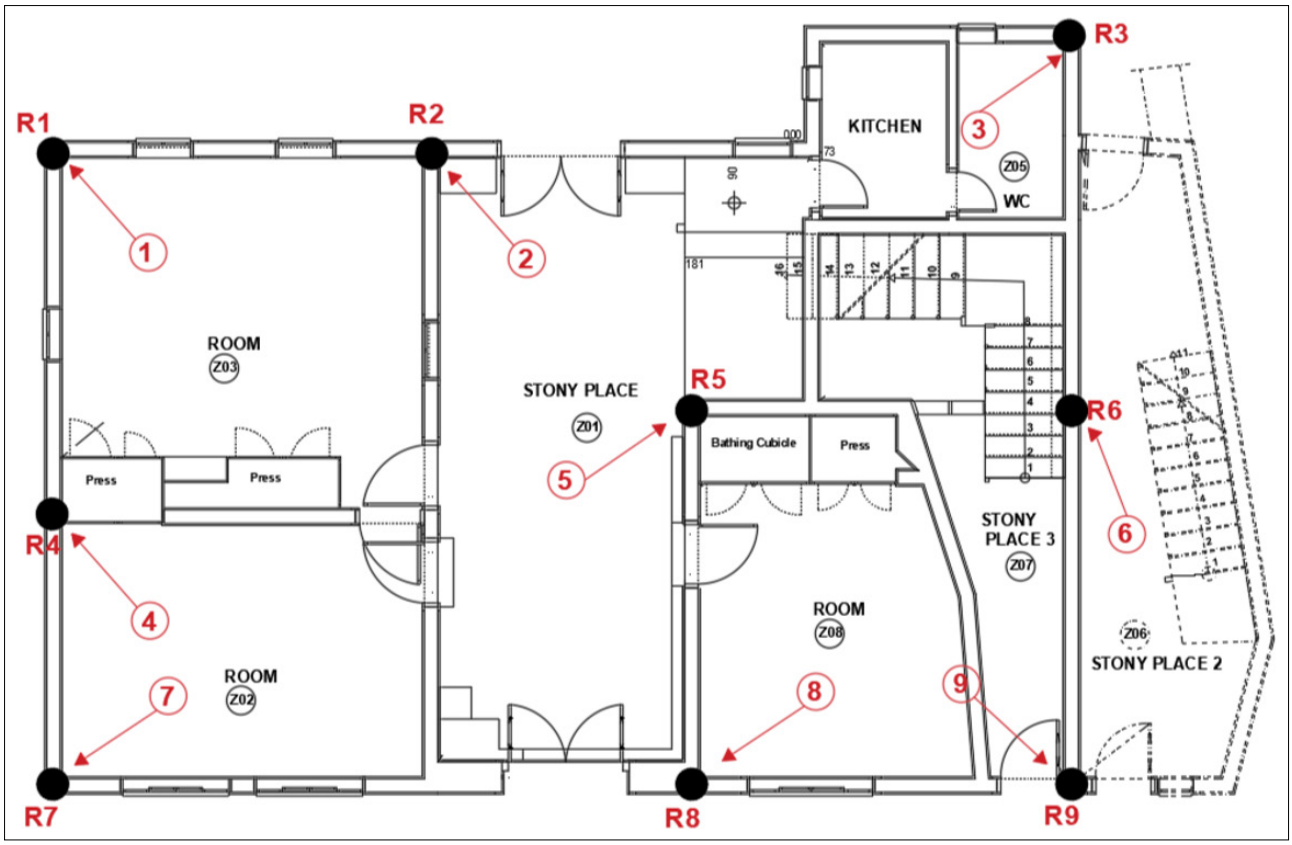

Figure 14. The locations of selected support reactions and selected members on the third floor.

at selected members on the third floor due to successive analyses are given in Table 5.

In the first analysis, the compressive stiffness of the T/C friction isolator element is selected as k_{comp3} = 15000 kN/m, assuming that all the infill adobe walls were in very good condition and the window and door openings were ignored. In the second analysis, the compressive rigidity is selected as k_{comp2} = 12500 kN/m of the T/C friction isolator element in the places where there are doors and windows. In the third analysis, the compressive stiffness of the T/C friction isolator element in the places where the material deterioration is effective and the infill adobe walls are observed in places are selected as k_{comp1}= 10000 kN/m (Vakıflar Genel Müdürlüğü, 2017; Ahşap Yapıların Hesap ve Yapım Kuralları 1979; Duman and Ökten, 1988). Displacements at various selected points of the building show significant results about the structural behavior of the building according to the compressive stiffness of the T/C friction isolators, as can be seen in the tables where the results are summarized and Figure 12. At the same time, significant changes in internal forces, which are calculated in proportion to displacements in the beams and posts of the building, also enable the monitoring and evaluation of the structural behavior of the building.

RESULTS AND DISCUSSION

First, a plane frame numerical model is prepared for these analyses. It has been assumed that the adobe intermediate element behaves wholly with the first model TFwAF-01 timber frame system prepared for easier understanding of displacements. TFwAF-02 T/C friction isolator element that transmits compressive forces that do not transmit tensile forces is defined on adobe and timber frame interface. According to the results of these analyzes, the displacement of the numerical model TFwAF-02 (Δx = 63.01mm), which is thought to reflect the realistic behavior between the timber frame and the infill adobe walls which uses only link elements that transmit compressive stresses, is 3 times larger than the displacement of the TFwAF-01 (Δx= 22.15mm) model.

Numerical models TFwAF-03 and TFwAF-04 have been prepared to be diagonally connected T/C friction isolator elements from the corners of the timber frame. In the TFwAF-03 model, the displacements obtained as a result of the second analysis (TFwAF-02) were applied instead of the forces applied to the corner point of the frame. Thus, the stiffness of the two diagonal T/C friction isolators to be used in the TFwAF-04 numerical model was approximately determined with the larger compressive stress in the infill adobe walls in the diagonal

region. At the junctions of the modeled frame, the displacements obtained in the TFwAF-04 analysis model, which is accepted to show more realistic behavior than the applied force, and the TFwAF-03 analysis model, which is proposed as a simplified analysis method, are quite close to each other. Although it will not fully determine the actual structural behavior of such structures, the moments obtained in the corners where the beam, posts, and infill adobe walls are defined by tensile stress according to the loading direction also indicate an idea about the convenience of the simplified structural analysis method proposed to some extent.

The results of simplified calculation method and the experimental studies were similar. T/C isolators used at the connection points have verified the displacement-compression stiffness of timber frames with adobe fill walls within the framework of engineering principles. The structural behavior of timber frames with adobe or stone fill walls in experimental and numerical studies is consistent with the simplified calculation scenarios. In the seismic capacity assessment of the adobe structure, Aguilar et al. (2019) showed that the compressive-tensile stresses at the connection points were weak against the earthquake loads of the case studies. Sandak et al. (2019) showed that the first local displacement was 7 mm and the displacement was 60-80 mm in the subsequent cyclic loadings in the experimental studies with timber-framed stone infill walls. In the simplified calculation model, which has similar characteristics with these studies, the displacement of the TFwAF-02 (Δx =63.01 mm) model was found to be within the limits of agreement with TfwAF-01 (Δx=22.15 mm) (stone-brick infill difference). Dutu (2021), on the other hand, has shown that timber diagonal frame members are significantly effective in preventing lateral displacements Similar results were obtained by defining adobe infill walls with different stiffness coefficients in numerical modeling. With the simplified calculation method, the structural behavior can be easily interpreted by every professional. For this reason, the simplified calculation method can be considered as feasible in terms of time, cost, and labor savings.

CONCLUSION

Interdisciplinary approaches are needed for the conservation and restoration of historical buildings. Ensuring the stability of the structure can be managed primarily by interpreting the building correctly. The structural analysis of traditional timber buildings differs from the analysis approaches of today's modern structures. In the analysis of a traditional timber building, criteria such as member sizes of frame systems, connection details, and material properties of unit elements may not be analyzed with a simple approach as the systems used in modern structures. Therefore, it is necessary to develop a simplified calculation method to reach the closest results in the conservation and strengthening works of traditional timber buildings.

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Article

Evaluation of thermal performance of an elementary school building with the experimental method: Double-skin façade system

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ABSTRACT

A double-skin façade is one of the generally preferred energy-efficient design strategies to reduce energy consumption in buildings. In this study, one of the two similar, south-oriented classrooms in a one-story elementary school building in Ereğli, Konya, Türkiye, was turned into a Test Classroom by installing double-skin façade and the other classroom was designated as the Basic Classroom, and hourly ambient temperatures were measured in both classrooms. Hourly ambient temperature values were measured in the Test Classroom and Basic Classroom on 6 consecutive days between January 26 and January 31 during the heating period. The working principle of double-skin façade systems is based on heating the adjacent space by transferring warmed air from the cavity to the adjacent space in the heating period, cooling the adjacent space by transferring warmed air from cavity to outside environment in the cooling period using the openings such as windows and vents on the façade of cavity and glass façade. Openings (windows and vents) in the Test Classroom and glass façade were kept open or closed for periods of 24 h depending on whether it was the heating period to create different experiment set-ups. Ambient temperatures that were obtained with the measurements done in different experiment set-ups with different conditions were analyzed and values of the Test Classroom and Basic Classroom were compared. According to the measurements, 0.3°C and 3.0°C higher temperatures were recorded in the Test Classroom compared to the Basic Classroom between January 26 and January 31 (heating period).

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INTRODUCTION

Limited fossil energy sources, higher cost of extracting energy from these sources, and the environmental damage caused by these fossil fuels make energy conservation a must and increase the importance of renewable energy sources and sustainable environment concepts. The majority of energy is used to meet climatic and visual comfort requirements in buildings and mostly fossil energy sources which are generally limited and cause environmental problems are preferred (Yılmaz et al., 2006.)

Sustainability can be described as "meeting the needs of today without damaging the sources that future

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Ambient temperature measurement devices used in this study were provided by the ITU Scientific Research Project titled "Use of Solar Energy in Single-Storey Elementary School Buildings with Passive Systems"; hotwire anemometer that measures air movement was provided by the Association of Building Physics and aluminum profile elements and glass materials were provided, transferred and glass façade was built by Çuhadaroğlu Alüminyum Sanayi ve Ticaret A. Ş.

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generations will need," "transferring today's sources to future generations," and "principles of social, economic, and environmental priorities of the harmony that need to be established between humankind and ecosystems at local and global levels today and in the coming centuries" (Utkutuğ, 2011). The most important step of sustainable architecture which is defined as the design and construction of buildings that meet occupants' needs using local and natural sources without damaging the environment and depleting the sources of future generations is to use renewable sources instead of fossil sources to meet their energy requirements and design and build energy-efficient buildings and settlements.

Based on this perspective, the goal today is to design buildings that can promote occupant comfort with minimum energy consumption. Energy requirements can be reduced by designing buildings according to the climate and environmental conditions they are in and using renewable energy sources where possible. Furthermore, as an effective solution to ever-growing construction industry with the addition of new buildings, which accounts for 39% of CO_2 emission, 36% of energy consumption, 50% of raw material production, and 1/3 of drinking water consumption and therefore increases energy consumption and contributes to global warming, envelopes of existing buildings can be improved using advanced technological products (Ascione et al., 2021). A study in Spain on existing single-family and block housing typologies which were constructed between 1980 and 2007 in 13 different climate zones investigated and simulated according to the improvements in envelope and observed that the retrofitting of existing building walls with 10 cm and roofs with 5 cm of insulation and substitution of single glazing by double glazing resulted in a reduction in consumption values from 37.7% to 58% depending on the climate zone and housing typology (Sanchez et al., 2022).

Renewable energy sources should be preferred instead of fossil fuels because, in addition to being sustainable, they reduce export dependency on fuel, do not cause high import costs, their impact on the environment is low and they can be found everywhere in the world.

When we look at the distribution of the energy consumed in Türkiye among the industries, according to the "2020 General Energy Balance Table" of the Republic of Türkiye Ministry of Energy and Natural Resources the amount of energy used in buildings comes third in the total energy consumption with 24% consumption rate after industrial goods (33%) and transportation (25%). In the same table, fossil fuels come first with 68% of all energy sources and solar energy is used only at a rate of 1% as an energy source (Republic of Türkiye, Ministry of Energy and Natural Resources, n.d). A higher rate of use of fossil fuel shows that our country is export-dependent on energy. Effective use of such sources in Türkiye which has a wealth of renewable energy sources will reduce dependency on export energy products and contribute to alleviating environmental problems caused by consumption of fossil fuel energy. Solar energy which is the primary source among renewable energy sources has become increasingly important since it is easily available and does not have any harmful effect on the environment.

An energy-efficient building is a building designed to achieve minimum energy consumption by minimizing the role of active systems that consume energy from the settlement scale to the material scale without compromising comfort conditions using passive design strategies. A passive solar system which is one of the most important passive design strategies includes the design and operational process of solar energy for heating and cooling purposes. In these systems which are designed to heat or cool buildings by providing optimum values to the building's design parameters without using any mechanical system, the building itself acts as a solar power collector and collects, stores solar radiation, and transforms it into heat and allows the use of this heat in other parts of the building during the heating period (Yılmaz et al., 2006). In the cooling period, the building is cooled by integrating systems that remove the heating effect of solar radiation into the building and with the correct design of building elements. Although passive solar systems have some disadvantages which one is that their activity lasts only for 16–18 h/day and other sources should be used for heating/cooling in the remaining period, these systems used for heating/cooling save a significant amount (Aktas and Kırçiçek, 2021).

Passive heating systems are classified into three main groups: Direct gain systems, indirect gain systems, and combined systems. Solar radiation gain through south-oriented windows (for the northern hemisphere) in direct gain systems is absorbed by building components such as floor, ceiling, and wall, and when the temperature drops at night, this stored energy is reintroduced into the environment through thermal radiation and convection. There is a thermal mass to store heat between south-oriented windows and interior space in indirect gain systems; solar radiation is absorbed and stored by the thermal mass and heat is reintroduced into the interior environment depending on the time. Combined gain systems are like a combination of direct and indirect systems; a greenhouse is created between south-oriented windows and thermal mass to transfer/exchange air between the greenhouse and adjacent unit through ventilation windows or openings on the lower and upper parts of the greenhouse (Yılmaz et al., 2006).

Double-skin façades as one of the mixed systems are often used as a passive system since it can easily be integrated into existing buildings. A double-skin façade consists of an external transparent component, an intermediate cavity,

and interior transparent or opaque-transparent surface and is widely used for energy gain. In winter, windows looking into the interior environment are kept open to let the air heat in the cavity into the interior environment and windows facing the exterior environment are kept closed in order not to lose the heat in the cavity. In summer, windows looking into the interior space are kept closed and windows facing exterior environment are kept open to reduce the temperature in the cavity (Figure 1). When choosing a double-skin façade system; it is possible to determine the combinations of options such as selection of glass material, whether to use double or multi-glazed glasses, the position of louvers and if there are panels, the angle of these panels, sizes, locations, and number of openings which allow air movement such as vents and windows, and whether to use fans as active system components to accelerate or increase air movement with experimental studies or simulations.

Double-skin façades which are based on the principle of removing air heated in the cavity from the building during the cooling period and taking in the heated air in the cavity into the interior space have been investigated by many scientific studies to achieve good visual quality, acoustic quality, effective air movement, and thermal performance (Chen et al., 2019). A range of experiment set-ups can be developed to achieve and calculate air movement between the interior space and external environment by opening and closing four openings at the lower and upper levels at the internal and external envelope (or at structural element or building envelope) at different times as shown in Figure 2 (Jankovic and Goia, 2021).

Evaluations of the performance of double-skin façades made in different climatic regions worldwide help to nationalize the use of double-skin façades (Ghaffarianhoseini et al., 2016). A study conducted in China different sunspace departments which is one of the critical influence factors for attached sunspace is investigated and observed that 0.6 m depth is ideal in comparison with the 0.9 m, 1.2 m, and 1.5 m depths without considering the occupants' activity (Liu et al., 2022). A study in Japan on a two-story building with double-skin façades examined 5 different double-skin façade models which were developed by defining a range of openings and air movement systems and observed that with these models 20–30% energy gain was achieved during the heating period with the use of greenhouse effects and 10–15% energy gain during the cooling period with the use of chimney effect (Xu and Ojima, 2007). A study conducted in South Korea investigated

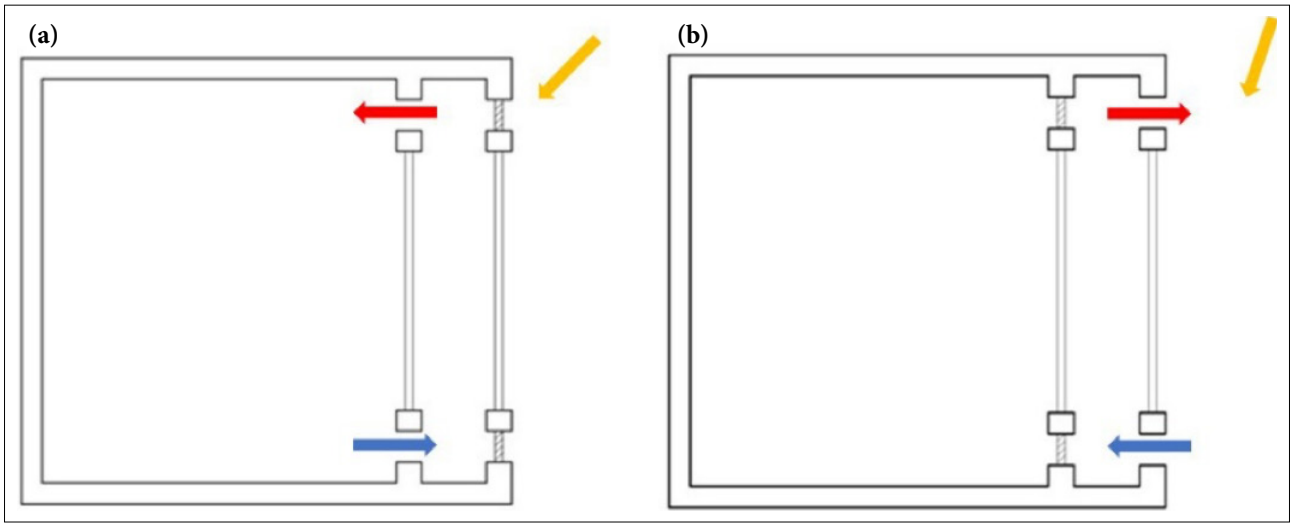

Figure 1. Schematic diagram of double-skin façade for winter **(a)** and summer **(b)** period daytime.

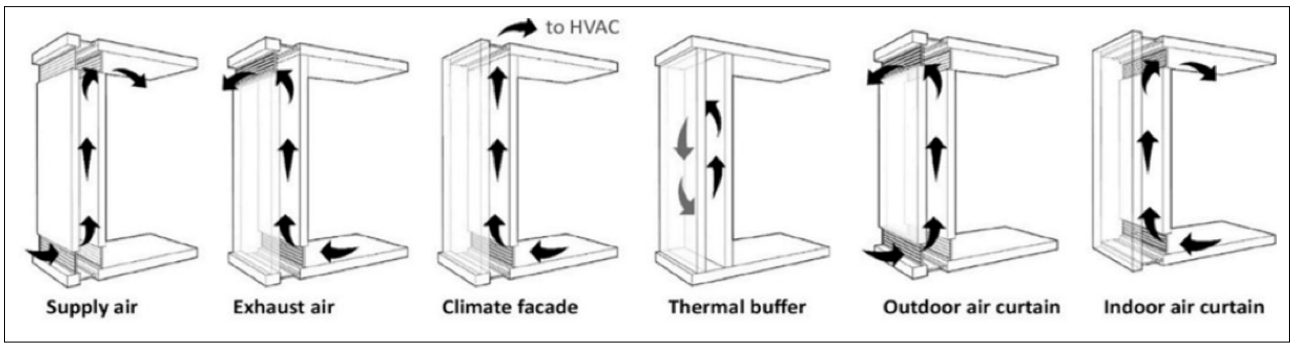

Figure 2. Double-skin façade air movement models [6] (Jankovic and Goia, 2021).

the basic condition where a double-skin façade was used as a buffer zone (Condition-1), a condition where there was a window to allow air transfer between the intermediate cavity and interior environment (Condition-2), and a condition where the air heated in the cavity was transferred to the HVAC system (Condition-3) and Condition-2 achieved 1% energy gain and Condition-3 achieved 41% energy gain compared to Condition-1 (Choi et al., 2012.). In another study on a multi-story building with a double-skin façade in South Korea 34 types of glass and intermediate cavity depths ranging from 8 to 148 cm were investigated and when optimization was done for all configurations a reduction of 5.62% in total energy consumption was observed (Jaewan et al., 2014). In a study conducted in China, the effect of a range of window openings on the temperature in the intermediate cavity and thus interior environment was assessed and compared to a single-skin façade, double-skin façade allowed 27.7–49.2% energy gain in the cooling period and 25.6–46% in the heating period (Kong et al., 2021). In another study done in China, optimizations of parameters such as interior wall window-wall ratio on the building, building orientation, wall structural elements, exterior façade glass type, and cavity shading element were assessed and double-skin façade was found to provide 17.2–28.7% energy gain compared to single-skin façade (Hancheng et al., 2021.) A study done in Holland on a high-rise building with double-skin façade reported that the building achieved 42% reduction in total energy consumption with its glass type, window-wall ratio, shading component, and high-performing envelope design that includes roof isolation (Raji et al., 2016.). When we look at energy consumption in Türkiye, we see that high volumes of fossil fuels are used and the total share of renewable energy sources in the total energy consumption is very low. In Türkiye, which has a high solar energy potential, the use of solar energy in passive systems in buildings will result in significant reduction in energy consumption and contribute to the country's economy.

Türkiye has a young population and school buildings constitute a major part of public buildings and energy consumption of these buildings is high. Fossil fuels are also the primary choice for school buildings. Since the number of education buildings is high and thus accounts for a significant part of a country's energy consumption, studying alternative methods that will reduce the energy consumption of education buildings is an important approach to develop sustainable energy use in the country (Mytafides et al., 2017). Especially in the regions where heating requirements are high heating energy costs can be reduced using indirect heat gain systems. In this study, a school building is chosen from the options of buildings that are not used for a whole year and do not require energy consumption mostly during the cooling period, and aimed to reduce energy consumption by installing a passive solar gain system in this building.

The efficiency that can be obtained with retrofitting buildings depends on multiple factors including the climate the building is in, the heating-cooling system in the building, materials used in the design and construction, and occupant profile. Therefore, measurement simulation and evaluation results of the same type of studies conducted in different climates and in different geographies in the world can be different.

Studies conducted by performing measurements in a range of climates allow us to understand and compare and classify retrofitting in a better fashion. At the same time, data obtained in measurements and experiments are required to find optimal solutions that can be implemented to improve ambient conditions in buildings with different functions. Estimating double-skin façade performance in buildings with different functions is quite difficult since it depends on the mutual effect of many variables. Although experimental data are the primary source, there are a limited number of studies in literature. Several simulation programs are used to understand the complicated behavior of double-skin façades (Hancheng et al., 2021). Therefore, studies that both use experimental studies and simulation programs are important since they allow comparison of measurements and calculations. Furthermore, although experimental studies are time-consuming and costly, it is the best way to reliably evaluate thermophysical conditions on advanced façade systems such as double-skin façade (Jankovic et al., 2022). Thus data obtained with experimental studies can be compared with the calculations made by simulation programs and this allows testing of new strategies that would be proposed to retrofit buildings. Therefore in this study, an elementary school building in Central Anatolia was evaluated by making measurements. Measurements were done for 6 days to analyze ambient temperature in two classrooms with the same volume and with south orientation in the elementary school building during the heating period (26/01–31/01). One of the classrooms was called the Test Classroom after installing a glass façade system and no change was done in the other classroom which was then called the Basic Classroom. Different experiment set-ups were developed by keeping windows and vents closed or open and ambient temperature was measured on the days when these experiment set-ups were analyzed.

METHOD

In this study, a glass façade was used in one of the classrooms with south orientation in an existing elementary school building to achieve double-skin façade and conditions were measured and evaluated for 6 days separately for the cooling and heating periods. The steps of the study are explained below.

Determining the Variables of the Building

In this study, measurements were done in a one-story

elementary school building in Ereğli, Konya in the Central Anatolia region of Türkiye (37° 36' north latitude and 34° 31' east longitude), which has a temperate dry climate where the winter period is more dominant compared to summer period (Figure 3).

The building has four classrooms facing south, a school counselor's office facing west, a teachers' room, a classroom, and bathrooms facing north, and a classroom facing north and east. The Test Classroom in which a glass façade is installed and the Basic Classroom which acts as the control have only south-oriented external walls and have the same area and volume (Figure 4).

This is a one-story masonry building built with 3.5 m floor height and 40 cm sub-basement level. The thickness of the external walls of the existing classroom is 60 cm and the wall components consist of external plaster, stone masonry wall, and internal plaster. The thickness of the internal walls of existing classrooms is 55 cm and the wall components consist of external plaster, stone masonry wall, and internal plaster. The thickness of cavity external walls is 23 cm and the wall components consist of external plaster, brick wall, and internal plaster. No thermal insulation material is used in the walls. The structural members of the elementary school building and the glass façade integrated into the south façade are shown in Table 1.

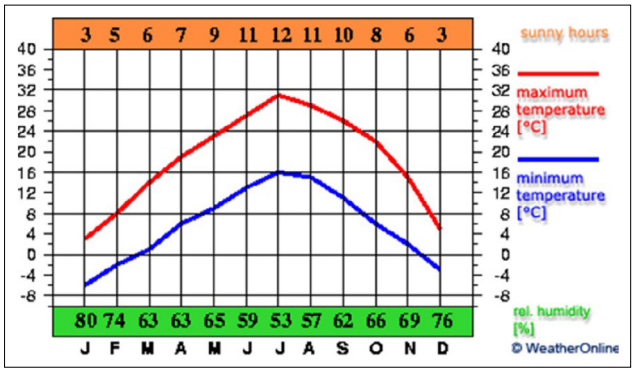

Figure 3. Climate conditions for Ereğli (WeatherOnline, n.d.).

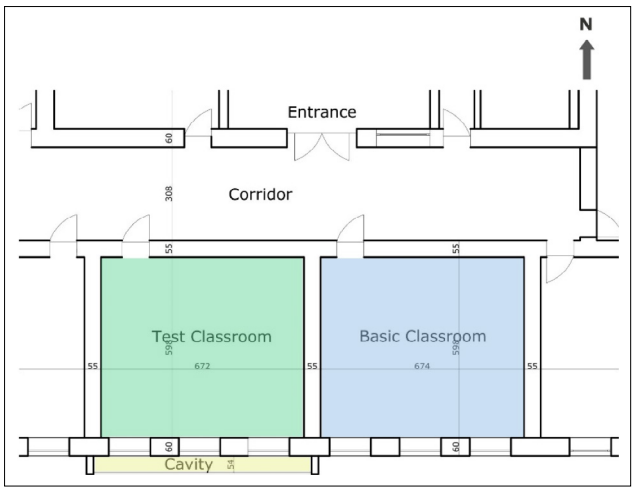

Figure 4. Plan of the test classroom in which glass façade is installed and basic classroom.

The second glass façade was applied on the south façade of one of the selected classrooms and no change was done in the other classroom and temperature measurements were done simultaneously in both classrooms.

The installed applied on the external façade of the Test Classroom is 720 cm in length, 352 cm in height including 40 cm sub-basement, and 60 cm in width. There are 6 windows in the 60*60 cm modular system built on the glass façade and 3 of these windows are in the upper section and 3 at the lower section of the façade. There are 3 ea 20*40 cm vents on the lower section of the wall facing the cavity and 6 ea 20*20 vents on the windows on the upper section of the wall (Figure 5). The second glass façade applied on the south façade of the school building is shown in Figure 6.

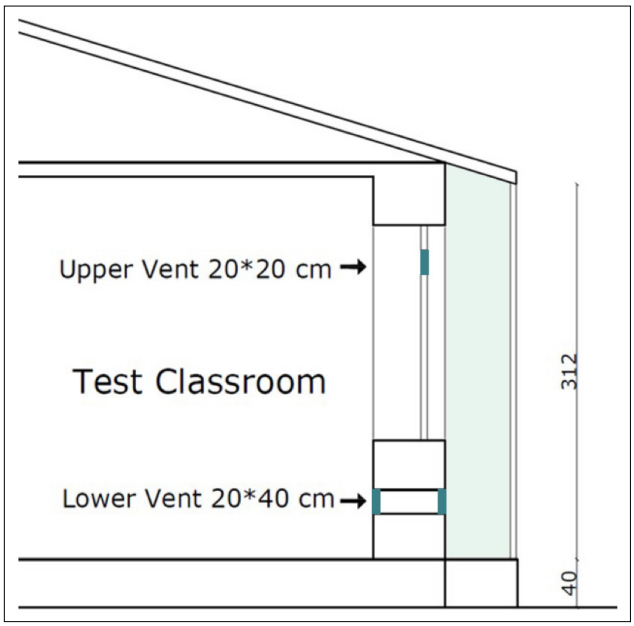

Figure 5. Cross-section.

Figure 6. Applied second glass façade.

Table 1. Structural Materials of the School Building

Structural Elements	Material	Thickness (m)
Glass Façade Floor	Reinforced Concrete	0.40
Glass Façade Window (Aluminium joinery)	Tempered double glazed glass	0.006+0.012+0.006
External wall	Cement plaster	0.02
	Brick wall	0.19
	Cement plaster	0.02
Cavity	Cavity Air	0.54
Glass Façade Ceiling	Tile roof covering	0.03
	Water insulation Roof board	0.003
	Weatherboard	0.025
	Rafter	0.10
	Aluminium composite panel	0.007
Existing Classroom floor	Blockage	0.30
	Lean concrete	0.10
	Floating screed	0.05
	Adhesive mortar	0.02
	Tile	0.007
Existing Classroom Window (PVC joinery)	Double glazed glass	0.003+0.012+0.003
Existing Classroom External Wall (facing the cavity)	Cement plaster	0.02
	Stone wall	0.56
	Cement plaster	0.02
Existing Classroom interior wall	Cement plaster	0.02
	Stone wall	0.51
	Cement plaster	0.02
Existing Classroom Ceiling	Tile roof cover	0.03
	Water insulation	0.003
	Weatherboard	0.025
	Rafter	0.10
	Reinforced Concrete Floor	0.10
	Cement plaster	0.02

Determining Measurement Variables

Measurement devices were placed in mesh boxes that do not obstruct air movement to prevent elementary school students from accessing the devices and ensure uninterrupted and correct measurement (Figure 7a). Wood mesh boxes were built so that the measurement device in the external environment is not affected by solar radiation and wind and the measurement device in the cavity is not affected by solar radiation (Figure 7b). The systems in the Konya–Ereğli meteorology office were examined to build mesh boxes to make measurements in the external environment and their heights compared to road elevation and sizes were determined according to expert opinion and then mesh boxes were built.

One ambient temperature device was placed in the external environment, one in the Test Classroom and one in the Basic Classroom and one was installed in the cavity. The ambient temperature device in the cavity was located right in the middle of the cavity height. Devices were installed 2 m above the ground hanging right in the middle of the classroom for the safety of the students (Figure 7a). The temperature measurement device was fixed right in the middle of the 30*30 box at a height of 2 m from the road in the external environment. When deciding about the location of the temperature measurement device, it was important to find a location that was as far away from trees and high buildings as possible in an open field.

Figure 7. Ambient temperature measurement device locations **(a)** Test classroom **(b)** Cavity.

The ambient temperature measurement device used in the field is the Extech RHT10 Humidity and Temperature USB Datalogger. The device measures temperatures between (−40) and 70°C and the error margin is ± 1°C between (−10) and 40°C; ±2°C between (−40) and (−10) ±2°C between 40 and 70°C. Measurement frequency was between 2 and 24 s (Teledyne Flir, n.d). The device used to measure air movement speed was DELTA Ohm HD 2103.2 datalogger and AP741S1 hot-wire. The devices measured air movement speed in the range of 0.1–40 m/s and the error margin is ±0.02 m/s for air movement speeds in (0.0–0.99) m/s range and ±0.04 m/s for (1.0–9.99) m/s range and ±0.04 m/s for (10.0–40) m/s range (Delta OHM, 2017).

Determining Experiment Set-ups

Experiment set-ups included keeping vents and windows open or closed during the day and at night depending on the requirements of the heating period.

Six experiment set-ups were created for the period of 26/01–31/01 (heating period.) Since the school was closed due to winter break, all radiators in the Test Classroom and Basic Classroom were turned off. Radiators in the adjacent classrooms and corridors were turned on and doors opening to the corridor of the classrooms not included in the experiment were always open. Windows and classroom doors of the Basic Classroom were kept closed all day. The door to the Test Classroom was closed and experiment set-ups were developed according to open or close status of windows, vents, and curtains. Windows and vents were kept open to let the heated air in the cavity into the Test Classroom during the day and closed to prevent heat loss at night. Glass façade windows were always closed. Under certain conditions, curtains were used on the external surface of the glass façade to prevent heat loss from the glass façade during nighttime. Experiment set-ups and conditions are shown in Figure 8.

It was not possible to change the condition at 00:00 h when determining measurement conditions in all experiment set-ups. Therefore experiment set-ups were changed at the hours shown in Figure 8 every day.

FINDINGS

Measurements in the study were done for 6 consecutive days during the heating period. This 6-day period was between January 26 and January 31.

26–31 January (Heating Period) Ambient Temperature Measurement Results

Based on the measurements done between 26/01 and 31/01, changes in the interior space and external environment temperatures and solar radiation values are shown in Figure 9. Since solar radiation was not measured in the field, the values were obtained from the Ulukışla meteorology office which measures solar radiation and is at the closest location to the experiment building. Ambient temperature measurement values in the Test Classroom and Basic Classroom are shown in Table 2.

As seen in Figure 9, the Test Classroom ambient temperature was measured higher than the Basic Classroom ambient temperature on ESU-1, ESU-2, ESU-3, ESU-4, ESU-5, and ESU-6. Solar radiation values are 550–600 kWh/m² in ESU-1 and ESU-4 measurements and 250–300 kWh/m² in ESU-3, ESU-5, and ESU-6 measurements. Since solar radiation values were low as shown in Figure 9, cavity temperatures were measured around 10°C lower during daytime in ESU-3 and ESU-6 measurements compared to other experiment set-ups. It is possible to evaluate experiment set-ups by classifying them into two groups: ESU-1, ESU-2, ESU-4, and ESU-5 in which solar radiation values were higher and ESU-3 and ESU-6 in which solar radiation values were lower. In all experiment set-ups, warm air in the cavity rises and moves to the interior space through the upper opening on the classroom façade and cooler air enters in through the opening at the lowest level on the classroom façade. Accordingly, it is possible to comment that the temperature in the interior space is a function of the warm airspeed and rate of moving in the room, the area of entry and exit openings, and the difference in the height of these openings. Based on these principles, the performance of different experiment set-ups is evaluated as shown below.

- It was observed that since the temperature in the cavity was quite higher than the temperature in the Test Classroom in ESU-1 measurements and air entry and exit openings were at the same height, it was not enough for the warm air in the cavity to move to the interior space increasing the temperature difference between the Test Classroom and Basic Classroom. The highest and the lowest temperature differences in the alternative ESU-1 was 2.2°C and 0.3°C respectively.
- In ESU-2 measurements, although the middle window with the biggest surface area was closed, the effect of having lower and upper vents open, in other words having the distance between the intermediate cavity and air movement vents at the maximum (110 cm) on the interior space can

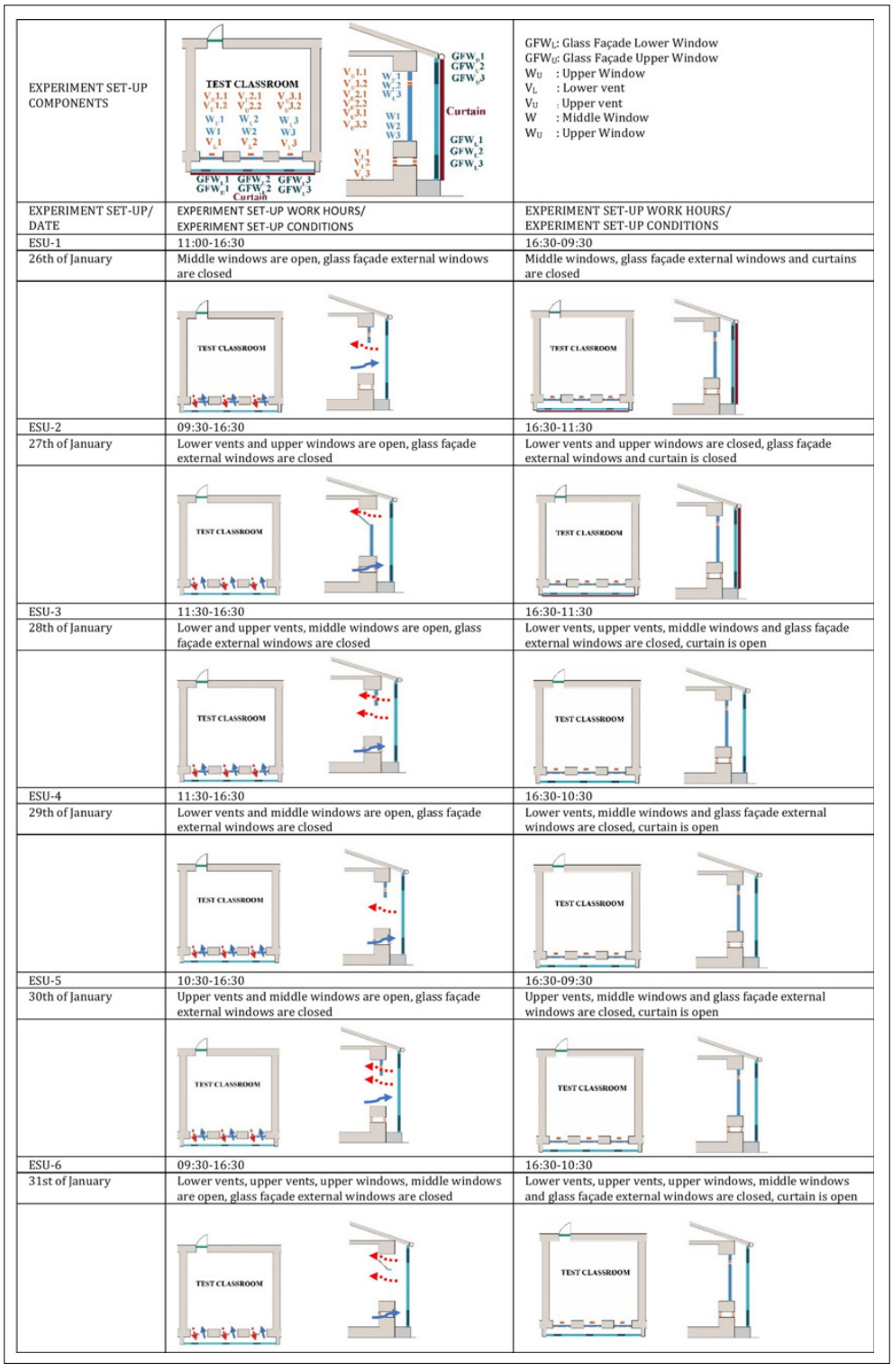

Figure 8. Experiment set-ups and conditions used on 26–31 January (heating period).

be seen. As this distance increases, warm air movement in the intermediate cavity increases and accelerates, and therefore the best results in the temperature difference between the Test Classroom and Basic Classroom were in ESU-2 after ESU-4 and ESU-5. In the alternative ESU-2, the temperature difference between the Test Classroom and Basic Classroom was 2.5°C.

- The height difference between air entry exit vents in the alternatives ESU-4 and ESU-5 were 110 cm and 90 cm, respectively. Since the height difference between air

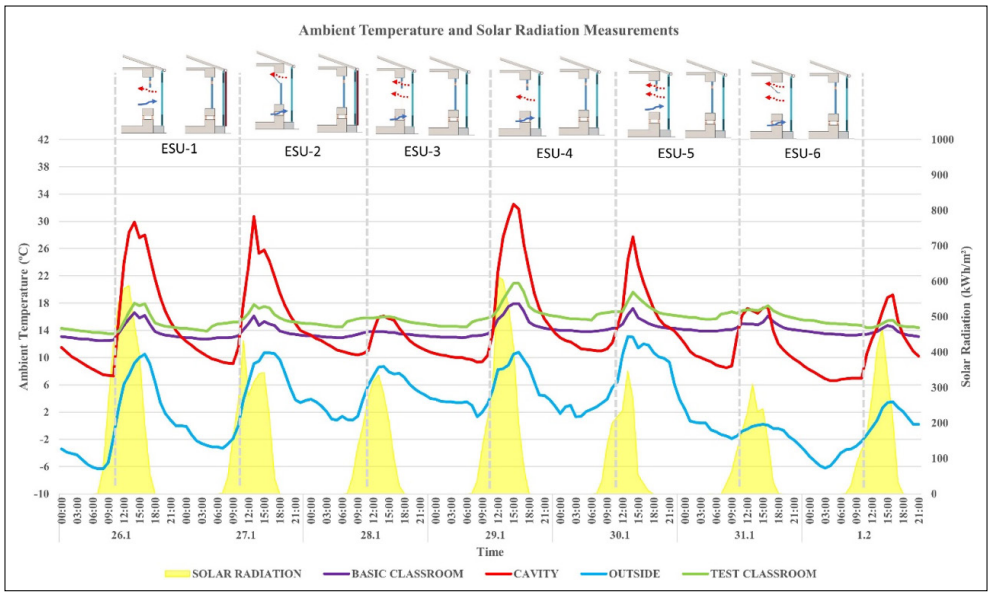

Figure 9. Ambient temperature and solar radiation measurement values on 26/01–31/01.

entry and exit openings was bigger and solar radiation values were higher, the temperature difference between the Test Classroom and Basic Classroom was maintained 1 h longer in ESU-4 (2 h) compared to ESU-5.

- At the same time in the alternative ESU-4, since the warm air in the cavity entered into the interior space through the middle window which was the biggest opening, this shows that this alternative has a high performance because the interior space temperature was high and interior air temperature value (20°C) which is used in the calculations for education buildings according to the TSE 825 could be maintained for 2 h although no active heating system was used. With this, the speed and volume of the transfer of warm air in the cavity to the interior space increased and the temperature difference between the Test Classroom and Basic Classroom also increased. When we look at the ESU-4 and ESU-5 measurements, the Test Classroom temperature was 3°C higher than the Basic Classroom temperature in the measurements done at 15:00 and 16:00 in ESU-4 and at 15:00 in ESU-5. This 3°C temperature difference is the highest temperature difference measured in 6 experiment set-ups (Table 2).
- In the experiment set-ups ESU-3 and ESU-6, entry and exhaust vents had similar areas and were at similar heights. However, upper vent in ESU-3 and upper window in ESU-6 which has a bigger area were used as upper opening. Having approximately the same temperature values in the Test Classroom and cavity in ESU-3 and ESU-6 resulted in less air movement between these two spaces. However, since solar radiation values in the external environment were low in both experiment set-ups, cavity temperature was very close to the values measured in the Test Classroom and at the same time lower than other experiment set-ups. As shown in Table 2, at 15:00 h when the temperature in the cavity was less than the Test Classroom temperature, since the upper vent in ESU-3 has a smaller area than the upper window in ESU-6, air movement from the Test Classroom which was warmer to the cavity was less and temperature difference between the Test Classroom and Basic Classroom in ESU-3 (2.3°C) was higher compared to ESU-6 (2.0°C.)
- Furthermore, the temperature in the Test Classroom was higher than that in the Basic room even in the ESU-6 measurements in which the exterior environment temperature dropped below zero during the day, which can be explained by the fact that the Test Classroom is adjacent to the cavity instead of the exterior environment. Although less air movement was present since the Test Classroom and cavity temperatures were very close with the use of the openings mentioned in the experiment set-ups, the cavity acted as a buffer zone so the temperature in the Test Classroom was higher than that the temperature in the Basic room.
- When ESU-3 and ESU-6 measurements in which solar radiation values were lower were examined, the highest temperature difference was 2.3°C at 15:00 (28/01) and 08:00, 09:00, and 10:00 (29/01) in ESU-3 where measurement results were higher in the Test Classroom than those in the Basic Classroom (Table 2). Table 2 shows 24 h interior air temperature values and temperature differences between the Test Classroom and Basic Classroom with different experiment set-ups.

Table 2. 26 January-31 January (heating period) Test Classroom and Basic Classroom Ambient Temperature Measurement Values

	Ambient Temperatures Measured in Basic Classroom and Test Classroom For Different Experiment Set-Ups (°C)			
		ESU-1		
Hour	Date	Basic Classroom	Test Classroom	Temperature Difference (TC-BC)
10:00	26th of January			
11:00		13.6	13.9	0.3
12:00		14.7	15.2	0.5
13:00		15.7	16.7	1.0
14:00		16.6	18.0	1.4
15:00		15.8	17.6	1.8
16:00		16.2	17.9	1.7
17:00		14.9	16.4	1.5
18:00		13.8	15.1	1.3
19:00		13.5	14.8	1.3
20:00		13.3	14.6	1.3
21:00		13.2	14.5	1.3
22:00		13.1	14.4	1.3
23:00		13.0	14.3	1.3
00:00	27th of January	12.9	14.3	1.4
01:00		12.9	14.2	1.3
02:00		12.8	14.1	1.3
03:00		12.7	14.0	1.3
04:00		12.7	13.9	1.2
05:00		12.8	14.6	1.8
06:00		12.9	14.9	2.0
07:00		12.9	15.0	2.1
08:00		12.9	15.1	2.2
09:00		13.0	15.2	2.2
10:00		13.2	15.2	2.0
11:00				
		ESU-2		
Hour	Date	Basic Classroom	Test Classroom	Temperature Difference (TC-BC)
10:00	27th of January			
11:00		14.1	15.7	1.6
12:00		15.0	16.5	1.5
13:00		16.1	17.8	1.7
14:00		14.7	17.2	2.5
15:00		15.3	17.5	2.2
16:00		14.9	17.3	2.4
17:00		14.7	16.3	1.6
18:00		13.9	15.8	1.9

Table 2. 26 January-31 January (heating period) Test Classroom and Basic Classroom Ambient Temperature Measurement Values (Cont.)

		ESU-2		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
19:00		13.7	15.5	1.8
20:00		13.5	15.3	1.8
21:00		13.4	15.2	1.8
22:00		13.3	15.1	1.8
23:00		13.2	15.0	1.8
00:00	28th of January	13.2	15.0	1.8
01:00		13.2	14.9	1.7
02:00		13.1	14.8	1.7
03:00		13.0	14.7	1.7
04:00		13.0	14.6	1.6
05:00		12.9	14.5	1.6
06:00		12.9	14.5	1.6
07:00		13.1	15.3	2.2
08:00		13.2	15.5	2.3
09:00		13.4	15.7	2.3
10:00		13.6	15.8	2.2
11:00		13.8	15.8	2.0
		ESU-3		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
10:00	28th of January			
11:00				
12:00		13.8	15.8	2.0
13:00		13.8	15.9	2.1
14:00		13.8	16.0	2.2
15:00		13.7	16.0	2.3
16:00		13.7	15.9	2.2
17:00		13.5	15.6	2.1
18:00		13.4	15.4	2.0
19:00		13.4	15.2	1.8
20:00		13.3	15.1	1.8
21:00		13.2	15.0	1.8
22:00		13.2	14.9	1.7
23:00		13.1	14.8	1.7
00:00	29th of January	13.1	14.7	1.6
01:00		13.0	14.6	1.6
02:00		13.0	14.6	1.6
03:00		13.0	14.6	1.6
04:00		13.0	14.6	1.6
05:00		12.9	14.5	1.6

Table 2. 26 January-31 January (heating period) Test Classroom and Basic Classroom Ambient Temperature Measurement Values (Cont.)

		ESU-3		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
06:00		13.0	14.5	1.5
07:00		13.2	15.2	2.0
08:00		13.2	15.5	2.3
09:00		13.3	15.6	2.3
10:00		13.5	15.8	2.3
11:00		14.1	16.1	2.0
		ESU-4		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
10:00	29th of January			
11:00				
12:00		15.6	17.1	1.5
13:00		16.3	18.5	2.2
14:00		17.5	19.8	2.3
15:00		17.9	20.9	3.0
16:00		17.9	20.9	3.0
17:00		16.8	19.6	2.8
18:00		15.2	17.5	2.3
19:00		14.7	16.9	2.2
20:00		14.5	16.6	2.1
21:00		14.3	16.4	2.1
22:00		14.2	16.2	2.0
23:00		14.1	16.1	2.0
00:00	30th of January	14.0	16.0	2.0
01:00		14.0	15.8	1.8
02:00		14.0	15.7	1.7
03:00		13.9	15.7	1.8
04:00		13.8	15.6	1.8
05:00		13.8	15.6	1.8
06:00		13.8	15.5	1.7
07:00		13.9	16.3	2.4
08:00		14.0	16.5	2.5
09:00		14.1	16.6	2.5
10:00		14.3	16.7	2.4
11:00				
		ESU-5		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
10:00	30th of January			
11:00		14.4	16.7	2.3
12:00		14.9	16.8	1.9
13:00		16.3	18.3	2.0

Table 2. 26 January-31 January (heating period) Test Classroom and Basic Classroom Ambient Temperature Measurement Values (Cont.)

		ESU-5		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
14:00		17.2	19.6	2.4
15:00		15.8	18.8	3.0
16:00		15.4	18.1	2.7
17:00		15.0	17.5	2.5
18:00		14.7	17.0	2.3
19:00		14.5	16.6	2.1
20:00		14.4	16.4	2.0
21:00		14.3	16.3	2.0
22:00		14.3	16.2	1.9
23:00		14.2	16.1	1.9
00:00	31st of January	14.1	16.0	1.9
01:00		14.1	15.9	1.8
02:00		14.0	15.9	1.9
03:00		13.9	15.7	1.8
04:00		13.9	15.6	1.7
05:00		13.9	15.6	1.7
06:00		13.9	15.7	1.8
07:00		14.0	16.4	2.4
08:00		14.1	16.5	2.4
09:00		14.1	16.7	2.6
10:00				
11:00				
		ESU-6		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
10:00	31st of January	14.4	16.5	2.1
11:00		15.0	16.9	1.9
12:00		14.9	17.0	2.1
13:00		14.9	17.0	2.1
14:00		14.8	16.9	2.1
15:00		15.2	17.2	2.0
16:00		16.1	17.6	1.5
17:00		15.3	16.9	1.6
18:00		14.8	16.5	1.7
19:00		14.4	16.2	1.8
20:00		14.2	16.0	1.8
21:00		14.1	15.8	1.7
22:00		14.0	15.6	1.6
23:00		13.9	15.5	1.6

Table 2. 26 January-31 January (heating period) Test Classroom and Basic Classroom Ambient Temperature Measurement Values (Cont.)

		ESU-6		
Hour	**Date**	**Basic Classroom**	**Test Classroom**	**Temperature Difference (TC-BC)**
00:00	1st of February	13.8	15.5	1.7
01:00		13.7	15.4	1.7
02:00		13.6	15.2	1.6
03:00		13.5	15.1	1.6
04:00		13.5	15.0	1.5
05:00		13.4	15.0	1.6
06:00		13.4	14.9	1.5
07:00		13.3	14.9	1.6
08:00		13.3	14.8	1.5
09:00		13.3	14.8	1.5
10:00		13.4	14.7	1.3
11:00				

CONCLUSION

The purpose of this study is to examine the performance of a double-skin façade system installed on a one story elementary school building in the temperate-dry climatic region by comparing ambient temperatures measured in different experiment set-ups in the heating period. The classroom where no change was made was called the Basic Classroom and the classroom where the glass façade was installed on the south façade was called the Test Classroom and the space between the glass façade and the Test Classroom was called the cavity. In the measurements done for 6 experiment set-ups between 26/01 and 31/01 in the heating period;

- Test Classroom ambient temperature values were minimum 0.3 and maximum 3.0°C higher than Basic Classroom ambient temperature values.
- Depending also on the solar radiation, when the experiment set-ups ESU-1, ESU-2, ESU-4, and ESU-5 in which intermediate cavity temperature was higher and the experiment set-ups ESU-3 and ESU-6 in which solar radiation values were lower were compared, the best result was achieved in the alternative ESU-4. As a result of having high cavity air temperature as well as 110 cm height difference between air entry and exit openings in the cavity and Test Classroom (the highest difference among the alternatives that have one large opening [middle window-lower vent, middle window upper vent/upper window]), higher temperatures were achieved in the Test Classroom compared to the other alternatives.
- In the alternatives ESU-3 and ESU-6 with almost similar opening properties in which solar radiation was lower, air movement was reduced because cavity and Test Classroom temperatures were very similar.
- When we look at the cavity and Test Classroom temperatures, temperatures were 15.7°C–16.0°C, respectively at 15:00 in ESU-3 and 16.5°C–16.9°C, respectively, at 14:00 in ESU-6 and since cavity temperature was lower than the temperature in the Test Classroom, there was a heat transfer from the Test Classroom to the cavity.
- Less upper vent area in the alternative ESU-3 resulted in less heat loss in the Test Classroom. Although there was less air movement since the Test Classroom and cavity temperatures were the same, intermediate cavity acted as a buffer zone so the temperature in the Test Classroom was higher than that in the Basic Room even in the ESU-6 measurements in which exterior environment temperature dropped below zero during the day.
- In this study, no equipment that allows air transfer such as fans that consumes energy was used in the set-ups used as passive systems and warm air in the cavity was planned to be transferred to the Test Classroom to increase the temperature thereby natural convection. As shown in Figure 9, the difference between cavity and Test Classroom temperatures measured in ESU-1, ESU-2, and ESU-4 was 8.9–12.9°C. In these experiment set-ups where the temperature difference between the intermediate cavity and Test Classroom is high, if a fan powered by solar energy which will increase transfer of warm air in the intermediate cavity to the Test Classroom is used, it will be possible to increase the temperature difference between the Test Classroom and Basic Classroom.

Following this study in which only measurement results were evaluated, the goal is to focus work on improving system performances by comparing measurement results with simulation calculation values and developing improvement suggestions for the size and location of vents and windows. In addition, with the help of the data obtained from this study, future studies can be carried out to improve the thermal performance of the building envelope and the results can be extended.

ETHICS: There are no ethical issues with the publication of this manuscript.

PEER-REVIEW: Externally peer-reviewed.

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Article

An evaluation for "spirit of place" focused preservation approaches in historic environments

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ABSTRACT

The starting point of this article is the thought that the effort to protect the meanings created by the collective experiences is lacking, even though the physical integrity of a historical environment is tried to be conserved in the preservation activities that have been done or are being done from the past to the present. However, historical environments have existed as a product of collective experiences as well as being a physical accumulation, and they carry these experiences as a meaning. While trying to define this meaning, the concept of "spirit of place (genius loci)," which emerged as a reflection of the existential debates of space, and has been continuing since the end of the 19th century, among the philosophical theorists in the middle of the 20th century, was encountered and the origin, adventure and existence of this concept in the field of preservation were researched. As a result, it was concluded that the meaning deemed necessary to be included in preservation processes is a component that will be identified and documented with the title of "spirit of place." To do this, a method needs to be determined and the research process needs to be carried out more systematically. This paper, which seeks a method for defining the spirit of place in historical environments, aims to shed light on a holistic approach in which the concern of preserving the spirit of place is included in the historical environment preservation process.

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INTRODUCTION

In today's world, where discussions on the interaction of culture with the physical environment have spread to different disciplines, application approaches in the field of cultural heritage preservation are also developing worldwide. When we look at the preservation history of Türkiye, the transition from building-scale preservation to a historical environmental preservation approach took place for the first time in an official sense with the Ankara zoning plan approved in 1932[1]. In this plan, it was mentioned that the Ankara Castle should be protected as the symbol of the city and perceived from the environment, and in 1937, the

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area covering the castle and its surroundings was taken under preservation as a protocol area. Thus, the concept of preserving an immovable cultural property together with its surroundings was put into practice for the first time (Dinçer and Akın, 1994). In Istanbul, the process of "reshaping the city by preserving its historical texture," which started with the work of Henri Prost[2], remained on the agenda simultaneously with the work in Ankara, but it took a long time to be officially implemented. With the declaration of 1975 as the European Heritage Year by the Council of Europe, preservation efforts gained momentum all over the country (Erder, 2020).

The Law No. 2863 on the Preservation of Cultural and Natural Assets, which was adopted in 1983 and is still in effect today, aims to carry out the preservation activities in Türkiye within the framework of international declarations and regulations to which our country is a party. The law defines the concepts of preservation in a contemporary dimension, deals with the processes to be undertaken at the scale of a single building and in protected areas, and also touches upon issues such as site management and management plan (Presidency of Republic of Turkiye, Legislative Information System, 2023). However, these contents are not sufficient for the implementation of a holistic preservation approach in which a building is handled together with its environment.

While the concept of cultural heritage is defined in international documents to include intangible cultural assets, the legislation in Türkiye emphasizes the physical environment in historical environmental preservation approaches. This situation is evaluated by Özlem Karakul as follows: "The main problem in preservation practices arises from the inability to understand the integrity of the intangible cultural heritage consisting of the structures that make up the tangible cultural heritage and the cultural practices and expressions produced by the inhabitants" (Karakul, 2019).

The starting point of this article is based on the observations on the intangible elements that make up the character and make one feel and recall the experiences in the collective memory, that are ignored even though the physical integrity is tried to be preserved in the preservation processes carried out in historical environments. Historical environments have existed as a product of collective experiences as well as being a physical accumulation, and they carry these experiences as a value. In order for the mentioned deficiency to be overcome in the preservation program, first of all, these values must be determined and defined even if their traces do not exist anymore in the physical environment. To do this, a method needs to be determined and the research process needs to be carried out more systematically.

The most important question sought to be answered in this study was as follows: How can the intangible traces that form the character of the historical environment be determined? While searching for the answer to this question, the concepts that will express the method correctly and form the framework that sheds light on the method are discussed. In this process, the concept of "spirit of place," which emerged with the reflection of the existentialism of place discussions continued since the end of the 19th century among philosophical theorists, on the field of architecture in the middle of the 20th century, and the origin, adventure and existence of this concept in the field of preservation were investigated. The components of the concept were determined and its definition was clarified, and the connection of the concept with historical environmental preservation was tried to be constructed through these components. In this context, the main purpose of the study is to reveal the main lines of a synthesis-approach within the framework of the main approaches in the literature.

This study, which searches for data collection and data analysis methods and techniques through current case studies providing guidance for the development of a future model defining collective meanings in historical environments, aims to shed light on holistic preservation approaches in which those meanings are focused on.

CONCEPTUAL AND THEORETICAL BACKGROUND

In this study, the search for a method to determine the spirit of place in the historical environment takes place within the framework of the conceptual and theoretical background of the problem under consideration. In this sense, the formation process of the conceptual and theoretical background also creates the flow that leads the search for a method to a conclusion. The process, which started with the questioning of the concepts of place and space, continued with the concept of the spirit of place coming to the fore in the fields of architecture and preservation and taking place in various international documents and regulations and has come to the present day with a series of research and questioning. Studies on the method continue today.

Changing and Developing Meanings of Place and Space

What is "place," what is "space?" What should we use to describe the house we live in or the street we pass through every day? Although these two concepts seem to mean the same thing in daily life, their meanings are quite different from each other. As the concepts of place and space are discussed and defined by various disciplines, their meanings have deepened, and inevitably sub-concepts such as the sense of place, the spirit of place, and the meanings of place have emerged.

Differentiating the definitions of the concepts of place and space from each other is a discussion developed

based on the "existentialism" movement that emerged in European philosophy in the middle of the 20th century. In the existentialism movement, man consists of an "essence" that reflects his own nature and an "existence (or being)" that he creates by living. French philosopher Jean-Paul Sartre, one of the pioneers of the movement, stated that existence comes before essence and that man exists as he does himself, and expressed existence as a more complex and superior structure than essence (Sartre, 1985). In this case, experiences are vital accumulations that contribute to the existence of human beings and that constantly increase, and people shape their existence as they practice these experiences. Another existentialist German philosopher, Martin Heidegger, defines the transformation of space into place and expresses "place" as a "space" that is produced and limited by keeping the human mind busy. Heidegger, giving the example of the extended family going to a park for a picnic, interprets the family members' laying out the picnic mat according to their choice of direction, and the fact that they take a position for themselves according to their choice of meeting with other members around the cover, as individuals reflect their "existence" to the space (Sharr, 2013). According to Heidegger, space, which is a non-existent "essence," transforms into a place by taking its "existence (or being)" from man.

The distinction between space and place in the philosophy of the 20th century began to be discussed in the discipline of human geography in the 1970s. Geographer Yi-Fu Tuan joined the discussion, saying that a space becomes a place when it becomes familiar to the individual. According to Tuan, space is transformed into place through experiences. Experience, on the other hand, consists of sensory perceptions that form thoughts by being influenced by what is in our minds, so it is never objective.

Tuan says that the place is a center of meaning built with experiences and expresses the difference of space from place as one's own experience (Tuan, 1975). Another geographer who defined these concepts is Edward Relph. Relph explains the evolution of space to place by repeating Heidegger's definition of "A space becomes a place by gaining existence" and associates the human tendency to own the place by giving meaning to it with the instinct of shelter. Later, Relph also talked about the concepts of "spirit of place" and "sense of place" and stated that the power of these two concepts increased and decreased in direct proportion to each other. According to Relph, the sense of place is a skill that combines the five senses with memory, imagination, and intuition and is unique to the individual. It is weak in people who have less interest in their environment, and strong in people who are related to their environment. The spirit of place, on the other hand, is a property of the place that occurs spontaneously by being influenced by the built environment and what happens there, and it can change as it goes on (Relph, 2007).

Origin and Definition of the Concept "the Spirit of Place" (Genius Loci)

The Latin word "Genius loci" means "spirit of places" in English[3]. According to the ancient Roman belief, every being has a guardian spirit. This spirit accompanies that being from birth to death like a guide, protects it and gives it its character. Not only humans but also places and even gods have a guardian spirit. The guardian spirit both affects the being throughout its existence and reveals what is in the being or, in a fictional discourse, "whatever it wants to be[4]."

The concept of the spirit of place has been used directly or indirectly in the field of architecture since the end of the 19th century and has reached the present day with various definitions. Sometimes it is used with the same meaning as "sense of place," while it is considered "specific to the individual," sometimes it is defined as "independent from the individual and specific to the place." However, all definitions state that the spirit of place is a composite value formed by the tangible and intangible elements which are the traces of collective sharing of societies on a place.

The most striking of the definitions is Norwegian architect Christian Norberg-Schulz's definition, which paved the way for incorporating the spirit of place into the design process as both a goal and a tool. Bringing the concept of the spirit of place to the fore with his publications in the field of architecture at the end of the 70s, Schulz says that Heidegger was influenced by the concept of "dwelling/ wohnen" and that when people acquire an identity that integrates with the environment they live in or have meaningful experiences in that environment, they tend to build houses. Building a house is a means of holding on to the environment in which people live and is the most basic example of transforming space into place. Schulz began to describe the spirit of the place by explaining the meaning of the place and the culture that nurtures it. According to him, the meanings or realities that arise naturally in the environment are brought together by people to form a new meaning, and this new meaning is now a brand-new meaning that is complex and an aggregation. Schulz, equating the effort to be a part of the culture with the goal of having a meaningful existence, stated that the most basic need of man is to make his existence meaningful (Norberg-Schulz, 1979). Schulz arrived at the concept of "spirit of place" by translating and interpreting the ancient Latin term "genius loci." According to ancient beliefs, places had a guardian spirit, and to settle in that place, people must first recognize that spirit and adapt to it. Since this situation brings with it a respect and care that positively affects the settlement policy of cities and the building process of architects, Schulz puts forward the concept of "spirit of place" as a remedy for the aforementioned chaotic and alienated environment of today's cities. According to him, when the right building action by architects in the past is fully understood and taken as an example, the chaos

related to cities will be resolved (Norberg-Schulz, 2001). Schulz used the "spirit of place" for "existential meaning" and talked about the phenomenological legibility of this meaning. Schulz wanted architects to see the spirit of place and to be concerned about harmonizing with this spirit when designing in an environment. According to this definition, reading the spirit of place is considered as a part of the design.

Architectural Preservation and Spirit of Place

The existence of differences separating place from space, the unique character and atmosphere of place, and similar issues have already been discussed in the field of architectural preservation, even before they were discussed in the field of architectural design. On the basis of the anti-restorationist discourse of the 19th century British art and society critic John Ruskin, who is seen as the representative of the romantic view by today's preservation theorists, lies the idea that the interventions made under the name of restoration would irreversibly destroy the spirit of place (Ruskin, 1849)[5]. While the spirit or sense of place is a condition that must be taken into account in the design process, it gains importance in the preservation process in a different way and comes to the fore as a value that needs to be revealed, kept alive, and delivered to the future. In fact, the act of preserving the cultural heritage itself is part of the effort to preserve the character, and atmosphere, i.e., spirit of place. The concept of the spirit of place which has gained an ambiguous definition is today progressed to be searched methodologically in the preservation discipline.

Since the Venice Charter of 1964, the "protection of intangible values" in the field of preservation has been on the agenda at various times and the elements that make up the place have been the subject of discussion, even without being officially defined. In many international charters, declarations, and recommendations since the 1970s, it has been stated that traditional architecture does not only consist of concrete spaces but also includes the values that create the identity of the area and the memory of humanity (Table 1). In these studies, "spirit of place" is not directly included as a concept, but a discourse that draws attention to the meaning of place in monuments and sites is mentioned and the necessity of protecting this existence is emphasized[6].

In the Introduction and Definitions section of the 1987 ICOMOS Washington Charter, the purpose of the charter is expressed as "The protection of cultural values that exist in private and public spaces in historical environments and constitute the collective memory" (ICOMOS, 1987). This purpose reveals that the mindset of preservation in the historical environment should also include the goal of preserving cultural values.

The main theme of the symposium held at the general assembly meeting of ICOMOS in Zimbabwe in 2003 was chosen as "Place-Memory value-Meaning: Preserving Intangible Values in Monuments and Sites." The common subject of the conference papers was the protection of intangible values in cultural heritage sites in accordance with the main theme of the symposium (ICOMOS, 2003a). In some studies, the relationship between these values and memory was examined, and in one study, these values were paired with the concept of the spirit of place . The Convention for the Safeguarding of the Intangible Cultural Heritage was also signed at the 2003 meeting of ICOMOS. In the definition made in the second article of this convention, "Intangible cultural heritage means the practices, representations, expressions, knowledge, skills and related tools, materials, and cultural spaces-which communities, groups and in some cases, individuals define as part of their cultural heritage. Intangible cultural heritage transmitted from generation to generation is constantly recreated by communities and groups based on their interaction with their environment, nature, and history, giving them a sense of identity and continuity; thereby contributing to respect for cultural diversity and human creativity" (ICOMOS, 2003b). The concept of "spirit of place" is not used in this article, but a definition that overlaps with the "spirit of place" has been made for intangible values as a value transmitted from generation to generation through collective memory.

In 2005, UNESCO signed the Convention on the Protection and Development of the Diversity of Cultural Expressions, and it was accepted that the issue of protecting traces of cultural diversity would be included in the development policies and programs of the state (UNESCO, 2005). Considering that this situation is also valid for policies that support preservation activities, it means that efforts to protect the spirit of the place are supported by this convention. Because one of the components that make up the spirit of place is the social culture, so conveying the spirit of place to the future plays a very important role in preserving the traces of the social culture.

2008 was a year that introduced the concept of "spirit of place" into the discipline of preservation and made a difference. ICOMOS determined the main theme of the scientific symposium held within the scope of the general assembly meeting held in Quebec, Canada in October 2008, as "Finding the Spirit of place." The papers presented at the symposium and addressing the concept of the spirit of place clarified the concept's position in the field of preservation and made it an approach. At the meeting, two important documents, which are significant in terms of the role of the concept of "spirit of place" in the history of preservation, were approved. The first is the Icomos Charter on the Perception and Presentation of Cultural Heritage Sites, and the other is the Quebec Declaration, an approved study on the Preservation of the Spirit of Place. These two documents, which were

Table 1. Charters and documents address the spirit of place and equivalent concepts in the history of preservation.

Year	Document	Definitions	Evaluations
1964	Venice Charter Definitions Article 1	"The concept of a historic monument embraces not only the single architectural work but also the urban or rural setting in which is found the evidence of a particular civilization, a significant development or a historic event. This applies not only to great works of art but also to more modest works of the past which have acquired cultural significance with the passing of time."	In this article, while defining the monument, the meaning it gains in line with the bond it establishes with society and the individual is kept in the foreground.
1964	Venice Charter Preservation Article 7	"A monument is inseparable from the history to which it bears witness and from the setting in which it occurs. The moving of all or part of a monument cannot be allowed except where the safeguarding of that monument demands it or where it is justified by national or international interest of paramount importance."	In this article, while it is mentioned that the monument will gain meaning with the environment it is in, it is indirectly referred to the fact that its surroundings have a meaning that integrates with it.
1987	Washington Charter Preamble and Definitions	"This new text defines the principles, objectives, and methods necessary for the preservation of historic towns and urban areas. It also seeks to promote the harmony of both private and community life in these areas and to encourage the preservation of those cultural properties, however modest in scale, that constitute the memory of mankind."	In this section, where the main purpose of the charter is explained, it is clearly seen that the comprehension of preservation in the historical environment also includes the goal of protecting cultural values.
2003	Preliminary report on the 14th General Assembly of ICOMOS and the International Scientific Symposium : « Place – Memory – Meaning : Preserving Intangible Values in Monuments and Sites »	The Themes for each session were: Sub-theme A: The Intangible dimension – concepts, identification and assessment A1 : Concepts, definitions and theoretical considerations A2 : Places and their intangible heritage A3 : Heritage places and living traditions Sub-theme B : Impact of Change and Diverse Perceptions B1 : Changing use of spirit and places B2 : Diversity of perceptions B3 : Preservation and traditional knowledge Sub-theme C : Conserving and Managing Intangible Heritage: methods C1 : Preservation, documentation management methods C2 : Transmission, interpretation and tourism C3 : Legal and other forms of preservation	The spirit of place is also mentioned in some of the papers prepared in accordance with the main theme of the symposium.

Table 1. Charters and documents address the spirit of place and equivalent concepts in the history of preservation (Cont.)

Year	Document	Definitions	Evaluations
2003	UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage Article 2	"The "intangible cultural heritage" means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artifacts, and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity."	The concept of the spirit of place is not included in the contract with its name directly but is defined as a value that must be protected.
2005	UNESCO Convention on Diversity of Cultural Expressions Article 13	"Parties shall endeavor to integrate culture in their development policies at all levels for the creation of conditions conducive to sustainable development and, within this framework, foster aspects relating to the preservation and promotion of the diversity of cultural expressions."	In the Convention, it has been accepted that the issue of protecting the traces of cultural diversity will take place in the development policies and programs of the state. This also applies to policies that support preservation activities.
2008	ICOMOS' 16th General Assembly and Scientific Symposium in Québec "Finding the Spirit of place"	Summary of theme and sub-themes Symposium Theme 1 : Re-thinking spirit and place Theme 2 : The threats to the spirit of place Theme 3: Preservation of the spirit of place Theme 4: Transmitting the spirit of place Theme 5: The role of memory Theme 6: The fragility of spirit of place Theme 7: Safeguarding and transmitting the spirit of place	Remarkable papers on the spirit of place were presented at the symposium.
2008	ICOMOS' The Quebec Declaration on the Preservation of the Spirit of Place	"Recognizing that the spirit of place is made up of tangible (sites, buildings, landscapes, routes, objects) as well as intangible elements (memories, narratives, written documents, festivals, commemorations, rituals, traditional knowledge, values, textures, colors, odors, etc.), which all significantly contribute to making place and to giving it spirit, we declare that intangible cultural heritage gives a richer and more complete meaning to heritage as a whole and it must be taken into account in all legislation concerning cultural heritage, and in all preservation and restoration projects for monuments, sites, landscapes, routes and collections of objects".	In the declaration, it was stated that the spirit of place is an inseparable whole with the cultural heritage and that it must be included in the preservation processes. With the titles it covers, the Declaration laid the foundations for the method of preservation based on the spirit of place.

Table 1. Charters and documents address the spirit of place and equivalent concepts in the history of preservation (Cont.)

Year	Document	Definitions	Evaluations
2013	Burra Charter The Australia ICOMOS Charter for Places of Cultural Significance Article 1	"Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present, or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or Groups."	In the charter, some concepts such as culture, place, cultural significance, place with cultural significance have been defined specifically for Australia. The definition of cultural significance overlaps with the definition of the spirit of place.

approved in the same year and are complementary to each other, are the clarification of all the official documents and regulations that have been discussed and studied since the 1964 Venice Charter.

The Venice Charter mentions the importance of social communication in the preservation processes, stating "It is essential that the principles guiding the preservation and restoration of ancient structures are laid down on an international basis formed by the countries responsible for implementing the plan within the framework of their own culture and traditions." In the ICOMOS charters, which are the continuation and explanatory nature of the Venice Charter, this issue has been frequently mentioned and emphasized with different concepts such as dissemination, popularization, presentation, and interpretation. The ICOMOS Charter on the Perception and Presentation of Cultural Heritage Sites, one of the two important documents that ICOMOS Quebec 2008 brought to the preservation area, is an approved study with the aim of explaining all the expressions that mention the importance of social communication, standardizing the terminology on this subject and presenting rational principles. Following the redefinition of the terms related to the subject in the regulation, 7 principles, titled "1. Access and Understanding, 2. Sources of Information, 3. Drawing Attention to Context and Environment, 4. Preserving Authenticity, 5. Planning for Sustainability, 6. Concern for Inclusivity 7. The importance of Research, Education, and Evaluation," were determined. The third-ranked principle titled "Attention to the Context and Environment" mentions that the targeted perception should cover all the cultural, social, and environmental importance and values of the cultural heritage. The fourth rank principle of "Preservation of Authenticity" states that all planning and work to be done for the perception and presentation of the cultural heritage must be carried out without damaging the texture of the place, which expresses the cultural value while respecting the character of the place to preserve the originality. These principles are guiding recommendations that ensure the preservation of the spirit of place for those who will develop presentation methods as part of the preservation processes (ICOMOS, 2008a). Another document that ICOMOS Quebec 2008 brought to the field of architectural preservation is the Quebec Declaration on the Protection of the Spirit of Place (ICOMOS, 2008b). The Declaration explains in detail the "cultural, social and environmental values" in the article, which is accepted as the third principle of the "ICOMOS Regulation on the Perception and Presentation of Cultural Heritage Sites" mentioned above. Emphasizing the importance of preserving the spiritual values and the spirit that constitutes the cultural property, the declaration aims to clarify the framework of this subject, which has been discussed recently. Another remarkable point in the

declaration is that it states that tangible and intangible values, which have been expressed as two opposite and separate concepts, are actually intertwined and integrated with each other (Erder, 2020).

The Quebec Declaration, in a sense, draws a roadmap for the process of understanding, protecting, and presenting the spirit of place, with ten articles gathered under four main headings. The first title of the manifesto is "Rethinking the Spirit of Place." The three items under this heading list the tangible and intangible elements that make up the spirit of place, and state that intangible elements are more effective than tangible ones to emphasize the spirit of place and must be taken into account in the preservation processes. Under this title, it is also explained that a multidisciplinary team and traditional practitioners must be assigned in the processes of identifying, protecting and transmitting the spirit of place, that the spirit of place varies from culture to culture, according to time and practices, and that a place can have different spirits that mean different attributions for different cultures (ICOMOS, 2008b).

Although the Quebec Declaration does not provide a direct method for determining the spirit of place, identifying its threats, protecting it and bringing it to light, it is the most striking of the charters and documents that refer to the spirit of place in terms of providing a general framework for a method to be developed (Figure 1). The declaration aims to secure not only the cultural heritage but also the cultural groups, which are the sources of the spirit of the cultural heritage. The Declaration proposes the development of specific management plans and strategies that can be adapted to the pluralistic context of multicultural societies, with the concern that these spirits may clash and destroy the other in places with more than one spirit.

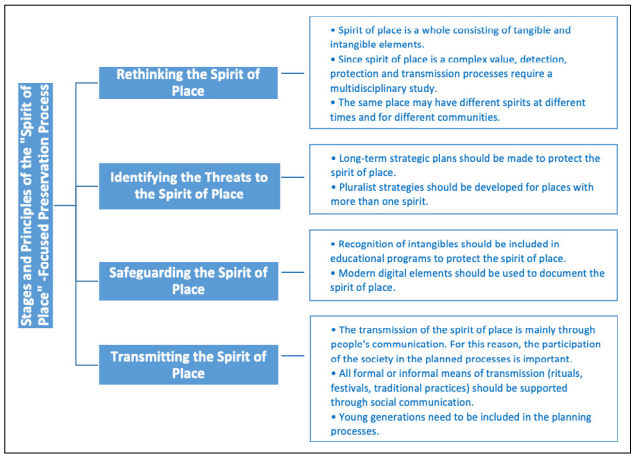

Figure 1. Stages and principles of "spirit of place"-focused preservation according to the Quebec Declaration (Edited by the authors based on the main headings of the Quebec declaration, 2023).

METHOD STUDIES

Searching for Meaning and Spirit in a Place

When focusing on the equivalent of the concept of the spirit of place in Roman mythology, it is understood that the main reason for the inclusion of this concept in the discipline of architecture is to design it with the concern of preserving the meaning and character of the place. In this context, the spirit of place is not only a meaning that is there and waiting to be discovered, but also a guide that accompanies the place in the form that overlaps with the equivalent of the concept in mythology interacts with and directs people at every moment of life on the ground. This feature defines a task for the spirit of place, and obliges it to be in constant interaction with its environment, in other words, to be alive by showing its own existence. The spirit of place is basically a construct of the mental interaction between the individual and the place. In this interaction, the whole of the impressions and images that the individual creates in his/her mind with his/her experiences transforms into the corresponding meanings. When the theoretical approaches that address the connection between the individual and the place in different disciplines are examined, it is understood that these approaches focus on similar things with different concepts and basically examine the relationship between meaning and memory. The meaning that should be preserved together with the place as a social value in the historical environment is created in the collective memory, in other words, with the common images formed in the mind of the society. Therefore, to reach this meaning, it is necessary to concentrate on a method in which the spirit of place as a collective meaning can be reached through the common codes of the collective experiences lived in a place which correspond in minds.

The German philosopher Edmund Husserl, who stated that the meaning of place is a whole united with the practices experienced, with the definition of "The place is a kinesthetic formation," is one of those who planted the seeds of the idea of analyzing the place with phenomenological methods. This theory of Husserl's method influenced many philosophers, especially Martin Heidegger, and started a process in which individual experiences were discussed in philosophy as a component of place. German philosopher Martin Heidegger said that place has components perceived through experiences; defined the place as an experiential center, not as a dead location, and thus presented a method that brings sensory perception to the fore (Heidegger, 1971). The declaration titled "Building, Dwelling, Thinking," which Heidegger presented to architects at a conference held in Darmstadt in 1951, soon influenced architects from all over the world and caused architecture to be questioned from a different perspective and phenomenologically[8](Sharr, 2013).

Christian Norberg-Schulz is the first follower of the phenomenological approach in the field of architecture,

which Edmund Husserl transformed into a method and his student Martin Heidegger made one of the most important philosophical approaches of the 20th century. Schulz combined this approach with Lynch's schematization of perception of the physical environment and adapted it to architecture as a synthesis of scientific views from the fields of sociology, psychology, and semiotics. Schulz brought a new approach to the problem of architectural space in his work called "phenomenological trilogy," which consists of three books, "Existence, Space and Architecture," "Genius Loci" and "The Concept of Housing," published in 1971, 1980, and 1985. According to Schulz, architectural space can be understood as the embodiment of environmental schemes or images that form an indispensable part of man's general harmony or "being in the world." Schulz presented a new approach saying that architecture should be perceived not only with scientific ones but also with qualitative methods. For this purpose, he aimed to find the essence of human experiences by analyzing the spirit of place through phenomenological means.

American architect Steven Holl stated that the architectural product is perceived by the senses as an experience lived differently from other works of art. Holl defines architecture as a combination of mathematics and phenomenology (Holl et al., 1994). Finnish architect Juhani Pallasmaa almost defines the concept of the spirit of place when talking about the aura of a building. According to him, a structure's aura is an intangible feature that it carries on and tells something. When an individual encounters a structure, he undoubtedly perceives it primarily with his own memory and what is in his memory, but the aura of the structure is a dominant character and directs the individual's personal perception by influencing it. In this case, the aura is a structure-specific and powerful "perception guide." Peter Zumthor, on the other hand, describes the element that Pallasmaa defines as the "aura" as the "atmosphere" and states that the atmosphere felt within while entering in, creates a bond between the person and the space, and this bond is a very important part of architectural comfort (Zumthor, 2006). Katherine Benzel's approach is also parallel to other theories. Benzel states that the architectural work is in interaction with social life and nature, and the design is shaped in a process compatible with this interaction (Benzel, 1997). All these theoretical approaches, which refer to the spirit of a place or equivalent components, are important in terms of emphasizing the existence of a "spiritual" element as well as a physical body in architectural products (Table 2).

Table 2. Leading theorist architects and their theories, who associate place with existence and meaning under the influence of Heidegger

Theorist Architect	Emphasized Concept	Main Idea in Theory	Announcement Date
Christian Norberg-Schulz	Genius Loci/Spirit of place	Architectural space is the embodiment of environmental schemes and images.	1980
Steven Holl	Paralax/Perspective perception changing with movement and viewpoint	The perception of a place is personal. The space gains a personal meaning with a perception that changes with experience and movement.	1989
Juhani Pallasmaa	Aura/ Spiritual energy	Architecture can be defined not only with objects but also with verbs, it gains meaning as it is perceived by the senses, it is not just a visual product.	1994
Katherine Benzel	Harmony	A space is shaped by interacting with its environment (city, topography, social life).	1998
Peter Zumthor	Atmosphere	The structure, with its various features, forces people to relate to the world and calls something from memory with what they visualize in their minds.	1998

Analysis of Methods and Techniques

In his book "Genius Loci: Toward a Phenomenology of Architecture" published in 1979, Schulz conducted city assessment studies that will shed light on searches for methods and techniques in determining the spirit of place. Although the studies in the book do not fully express a

method flow, it was found worthy of being analyzed as one of the first concrete research to determine the spirit of place in a historical environment. Other studies analyzed are current studies on understanding of place, which have been made in the last 5 years, and which are remarkable in terms of clearly revealing methods and techniques.

Norberg-Schulz's City Assessments

In his previous books, Intentions in Architecture (1963) and Existence, Space, and Architecture (1971), Schulz talked about the transformational journey of space into existential space and defined existential space as the place where meaningful actions are embodied (Norberg-Schulz, 1971). In these books, he used the concept of genius loci in response to the unique character of places and defined this character as a power unaffected by political, social, or cultural changes. In his book Genius Loci: TowSards a Phenomenology of Architecture, published in 1979, the concept of "spirit of place" is discussed as a theory that sheds light not only on architecture but also on ethnographic and anthropological researches. Schulz says "human beings only take root in an environment where they experience meaning" and states that both the spirit of place is formed through meaningful experiences and that people need to hold on to the spirit of place as a support (Norberg-Schulz, 1979). According to him, settlement is more than building and sheltering, he focuses on the intangible elements of the physical environment and tries to analyze and explain them. The process of formation of the spirit of place can be listed as follows with the help of the stages Schultz himself expressed (Figure 2).

In his book "Genius Loci: Towards a Phenomenology of Architecture", Schulz evaluates three different cities, Prague, Khartoum, and Rome, in terms of the spirit of place (Norberg-Schulz, 1979). Schulz's assessment approach can be expressed as "expert researchers' interpretations based on field observations and historical studies." Here, the researcher is almost always himself, and occasionally he evaluates by taking into account the opinions in the published texts. He makes inferences about the spirit of

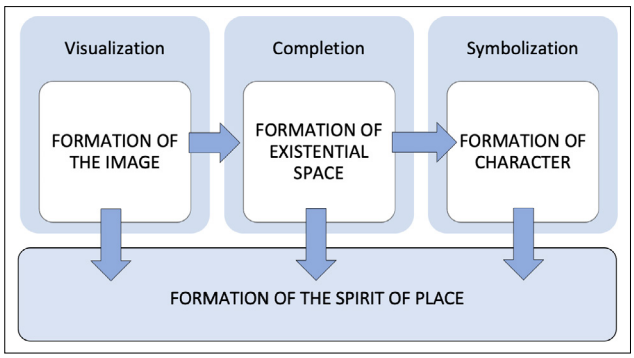

Figure 2. The stages of formation of the spirit of place according to Schulz.

place in the cities he examines, searches its origin, but avoids putting forward a definite and clear formula about the formation of this spirit. In addition, after determining the spirit of place, he leaves its determinations only at a level of interpretation. This situation was evaluated by the authors of this article as a concern to avoid ending the interpretation process due to the continuity feature of his phenomenological approach.

According to Wilken, Schulz traveled the cities by considering their history and current situation, and evaluated them with inspiration from Heidegger's concept of the unity of the four legs consisting of "earth-sky-mortals-gods" (Wilken, 2013). However, he did not systematize his evaluations and left the conclusion uncertain. For this reason, the study of determining the spirit of place did not create data for a path to be followed afterward.

Among the city evaluations of Schulz, his determinations about Rome are remarkable. First of all, Schulz emphasizes that the city has been called the "eternal city" for a long time, and its title of being a "capital," which has the effect of monumentality and greatness. However, according to Schulz, these adjectives alone cannot express the spirit in the city, because the absolute order which is the mental equivalent of these adjectives does not exist in this city. Here, Schulz puts a comma in his comments to include the words of art historian Hans Peter L'orange[9] that describe the streets of ancient Rome: "the self-satisfied, closed world of the street is characteristic of ancient Rome: a complete world, a small universe, the paradise from which Scandinavian people were expelled." Making use of L'orange's findings, Schulz describes the features that do not separate the houses from the street, on the contrary, integrate them, that the entrances to the houses are provided directly from the street without sidewalks or steps, therefore, the house life continues on the street, and this situation gives the streets an "urban interior" appearance. Features that were a part of life in ancient Rome still exist in the city of Rome, and this is the most important reason why, according to Schulz, a capital full of monumental buildings offers a surprisingly pastoral/rural effect. Schultz calls this influence the Roman spirit of place. After depicting the streets in the city, Schulz goes out of the city and looks at the city from the outside. In this way, he sees the divinity and greatness of the city's existence in its natural environment. The ancient Romans built the city as a Greek statue, with details complementing each other. In its natural environment, the city is like a giant statue carved for the gods. Schulz interprets the spirit, which is felt in the city and exists in every corner, as a synthesis of this divinity/sublimity and Roman pastoralism. In summary, the spirit of place in Rome was formed through the self-confidence of divinity and the "existential meanings" that emerged from the sincerity of Roman life. In his book, Schultz also included images with the meanings he wanted to emphasize. The most striking of these is a painting by Franz Roesler[10]

Figure 3. The Franz Roesler painting that Schulz included in his book and the photograph depicting the city's stance in the natural environment (Norberg-Schulz, 1979).

depicting ancient Roman streets and a recent photograph expressing the city's topography (Figure 3).

Since Schulz's leading work, many studies have been conducted to understand place. In the following lines, current scientific researches on understanding place are analyzed in terms of their methods and techniques. The information obtained from this analysis is intended to contribute to future studies for determining the spirit of a place.

Sample Research 1: Identifying and expressing the spirit of place in the Sziget festival area (Pap, 2019)

The research that Victoria Pap carried out between 2014 and 2019 within the scope of her doctoral study in sociology and social policy at Corvinus University in Budapest was the most remarkable among the sample studies in terms of the diversity of method techniques (Table 3). In her study, Pap dealt with the area of the Sziget festival, one of the most important music events in Europe and held in August every year, and she aimed to determine and express the atmosphere that is as important as the music presented in the week-long festival. In this study, Pap questioned the characteristic points in the area, the alternative spaces that developed in addition to the existing spaces, and the elements that determine the atmosphere in the place, and sought an answer to the question of what the channels of perception of the spirit of place would be.

Pap mainly used the mental mapping method in her study, supplementing this method with questionnaires and participant observations, which she referred to as "content analysis of fieldwork diaries." Pap describes the spirit of place as "the mental perception of subjective experiences and feelings associated with place through experiences that can be verbally expressed." Therefore, she sees mental mapping as the most appropriate method for determining the spirit of place.

As the first step, Pap asked 225 festival attendees to write their "experiences" on a blank map, thus she obtained 225 "experience maps." In the second step, she conducted a survey with 533 randomly selected participants and aimed to collect the words corresponding to the spirit of the place by asking questions such as: "If asked to describe the atmosphere in one word, what would this be? How would you describe the aura?" The third and final step in Pap's fieldwork is the "fieldwork diaries." These data, consisting of the notes of 30 researchers who took part in the field study, were also used in the analysis phase.

Among the findings, it is noteworthy that the venues that are outside the boundaries of the official festival area formed spontaneously were determined on the mental maps. By combining the mental maps she collected, Pap created a map that she called visitors' mental places. She analyzed the data of her research with computer support and expressed her findings with maps, tables, flow charts, and word cloud diagrams (Figure 4).

Table 3. Analysis of Victoria Pap's study in terms of method techniques

Sample Research 1: Identifying and expressing the spirit of place in the Sziget festival area				
Data Collection Techniques	**Data Sources**	**Data Type**	**Explanation**	**Data Analysis Techniques**
Interview	Festival participants	Words	A survey was conducted with 533 participants, and symbol words were collected by asking questions.	Coding
Mental mapping	Festival participants	Experience map	225 participants were asked to write their experiences on the sketch.	Geolocation Frequency Analysis (ArcGIS)
Observation	Researchers	Notes	The notes taken by 30 researchers in their field studies were used as data.	

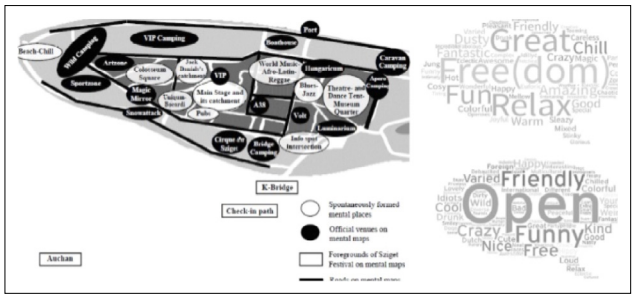

Figure 4. Expression technique of Victoria Pap's work (Pap, 2019).

Sample Research 2: Mapping historical urban landscape values using social media (Ginzarly&Roders&Teller, 2018)

The study, which was carried out within the scope of an article written in the field of urban design, proposes the method of using the photo angles and tags shared on the social media of that place in determining the perceived character of an area. The findings of the study express the differences in the preferences of local people and visitors (Table 4).

The location chosen for the research is the El-Mina district in Tripoli, Lebanon. During the data collection phase, 1320 photos shared for this region between 2003 and 2016 were taken from the social media platform Flickr. The goal here is to determine how users refer to inheritance entities and whether they relate to tangible or intangible attributes. Accordingly, tags referring to an abstract attribute such as activities, expressions, knowledge, or practices (Example: tradition, work, shopping, and medieval) were extracted together with their geographic information, and a tag clouds map was created using ArcGIS. In this map, each label is given a rating, symbolized by font size, based on frequency of use. This map was made to visualize the density and spatial distribution of the photographs. To distinguish the photograph angle preferences of local people and tourists, the nationality information of the users was transferred to the ArcGIS medium and visualized by grading according to the frequency of tagging (Figure 5).

Since the study was found successful by the authors in terms of visualizing the results of data analysis, it ranks high among the case studies.

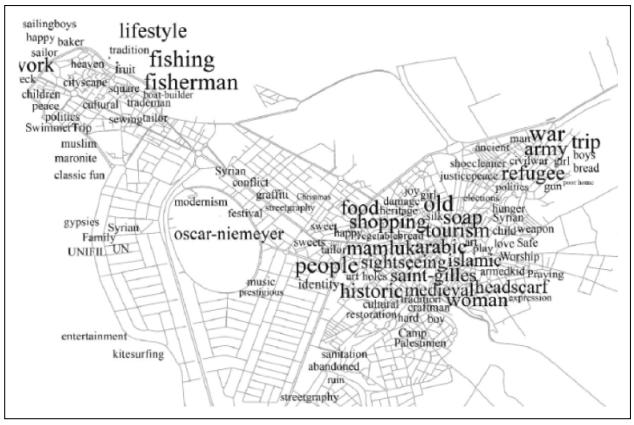

Figure 5. Expression technique of Manal Ginzarly's work (Ginzarly et al., 2019).

Sample Research 3: Reviving the past through collective memory in Tehran Baharestan Square (Lak & Hakimian, 2019)

The research, which was carried out within the scope of an article written in the field of urban design, aims to propose a theoretical model to sustain and reproduce the traces of collective memory in historical urban spaces. Baharestan Square, which is an area that has been transformed both physically and semantically depending on the changes in the city of Tehran, was chosen as the study area, and a qualitative research was conducted by conducting in-depth interviews with 20 local residents during the summer of 2016. In addition to the interviews, observations, related documents, and texts were evaluated with qualitative content analysis (Table 5).

The qualitative method used to investigate the collective memory in the square can be expressed in two stages. The first part of the first phase is the "review of the literature on collective memory," in which the historical studies, related internet resources, and documents are reviewed. This section was completed in a desk-based work process and resulted in the determination of open-ended interview questions.

The second part of this phase is a field study in which the determined questions are directed to the participants through in-depth interviews. Participants were selected by

Table 4. Analysis of Manal Ginzarly's study in terms of method techniques

Sample Research 2: Mapping historical urban landscape values using social media

Data Collection Techniques	Data Sources	Data Type	Explanation	Data Analysis Techniques
Mental mapping	Flickr contributors	Tag map	The shooting directions, tags, and hometown information of the 1320 photographs were used as data.	Geolocation Frequency Analysis and Classification (ArcGIS)

Table 5. Analysis of Azadeh Lak's study in terms of method techniques.

Sample Research 3: Reviving the past through collective memory in Tehran Baharestan Square				
Data Collection Techniques	**Data Sources**	**Data Type**	**Explanation**	**Data Analysis Techniques**
Interview	Historical documents and texts	Words	The history of the square has been researched.	Coding Qualitative Content Analysis
Mental mapping	20 local residents	Experience map	Open-ended questions were asked to 20 people selected by random sampling from local residents and shopkeepers who had lived or worked in Baharestan Square for more than 10 years and were also asked to tell their memories.	
Observation	Baharestan Square	Notes	Thematic codes were enriched with the observations made.	

random sampling from local residents and shopkeepers who have lived or worked in Baharestan Square for more than 10 years. After the interview, the participants were also asked to tell their memories of the past and present in the square.

Data analyses were made with the qualitative content analysis method, in which the researchers repeatedly read, discussed, and interpreted the transcribed interviews. At the end of this process, general thematic sections and subcategories could be determined with the embedded theory method[11]. The analysis study aimed to extract the main categories related to the conceptual model of the collective memory features proposed in the form of four broad themes including place, activities/events, history, and personal images/values.

In the second stage of the research, the concepts were unfolded in contexts such as buildings/monuments, functions, land uses/activities, and as a visual survey of the street landscape, and physical features such as space use, building age, architectural style were defined.

The study aims to reveal the features that revive the collective memory in Baharestan Square to support urban renewal policies (Figure 6).

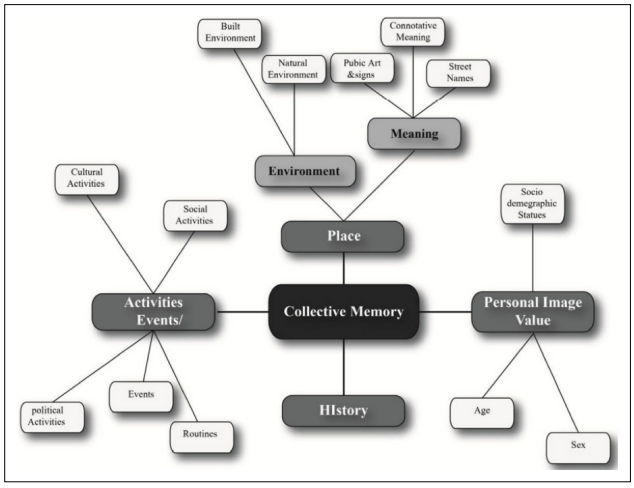

Figure 6. Expression technique of Azadeh Lak's work (Lak & Hakimian, 2019).

Sample Research 4: Investigation of cultural memory and the spirit of place in the context of a destroyed theater in Alexandria, Egypt (Hussein&Stephens&Tiwari, 2020)

The research is about the Al Salam Theater, which was built in 1956 in Alexandria, Egypt's second-largest city, and which has become a very important figure for the city during its 62 years of service as a theater, in the city's memory before being demolished. The research consists of an investigation of traces carried in the spirit of place from the time it was there to today when a hotel exists in its place.

The first stage of the study includes library research, and the second stage includes field studies. In the first stage, the existing literature was reviewed to create the conceptual framework of the research and to prepare the interview questions that would be required in the second stage.

In the second stage, semi-structured face-to-face interviews were conducted in the field through the prepared 20 questions. During the field study, which lasted for about 2 months, a total of 12 participants, six of whom were locals of the mentioned region and six of whom had no regular connection with the region, were interviewed, and each interview lasted 30–45 min. The second stage, the data collection stage, also includes some studies on social media. For this purpose, a Facebook group called "The Spirit of Alexandria" was created, and the participants were allowed to express their opinions and thoughts by sharing freely without pressure in face-to-face meetings. In the group of 90 participants, 42 comments about the Al Salam Theater were included as data in this study (Table 6).

Table 6. Analysis of Fatmaelzahraa Hussein's work in terms of method techniques

Sample Research 4: Investigation of cultural memory and the spirit of place in the context of a destroyed theater in Alexandria, Egypt				
Data Collection Techniques	**Data Sources**	**Data Type**	**Explanation**	**Data Analysis Techniques**
Interview	12 local residents	Texts	A total of 12 participants, 6 of whom are locals of the mentioned region, and 6 of whom are not in regular connection with the region, were interviewed.	Coding Qualitative Content Analysis
Social media comments	90 group participants	Texts	In the created Facebook group, the participants were allowed to freely express their opinions and thoughts by sharing. In the group of 90 participants, 42 comments about the Al Salam Theater were included as data in this study.	

The researchers analyzed the data based on the "qualitative triangulation method[12]," and field notes, interview texts, and social media posts were evaluated together. Analytical software called QSR NVivo 12 was used while evaluating the coding. After the study, a diagram indicating the main research themes and relationships used throughout the coding process and a word tree showing the frequency of participants' mention of summer were obtained from the software (Figure 7).

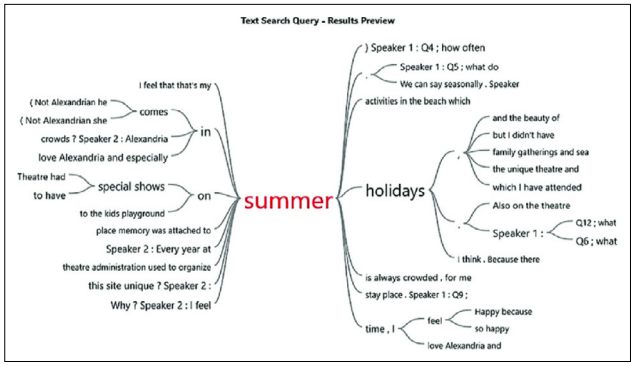

Figure 7. Expression techniques of Hussein et al.'s (2020).

During the interviews, the participants recalled their good memories and experiences at the theater with their families and friends, and the events they had in the urban area around the theatre. A great majority of the interviewees combined the theater with the summer vacation and the sea, this situation is also emerged during the evaluation (Figure 7).

Sample Research 5: A Workshop to Determine the Spirit of place in Kocaeli[13]

The research carried out within the scope of the first thesis studies, which is considered as an example, is remarkable because it includes a workshop held in the field with a group of experts. In the research, a 1-day workshop was held in Kocaeli with 19 experts, including architects, city planners, interior architects and civil engineers, consisting of academicians, local government employees, private sector employees and students, and it was ensured that they experienced the field during the workshop. After the workshop, the participants were asked to convey their

Table 7. Analysis of Filiz Ertürk's study in terms of method techniques

Sample Research 5: A Workshop to Determine the Spirit of place in Kocaeli (Ertürk, 2019)				
Data Collection Techniques	**Data Sources**	**Data Type**	**Explanation**	**Data Analysis Techniques**
Workshop + Interview	19 experts consisting of academicians, local government employees, private sector employees and students, architects, city planners, interior architects and civil engineers	Experience transfer, matching and connection forms	A one-day workshop was held, in which participants were asked to first experience the area, then transfer it and fill out a few forms.	Content Analysis

experiences in writing and it was tried to determine the components of the place and their relations through a pre-prepared form.(Table 7).

Sample Research 6: Evaluation of Changes in Konya Historical City Center through the Concept of 'Spirit of Place'[14]

The second of the thesis studies includes a quantitative research to determine the user's perception of the historical city centers in Konya. In the first stage of the study, a sample area was selected by researching the historical areas of Konya, and in the second stage, a survey was conducted with 45 local residents in this area. Participants were asked to answer 17 questions such as "Today's Konya Historical City Center is a Cultural Center (Perception1)" or "Today's Konya Historical City Center is a Service Center (Perception2)" by rating them on a Likert scale[15]. The survey results were evaluated through quantitative analysis and the perceptions were hierarchically ordered and interpreted (Table 8).

In the Table 9, the data collection and data analysis methods and techniques used by various researchers to determine the spirit of place and the results they revealed were examined. As seen, those who have achieved successful results in the last 5 years to determine the meaning of place, conducted with phenomenological approaches, have revealed results emphasizing intangible values with a perspective integrating the physical environment and society. In most of the studies analyzed and evaluated as an example, people who have a connection with the field were chosen as the data source and the data were compacted by coding or labeling the interviews. The coding method makes it possible to present the data by abbreviation and geolocation. The first two studies are remarkable in that they present the visuals that express the coded data on the physical environment in an architectural language. Other studies were also evaluated in terms of data collection and analysis techniques used.

Based on this analysis, an evaluation can be made on data collection techniques as follows:

Interview: Conducting interviews is a very important way to collect data by making connections with the collective memory of a place. Care should be taken to interview with especially local inhabitants, in order to get the accurate data.

Mental mapping: Since creating a map that addresses what is remembered requires an expert perception of the physical environment, it was concluded that it would be more appropriate for the researcher to make the memory maps during and after the interviews.

Observation: Observations made by the researcher are always important as a support and complement to other data collection techniques.

Social media comments: When the case studies above are examined, it is revealed that social media can create a context that can be used as a very rich data source when its reliability is ensured.

Workshop: In some researches, the fact that the workshops were conducted by experts rather than local residents created a disconnection between the study and the place. Conducting the workshop with local residents and completing the evaluation by experts would lead to more accurate findings.

Document research: Historical and visual document scanning made by the researcher should also support and complement other data collection techniques.

The evaluation of sample researches has shown that the most essential data collection technique is the interviewing

Table 8. Analysis of Hatice Kübra Söğütlü's study in terms of method techniques

Sample Research 6: Evaluation of Changes in Konya Historical City Center through the Concept of "Spirit of Place" (Söğütlü, 2023)

Data Collection Techniques	Data Sources	Data Type	Explanation	Data Analysis Techniques
Documentary search	Historical documents and texts	Texts	The history of the historical city center of Konya has been researched.	Quantitative Analysis (SPSS)
	45 local residents	Answers evaluated with a Likert scale	17 questions were asked to 45 people who knew the historical city center of Konya, were somehow connected with the area and witnessed the transformation of the center, and were asked to mark the options prepared according to the Likert scale.	

Table 9. Analysis and evaluation of place understanding studies in terms of methods and techniques

Sample Number	Research Subject	Date and Location of the Research	Researcher	Publication Name, Place, Date	Data Collection Techniques	Evaluation of Data Collection Techniques	Data Analysis Techniques	Evaluation of Data Analysis Techniques	Evaluation of Expression Technique of Findings
1	Identifying and expressing the spirit of place in the Sziget festival area	2014-2019 Budapest, Hungary	Victoria Pap	Researching the spirit of place: Mental mapping on Sziget festıval, Cornivus Journal of Sociology and Social Policy, 2019	Interview, Mental mapping, Observation	Data collection techniques are very compatible and sufficient with the study.	Coding, Geolocation, Frequency Analysis	The analyzes were made with the help of the software with sufficient sensitivity, were found reliable and sufficient.	The visual work for Mental places was found to be very understandable and having clear in terms of an architectural language. The fact that the findings related to the spirit of place were not combined with the physical environment was evaluated as a deficiency.
2	Mapping historical urban landscape values using social media	2003-2016 Tripoli, Lebanon	Manal Ginzarly, Ana Pereira Roders, Jacques Teller	Mapping historic urban landscape values through social media, Journal of Cultural Heritage, 2018	Mental mapping	The reliability of data from social media has not been proven in the study. However, when these studies are examined, it is revealed that social media can create a context that can be used as a very rich data source when its reliability is ensured.	Geolocation, Frequency Analysis and Classification		It was found very successful that the findings were reduced to codes and located in their places in the physical environment and visualized very clearly.
4	Investigation of cultural memory and the spirit of place in the context of a destroyed theater in Alexandria, Egypt	2018 Alexandria, Egypt	Fatmaelzahraa Hussein, John Stephens, Reena Tiwari	Cultural Memories and Sense of Place in Historic Urban Landscapes: The Case of Masrah Al Salam, the Demolished Theatre Context in Alexandria, Egypt, Land, 2020	Interview, Social media comments		Coding, Qualitative Content Analysis	The tags in the social media were used as codes directly without being changed. This technique has been found interesting because it offers an advantage of a very practical and fast working process.	The fact that the findings were not matched with the places in the physical environment and the results were not visualized in an architectural language was considered as a deficiency.

Table 9. Analysis and evaluation of place understanding studies in terms of methods and techniques (Cont.).

Sample Number	Research Subject	Date and Location of the Research	Researcher	Publication Name, Place, Date	Data Collection Techniques	Evaluation of Data Collection Techniques	Data Analysis Techniques	Evaluation of Data Analysis Techniques	Evaluation of Expression Technique of Findings
3	Reviving the past through collective memory in Tehran Baharestan Square	2016 Tehran, Iran	Azadeh Lak, Pantea Hakimian	Collective memory and urban regeneration in urban spaces: Reproducing memories in Baharestan Square, city of Tehran, Iran, City, Culture and Society, 2019	Interview, Observation	Interviews were conducted with the local residents with the help of open-ended questions and the study was found to be efficient since a wide variety of data were obtained by supporting observations.	Coding, Qualitative Content Analysis	The coding was found very careful and successful.	
5	A research to understand the place and the spirit of place through street practice in Kocaeli	2019, Kocaeli, Turkey	Filiz Ertürk	Sokak pratiği aracılığıyla yer ve yerin ruhunu anlamaya yönelik bir sentez önerisi: Hermeneutik-fenomenolojik-semiyolojik (HFS) çerçeve yaklaşım, Phd Thesis, 2019	Workshop, Interview	The fact that the participants were not selected from local residents was found to be negative. It was thought that conducting the workshop and interviews with the residents and completing the evaluation by experts would lead to more accurate findings.	Content Analysis	Analyzes were made by experts different from the experts who were workshop participants. The analyzes are revealed as tables expressing the relationships between the components of the earth. The analysis technique was found to be sufficient.	
6	Evaluation of the change in the historical city center of Konya by measuring perceptions	2021, Konya, Turkey	Hatice Kübra Söğütlü	Konya Tarihi Kent Merkezinde Meydana Gelen Değişimlerin "Yerin Ruhu" Kavramı Üzerinden Değerlendirilmesi, Master Thesis, 2021	Document search, Interview	Receiving the answers with a Likert scale limits and ordinaryizes the participant's view.	Quantitative Analysis (SPSS)	The fact that the analysis was done in a quantitative way prevented the researcher from reflecting his expertise on the study with his comments, and kept the architect-researcher out of the evaluation. This situation has been evaluated as a deficiency since it has taken the study out of the field of architecture.	

as it directly enables a collecting method of collective experiences in the memory of users of a place as data. Interviewing should be supported and complemented by mental mapping, observation and document research.

Data analysis techniques in line with the examinations from the sample researches can be evaluated as follows:

Coding: The coding method is a technique that summarizes and shortens the data, as in all qualitative researches. In this way, it enables the data to be expressed in an understandable way within the findings.

Geolocation: This technique is important in architectural researches because it enables data or findings to be matched with the physical environment and the results to become usable documents.

Frequency analysis: It should be used as an intermediate stage in researches where the general approach is not quantitative but the frequency of mentioning the coded data is important.

Classification: Classification is a coding stage that allows similar data to be grouped and collected under the same heading and these headings to be used in the ongoing process. It was found useful in terms of simplifying the data.

Content analysis: It is a very appropriate technique to be used in research on "place" as it reflects the expertise of the researcher by adding his/her interpretation and ensures that the study remains within the boundaries of the desired area.

Quantitative Analysis: It has been observed that this analysis technique is not sufficient in studies on "place," as it does not include the interpretation and intervention of the researcher in the research.

As it is understood from the information expressed in the literature review, coding is considered as the first and most practical technique among these analysis techniques as it shortens the data and provides practicality. The efficiency of the coding technique can be increased by supporting it with frequency analysis and geolocation. The combinations of data collection and data analysis techniques may change from case to case according to terms and aim of the research.

CONCLUSION

Identifying and documenting the spirit of place is the first step in a "spirit of place"-oriented preservation process. The process to be carried out should also be expected to include the flow that ensures the protection of the determined and expressed "spirit" and its transfer to the future. As the literature suggests, studies that propose a clear model should be carried out for determining the spirit of a place. The goal of this study is to emphasize the lack of a viable method/model that aims to "determine the spirit of place" and which is revealed by synthesizing the approaches focused on the spirit of place in preservation, to support the spirit of place focused approaches in the historical environment and to contribute to making the preservation activities of the historical environment more holistic.

The twenty-first century has started as a century in which concepts are questioned again, problems are re-discussed and current solutions to problems are sought. In this context, one of the most important phenomena that has come to the fore in recent years is the inevitable isolation of the individual in crowded cities and hybridized societies. The fact that people cannot connect with the environment they live in plays a major role in this isolation. The activities carried out in historical cities under the name of "preservation" with commercial and touristic concerns cause the historical environment to lose its identity and original character, weakening the bond between people and the environment day by day. As Lynch said, "the visual environment should be meaningful; that is, its visible character should relate to other aspects of life." In this respect, it is important that what is felt in the historical environment should be the existential meaning of the place, in other words, a place should tell you the original story. In this way, it will be possible for the individual to establish a relationship with the past as well as with the environment, and to form a cognitive collective sharing from the past among people living together. The spirit of place is the meaning of place, together with everything that has lived and left a trace in the environment. It is spatial, existential and original. It welcomes the users and visitors of the place, influences the experiences, connects and unites people with each other and the place. It is what makes a house home or a town homeland.

The use of urban scale as a reminder to people is not a new phenomenon for urban designers. However, the application of this effort in the field of preservation has sometimes been the subject of discussion. Without turning the city into a museum that can be visited with one's fingertips, it is enough for the city to make a connection between the past and the individual by reminding it at intervals (Othman et al., 2013). These reminders, which are links between the individual and the environment and society, can be defined as "guidance of the spirit of place" as in Roman mythology.

If a place has a spirit, which is defined as a spiritual element and perceived by the senses, it is possible to detect this spirit with a method that includes sensory evaluations. As a result of the analyses and evaluations made, it has emerged that a new method to be designed to determine the spirit of place should be created in line with the following flow:

Collective sharing of practices as well as the physical environment play a role in the formation of the spirit of place. This situation will find its place in the general framework of the method as a reflection of the mentality

that has come to the agenda for the first time with the Washington Charter of 1987 and has continued until today. Intangible values which are traces of social life in a place, are the drivers of phenomenological perceptions together with the physical environment. Phenomenological perceptions correspond to the meanings encoded in memory under the influence of these directors. Acquiring the right techniques to reach these meanings and evaluate them together is one of the most important determinants of the method flow sought in this study.

Identifying meanings for collective sharing may be possible by making use of collective memory studies. Collective memory data can be obtained by interpreting researches conducted with the participation of local people by experts from various disciplines. The necessity for expert researchers to be involved in the process was also expressed in the 2008 Quebec Declaration. In the declaration, it is also mentioned that local masters should be supported to analyze the spirit of place, which is a complex element. The role of local residents, who are first-degree experiencers of the place, was not mentioned in the declaration. However, when the studies of understanding the place made in recent years are analyzed in terms of methods and techniques, it has been concluded that the most efficient source of data on collective memory is local residents. Since Schulz's evaluations of the city and sample research (5) analyzed in this study neglected to collect data from the local people, the findings they put forward as the "spirit of place" do not integrate with the social life of the place. For this reason, it will be appropriate to benefit from the local residents as a data source in the field studies to be carried out. Figure 8 shows the appropriate data collection and data analysis methods which can be used in a field study.

The meanings that make up the spirit of place should be combined with the physical environment in line with the supporting data obtained through research. Since the spirit of place is an element that gains meaning when it is with the place, the work of determining the spirit of place should also include an addressing effort and should also express this information at the end.

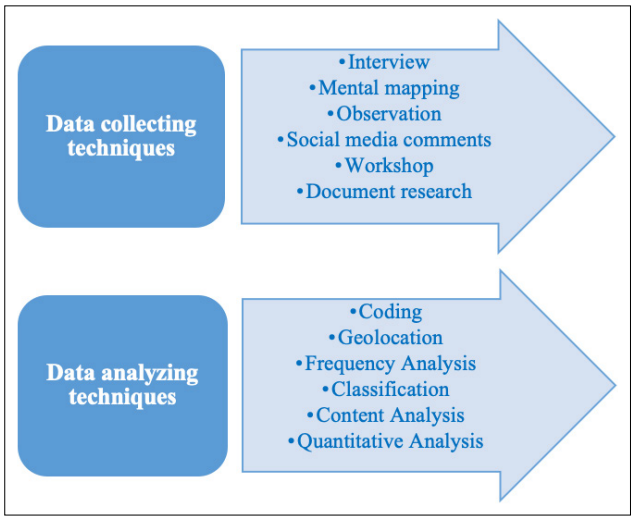

Figure 8. Data collection and analysis techniques.

The "spirit of place" obtained as a result of a research carried out with this flow is a place map where all data are coded, hierarchically ordered and geographically placed in the physical environment. The results obtained in this way will have an understandable and archival quality.

NOTES

[1]Prof. Hermann Jansen's plan won the Ankara City Development Plan competition, which was opened in 1928, and was put into practice in 1932. The most important feature of the plan is that it proposes not to interfere too much with the old city and to establish the new city next to the old one. The plan, known as the Jansen Plan, was the plan that guided the development of Ankara with minor changes until the 1950s (Tunçer, 2009).

[2]Henri Prost is a French city planner who was invited by M. Kemal Atatürk to carry out urban planning studies for Istanbul in 1933, after he started the work on the reconstruction of Ankara. The reason why Atatürk chose him for this task is that Prost is an expert in the planning of historical cities and the work he had done in various cities of the world in this field (Aydemir, 2008).

[3]The Latin word "genius" means "spirit", while the singular form of the word "loci" meaning "places", is "locus" (Online Etymology Dictionary, 2021).

[4]American architect Louis Kahn, in his speech at a conference, stated that building materials did not come together by chance or at our will, they actually wanted to become something and told us this. Kahn expressed this with the following words: "… You say to brick, 'What do you want, brick?' Brick says to you, 'I like an arch'" (Lesser, 2017).

[5]The British art and society critic John Ruskin, who is accepted as the representative of the "Romantic View" in preservation, expressed the idea that the place has a spirit in his book Seven Lamps of Architecture, published in 1849. Each of the "lights" described as chapter titles in the book represent the connotations that direct/affect the audience of an architectural work while perceiving it. (Baljon, 1997).

[6]While defining the concept of historical monument in the first article of the Venice Charter, the scope is kept wide and it is stated that an architectural work does not necessarily have to have superior values in order to be defined as a

"monument", and that a simple building can also be considered as a monument if it has a cultural meaning. With this expression, the relationship between monument and meaning is emphasized, and the meaning gained by the monument in line with the bond it establishes with the society and the individual is kept in the foreground. In the seventh article of the same charter, while it is mentioned that the monument will gain meaning with the environment it is in, it is indirectly referred to the fact that its surroundings also have a meaning that integrates with it (ICOMOS, 1964).

[7]A paper with a title "Genius Loci-The Spirit Of Archeological Sites" presented by Visy Zsolt from Hungary, was a remarkable work for emphasizing the necessity of protecting the spiritual value of monuments in restoration processes (ICOMOS, 2003a).

[8]As Edmund Husserl expressed in his book "Five Lessons on Phenomenology", phenomenology is a method of perception and interpretation in which vision (but seeing in which consciousness plays a more important role than the eyes) is at the forefront (Husserl, 2003).

[9]Hans Peter L'orange, in his book titled "Art Forms and Civic Life in the Late Roman Empire" published in 1965, mentioned that artistic and architectural production are linked to social life and reflect each other, and visualised Roman cities from this perspective (Pack, 1968).

[10]Franz Roesler painted life in the ghettos of Rome, using memories, in a series of 120 watercolor paintings titled "Roman Spirita/Lost Rome", which he made between 1878 and 1896 (Ettore Franz Roesler Collection Official Website)

[11]According to Corbin and Strauss, three types of coding are mentioned in the embedded theory: 1. In open coding, initial codes (themes) with low abstraction are assigned, categories are estimated, 2. Axis coding is the stage where data is passed over for the second time. At this stage, connections are made between the themes, some themes are excluded from the coding, some new ideas are produced and subcategories are revealed, 3. Selective coding is the stage where the themes are reviewed and clustered for the last time, and the main categories are revealed (Corbin and Strauss, 1990).

[12]According to Denzin and Patton, four different types of triangulation can be made in qualitative research: 1. Method triangulation, 2. Investigative triangulation, 3. Theory triangulation, 4. Data source triangulation. Method triangulation means diversification of the method and is usually done in the form of interview-observation-field notes. Investigative triangulation, on the other hand, is when at least three researchers do the same work together and allows evaluation from different perspectives. While various theories and hypotheses are used in theory triangulation, in data source triangulation, different participant types such as individual, family, and group are studied. The purpose of triangulation in qualitative research is to obtain comparative perspectives as well as to ensure the reliability of the findings (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville et al., 2014).

[13]This study is the research included in Filiz Ertürk's doctoral thesis titled "A synthesis suggestion to understand place and the spirit of the place through street practice: Hermeneutic-phenomenological-semiological (HPS) framework approach" in Kocaeli University Architecture Department in 2019.

[14]This work is the research included in Hatice Kübra Söğütlü's master's thesis titled " Evaluation of changes in the historical city center of Konya through the sense of space concept" conducted in Konya Technical University, Department of Architecture in 2021.

[15]It is used to measure attitudes towards objects and events. The scale consists of statements that can be evaluated positively or negatively. Scales can have 2-9 degrees. Often 3, 5 or 7 grades are used. Participant items are rated, for example, in the range of "strongly agree" (or "very positive") to "strongly disagree" (or "very negative"). The total score is calculated from the sum of the grades specified for the items (Prof. Dr. Sirel Karakaş Psikoloji Sözlüğü, 2023).

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Article

"Context" knowledge in architecture: A systematic literature review

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ABSTRACT

The goal of this research is to investigate the definition, development of techniques, and consequences of context, as well as to contribute to the growth of knowledge in the field of study. For this purpose, a full systematic literature review (SLR) was undertaken on the methods and approaches that have been used in the generation of architectural knowledge in recent years. The Google Scholar Web of Science and Scopus databases were searched for relevant studies as part of a directed SLR. The article describes the SLR methodology, which condensed the related studies to 79 publications using the preferred reporting items for systematic reviews and meta-analyses reporting procedure. The chosen publications were examined quantitatively. The second step of the inquiry was a qualitative analysis of the data, which was based on the results of the quantitative analysis. It has been found that current research on the context of architecture has concentrated on new designs, infill designs, Islamic architecture, and mosque designs in a historical and urban context, as opposed to studies that have concentrated on vernacular and sustainable architecture. Along with the conclusions drawn about the research domains for context knowledge in architecture, it is clear that the studies focus on specific topics such as physical context, sociocultural context, local context, and place identity.

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INTRODUCTION

With the aid of science and philosophy, architectural knowledge has been produced in a variety of ways throughout the evolution of architectural thought. Knowledge of "context" has also played a significant role in the field of architectural knowledge. While designers use environmental data from the context to take decisions in the architectural design process, theorists have handled context knowledge by developing theoretical and methodological approaches. By undertaking a comprehensive analysis of how "context" information has been discussed in the literature recently and what its scope is, the goal of this study is to create a framework for the distinguishing aspects of the context.

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Vitruvius, who introduced the ideas of climate and direction, is credited with introducing the concept of context as knowledge. Due to modern architectural critique, it rose to prominence in the realm of architectural theory in the 1950s and 1960s. In the second part of the 20th century, the notion of "context" knowledge in architecture was developed and started to become a paradigm. The philosophy of the Enlightenment held that knowledge could only be created through abstraction, as the positivism of the 19th century had predicted. The decisiveness of abstract design knowledge has grown stronger in the 20th century with modernism, and it has influenced the methods that knowledge has produced in the field of architecture. While laws of relationships such as form and esthetics or composition and geometry determined abstract design knowledge throughout this time, subjects such as space, time, function, and place became the standards of design and knowledge. Modern architecture thinks that production cannot adapt to the features of the age because of its fixation with historicism, despite criticism of its aim to abstract architectural knowledge with particular standards, notably in form. In this way, context has evolved into an unavoidable element in contemporary design. Once more, the appearance of historical centers in CIAM between 1945 and 1951 demonstrates that modern design does not entirely disregard the context. In the same years, Robert Venturi's master's thesis, "Context in Architectural Composition," was defended at Princeton University. It included analyses of historical structures using Gestalt principles and revealed the idea that context gives an architectural structure meaning. Ernesto Rogers' emphasis on the value of the environment is also demonstrated as one of the modern and contextualist approaches of the time (Isenstadt, 2005). Meeting the scientific standards for design and information production has undergone a significant revolution because of the new, universal, functionalist ideology of modern architecture, which rejects the past and tradition. However, at this time, discursive knowledge was created with the help of individual and group manifestos, and normative knowledge was transformed into speculative knowledge (Tanyeli, 2004).

In the second part of the 20th century, structuralist approaches to architecture began to demonstrate the discovery of context as architectural knowledge. "The Image of the City" by Kevin Lynch, published in 1960, is the earliest indication of the structuralist approach. Another noteworthy research is Christopher Alexander's book "Pattern Language: Towns, Buildings, Construction" published in 1977. During this time, structuralism manifested itself in architecture through the use of techniques from disciplines such as languages, semiotics, anthropology, psychology, and sociology. The syntactic method was used to analyze the city's grammar, while the semantic method was utilized to analyze its meaning.

During the same period as "The Image of the City," names like Rossi, Venturi, Rowe, Koetter, Leon, and Rob Krier developed novel ways to context awareness. The concept of context has been associated with the term "contextuality," which refers to a collection of techniques identified in Cornell's urban design graduate program, which began its studies in 1963 under the direction of Colin Rowe. In his book Collage City, which he co-authored with Fred Koetter and was released in 1978, Rowe later compiled his thoughts on contextual urban design. Contextualism became a vital idea in these years, and this method, which emphasized the connection between the entire city and architecture, was later broadened by adopting other perspectives in numerous studies. The first such studies that come to mind are those by Steven Peterson (1979), such as "Urban Design Tactics," "Space and Anti-Space," Colin Rowe's (1981) "The Present Urban Predicament," Thomas Schumacher's (1971) "Contextualism: Urban Ideals and Deformations," Stuart Cohen's (1974) "Physical Context/Cultural Context: Including it All," William Ellis's (1998) "Type and Context in Urbanism: Colin Rowe's Contextualism," and Steven Hurtt's (1983) "Conjectures on Urban Form."

Rossi, on the other hand, coined the term "locus" in his 1966 book Architecture of the City, which encompasses all history of architecture. Rossi used the idea of "locus" to analyze the typological and morphological traits of the city in a historical context (Rossi, 2006).

Alternatives to the traditional positivist strategies created by method and model thinking have emerged since the 1980s. Norberg-Schulz, Cooper Marcus, Dovey, Seoman, Mugerauer, Lerup, Moore, and Lyndon are just a few of the people who have recreated context knowledge using the phenomenological, hermeneutical, and post-structuralist schools of thought. Different viewpoints in the creation of contextual knowledge are illustrated by Norberg-Schulz's concept of "genius loci" for "place" (Norberg Schulz, 1980), Dovey's critique of the idea of authenticity (Dovey, 1995), Lerup's skewed perception of cities and metropolises (Zizek, 1999), and Moore and Lydon's descriptions of their experiences (Lydon, Moore, 1994).

Critical contextualist approaches have developed various perspectives on the concept of "place" in addition to challenging its meaning in context, such as Rossi's examination of the meaning through the concept of "locus" and Schulz's introduction of the concept of "genius loci,". This strategy, known as critical regionalism, was established by Alexander Tzonis and Liane Lefaivre, and supported by Kenneth Frampton's book "Towards a Critical Regionalism: Six Points for an Architecture of Resistance (1983)." By concentrating on issues like sustainability to local texture, place, and identity, it has evolved into an alternative in the production of context knowledge.

When the Second World War came to a close, the gaps

and destruction in the cities put the new building in historical environment phenomena at the forefront. The concept of contextual suitability has been used in the field of architecture to discuss the relationship between the old and the new. Historical context, or the information from historical buildings, has been an essential source of data for the design of new buildings in historical environments. Infill architecture, or the creation of modern buildings inside a historical environment, has been studied in the literature. Brolin's book "Architecture in Context," which was released in 1980 and contextually discusses the cohabitation of old and contemporary structures, is one of the earliest groundbreaking works on this subject (Brolin, 1980). The 1988 book "Contextual compatibility in architecture: a problem of personal taste?" by Linda Groat can be used as an illustration of how structuralist ideas were supported by environmental behavior research during this time. Her other publications on the subject include "Contextual compatibility: An issue of composition, not replication" (Groat, 1987), and "A study of the perception of contextual fit in architecture" (Groat, 1983), as well as "Measuring the fit of new to old: A checklist resulting from a study of contextualism" (Groat, 1983).

According to previous research on the application of context knowledge in architecture, context encompasses not only the geography and physical conditions of the present building site, but also the sociocultural, economic, legal, and historical conditions of the immediate environment. Consequently, the phenomena of architectural context have become an architectural ideology, as its content has evolved and transformed over time. The direction of future research endeavors can be determined by examining a general picture of the data in the multidimensional field of context knowledge during the past few years. An investigation into contextual architecture-related research methodologies was done to better understand the definition, development of technique, and effects of context.

RESEARCH METHODOLOGY: A SYSTEMATIC LITERATURE REVIEW (SLR)

In this study, the SLR approach was used to find, select, and analyze the research literature critically, as well as to generate fresh insights. It provided theoretical information and insight into contemporary trends relating to the research issue (Petticrew and Roberts, 2008). The systematic literature search was conducted according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) standards (Liberati et al., 2009) (Page et al., 2021). A SLR consisting of four phases was undertaken in accordance with these guidelines: (1) identifying the research topics, (2) describing the research strategy and criteria, (3) defining the data selection method, and (4) defining the data analysis techniques (Figure 1).

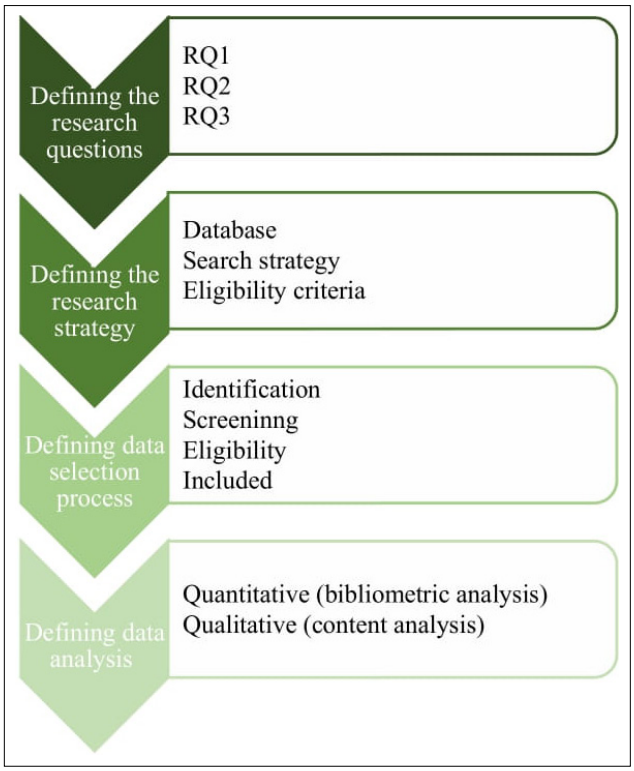

Figure 1. Systematic literature review method.

In the initial phase of the investigation, the keyword technique was used to scan databases and collect relevant articles (Saade et al., 2020). The search results were then filtered to exclude irrelevant studies. First, terms from fields other than architecture, urban design, and building were removed. Second, the papers were reviewed based on their titles and abstracts, and the most relevant ones were chosen. Finally, the remaining articles were full-text scanned and irrelevant ones were eliminated. The created sample of literature was then submitted to quantitative and qualitative assessments considering the study questions posed.

Defining the Research Questions

We conducted a comprehensive SLR to capture the evolving subjects and emerging concepts in the theory of contextual architecture over the past few years. The review of relevant literature tackles the following principal research questions:

RQ1. What is the scope of "context" knowledge in architecture?

RQ2. How did methodologies and implications of context in architecture evolve?

RQ3. What are the changing, developing, and remaining ideas associated with "context" knowledge in architecture

Defining the Research Strategy and Criteria

SLRs are a strategy for making sense of vast amounts of information by surveying all published literature that addresses a certain research subject. SLR performs a

thorough search of selected literature based on meticulously chosen keyword strings (Saade et al., 2020). Simultaneously, SLR is a strategy for mapping unclear areas, identifying those with no or limited investigation among relevant studies (Petticrew and Roberts, 2008). Table 1 covers the principal search criteria for databases (according to the PRISMA checklist).

The data were collected by scanning the databases Web of Science, Scopus, and Google Scholar. Selected databases cover a vast array of research, including the most pertinent studies on the topic. Within the scope of the investigation, papers published between 2011 and the present were chosen. The purpose of this time frame is to evaluate how "context" information has evolved to be utilized in the 21st century. Finally, this analysis solely contains English language articles.

Utilizing the pioneering works in the literature, as stated in the study's introduction, the keyword strings were generated. Initially, the Google Scholar database was searched using the phrase "architecture and context," which is the subject's generic term. This initial search resulted in a number of 165 000 texts, which was questionable, as it included all research fields. Due to this ambiguity, the subject-related keyword strings "architecture and contextualism," "contextual architecture and architectural design," and "urban contextual architecture" were refined, and the number of results was decreased to 6,250. Later, a comparable technique was used to additional databases. Similar searches in the Web of Science database found 799 items. As a result of the Scopus database searches, 715 articles were discovered.

Defining the Data Selection Process

After conducting initial searches on the subject, the collected data were then further evaluated. As was mentioned in the previous section, basic searches were performed using the keyword method. The keywords of both abstracts and full-text articles were chosen as "architecture" and "context," which are most relevant to the research topic.

In addition to these terms, the keywords "architecture and contextualism," "contextual architecture and architectural design" or "urban contextual architecture" were also included, with the assumption that they encompass the majority of the research topic's primary aspects. After the initial searches, recurring trends were observed in all three databases and the terms "socio-cultural context and architecture," "infill architecture and historical context," "contextual architecture and sustainability" and "vernacular architecture and context" were added to the keywords.

Figure 2 provides a summary of the data selection procedure (PRISMA) and the number of selected publications at the conclusion of each procedure. Following the initial searches, the number of results in Google Scholar was reduced to 324, in Web of Science to 141, and in Scopus to 171. Thus, a total

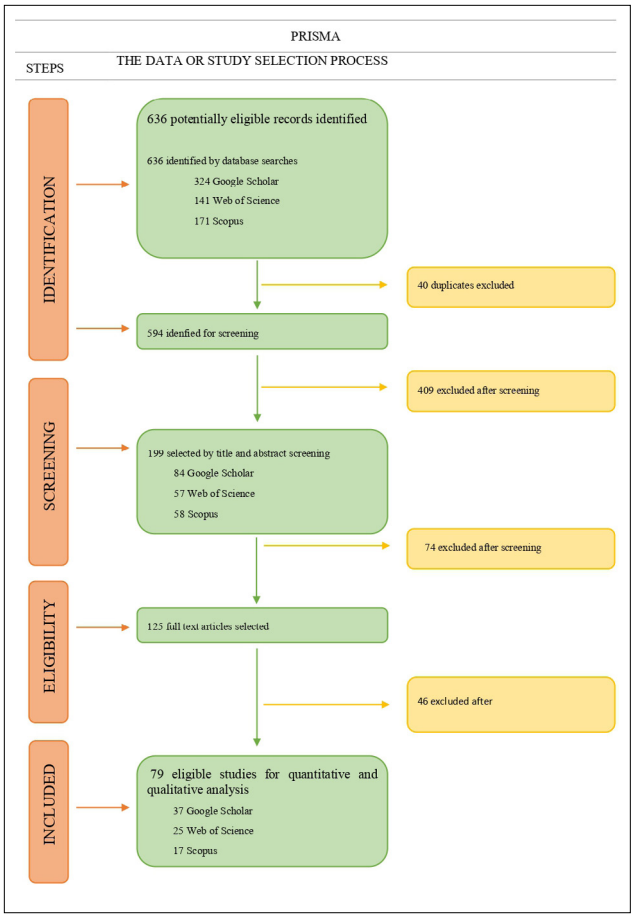

Figure 2. The data selection process (preferred reporting items for systematic reviews and meta-analyses).

Table 1. The research strategy and criteria

Database	**Google Scholar, Web of Science, Scopus**
Search strategy	Keyword method
	(Using keyword string: "Context and architecture" or "contextual architecture and architectural design" or "contextualism and architecture" or "urban contextual architecture")
Eligibility criteria	1. Document type: Journal papers.
	2. Search language: Title, abstract, keywords, and full text only in English.
	3. Data range: 2011-present

of 636 articles were collected. Later, 40 duplicate articles were deleted, leaving 596 items for further investigation. Before doing a deeper search, 409 papers with a tenuous relationship to the topic were deleted, reducing the number of abstracts to be studied to 199. Of the 199 publications whose abstracts were read, 74 were eliminated as irrelevant, and 125 were selected for full-text review. After evaluating 125 full-text papers, it was determined that 46 were of insufficient quality and were therefore eliminated from the study. Thus, 79 papers were considered to be necessary for a systematic literature evaluation.

Defining Data Analysis Methods

The chosen publications were analyzed using bibliometric analysis, a statistical and applied mathematical analysis technique (Broadus, 1987). In addition, network analysis, a major bibliometric tool, was employed to depict the intricate relationships between publications in this study (Soomro et al., 2022). Due to network analysis, the information-gathering process can be streamlined, and the relationship between articles can be clarified using networks and nodes (Soomro et al., 2022).

In the research, network analysis was conducted using the text-mining software Visualization of Similarities viewer (VOS viewer). VOS viewer is a software program used for displaying and navigating network-based maps. The VOS viewer can be used to build networks of scientific articles, scientific journals, researchers, research organizations, nations, keywords, and concepts. Simultaneously, VOS viewer displays three distinct maps: the network visualization, the overlay visualization, and the density visualization (Van Eck and Waltman, 2010). In this study, the literature sample produced by the bibliometric search was transferred to the VOS viewer for analysis, and keyword networks depicting the relationship between the articles in the area were built.

In the subsequent step of the research, qualitative analysis was undertaken based on the results of the quantitative (bibliometric) analysis-the network of keywords with clusters determined by their co-occurrence rate. While the quantitative study was done to assess how context information has been handled in architecture in past years, the qualitative study's objective was to classify the obtained data and analyze and organize the current research in greater depth.

RESEARCH FINDINGS

This section presents the findings of quantitative analysis and qualitative analysis organized in subsequent subheadings.

Quantitative Findings

Articles Publishing Trends

Figure 3 depicts the trend of the annual number of 79 articles selected from the papers published on the topic of context in architecture between 2011 and 2022, by year. As can be seen from the 79 selected publications, the number of available papers expanded substantially in 2015, 2016, 2017, 2020, and 2021. Although the number of publications on the subject reduces from time to time, it can be observed that a certain percentage of articles are ongoing and that there are not many significant differences. This demonstrates that the topic of context in architecture is constantly on the agenda.

While 2 articles published in 2011 constitute the least with %2.53 of the total number of articles, 12 papers published in 2016 and 2017 constitute the highest with %30.37 of the field.

Source Information

A sample of 79 papers published in 69 different publications constitutes the literature. The majority of the publications were published in architecture and buildings, architecture and urbanism, sustainability, Islamic architecture, arts and design studies, environmental sciences, social and behavioral sciences, design and culture, and arts journals. Due to the scope of the concept, there are no leading periodicals devoted to context in architecture (Table 2).

Figure 3. Number of filtered articles on contextual architecture per year.

Table 2. Relevant information on the journals included in the dataset

Source Journals	Journals Number	SCR (2021)	IF (2021)
Environment-Behaviour Proceedings	1	Q1	7.500
Journal International Journal of Applied Engineering Research	1	NA	NA
Techne Journal of Technology for Architecture and Environment	1	Q3	0.239
Journal of Islamic Architecture	2	NA	NA
Spring Journal of Arts, Humanities and Social Sciences	1	NA	NA
Space Ontology International Journal	1	NA	NA
Arts	1	NA	NA
The Journal of Architecture	2	Q1	0.255
The Turkish Online Journal of Design, Art, and Communication: TOJDAC	1	NA	NA
The quarterly journal of philosophical investigations	1	NA	NA
Armanshahr architecture and urban development	1	NA	NA
International journal of architectural research	1	Q1	0.968
International research journal of advanced engineering and science	1	NA	NA
Arts and design studies	1	NA	NA
Prosiding persidangan antarabangsa kelestarian insan	1	NA	NA
European online journal of natural and social sciences	2	NA	NA
Geography and territorial spatial arrangement	1	NA	NA
Global journal of arts education	1	NA	NA
Journal of faculty of architecture	1	NA	NA
Periodicals of engineering and natural sciences	1	Q2	1.098
International journal of education and social	1	NA	NA
Sciences journal of environment and earth	1	NA	NA
Science journal of sustainable development	1	NA	NA
International Journal of Innovative Research and Advanced Studies (IJIRAS)	1	Q4	0.068
International Journal of Engineering Research and Technology (IJERT)	1	NA	NA
An International Journal for Engineering and Information Sciences	1	NA	NA
Skills in Architectural Education: A New Paradigm	1	NA	NA
International Journal of Architecture and Urban Development	1	NA	NA
Journal of Applied Environmental and Biological Sciences	1	NA	NA
Fabrications	1	NA	NA
Studies in Sociology of Science	1	NA	NA
Journal of the Institute of Conservation	1	Q1	0.7104
Journal of Aesthetics and Culture	1	Q2	0.214
International Journal of Parallel, Emergent, and Distributed Systems	1	Q3	1.340
Urban planning	1	Q2	1.606
Architectural theory review	1	Q3	0.100
Urbanism	1	Q2	0.842
The Journal of Architecture	1	Q1	0.255
Urban Analytics and City Science	1	Q1	4.043
Nexus Network Journal	1	Q1	0.457
Journal of Architecture and Urbanism	1	Q2	0.389

Table 2. CONT.

Source Journals	Journals Number	SCR (2021)	IF (2021)
European Urban and Regional Studies	1	Q1	4.729
Journal of Urbanism	1	Q1	2.000
International Journal of Architectural Computing	1	Q3	1.038
Journal of Architectural and Planning Research	1	Q3	0.364
ACE Architecture, City and Environment	1	Q1	0.696
Architectural Research Quarterly	2	Q3	0.074
Architectural Science Review	1	Q1	3.000
Journal of Urban Technology	1	Q1	6.327
Journal of Asian Architecture and Building Engineering	1	Q1	1.212
International Journal of Urban Sciences	1	Q2	2.956
Journal of Cultural Geography	1	Q1	0.968
Journal of Fundamental and Applied Sciences	1	NA	NA
International Journal of Sustainable Development and Planning	1	Q3	1.566
Civil Engineering and Architecture	1	Q2	1.364
Open House International	1	Q3	0.559
Buildings	1	Q1	3.598
A|Z ITU Journal of Faculty of Architecture	3	Q1	0.338
Bagh-e Nazar	2	NA	NA
Procedia Engineering	1	NA	NA
Heliyon	1	Q1	3.918
World Applied Sciences Journal	1	NA	NA
Procedia Environmental Sciences	1	NA	NA
Frontiers of Architectural Research	2	Q1	2.562
Periodicals of Engineering and Natural Sciences	1	Q2	1.098
Journal of History Culture and Art Research	1	NA	NA
Design and Culture the Journal of the Design Studies Forum	1	Q1	1.000
Sustainability	1	Q1	4.166
Global Journal Al-Thagafah (GJAT)	1	Q2	0.101

A|Z ITU Journal of Faculty of Architecture (3 articles), Frontiers of Architectural Research (2 articles), Journal of Islamic Architecture (2 articles), The Journal of Architecture (2 articles), European Online Journal of Natural and Social Sciences (2 articles), Architectural Research Quarterly (2 articles), and Bagh-e Nazar (2 articles) have more context-related articles than the others, although the difference is not statistically significant (Table 2). Diverse concepts, such as infill design, sustainability, vernacular architecture, Islamic architecture, urban design, physical context, cultural context, social context, technology, as well as fields such as architectural design and theory, education, urban planning, environmental sciences, social and behavioral sciences, engineering, art, and philosophy, are presented in the publications.

Based on the SCImago Journal Ranking (SJR) algorithm and high impact factors (IF), 29 percent of journals with analyzed literature samples have a Q1 score. 26% of the analyzed literature sample consists of journals with Q2, Q3, and Q4 scores according to the SJR system.

Co-Occurrence Network Mapping: Keyword Analysis and Clustering

Keyword co-occurrence analysis allows for keyword clustering, defines the direction of progress, and summarizes research in an academic field. There are two sorts of counting techniques for keyword analysis: Binary and full. The binary method was not favored in this study since it does not calculate the repetition of words in an article; it just indicates if a word exists or not. In contrast,

in the full count approach, the location of each word is determined. To conduct a more exhaustive study, the full count approach was judged appropriate for this topic.

By analyzing the titles, keywords, and abstracts of every publication in the Web of Science and Scopus databases, repetitive keywords were identified. In contrast, they were chosen by scanning only the titles of Google Scholar databases due to a constraint in VOS Viewer. Word repetition is restricted to two or fewer instances to observe new research interests. Across all databases, 188 terms meet these criteria. Comparing the calculated occurrence values from three distinct datasets led to the selection of 33 common terms. Concurrently, keywords with identical meanings were grouped under a single keyword. Table 3 displays 33 selected terms with good connectivity.

Table 3. The occurrence and relevance of keywords in the analyzed literature sample

No	Cluster/theme	Keywords	No	Cluster/theme	Keywords
1	Infill Architecture and Design	Infill architecture	5	Contemporary Architecture and New Design	Heritage
		Urban design			Urban context
		Compatibility			Historical context
		Historic context			Modern architecture
		Contextual design			
		Contextualism			
2	Islamic architecture and design	Historic context	6	Architectural Design and Urban Environment	Urban environment
		Mosque design			Historical context
		Social context			Culture
		Urban context			Traditions
		Cultural environment			Architectural identity
		Islamic context			Place identity
		Climate			Meaning
		Contextualism			Conservation
					Technology
					Typology
					Shape grammar
					Neighborhood
3	Vernacular Architecture	Sustainability	7	Architectural design	Design approaches
		Climatic			Discourse
		Cultural context			Architectural theory
		Urban morphology			Modernism
		Vernacular architecture			Esthetic
		Space-syntax			Conceptual context
		Traditional houses			Museum image
		House typologies			Technology
4	Sustainable Architecture	Urban planning/design	8	Architectural Design and Education	Design education
		Contextualism			Environmental context
		Socio-cultural context			Design concept
		Sustainable development			Architectural education
		Urbanism			Site analysis
		City			Socio-cultural aspects
		Well-Being			
		Politics			

Co-occurrence network mappings produced by VOS viewer for three distinct databases depict keywords with distinct hues and groupings (Figures 4-6). Due to these discrepancies, clusters and themes were selected by evaluating the study as a whole, and colors were disregarded to minimize confusion. Therefore, VOS

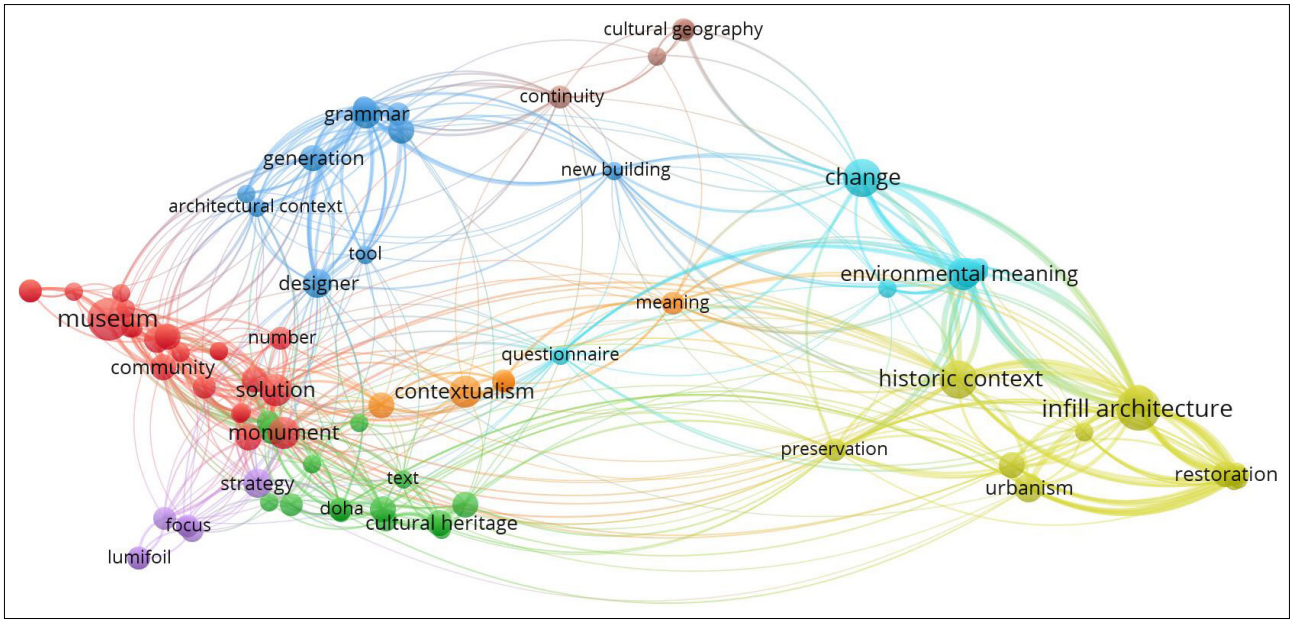

Figure 4. Co-occurrence network mapping for web of science database.

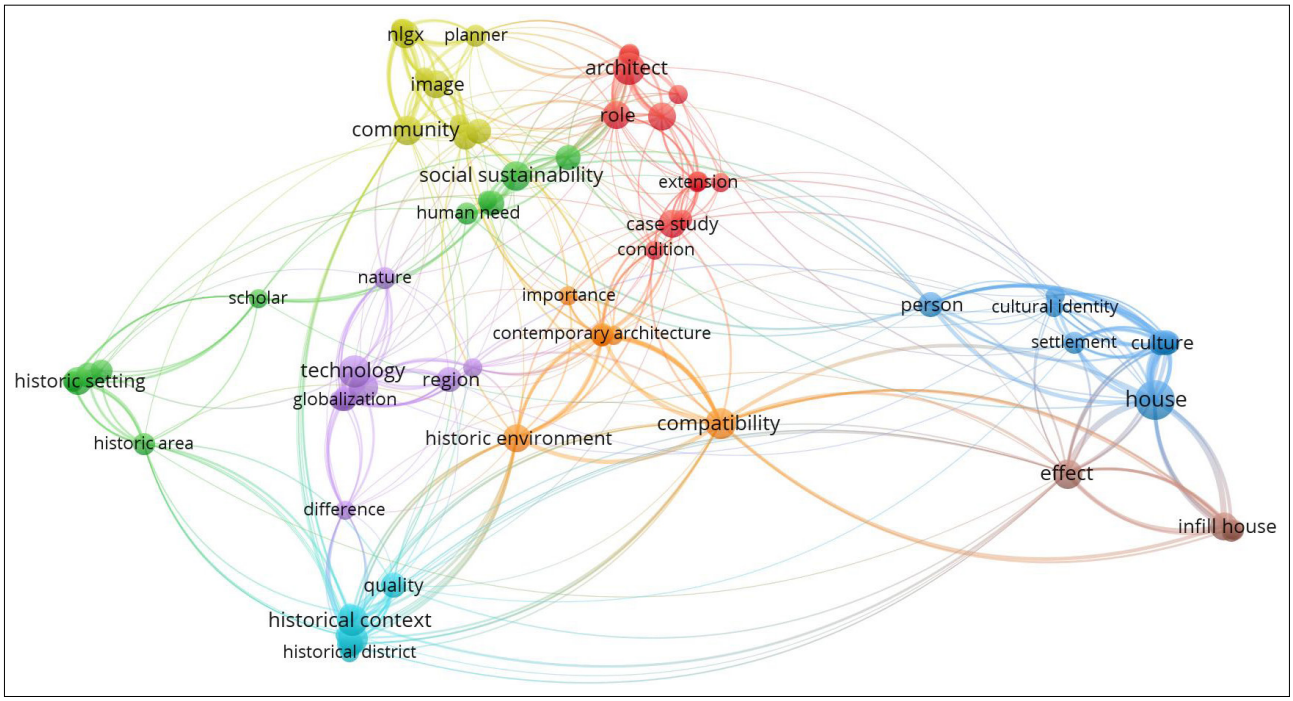

Figure 5. Co-occurrence network mapping for scopus database.

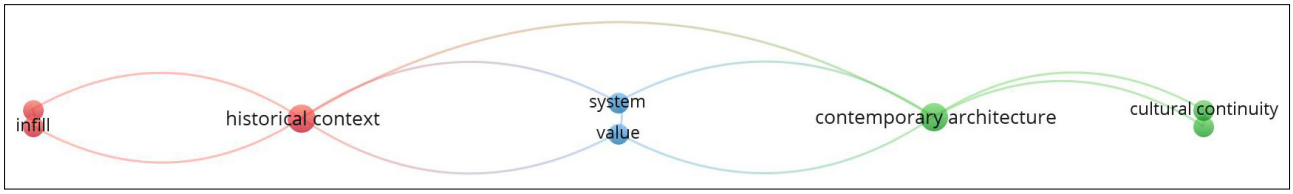

Figure 6. Co-occurrence network mapping for Google scholar database.

viewer has served as a source of early data for the study's themes.

Qualitative Findings

Creating Theme

Cluster 1/Theme 1: Infill Architecture and Design

The first cluster's focus is on infill architecture and design. The majority of the works on this subject concentrate on new architecture as an infill in a historical setting. According to studies (Sotoudeh, 2012; Parvizi, 2020; Stamps, 2011), and (Sotoudeh and Abdullah, 2013), understanding the contextual preferences of experts and residents/users regarding the issue of compatibility for new infill design in a historical context can help formulate the frameworks toward establishing the design guidelines for architectural intervention in such urban historical environments (Sotoudeh, 2013). On the other hand, some studies have shown that evaluating the design's suitability in an urban historical context using contrasting methods (Demiri, 2013) and establishing a model method (Gharehbaglou and Ardabilchi, 2019; Gharehbaglou and Ardabilchi, 2021), can offer useful knowledge in identifying the place identity and the effects of meanings on users' perceptions. The findings of the research might provide designers new views because it is up to the architect's point of view on how he approaches the historical material as a source of meaning and inspiration.

Cluster 2/Theme 2: Islamic Architecture and Design

The second cluster focuses on Islamic architecture in connection with the structural and societal elements of mosque design. Based on several design techniques, the findings of the studies in this cluster show that an inclusive mosque architecture may be improved (Samsudin et al., 2021; Kanesh et al., 2017; Rasdi, 2017; Saiful Hasan and Mahbuba Afroz, 2013). Iranian Islamic art can be seen in a comparison of the geometric motifs used in two separate mosques (Karim et al., 2020). The other research on Islamic architecture assesses mosques in relation to climatic variations and traditional Islamic homes as an example of sustainable architecture (Tabarsa and Naseri, 2017; Attia, 2021).

Cluster 3/Theme 3: Vernacular Architecture

The third cluster's focus is the context-specific vernacular architecture. Studies have shown that vernacular architecture is created based on the climatic context of the area and takes into account a variety of factors, including building types, urban texture, the types of materials used, their colors, and the way that building details are designed, as well as sustainable design principles (Ozorhon and Ozorhon, 2014; Mehrabi, 2016; Afsari and Yousefi, 2020). These studies focus on traditional residential architecture. According to the results, considering climatic conditions in the design process of houses can provide a basic understanding of the design of native homes, as well as the use of patterns of the functional spaces of native homes in the design of contemporary architecture. Alternatively, several studies in this cluster concentrate on cultural aspects (Asif et al., 2018; Oranratmanee, 2020; Costa and Rosado, 2021).

Cluster 4/Theme 4: Sustainable Architecture

The fourth cluster's topic of sustainable architecture and the third cluster's topic of vernacular architecture share comparable keywords in terms of sociocultural context. Sustainable development in the built environment, often known as sustainable architecture, is guided by three fundamental concepts: Ecological, socio-cultural, and economic. A number of studies have demonstrated the importance of social sustainability for sustainable urban development in the fields of architectural design and urban planning (Bahrami, 2016; Peters, 2016; Andersen and Røe, 2017; Filep and Thompson-Fawcett, 2020; Aurigi and Odendaal, 2021; Zoranić, 2021). The results of the other two studies indicate that culture demonstrates change and sustainability as a result of the differentiation of the aspects that make up the culture; and architecture, which reflects the culture (Memmott and Keys, 2015; Ertaş and Taş, 2017). In contrast, the important literature focuses on the interaction between contextual design standards and sustainability principles (Farmer, 2013; Lee and Lee, 2014; Zhou and Zhang, 2015; Bahrami, 2016; Saradj, 2016; Ghahremani et al., 2017; Filep and Thompson-Fawcett, 2020; Shahbazi, 2016; Malek and Grierson, 2016).

Cluster 5/ Theme 5: Contemporary Architecture and New Design

In terms of new design in a historical context, there is a substantial overlap between the works in this and the preceding cluster. The works in this cluster examine the interaction between new construction in an old context with an emphasis on the value recognition of contemporary buildings (Franco, 2016; Cetin, 2017; Mısırlısoy, 2017; Jagxhiu, 2020; Zoranić, 2021; Rıza and Doraltı, 2015; Choi and Park, 2021).

Cluster 6/ Theme 6: Architectural Design and Urban Environment

The sixth cluster contains the greatest number of keywords. Based on the frequency of occurrence and link strength, the most prevalent words in this cluster are "place identity," "shape grammar," "meaning," "urban environment," "neighborhood," "culture," "Historical context," "technology," "typology," and "conservation," indicating the presence of multiple topics. The majority of authors in this

cluster focus their research on "culture continuity," "place identification," and also "architectural identity" in diverse urban environments, such as scale of building, scale of street, scale of historical axes, or scale of neighborhood, in different cities (Salama, 2014; Lambe and Dongre, 2016; Abedi and Iravani, 2015; Abuorf and Wafi, 2020; Skaboni and Pourjafar, 2017; Rahimi et al., 2021). On the other hand, the two studies, unlike the other studies that address contextual design in urban environments using a shape grammar approach to evaluate conventional architectural style, have concluded that the contextual design approach greatly influences a designer's decision-making process (Lambe and Dongre, 2019; AlFadalat and Al-Azhari, 2022). The one study contends that if the original context is lost, the situation can be remedied by gathering, compiling, and making available all existing information about the place, and the research seeks to preserve tangible cultural heritage (Tamborrino and Wendrich, 2017). One study examined typology in the context of three distinct initiatives (Moneo, 2015).

Cluster 7/ Theme 7: Architectural Design

The majority of authors in this cluster focus their research on architectural theory and design methodologies. Some studies concentrate on the emergence and evolution of contextual theories and design methodologies (Komez Daglioglu, 2015; Zavoleas and Taylor, 2021; Saad, 2022; Miao, 2012; Naghavi and Mazaherian, 2019, Abrar, 2021; Saadlounia et al., 2021). On the other hand, some studies evaluate contextualism in relation to certain building types, such as hotels and museums (Jakobsen, 2012; Ozorhon and Ozorhon, 2015; Ukabi, 2016; Tabarsa and Naseri, 2017). In one study, contextual design was discussed in the context of technology and science (Neumann, 2014). In the other two studies, the architectural designs of well-known designers including Mies, Lumifoil, and Tschumi were used to study the context (Aitchison, 2012; Bieg and Odom, 2017).

Cluster 8/ Theme 8: Architectural Design and Education

The final cluster's focus is on architectural design and contextual design education. The majority of the studies in this cluster focus on the influence of the current surrounding context's traits and qualities on the educational design process for architecture. According to studies, some pupils are skilled at creating projects that blend in with their surroundings and demonstrate contextual fitting. However, several students struggled with adopting urban fabric (Molaee and Mahdavinejad, 2011; Dessouky, 2016; Tarboush and Gürdallı, 2022). One paper stands out from the rest because it offers instructions on how to perform contextual studio, including its elements and significance (Bhagyajit Raval et al., 2020).

Creating Category Based on Method

Case Studies

The majority of studies in this group use a qualitative case study technique that includes tools from environmental behavior studies such as observation, interviewing, surveys, and descriptive analysis (Stamps, 2011; Sotoudeh, 2012, 2013; Sotoudeh and Abdullah, 2013; Salama, 2014; Zhou and Zhang, 2015; Lambe and Dongre, 2016; Peters, 2016; Saradj, 2016; AboWardah, 2017; Kanesh et al., 2017; Kanesh et al., 2018; Filep and Thompson-Fawcett, 2020; Oranratmanee, 2020; Parvizi, 2020; Gharehbaglou and Ardabilchi, 2021; Kaboli et al., 2021; Samsudin et al., 2021; AlFadalat and Al-Azhari, 2022; Saad, 2022; Abedi and Iravani, 2015; Skaboni and Pourjafar, 2017; Rahimi et al., 2021; Choi and Park, 2021). In a different way, some case studies use a qualitative content-based strategy for understanding data, as well as a descriptive analytical method and a systematic analysis approach (Lee and Lee, 2014; Ozorhon and Ozorhon, 2014, 2015; Laurens and Salura, 2015; Rıza and Doraltı, 2015; Bahrami, 2016; Cetin, 2017; Bhagyajit Raval et al., 2020; Jagxhiu, 2020; Costa and Rosado, 2021; Gharehbaglou et al., 2019; Seyedeh Masoumeh Fotokian, 2022; Abuorf and Wafi, 2020; Afsari and Yousefi, 2020; Karrimi, et al., 2020). On the other hand, case studies analyze student projects in architectural design studios (Molaee and Mahdavinejad, 2011; Farmer, 2013; Dessouky, 2016; Tarboush and Gürdallı, 2022). Several case studies that analyze spatial change in the built environment employ the space syntax method and the shape grammar methodology (Ertaş and Taş, 2017; Asif et al., 2018; Lambe and Dongre, 2019). Further studies use a qualitative method to compare a series of case studies (Moneo, 2015; Ukabi, 2016; Mısırlısoy, 2017; Attia, 2021; Fabbri, 2022).

Theoretical Studies

This collection of research dealt with the issue theoretically. The scholars conducted their theoretical research using a historical, critical, and descriptive approach (Aitchison, 2012; Miao, 2012; Jakobsen, 2012; Demiri, 2013; Saiful Hasan and Mahbuba Afroz, 2013; Neumann, 2014; Komez Daglioglu, 2015; Memmott and Keys, 2015; Franco, 2016; Andersen and Røe, 2017; Bieg and Odom, 2017; Ghahremani et al., 2017; Rasdi, 2017; Tabarsa and Naseri, 2017; Tamborrino and Wendrich, 2017; Jon-Nwakalo, 2018; Naghavi and Mazaherian, 2019; Abrar, 2021; Aurigi and Odendaal, 2021; Zavoleas and Taylor, 2021; Zoranić, 2021; Saadlounia et al., 2021; Shahbazi, 2016). Several studies have been carried out to establish a model (Lejano and Kan, 2015; Mehrabi, 2016; Malek and Grierson, 2016; Mehan, 2017; Zoranić, 2021; Abuorf and Wafi, 2020).

Literature Review Summary

Table 4 provides a comprehensive summary of all papers included in this review. It maps each article according to the year of publication, clusters, and main method.

Table 4. Literature review summary

Year	Theme								Method		Author
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7	Cluster 8	Case study	Theoretical study	
2011								•	•		Molaee and Mahdavinejad, 2011
	•								•		Stamps, 2011
2012	•								•		Sotoudeh, 2012
							•			•	Aitchison, 2012
							•			•	Miao, 2012
							•			•	Jakobsen, 2012
2013	•									•	Demiri, 2013
	•								•		Sotoudeh, 2013
	•								•		Sotoudeh and Abdullah, 2013
		•								•	Saiful Hasan and Mahbuba Afroz, 2013
				•					•		Farmer, 2013
2014			•						•		Ozorhon and Ozorhon, 2014
							•			•	Neumann, 2014
				•					•		Lee and Lee, 2014
						•			•		Salama, 2014
2015						•			•		Abedi and Iravani, 2015
						•			•		Aurens and Salura, 2015
							•			•	Komez Daglioglu, 2015
						•			•		Moneo, 2015
							•		•		Ozorhon and Ozorhon, 2015
					•				•		Riza and Doratli, 2015
				•						•	Memmott and Keys, 2015
				•						•	Lejano and Kan, 2015
			•						•		Zhou and Zhang, 2015
2016					•					•	Franco, 2016
			•							•	Mehrabi, 2016
							•		•		Ukabi, 2016
						•			•		Lambe and Dongre, 2016

Table 4. Literature review summary (cont.)

Year	Theme								Method		Author
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7	Cluster 8	Case study	Theoretical study	
				•						•	Shahbazi, 2016
				•					•		Saradj, 2016
				•					•		Peters, 2016
				•					•		Bahrami, 2016
				•						•	Malek and Grierson, 2016
								•	•		Dessouky, 2016
2017								•	•		AboWardah, 2017
						•			•		Skaboni and Pourjafar, 2017
		•								•	Rasdi, 2017
				•						•	Ghahremani et al., 2017
						•				•	Tamborrino and Wendrich, 2017
							•			•	Bieg and Odom, 2017
				•						•	Andersen and Røe, 2017
					•				•		Mısırlısoy, 2017
				•					•		Ertaş and Taş, 2017
					•				•		Cetin, 2017
							•			•	Tabarsa and Naseri, 2017
		•							•		Kanesh et al., 2017
				•						•	Mehan, 2017
2018							•			•	Jon-Nwakalo, 2018
			•						•		Asif et al., 2018
		•							•		Kanesh et al., 2018
2019						•			•		Lambe and Dongre, 2019
							•			•	Naghavi and Mazaherian, 2019
	•								•		Gharebaglou et al., 2019
2020		•							•		Karimi, et al, 2020

Table 4. Literature review summary (cont.)

Year	Theme								Method		Author
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6	Cluster 7	Cluster 8	Case study	Theoretical study	
						•			•		Abuorf and Wafi, 2020
			•						•		Afsari and Yousefi, 2020
								•	•		Bhagyajit Raval et al., 2020
						•			•		Kaboli et al., 2020
	•								•		Parvizi, 2020)
				•					•		Filep and Thompson-Fawcett, 2020
					•				•		Jagxhiu, 2020
			•						•		Oranratmanee, 2020
2021		•							•		Samsudin et al., 2021
						•				•	Saadlounia et al., 2021
						•			•		Rahimi et al., 2021
				•						•	Zoranić, 2021
						•				•	Abrar, 2021
							•			•	Zavoleas and Taylor, 2021
	•								•		Gharehbaglou and Ardabilchi, 2021
		•							•		Attia, 2021
					•				•		Choi and Park, 2021
			•						•		Costa and Rosado, 2021
					•					•	Zoranić, 2021
				•						•	Aurigi and Odendaal, 2021
2022		•							•		Seyedeh Masoumeh Fotokian, 2022
							•		•		Fabbri, 2022
								•	•		Tarboush and Gürdallı, 2022
						•			•		AlFadalat and Al-Azhari, 2022
							•		•		Saad, 2022

DISCUSSION

After evaluating the findings of the papers chosen for the SLR, it was determined that context knowledge could be explored under four major topics.

Historical and Urban Context

Studies on the topic of contextual design tend to focus on new design, contemporary design, and infill design in historical and urban contexts. According to these scholars, contextual design may be achieved in modern architecture by creating new designs that are respectful of and compatible with existing architecture (Zhou and Zhang, 2015) and the traditional principles and rules (Sotoudeh and Abdullah, 2012). In the studies done in the residential areas, it was believed that new neighborhoods should be established while maintaining the natural appearance of the neighborhoods and fusing them with the historical texture (Zhou and Zhang, 2015; Abedi and Iravani, 2015). To put it another way, it is critical to comprehend and preserve a place's spatial character (Zhou and Zhang, 2015), historical texture (Saradj, 2016), and regional features (Salama, 2014).

Architecture's context-awareness makes it simpler to establish a connection between the past and the present. In contemporary designs for the urban environment, architects have addressed the link between old and new structures through the concept of "compatibility" or "fitting," particularly in infill designs (Stamps, 2011; Sotoudeh, 2012; Sotoudeh and Abdullah, 2013; Saradj, 2016; Choi and Park, 2021). The majority of research has determined that the harmony between the old and the new is essential for urban continuity and that it should be avoided to replicate the past (Zhou and Zhang, 2015; Saradj, 2016). Similarly, research in the field of architectural design and education has examined the projects developed by students in the architectural design studio and focused on contextual compatibility. Some students are able to develop projects that are suitable for the surrounding environment and reflect the nature of contextual fitting, according to the research. However, some students failed the urban fabric fitting criteria (Molaee and Mahdavinejad, 2011; Dessouky, 2016; Tarboush and Gürdallı, 2022).

Studies conducted in historical environments have incorporated cultural heritage values as one of the significant factors (Franco, 2016; Mısırlısoy, 2017; Jagxhiu, 2020). Similarly, cultural heritage values have been included as one of the important issues in studies conducted in historical environments. The samples selected in the studies were critically evaluated according to the defined conservation principles (Gharehbaglou and Ardabilchi, 2021).

Physical, Social, and Cultural Context

Some of the studies in this group focused either on the physical context or the cultural context, while others examined both settings simultaneously. Studies addressing contextual knowledge from a physical perspective have typically evaluated new buildings in terms of "visual quality" (Salama, 2014), "aesthetic quality," "aesthetic fitness" (Sotoudeh and Abdullah, 2013), "visual compatibility," "visual diversity" (Stamps, 2011), "design quality" (Sotoudeh, 2012), and "design compatibility" (Sotoudeh and Abdullah, 2013). Physical and cultural environments were analyzed using the space syntax method and shape grammar approach to analyze the spatial change in the built environment (Ertaş and Taş, 2017; Asif et al., 2018; Lambe and Dongre, 2019).

While vernacular architecture focuses mostly on the physical impact of the region's climatic conditions on the design (Ozorhon and Ozorhon, 2014; Mehrabi, 2016; Afsari and Yousefi, 2020), other studies have emphasized the cultural context (Asif et al., 2018; Oranratmanee, 2020; Costa and Rosado, 2021). In addition, one study approached the cultural context through the concepts of "culture continuity" and "place identity" and underlined the need for designs that are consistent with historic locations (Abuorf and Wafi, 2020).

In a way of comparison, Islamic architecture has investigated the physical and social impacts of mosque design. (Kanesh et al., 2017; Rasdi, 2017; Samsudin et al., 2021). The findings of studies in Islamic architecture indicate that inclusive mosque architecture can be improved via the use of diverse design techniques (Saiful Hasan and Mahbuba Afroz, 2013; Samsudin et al., 2021). Islamic art in Iran was exemplified by a comparison of the geometric patterns of two mosques (Karim et al., 2020). Other research on Islamic architecture assesses mosques in relation to climatic variations (Tabarsa and Naseri, 2017), and traditional Islamic households as an example of sustainable architecture (Attia, 2021).

Several studies have shown that social sustainability is significant for sustainable urban development in the field of architectural design and urban planning (Bahrami, 2016; Peters, 2016; Andersen and Røe, 2017; Filep and Thompson-Fawcett, 2020; Aurigi and Odendaal, 2021; Zoranić, 2021). The other two studies have demonstrated that culture exhibits change and continuity due to the diversity of its constituent aspects and that one significant factor representing culture is architecture (Memmott and Keys, 2015; Ertaş and Taş, 2017). Important publications also emphasize how sustainability concepts relate to contextual design factors (Farmer, 2013; Lee and Lee, 2014; Zhou and Zhang, 2015; Bahrami, 2016; Saradj, 2016; Ghahremani et al., 2017; Filep and Thompson-Fawcett, 2020; Shahbazi, 2016; Malek and Grierson, 2016).

Local context, Place, Identity, and Meaning

A critical regionalist approach that focused on local texture, place, and identity was created by Alexander Tzonis and

Liane Lefaivre and supported by Kenneth Frampton's book "Towards a Critical Regionalism: Six Points for an Architecture of Resistance (1983)." This approach eventually evolved into a vernacular architecture approach in contemporary studies. However, the subjects covered are still pertinent and do not significantly diverge from the groundbreaking investigations. In the subject of vernacular architecture, contextual designs put an emphasis on the geographical features and cultural traditions of the area and consider how the climate may affect them (Mehrabi, 2016; Ozorhon and Ozorhon, 2014; Afsari and Yousefi, 2020; Zoranić, 2021).

Recent research on identity, however, contends that contextualism is about conforming to "place identity" (Lambe and Dongre, 2019), "identity" (Demiri, 2013), "architectural identity" (Salama, 2014; Parvizi, 2020) "unique identity "of a place (Abuorf and Wafi, 2020) "sense of place" (Riza and Doratli, 2015) "collective memory," (Parvizi, 2020), "place attachment" (Rahimi et al., 2021). In terms of sense of place, contextualism emphasizes architectural spatial character, behavioral patterns, and image-making (Salama, 2014; Lambe and Dongre, 2016). In addition, a sense of place can be created by reproducing the natural, physical, and atmospheric characteristics of the region (Zhou and Zhang, 2015; Komez-Daglioglu, 2015) or the quality of place (Sotoudeh and Abdullah, 2012). Two of the studies concentrate on how users perceive infill design in a historical context (Sotoudeh and Abdullah, 2013; Gharehbaglou and Ardabilchi, 2021). They also discuss the replication and differentiation of new infill designs and come to the conclusion that users prefer harmonious but distinctive architectural styles.

CONCLUSION

It has been determined that current research on contextual knowledge in architecture focuses on new designs, infill designs, Islamic architecture, and mosque designs in historical and urban contexts, in contrast to studies focusing on local and sustainable architecture. The majority of theoretical studies, on the other hand, evaluated the discussions on the concept of context in architecture by placing them in the context of historical processes. Less research has been conducted in the fields of architectural design and education compared to other fields. Together with the conclusions drawn about the areas of research on contextual knowledge in architecture, it is clear that studies focus on specific topics such as physical context, sociocultural context, local context, and place identity On the other hand, the keywords of the topics focus on words such as infill architecture, historical context, compatibility, contextualism, socio-cultural context, physical context, identity, sustainability, and vernacular architecture (Figure 7).

The findings reveal ongoing diversity in the understanding of contextuality, with studies showing consensus and disagreement on the three issues identified. In discussions of place identity, studies show a consensus on linking contextuality to the preservation of local character and identity. In contrast, discussions on physical and cultural aspects show that there is considerable inconsistency in defining contextuality as physical or cultural, with limited consensus between them. Finally, discussions of traditional and contemporary architecture, where new designs are evaluated in historical and urban contexts, tend to associate contextuality with traditional and historical patterns rather than modern ones. Especially in "infill" designs, compatibility with the historic fabric was considered an important issue.

According to the studies, it has been revealed that field studies are important for obtaining contextual knowledge. On the other hand, it is evident that contextualism is treated similarly in studies that deal with the topic within a theoretical framework. All studies maintain their consistency after undergoing some current transformations in the light of pioneering studies. The approach in Linda Groat's research, used as an example of how constructivist ideas are supported by environmental behavior studies, is methodologically used in current "infill" design case studies. Similarly, Brolin's formal approach to adapting new designs to the historic environment remains relevant as a methodology in research on infill design and contemporary design.

Through various methodologies, the study offers new definitions of contextual knowledge, which is still essential in the field of architectural knowledge. As recent research suggests, there is a lack of a holistic approach to the use of contextual knowledge in architectural design. According to the study, contextuality should be redefined for new designs realized in urban and historical contexts and should not be considered only in the framework of old or new based on the concept of convenience. By redefining these two concepts, theorists and practitioners will be able to better understand how local characters and traditional or historical patterns interact with the environment in new designs.

This research has revealed the theoretical gaps for future design by identifying how "context" knowledge is used in existing studies in the field of architectural knowledge and what its scope is. Further research is needed to fill these theoretical gaps by exploring innovative approaches to the use of contextual knowledge in architectural design. At the same time, the multidimensional and complex nature of contextual knowledge places it in a special position within architectural knowledge. Therefore, a multidimensional assessment of the issues raised for the production of contextual knowledge, especially in architectural practice, is deemed necessary.

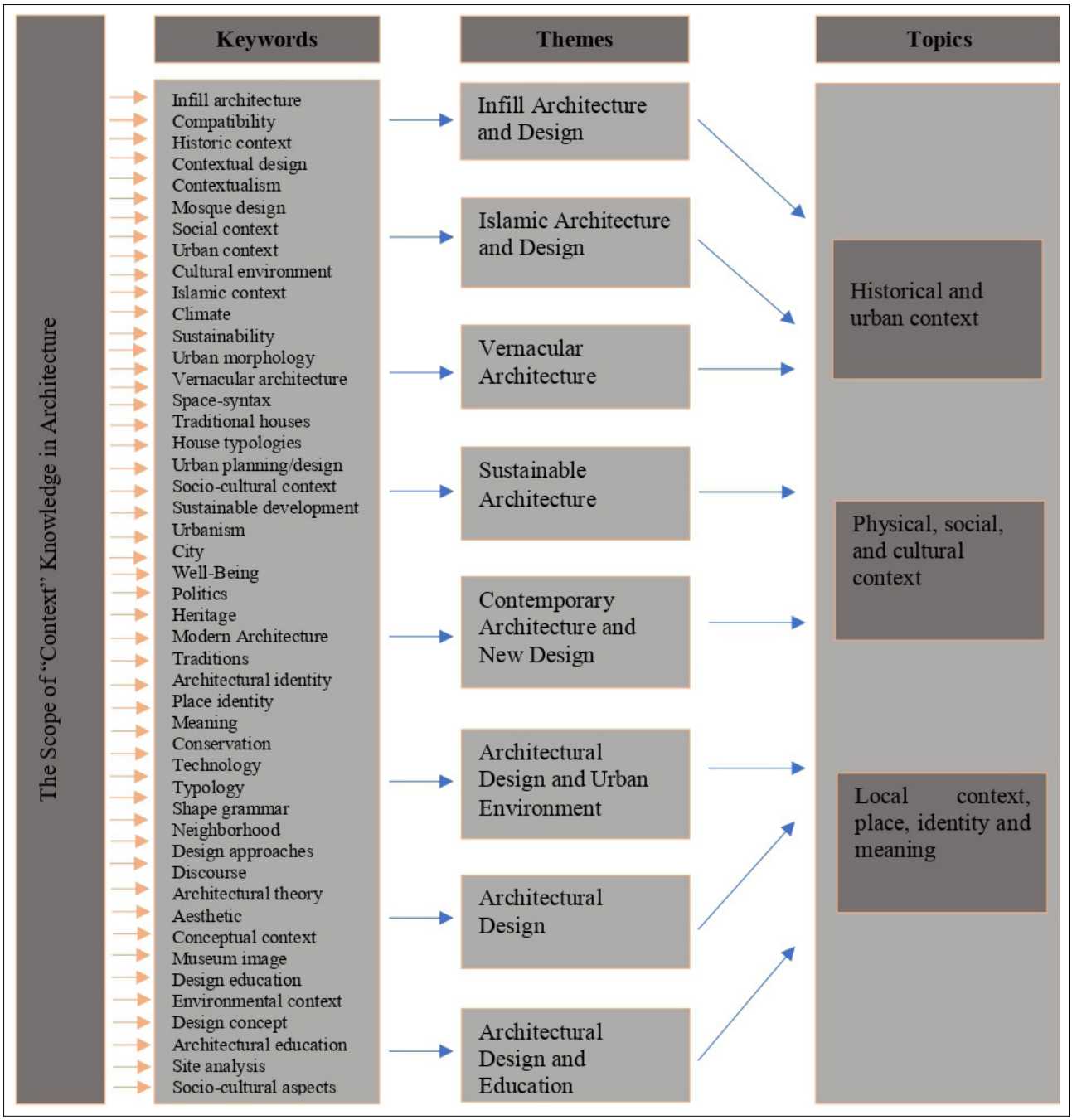

Figure 7. Scope of current research on context in architecture.

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Article

An analysis of comparative studies on embodied carbon and embodied energy assessment of tall building structures

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ABSTRACT

High-rise building construction can lead to a "carbon spike," which refers to excessive carbon emissions resulting from the massive use of structural materials during building production. Furthermore, the embodied carbon (EC) and embodied energy (EE) of buildings are gaining significance, considering the improvement in the operational energy performance of new buildings. Therefore, early design decisions regarding the structural system selection of tall buildings significantly affect the carbon footprint. Previous studies investigated the EC and EE of tall building structures using the life cycle assessment (LCA) approach. The effects of various design parameters on EC and EE are compared. Nevertheless, inconsistencies inherent to the LCA approach and variations in structural design methods used in these studies may lead to incompatibilities in the results. This study examines existing research on the EC and EE of tall building structures through a systematic literature review. The scope, materials, and methodologies employed in the literature are scrutinized to identify current gaps. Results from various scenarios are analyzed regarding specific design parameters, such as building height, structural material use, type of the structural system, and structural components, to identify patterns in reported EC and EE. To enhance the comparability of the findings, further research that adopts a consistent approach is required to explore the EC and EE of tall building structures.

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INTRODUCTION

The urgent need to mitigate the impacts of climate change was most recently addressed at the UN COP26 conference, where countries made commitments to take immediate actions to reduce greenhouse gas emissions. According to the latest report published by the UN Environment, the International Energy Agency (IEA), and the Global Alliance for Buildings and Construction (GABC), 37% of total global energy-related carbon emissions belong to

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the building sector in 2021 (United Nations Environment Programme, 2022). Thus, the construction industry has a substantial potential for mitigating carbon emissions as a major contributor to global emissions. A building is a complex product with a long life, leading to environmental impacts throughout its life. For a comprehensive and systematic environmental impact assessment of a building throughout its lifetime, the life cycle assessment (LCA) is one of the most recognized methodologies (Cabeza et al., 2021). LCA is a method employed to measure the environmental performance of materials, products, and buildings. According to the LCA method, a building's life comprises six main stages: raw material extraction, manufacturing, construction, operation and maintenance, demolition and disposal, reuse, and recycling (Crawford, 2011). In addition, the life cycle stages of buildings are identified in detail in EN 15978 (CEN, 2011) as product stage (A1-A3) including raw material extraction (A1), transportation (A2), and manufacturing (A3), construction stage (A4-A5), use stage (B1-B7), end of life stage (C1-C4), and benefits and loads beyond the system boundary (D). Life cycle methodology is developed within the ISO 14040 framework, and it includes four phases: goal and scope, life cycle inventory, life cycle impact assessment, and interpretation (International Organization for Standardization ISO, 2006). Life cycle inventory analysis (LCI) is one of the most significant processes that involves data compilation incorporating various LCI methods (such as process based, economic input–output, or hybrid), and measuring the inputs and outputs of a product over its entire lifespan.

According to the literature, embodied impacts play a substantial role in the global emissions originating from buildings (Cabeza et al., 2021). Embodied carbon (EC) refers to the cumulative carbon emissions from fuel and process-related sources, whereas embodied energy (EE) denotes the overall primary energy consumption resulting from both direct and indirect processes linked to a product or service within the ICE Database. EE accounts for all energy inputs, regardless of its source, such as renewables. Nevertheless, when quantifying EC, no greenhouse gases are produced through the use of renewable sources. Similarly, net carbon estimations may factor in carbon sequestration, which does not impact the EE of a building.

Although a building uses energy and produces carbon emissions throughout its life, scientific research mainly concentrates on operational energy use and, more recently, related carbon emissions (Röck et al., 2020). Nevertheless, Helal et al. (2018) emphasized that the designers should take action promptly to decrease carbon emissions in the short term, which generally corresponds to a 50-year working life of buildings. Instead, they should directly focus on mitigating carbon emissions starting from the building construction phase. In fact, there is a recent shift in the scientific community toward the embodied impacts of buildings and associated carbon emissions (Azari and Abbasabadi, 2018; Baek et al., 2013; Paya-Zaforteza et al., 2009; Sartori and Hestnes, 2007; Thormark, 2002).

Elnimeiri and Gupta (2008) emphasized the significance of tall building design since tall buildings consume vast resources, especially in the construction and operation stages. Over the last century, energy efficiency in the operational phase of tall buildings has become a prevalent issue owing to their typological evolution (Oldfield et al., 2009). As buildings progressively enhance their energy efficiency, the share of their embodied impacts increases (Gustavsson and Joelsson, 2010; Optis and Wild, 2010; Sartori and Hestnes, 2007). Besides, as the building height increases, the structural material use relatively increases due to the exponential growth of lateral loads. Therefore, the materials used in the structural elements of a building are the major contributors to the overall EC emissions (Moncaster et al., 2018). Due to higher wind sensitivity in tall buildings, the structural material use per unit floor area and the EC become relatively higher than in low-rises (Azari and Abbasabadi, 2018). Treloar et al. (2001) demonstrated that the EC per gross floor area (GFA) of high-rise buildings is almost 60% more than that of low-rise ones.

The number of studies on the LCA of low-rise buildings almost doubled that of high-rise ones (Bahramian and Yetilmezsoy, 2020). Azari and Abbasabadi (2018) also indicated the neglect in the current literature on the embodied impact assessment of tall buildings. Besides, there are incompatibilities in the methods of these studies, which is highlighted by (Trabucco et al., 2015; Bahramian and Yetilmezsoy, 2020; Helal et al., 2020). In this study, the comparative studies on the LCA of tall building structures are critically assessed in terms of their scope, materials and methods, and comparative building design parameters (i.e., building height, the type of the structural system, structural materials, and structural components). Despite the shared similarities in the results, the findings of these studies do not provide a comprehensive framework for the early design stage of a tall building. Helal et al. (2019) also emphasized the necessity of a comprehensive framework for the environmental impact assessment of tall building structural systems. Thus, a consistent approach is required to evaluate the effects of various design parameters for the embodied impact assessment of tall building structures. Table 1 illustrates the nomenclature employed in this paper.

METHODOLOGY

The main objective of this research is to scrutinize the comparative studies on the EC and EE of tall building structures via a systematic literature review. The review is conducted by searching in Web of Science and Scopus

Table 1. Nomenclature used in this paper

ABS	Australian Bureau of Statistics
ACI	American Concrete Institute
AIK	Architectural Institute of Korea
AISC	American Institute of Steel Construction
ASCE	American Society of Civil Engineers
AusLCI	Australian National Life Cycle Inventory Database
CLT	Cross laminated timber
DL	Dead load
EC	Embodied carbon
EE	Embodied energy
EGHG	Embodied greenhouse gas emissions
EL	Earthquake load
EPIC	Environmental Performance in Construction
GABC	Global Alliance for Buildings and Construction
GFA	Gross floor area
GWP	Global warming potential
HKBD	Hong Kong Building Department
HKEPD	Hong Kong Environmental Protection Department
ICE	Inventory of Carbon and Energy
IEA	International Energy Agency
KEITI	Korea Environmental Industry & Technology Institute
LCA	Life cycle assessment
LCI	Life cycle inventory
LL	Live load
NFA	Net floor area
PV	Photovoltaic panel
RC	Reinforced concrete
SEI	Structural Engineering Institute
SRC	Steel reinforced columns
UN	United Nations
UNEP	United Nations Environmental Programme
WL	Wind load

databases using the following keyword combinations: ("embodied energy" or "embodied carbon") and ("tall buildings" or "high-rise buildings"). In total, twenty-two studies on the LCA of tall buildings are identified by excluding which are not relevant to the scope of this study. Six of them (Bohne et al., 2017; Drew et al., 2014; Helal et al., 2019; Oldfield, 2012; Trabucco, 2011; Zhao and Haojia, 2015) are conference proceedings, and one of them (Trabucco et al., 2015) is a research report. The rest of the studies (Cho et al., 2012; Choi et al., 2016; Fakıoğlu Gedik and Ay, 2023; Foraboschi et al., 2014; Gan, Chan et al., 2017; Gan, Cheng et al., 2017; Helal et al., 2020; Hens et al., 2021; Kofoworola and Gheewala, 2009; Li et al., 2019; Mavrokapnidis et al., 2019; Moussavi Nadoushani and Akbarnezhad, 2015; Resch et al., 2016; Trabucco and Belmonte, 2021; Treloar et al., 2001) are published in peer-reviewed scientific journals.

Firstly, the 22 studies on the LCA of tall buildings are evaluated in terms of their scope. Then, the findings of the seventeen comparative studies on the embodied impact assessment of tall building structures (Treloar et al., 2001; Cho et al., 2012; Drew et al., 2014; Foraboschi et al., 2014; Moussavi Nadoushani and Akbarnezhad, 2015; Trabucco et al., 2015; Zhao and Haojia 2015; Choi et al., 2016; Bohne et al., 2017; Gan, Chan et al., 2017; Helal et al., 2019; Li et al., 2019; Mavrokapnidis et al., 2019; Helal et al., 2020; Hens et al., 2021; Trabucco and Belmonte, 2021; Fakıoğlu Gedik & Ay, 2023) are examined according to their materials and methods and building design parameters. The methodology of the paper is demonstrated in Figure 1.

ANALYSIS OF THE FINDINGS REGARDING SCOPE, MATERIALS AND METHODS, AND BUILDING DESIGN PARAMETERS

In this section, the existing studies on the LCA of tall building structures are examined according to their scope, materials and methods, and building design parameters. The materials and methods of these studies are categorized based on their LCA and structural design approaches, whereas the building design parameters incorporate the relationships between the building height, structural material, structural system types, and structural components with respect to the EC and EE.

Scope

There are differences in the scope of the existing studies on the LCA of tall building structures. Most of the existing studies (17 comparative studies) focused on comparing specific building design parameters such as building height, structural materials, and structural components (Tables 1-3). For example, Oldfield (2012) and Kofoworola and Gheewala (2009) compared the share of buildings' operational and embodied energy and carbon, respectively. On the other hand, Trabucco (2011), Gan, Chan et al.

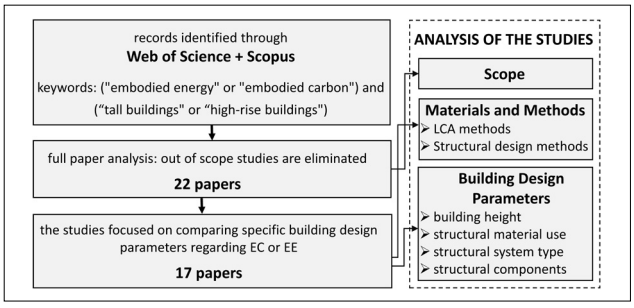

Figure 1. Flowchart of the methodology: the systematic review and the analysis of the selected studies.

(2017), and Helal et al. (2019) focused on the methods used for the LCA of tall building structures. Unlike the others, Resch et al. (2016) focused on the urban scale and investigated the environmental impacts of building height at an urban scale, considering the transportation and road infrastructure energy.

The seventeen comparative studies on the LCA of tall buildings are focused on EC, EE, or both. Trabucco (2011), Kofoworola and Gheewala (2009), Foraboschi et al. (2014), Resch et al. (2016), and Treloar et al. (2001) focused on only the EE of buildings. In contrast, Drew et al. (2014), Zhao and Haojia (2015), Choi et al. (2016), Gan, Cheng et al. (2017), Gan, Chan et al. (2017), Helal et al. (2019), Helal et al. (2020), and Hens et al. (2021) focused on only the EC. Cho et al. (2012), Moussavi Nadoushani and Akbarnezhad (2015), Trabucco et al. (2015), Li et al. (2019), and Mavrokapnidis et al. (2019) examined both EC and EE of tall buildings.

The majority of the reference buildings used in the selected studies are existing buildings (Treloar et al., 2001; Trabucco et al., 2015; Zhao and Haojia, 2015; Oldfield 2012; Kofoworola and Gheewala, 2009; Cho et al., 2012; Drew et al., 2014; Foraboschi et al., 2014; Helal et al., 2019; Moussavi Nadoushani and Akbarnezhad, 2015; Gan, Cheng et al., 2017; Mavrokapnidis et al., 2019; Bohne et al., 2017; Choi et al., 2016). The rest of the eight studies used hypothetical building models. Another difference among the existing studies is the functional use of buildings. For example, four studies used residential building examples (Cho et al., 2012; Drew et al., 2014; Resch et al., 2016; Trabucco and Belmonte, 2021), and in eight of these studies, buildings with office functions are used (Fakıoğlu Gedik and Ay, 2023; Helal et al., 2020; Kofoworola and Gheewala, 2009; Oldfield, 2012; Trabucco et al. 2015; Trabucco and Belmonte, 2021; Treloar et al., 2001; Zhao and Haojia, 2015). The functional use of the buildings is not indicated in ten studies (Bohne et al., 2017; Choi et al., 2016; Foraboschi et al., 2014; Gan, Chan et al., 2017; Gan, Cheng et al., 2017; Helal et al., 2019; Hens et al., 2021; Li et al., 2019; Mavrokapnidis et al., 2019; Moussavi Nadoushani and Akbarnezhad, 2015).

Materials and Methods

There are variations and inconsistencies between the LCA and structural design methods of the existing studies on EC and EE of tall building structures. Bahramian and Yetilmezsoy (2020) presented a detailed review of the LCA of high-rise buildings by introducing the differences in the life cycle inventory (LCI) compilation methods (either process-based, economic input–output, or hybrid). In addition, Helal et al. (2020) also identified five comparative studies on the existing literature on LCA of tall building structural systems and underlined the discrepancies and incompleteness in the approaches to both structural design and the LCA. The following sections present the disparities in LCA and structural design approaches.

LCA Methods

Many studies underlined the inconsistencies and variations in the literature related to EC calculation methods in buildings (Abd Rashid and Yusoff, 2015; Azari and Abbasabadi, 2018; Chau et al., 2012; Dixit et al., 2010, 2012; Shadram et al., 2016; Simonen et al., 2017). Some of the common reasons for the variation of EE calculations presented in these studies are the broad variation in system boundaries, using different LCI compilation methods (process-based LC, input-output LCA, or hybrid LCA), differences in the geographic location of a study, and variation in the data sources and low data quality. The inconsistencies inherent to the LCA method also exist in the studies on the embodied impact assessment of tall building structures as presented in Table 2. In fact, the system boundaries are not even indicated in some of the studies. Furthermore, there is no consensus on the functional units either, which can impede the comparability of the results (Table 2). According to Table 2, almost all studies except Cho et al. (2012) utilized databases rather than software tools for the embodied impact assessment. The UK-based Inventory of Carbon and Energy (ICE) database is the most frequently used database, followed by the Environmental Performance in Construction (EPIC) database from Australia.

Structural Design Methods

In this study, the structural design methods refer to the structural design loads, related specifications, and structural software tools used in the selected studies, as presented in Table 3. Treloar et al. (2001) investigated the existing buildings, so structural analysis was not performed. The structural design methods are not transparent in some studies (Drew et al., 2014; Trabucco et al., 2015; Trabucco and Belmonte, 2021) since no detailed information is given regarding the structural design and analysis.

Depending on the geographic location, buildings taller than 30–40 storeys are more sensitive to wind-induced loads (Momtaz et al., 2017). All of the studies in Table 3 considered the effects of wind loads on the structural design except Moussavi Nadoushani and Akbarnezhad (2015). However, the wind load can be insignificant since the maximum height of the alternative buildings is only 15 storeys. Unlike the wind loads, most of the studies in Table 3 neglected the effects of seismic loads (Cho et al., 2012; Foraboschi et al., 2014; Bohne et al., 2017; Gan, Chan et al., 2017; Hens et al., 2021; Mavrokapnidis et al., 2019). Nevertheless, the structural models should be analyzed and checked considering all the load combinations described in the codes and specifications rather than the most demanding scenario.

Helal et al. (2020) investigated the effects of static wind, static earthquake, and dynamic earthquake on the carbon emissions of tall building structures. The research indicates

Table 2. Inconsistencies in the LCA methods

Authors/year of the study	Life-cycle stages	Functional unit	LCA databases and software tools	Geographic location
Treloar et al. (2001)	not indicated	GJ/m² (GFA)	based on Treloar (1997) (hybrid LCI)	Australia
Cho et al. (2012)	not indicated	$kgCO_{2eq}/m^2$ (GFA)	SBTool (process-based LCI)	Korea
Drew et al. (2014)	A1-A3	tCO_2	ICE Database, Athena Institute (process-based LCI)	Chicago, USA
Foraboschi et al. (2014)	A1-A3	MJ/m² (NRA)	ICE Database (process-based LCI)	Australia
Moussavi Nadoushani and Akbarnezhad (2015)	A1-A3, A4, A5	$kgCO_{2eq}/m^2$	ICE Database (process-based LCI)	Atlanta, USA
Trabucco et al. (2015)	A1-D	tCO_{2eq}	EcoInvent, Wordsteel databases, BETIE and various US EPDs (process-based LCI)	Chicago, USA
Zhao and Haojia, (2015)	A1-A3	tCO_2	ICE Database (process-based LCI)	China
Choi et al. (2016)	not indicated	$kgCO_2/m$ (m denotes the unit length of the column)	KEITI 2016 (process-based LCI)	Korea
Bohne et al. (2017)	A1-A3	$kgCO_{2eq}/m^2$	based on Kaspersen et al. (2016) (SimaPro, EPDs)	not indicated
Gan, Chan et al. (2017)	A1-A3, A4	$kgCO_{2eq}/m^2$ GFA	A1-A3: The formula proposed by Gan, Cheng et al. (2017) is used. 4: HKEPD 2008 (process-based)	Hong Kong
Helal et al. (2019)	not indicated	$kgCO_2$-e/m² GFA $kgCO_2$-e per capita	AusLCI - process data ABS – input–output tables Australian National Greenhouse Gas Inventory (DEE 2015) - GHG emission data (hybrid LCA)	South Korea
Li et al. (2019)	A1-A3 (the carbon in the atmosphere absorbed by trees included)	tCO_2	AusLCI, EPDs of Structurlam (from North America)	Australia

that the static linear analysis of seismic loads results in the overestimation of structural materials compared to that of dynamic linear analysis. Nevertheless, further investigation is required for buildings over 30 storeys to verify this statement. Another statement is that static wind and dynamic earthquake loads can result in up to a 22% increase in EC emissions per NFA for a 50-storey building. Thus, the variation in design loads can substantially impact the EC emissions of high-rise buildings.

Building Design Parameters

The main contributions of the comparative studies on the EE or EC of tall building structures are presented in Table 4. In these studies, the parameters regarding building design, such as the building height, structural systems, structural materials, structural components, and structural loads, are investigated in terms of their effect on the EE or EC.

Building Height

The current literature evaluates a wide range of building heights regarding the EC and EE of tall building structures. As indicated in Figure 2, the number of studied buildings decreases as the building height increases, except for the buildings with 60–70-storey height. Only five buildings are studied that are taller than 120 storeys. Furthermore, there are only nine supertall buildings (+300m).

Table 3. Inconsistencies in the structural design methods

Authors/year of the study	Structural software tool	Structural design loads	Related specifications on structural design
Treloar et al. (2001)	not indicated	not applicable	not applicable
Cho et al. (2012)	not indicated	DL: 3.8 kN/m², LL: 1.7 kN/m², WL: applied, EL: not applied	not indicated (but the buildings are assumed to be in Korea)
Drew et al. (2014)	Neither the structural method nor the loads are indicated by stating that structural engineers identify the dimensions of structural components.		
Foraboschi et al. (2014)	not indicated	DL: 2.5 kN/m², LL: 3 kN/m², Façade load: 4kN/m, WL: applied, EL: not applied	Eurocode 1
Moussavi Nadoushani and Akbarnezhad (2015)	ETABS	DL: 2.1 kN/m² for composite and 2.8 kN/m² for concrete floors, LL: 1.7 kN/m², Super-imposed DL: 3.6 kN/m², EL: applied, WL: not applied	AISC Seismic Provisions ASCE7-05, AISC360-10, ACI 318-08
Trabucco et al. (2015)	Neither the structural method nor the loads are indicated by stating that structural engineers identify the dimensions of structural components.		
Zhao and Haojia (2015)	not indicated	not indicated	not indicated
Choi et al. (2016)	not indicated	WL: applied but not indicated, EL: applied but not indicated	ACI 2008, AISC 201, AIK 2010
Bohne et al. (2017)	not indicated	DL: not indicated, LL: 2.4 kN/m², WL: applied, EL: not applied	Norwegian engineering consultancy company
Gan, Chan et al. (2017)	ETABS	DL: 4.55 kN/m², LL: 4 kN/m², Façade load: 8 kN/m, WL: applied, EL: not applied	The codes and standards for high-rise buildings in Hong Kong are used (HKDB 2011, 2004a; HKDB, 2004b; HKBD 2013)
Helal et al. (2019)	not indicated	WL: applied but not indicated, EL: applied but not indicated	not indicated
Li et al. (2019)	Space Gass 12.6	DL: applied but not indicated, LL: applied but not indicated, WL: applied (dynamic load), EL: applied (equivalent static analysis)	AS1170.0 (Australian Standards) AS3600-2009 (RC standards)
Mavrokapnidis et al. (2019)	ETABS	DL: applied but not indicated, LL: applied but not indicated, Super-imposed DL: applied but not indicated, WL: applied but not indicated, EL: not applied	Eurocode 1

Table 3. Inconsistencies in the structural design methods (Cont.)

Authors/year of the study	Structural software tool	Structural design loads	Related specifications on structural design
Helal et al. (2020)	ETABS	LL: 2 kN/m^2, Super-imposed DL: 1 kN/m^2, Facade loads: 3.5 kN/m, WL: applied, EL: applied (both static and dynamic linear analyses are performed)	Australian Standard AS1170.1:2002 Structural design actions
Hens et al. (2021)	Karamba3D in Grasshopper and Python code	Super-imposed DL: 2.06 kN/m^2, Facade load: 0.57 kN/m^2, LL: 3.83 kN/m^2, WL: 1.92 kN/m^2, EL: not applied	ASCE 7-10
Trabucco and Belmonte (2021)	Neither the structural method nor the loads are indicated by stating that structural engineers identify the dimensions of structural components.		
Fakuoğlu Gedik and Ay (2023)	ETABS	DL: applied but not indicated Super-imposed DL: 3.5 kN/m^2, LL: 2.4 kN/m^2, WL: applied, EL: applied (equivalent static analysis)	ASCE/SEI 7-16

Considering the growing concerns about the environmental impact of tall buildings, determining the optimal building height regarding carbon emissions becomes a prevalent research question. Treloar et al. (2001), Drew et al. (2014), Foraboschi et al. (2014), Bohne et al. (2017), and Gan, Chan et al. (2017) investigated premium building height in terms of carbon savings. According to Bohne et al. (2017), the optimum building height is between 10 and 20 storeys for reinforced concrete (RC), steel, and timber structures in terms of mitigated EC. Yet, buildings over 21 storeys are not investigated in the study. Foraboschi et al. (2014) stated that there is an upward trend in the EE per NFA of tall buildings as the building height increases. In contrast, there is a convex trend in EC per GFA of tall buildings according to the study of Gan, Chan et al. (2017), demonstrating a premium for height in terms of EC for various structural systems ranging between 50 and 90 storeys. Drew et al. (2014) have a broad perspective and evaluated the carbon emissions of buildings based on their height on the urban scale. According to the research, 34 and 58-storey buildings perform best in terms of carbon saving where the land saved for electricity generation from PV panels is concerned. Resch et al. (2016) conducted a similar study focusing on the environmental impacts of high-rise developments in cities regarding EE and lifetime energy. The height of the buildings range between 3 and 60 storeys, and the unitary EC emissions of materials are obtained from previous literature. The results showed that the optimum building height is between 7 and 27 storeys, depending on the city's population and the building's lifetime. Thus, the optimum building height depends on the scope of the research, system boundaries, and various other parameters. There is no consensus in the existing literature on the optimum building height considering the embodied impacts.

Structural Material Use

Mainly four structural materials are examined in the existing literature regarding EE or EC: RC, steel, composite (steel and RC), and timber. Due to its relatively low carbon footprint, timber became a popular structural material for tall buildings as an alternative to RC and steel. Bohne et al. (2017) stated that the EE of timber structures is considerably lower than the RC and steel structures: the EE of a 20-storey timber building is approximately 25% that of the RC and the steel buildings, even if the net carbon storage of the timber is excluded. However, if carbon storage is included, negative emissions (approximately 600 kgCO2 per square meter of a building) can be gained from timber buildings. Li et al. (2019) investigated the embodied impacts of structural timber for a 43-storey building. The results are interestingly different from the study of Bohne et al. (2017); although the timber alternative has the lowest EC, the EE of the timber alternative is greater than the RC alternative.

Despite the increasing popularity of timber as a structural

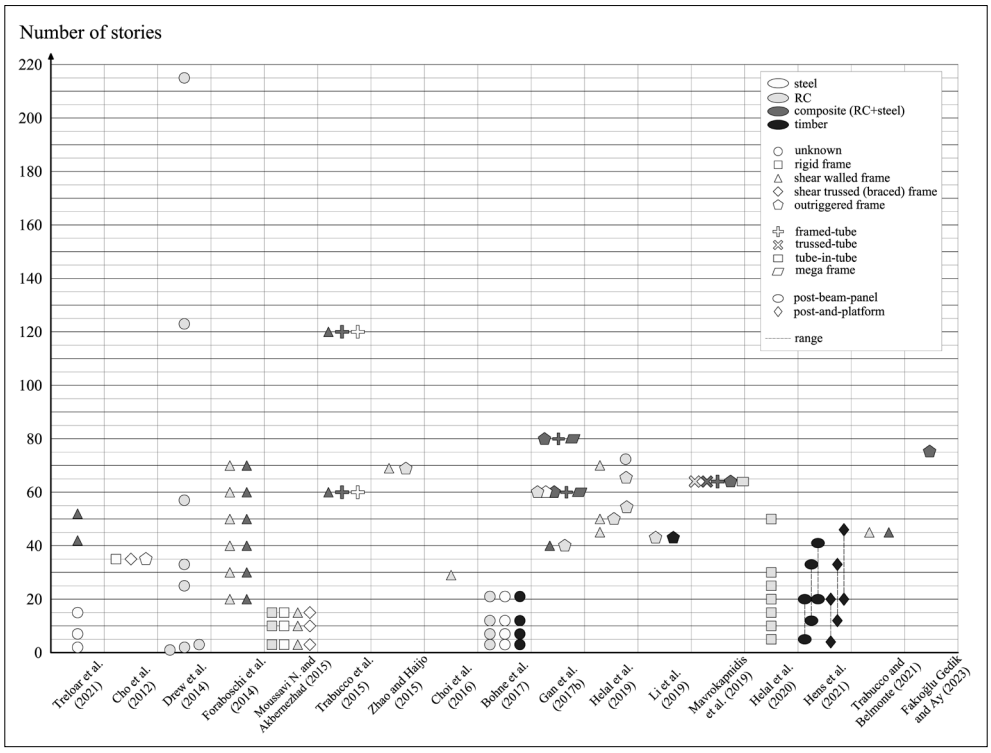

Figure 2. Building models according to their height, structural system, and material.

material, RC and steel still dominate the building industry and scientific research. According to the literature review of Bahramian and Yetilmezsoy (2020) on EE of high-rise buildings, only 3 of the 28 studies investigated timber as a structural material. Many of the studies compared the effects of RC and steel structures in terms of EC or EE depending on the building height and the type of the structural system (Foraboschi et al., 2014; Gan, Chan et al., 2017; Mavrokapnidis et al., 2019; Moussavi Nadoushani and Akbarnezhad, 2015; Trabucco et al., 2015; Trabucco and Belmonte, 2021; Zhao and Haojia, 2015). According to these studies, RC buildings consume less EC and EE per GFA than steel buildings for various structural systems whose height ranges between 3 and 60 storeys. However, Trabucco et al. (2015) indicated that a composite diagrid building is better than RC alternatives in terms of global warming potential for a 120-storey building. More research is required for buildings ranging from 60 to 120 storeys to clarify the effects of RC and steel on EC.

The amount of recycled content, manufacturing technologies, and material strengths are critical parameters when comparing the EC and EE of RC and steel structures. Although RC structures are commonly accepted as less carbon-intensive when compared to steel structures, the amount of recycled content can change the results (Zhao and Haojia, 2015; Gan, Chan et al., 2017; Mavrokapnidis et al., 2019). For instance, according to Gan, Chan et al. (2017), a 60-storey steel building is less carbon-intensive than the RC alternative when the recycled content of steel is <70% and 100% Portland cement is used. Similarly, Zhao and Haojia (2015) indicated that when the recycling rate of steel is above 70%, and 15% fly ash concrete is used, the 69-storey building with two outrigger levels becomes less carbon-intensive than the RC alternative. Although the system boundaries of both studies and data sources are different, as indicated in Table 2, there is a critical point in the recycled content percentage of steel where steel buildings produce less EC than RC alternatives, depending on the recycled content of concrete and building height.

The manufacturing processes of steel are an essential factor that has a substantial impact on both the quantity of recycled scrap and the associated EC emissions (IEA, 2007). For example, the amount of recycled steel scrap is limited to 30% for blast furnace-basic oxygen furnace, whereas steel containing 100% scrap can be produced with an electric arc furnace (Gan, Chan et al. 2017). Zhao and Haojia (2015) contributed that as the recycling content of steel increases, in addition to the developments of steel-making techniques, steel buildings with high recycled contents will be more common due to increasing economic and environmental advantages.

Using high-strength materials substantially reduces EC emissions of tall buildings (Choi et al. 2016; ASCE Carbon Task Group 2017). For example, Choi et al. (2016) proposed that choosing composite columns, namely the steel-reinforced concrete (SRC) columns rather than conventional RC columns, substantially decreases the

Table 4. The main findings of the existing studies

Authors/year of the study	Main contributions
Treloar et al. (2001)	The EE per unit GFA of 42 and 52-storey buildings is 60% more than the others.
Cho et al. (2012)	The least amount of EE and associated EC emissions per unit area belongs to chevron bracing, followed by X bracing, outriggered frame, and rigid frame system, respectively.
Drew et al. (2014)	34 and 58-storey buildings perform best in terms of carbon saving by using the land saved for electricity generation from PV panels.
Foraboschi et al. (2014)	1. Reinforced concrete (RC) frames consume less EE than steel frames.
	2. The majority of the EE almost always belongs to the floors compared to other structural components.
	3. The lowest EE is consumed by RC slabs and followed by lightweight floor systems and steel-concrete floors.
Moussavi Nadoushani and Akbarnezhad (2015)	When only the EC at A1-A3, A4, and A5 stages are considered, RC structures are less carbon-intensive; however, when life-cycle carbon emissions are considered, steel structures are less carbon-intensive.
Trabucco et al. (2015)	1. 60-storey RC buildings have the highest GWP and cradle-to-grave EE among the other 60-storey alternatives with no recycled content.
	2. 120-storey composite diagrid building has the lowest GWP and cradle-to-grave EE among the other 120-storey alternatives with no recycled content.
Zhao and Haojia (2015)	RC shear frame system has the least EC compared to outriggered frame systems because of the limited steel recycling rates in China.
Choi et al. (2016)	1. SRC columns are more advantageous in carbon emissions than RC columns.
	2. Increasing material strength and cross-sectional area of steel shape rather than concrete is a better strategy in a composite structure for reducing carbon emissions.
Bohne et al. (2017)	1. Timber structures have far less EE than steel and concrete, even the carbon capture is not included.
	2. Optimum building height is 10–20 storeys for each alternative.
Gan, Chan et al. (2017)	1. Among the 60-storey buildings with RC, composite, and steel structures, the RC alternative is less carbon-intensive (EC/GFA) when no recycling content is included. However, the EC of alternative models changes as the ratio of the recycled content of steel and RC increases.
	2. Optimal building height in terms of minimum EC ranges between 50 and 90 storeys for the compared structural systems.
Helal et al. (2019)	1. Triangular floor plan configuration has lower embodied greenhouse gas (EGHG) per GFA than the rectangular configuration.
	2. A new functional unit is introduced: EGHG per capita (person).
	3. Steel reinforcement constitutes most of the EGHGE despite its relatively smaller volume.
Li et al. (2019)	1. EE of CLT is much higher than concrete; thus, all timber alternatives (except the RC core) have the highest EE among the three alternatives.
	2. Unlike EE, EC of the all-timber alternative is the lowest (indeed has negative carbon emissions) among the others.
Mavrokapnidis et al. (2019)	The EC emissions of the five structural systems are sorted from lowest to highest as RC trussed tube, RC tube-in-tube, steel diagrid, steel trussed tube, and steel outriggered frame.
Helal et al. (2020)	The EGHGE of structural systems can be influenced by as much as 22% due to the structural design techniques and the magnitude of structural loads.
Hens et al. (2021)	The post-beam-panel system exhibits a greater EC compared to the post-and-platform system, and this gap widens as the building height increases.
Trabucco and Belmonte (2021)	RC alternatives are the best regarding EE, EC, and cost, whereas the steel alternatives have the highest EE, EC, and cost.
Fakıoğlu Gedik and Ay (2023)	Reducing the structural core increases the cumulative EC, whereas surrounding outriggers with belt trusses increases the structural efficiency, and less EC can be obtained compared to a relatively larger structural core.

EC of columns (43% EC reduction) for a 29-storey core-frame building. Tall building construction requires high-performance materials such as composite materials, high-strength concrete, and pre-stress tendons, which are not commonly required for conventional building design (Gan, Cheng et al. 2017). The EC factors of these high-performance materials differ from conventional structural materials, yet they are commonly overlooked in the current literature. Gan, Cheng et al. (2017) investigated the EC factors of commonly used structural materials in tall building design.

Gan, Cheng et al. (2017) investigated the share of EC (A1-A3 and A4 phases) produced by concrete (%35 fly ash), structural steel, and steel reinforcement (no recycled content in structural steel and rebar) in a 60-storey high-rise building with outriggered frame system. The results show that although the mass of concrete, structural steel, and reinforcement are 82%, 12%, and 6%, the EC of those materials is 17%, 54%, and 27%, respectively. Thus, the EC of reinforcing bars is much greater than the concrete in contrast to its relatively small weight. Zhao and Haojia (2015) also analyzed the amount of EC produced by rebar, structural steel, and concrete for three different structural systems for a 69-storey building. The EC share of concrete, structural steel, and reinforcement in RC shear frame structural systems is approximately 52%, 12%, and 36%, respectively. On the other hand, in outriggered frame systems, their respective contributions are around 28%, 54%, and 18%. In the study by Gan, Cheng et al. (2017), the EC share of rebar in outriggered frame systems is higher than Zhao and Haojia (2015). Nevertheless, the variation can be clarified by the usage of recycled scrap (38%) in rebars and also the lower amount of recycled content (15% fly ash) in concrete by Zhao and Haojia (2015). Unlike the EC contribution of reinforcing bars, the EC share in structural steel is quite similar in both studies (Gan, Cheng et al., 2017; Zhao and Haojia, 2015) despite the differences in LCA data sources as indicated in Table 2.

Type of the Structural System

Diverse structural system categorizations for tall buildings are utilized in practical applications and within academic discourse (Ilgın et al., 2021). Günel and Ilgın (2014) proposed a rather comprehensive classification system and categorized the tall building structural systems as rigid frame systems, flat plate/slab systems, core systems, shear wall systems, shear-frame systems (shear trussed/braced frame and shear walled frame), mega column (mega frame, space truss) systems, mega core systems, outriggered frame systems, and tube systems. The selected studies also used different names to refer to tall building structural systems. To address this, the classification system proposed by Günel and Ilgın (2014) is used to define tall building structural systems in Table 3. Nevertheless, Treloar et al. (2001) Drew et al. (2014), and Choi et al. (2016) conducted their studies regardless of the type of the structural system, even if it directly affects the EC emissions.

According to the study by Mavrokapnidis et al. (2019), the EC emissions of a 192-meter building with outriggered frame system are greater than steel trussed tube, steel diagrid, RC tube-in-tube, and RC trussed tube. Similarly, Zhao and Haojia (2015), the RC shear frame system produces less EC than the outriggered frame system for a 69-storey building. Although lateral loads are critical for the structural design of tall buildings, they are not discussed in the research conducted by Zhao and Haojia (2015), as indicated in (Table 3). Furthermore, in contrast to Zhao and Haojia (2015), Gan, Chan et al. (2017) indicated that outriggered frame system is the best alternative to minimize EC emissions compared to a tube-in-tube and mega-frame system for a 60-storey height building. Nevertheless, for 80-storey and 100-storey buildings, the lowest EC emissions are produced by the mega-frame system (Gan, Chan et al., 2017).

Cho et al. (2012) indicated that the chevron-braced structural system's EE per unit area is lower than the X-braced one. Hens et al. (2021) investigated two different structural systems for tall timber buildings: the post-beam-panel and post-and-platform systems. They concluded that the latter has lower EC than the prior for buildings with varying heights (40–140 meters). Through extensive research, Gan, Chan et al. (2017) demonstrated the optimum height for tall buildings regarding EC for various structural systems. Finally, Fakıoğlu Gedik and Ay (2023) investigated the effect of structural core on EC emissions of tall buildings. Although the cumulative carbon emissions increase by reduced core size, the EC per unit area can be decreased by increasing the structural efficiency.

Structural Components

Gan, Chan et al. (2017) categorized the structural system of a tall building as (i) the lateral load-resisting system composed of core walls, columns, and outriggers, (ii) the floor framing system composed of floor slabs and beams, and (iii) the foundation. According to the study, the EC share of the lateral load-resisting system of a 60-storey outriggered frame building is around 70-80% for the floor slabs, 16–25% for the beams, and 2–5% for the foundation. Zhao and Haojia (2015) also examined the amount of EC production according to the structural components for a 69-storey building with alternative structural systems (Table 3). The share of EC is roughly 25% for walls, 22% for columns, 37% for beams, 15% for slabs, and 1% for outriggers. Foraboschi et al. (2014) emphasized the significance of the floor type on the total EE of a tall building structure. They indicated that the EE of the floor slabs and beams ranges from 34.7% to 78%, depending on the floor type, materials, and building height.

According to the study of Mavrokapnidis et al. (2019), the

EC share of building components varies depending on the type of structural system. For instance, the EC share of the lateral load resisting system and the floor framing system are almost equal for RC tube in tube, RC braced tube, steel braced tube, and outriggered frame 64-storey building alternatives. In contrast, the EC share of the lateral load resisting system in the diagrid building is much higher than that of the floor framing system. Despite the variations in the existing studies on the EC or EE share of structural components, floor type is a significant component for the embodied impact assessment of tall buildings (Table 5). Furthermore, Gan, Chan et al. (2017) stated that as building height increases, the EC attributed to the columns and core walls experiences exponential growth, primarily due to the growing impact of wind loads.

DISCUSSION

The scope, materials, and methods of the current literature on EC and EE of tall buildings are investigated in this study. Then, studies comparing the embodied impacts of specific building parameters for tall building structures are analyzed regarding their LCA and structural design methods. Although some variations are inherent to the LCA method, system boundaries, and geographic locations are not indicated in some cases, as shown in Table 2. Another significant problem in the existing studies is the lack of transparency, variations, and uncertainties in the structural design methods, as indicated in Table 3. Furthermore, while some studies establish a lateral deflection limit, others do not provide a precise method for ensuring structural equivalency among different models.

Considering the numerical values in terms of building height, supertall buildings (+300m) are mostly overlooked in the existing literature (Figure 2). Moreover, despite the recent popularity of timber as a structural material compared to reinforced concrete, steel, and composite (RC and steel), there is a growing interest in the current literature for timber tall buildings (Bohne et al., 2017; Li et al., 2019; Hens et al., 2021). However, there is a lack of research dedicated to timber tall buildings surpassing 50 storeys, given the limited examples of such structures.

The majority of the structural systems of tall buildings defined by Günel and Ilgın (2014) are examined in the existing literature, except rarely used structural systems, specifically flat plate/slab systems, core systems, shear wall systems, mega core systems, and bundled tube systems. According to Ilgın et al., (2021), the most common structural system used in supertall buildings is the outriggered frame system, followed by tube systems. This observation aligns with the numerical data presented in Figure 2.

Current studies investigated the effects of various design parameters of tall building structures in EC and EE assessment. There is no consensus in the existing literature regarding the optimum building height for minimized EC and EE. In fact, there is a broad variation in the optimum building height, which ranges between 7 and 58 storeys. Gan, Chan et al. (2017) found that the optimum building height varies depending on the type of the structural system in a tall building. Thus, optimum building height can vary depending on the research scope.

The amount of recycled content is decisive in identifying less carbon-intensive materials. According to the existing literature, the EC and EE of RC structures are lower than the steel alternatives for buildings up to 60-storey, when all the structural materials are virgin. However, the steel alternatives become less carbon-intensive when the steel scrap is more than approximately 70% for a 60-storey building. Therefore, the recycled content in steel can significantly change the results. Steel can be more advantageous for supertall buildings (+300m) regardless of its recycled content. Trabucco et al. (2015) indicated that 120-storey steel diagrid buildings are less carbon-intensive than RC alternatives. Nevertheless, further investigation is required.

There is not a single deterministic result for the proportional EC or EE share of structural components of tall buildings. However, previous research has shown that the floor framing system contributes significantly to the overall EC or EE of a tall building structure. Moreover, as the building height increases, the EC or EE share of the lateral load-resisting system increases exponentially.

CONCLUSION

The construction of tall buildings leads to significant energy and carbon emissions due to the massive use of structural materials. Therefore, decisions in the early design phase of a tall building are critical for reducing energy use and carbon emissions. Recent studies investigated the effects

Table 5. EC and EE share of the structural components according to the existing studies

	Gan, Chan et al. 2017	Zhao and Haojia, 2015	Foraboschi et al., 2014	Mavrokapnidis et al., 2019
Lateral load resisting system	70–80% (EC)	48% (EC)	35–78% (EE)	50–63% (EC)
Floor framing system	16–25% (EC)	52%	-	37–50% (EC)
Foundation	2–5% (EC)	-	-	-

of various design parameters on the EC assessment of tall building structures. This study analyzed the scope, materials and methods, and findings of these comparative studies, considering the design parameters of tall building structures.

There is no consensus on the optimum height of tall buildings since the scope and the method of these studies vary. Only a few studies investigated the environmental impacts of tall buildings on a larger scale. Resch et al. (2016) highlighted that when considering the optimum building height in terms of carbon and energy, the lifespan of the building and the population of a city plays a significant role. Furthermore, Drew et al. (2014) claimed that carbon and energy can be saved by using PV panels to generate energy in high-rise development zones where the land is saved compared to low-rise development areas. The optimum building height depends on various factors. Instead of seeking a one-size-fits-all solution, future studies can establish standards for environmental impact assessment based on the level of details in categorized spatial scales to determine the optimum building height.

According to this study, the lack of uniformity and the uncertainties in the LCA and the structural design methodologies lead to an extensive variation in the results. To establish consistency among diverse design parameters of tall buildings in terms of their EC or EE, it is crucial to develop a uniform methodology to estimate their EC or EE. This would effectively eliminate the uncertainties, variations, and inconsistencies previously identified in the LCA and structural design methods. In future studies, a standardized procedure can be developed for running various scenarios based on categorizations to consistently evaluate the effects of various design parameters on the environmental impacts of tall buildings. By revealing the effects of various design parameters on tall building structures, a holistic framework can be generated to guide designers in the early design stage.

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Article

Rethinking national parks as a key to regional development: Beyşehir Lake National Park

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ABSTRACT

National parks are defined by showing a unique structure with residential areas where bring various cultural and traditional aspects and sustain local handicrafts being loca-specific. National parks are not only protected due to their natural beauty and resources but also seen as a mechanism to stimulate different economic activities locally. Therefore, it has been necessary to define a multidimensional and layered actor system in the management of national parks. National parks, where are an economic landscape based on knowledge and innovation; being more efficient, more environmentally, and more competitive in terms of resource use; facilitate social and regional integration by encouraging a high employment rate within the framework of inclusive growth principles, are considered not only ecological factors, but also an important element of the planning system. This study aims to reveal the implications of how national parks can be an element of value in terms of regional development policies. Three main topics have been discussed on this subject: evaluations of the social, economic, and governance dimensions. In this study, In-depth interviews were conducted with visitors of the national park, local people, and various institutions for revealing the conflict areas, especially between local people and economic actors. As a result of the study, proposals have been developed to overcome the existing problems in front of the national parks to have an active role in terms of regional development policies.

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INTRODUCTION

Due to technological developments to meet the needs of the increasing world population, the ecological balance is disrupted by the excessive and rapid use of natural resources as raw materials in the execution of economic activities. The deterioration in nature over time negatively affects public life and the utilization of natural resources by individuals. Considering the environmental quality or quality of the environment as a welfare-enhancing factor like other needs in developed and developing countries, it complies with the rational behavior criterion, which is one of the main

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This study, being a part of a research project titled "Environmental Valuation of Beyşehir Lake National Park" prepared by Zuhal Karakayacı as coordinator, Ahmet Tuğrul Polat and Özer Karakayacı as researchers, and Kübra Karkın as scholar, was supported by the project number 218K315 within the scope of the TUBITAK 1002 project.

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objectives of the economy. From this perspective, the rational use of natural resources has become a necessity to ensure a welfare-enhancing quality of the environment. In addition, it is pointing out that countries that process and utilize natural resources are more developed.

It is emphasized in many studies that natural resources should be included in national income accounting, which is a measure of the growth rate (Talay et al., 2010; Mendelsohn and Olmstead, 2009; Füzyova et al., 2009; Pirikiya et al., 2016). National parks, which comprise the issue of this study, can be expressed as one of the natural resource elements. Besides, national parks make significant contributions to the economy and providing social benefits, since national parks are defined by showing a unique structure with residential areas where bring various cultural and traditional aspects and sustain local handicrafts being local-specific (Maior et al., 2016). Hence, it can be said that national parks can provide a contribution to rising national income.

The main factor that led to the emergence of the national park concept was the need to protect natural, historical, and cultural values. First, on a trip to the Dakotas in 1832 by George Catlin, an American artist, raised concerns about the effects of the westwards spread of America on nature and the need to protect it through government policies. Catlin's idea resonated widely, and Yellowstone became the starting point for the perception of a protected space (Brockington, 2003). Thus, Yellowstone National Park was declared the world's first national park in the United States in 1872. In Europe, Sarek National Park was declared the first national park (Kılıç, 2018). In Turkey, "Yozgat Pinetum National Park" was declared a national park for the 1st time in 1958. Shah (1995) offers clues on the changing meaning of national parks within the framework of the new paradigm, emphasizing the need to develop a wide range of solutions for the protection of resources. It is stated that the exploitation of national parks due to excessive use will require institutional arrangements to compensate for their externality and are extremely important for sustainability.

In this study, the activities of national parks such as agriculture, food, forests, tourism, as well as the production and marketing of local products, being attractions for people's choice of a healthy and peaceful environment, providing fresh air and water and preventing flood risk have also been discussed as the subjects of regional planning. While the main emphasis has traditionally been on conservation, it has been focused on the shift of the paradigm on national parks. Within the framework of these disputations, it was aimed to reveal the role of Beyşehir Lake National Park (BLNP) in new regional development paradigms. BLNP, which is the study area, is located between the borders of Konya and Isparta provinces, in a transition area between the Central Anatolia Region and the Toros Mountains. The National Park includes a large part of Beyşehir Lake, Turkey's largest freshwater lake. There are 33 large and small islands in the lake. The presence of Byzantine monasteries on some islands gains importance in terms of faith tourism. BLNP is an extremely convenient environment for tourism with its nature landscapes and trekking, hiking, mountain biking, safari areas, picnic areas, and camping opportunities. In addition, 588 plant samples were collected within the borders of the National Park, 153 bird species were determined, and it is seen that it is quite rich in ecological terms. Discussing the important social, economic, and institutional problems of the national park, which has an important potential in terms of ecological and natural features in the region, constitutes the main starting point of the study. The paper, which evaluates protected areas within the frame of new discourses such as governance, participation, social networks, and learning, will contribute to planning approaches for sensitive areas such as national parks.

THE ROLE AND CHANGING MEANING OF NATIONAL PARKS

National parks are seen primarily as an ecological problem. This perspective ignores the relationship between both ecological and socioeconomic location, context, and connectivity. In particular, the existence of a social context that creates demands and expectations about ecosystem management, as well as administrators and policymakers, as well as people working and visiting protected areas, has brought policies beyond the protection of ecological structure to the agenda in recent years (Allen and Giampietro, 2014; Cumming and Allen, 2017). In recent years, scientific studies have increased the discussions on protected area discourse. Several other social impacts such as the problem of development of residential areas in protected areas, conflicts, limited access to natural resources, the collapse of cultural and social institutions, and local livelihoods have revealed this perspective. In addition, the emergence of protected areas as a means of achieving better protection and socio-economic results, which adopts an inclusive management approach, including joint management, local empowerment, and the provision of culture and livelihoods, has accelerated the process (Xu and Melick, 2007; Wang, 2019).

Therefore, the protection of the natural structure, approaching economic and social development with a holistic perspective and the triggering of the local economy are among the important issues discussed in terms of the development of the relations of national parks with their social and economic environment (Borrini et al., 2013; Getzner, 2010; Mose and Weixlbaumer, 2007; Phillips, 2003). In the process, the introduction of new spatial approaches regarding protected areas by emphasizing

the legal framework of the regions and revealing the local development dynamics between the users and the inhabitants by diversifying the functions of protected areas has become a current issue (Dudley, 2008). These discussions have been forcing us to have a new and different perspective on national parks.

Determining the role of national parks in the local economy stands in the way of researchers as an overly sensitive and difficult issue. Although important studies have been carried out on this subject since the Brundtland Report in 1988, no clear methodological conceptualization has been presented. Discussions on the economic aspect of protected areas are addressed from three perspectives: the economic valuation of the protected natural environment, the effects of protected areas on the local economy, and the social aspects of national park management (Costanza et al., 1997; Povazan et al., 2014).

It is known that the understanding of conservation or the perspective regarding protected areas has undergone significant changes in the past 30 years. The International Union for Conservation of Nature (IUCN) defines a protected area as "a land and/or marine area dedicated to the conservation and maintenance of biodiversity, natural and associated cultural resources, governed by legal or other effective means." (IUCN, 1994) In another definition; areas with protected status are described as "a geographically defined area designated or arranged to achieve specific conservation objectives" (Borrini et al., 2004). It can be said that the IUCN refers more directly to the economic and cultural aspects of conservation. In 1969, at the 10th General Assembly Meeting of the lUCN, a definition of the national park was accepted: "A national park is a fairly large area: (1) where one or several ecosystems have not undergone significant change by human activities; has a special scientific, educational and recreational value in terms of plant and animal species, geomorphological areas and habitats, or that the natural landscape is of superior beauty; (2) that the necessary measures have been taken by the highest expert decision-making body of the country as soon as possible to prevent or remove the operation or occupation of the whole area and to require a careful approach to the ecological, geomorphological or aesthetic features that distinguish it as a national park; and (3) places where visitors are allowed to enter under special conditions for inspirational, educational, cultural and recreational purposes" (Gülez, 1990).

In recent years the national parks have undergone a change as an important mechanism that supports domestic economic sustainability. This approach has intensified efforts to understand the impact of functional change between national parks and areas surrounding the park. In today's discussions, efforts to explore the social and economic aspects of national parks have been accentuated by the conservation of nature and the development of tourism and the local economy (Getzner, 2010; Mose and Weixlbaumer, 2007; Phillips 2003). It, however, should not be forgotten that there is a delicate balance between tourism and the sustainability of the resource values of protected areas. The discussions are taking place on new spatial forms that will focus on improving the social functions of national parks and establishing positive relationships between the institutions/actors responsible for the national parks and local communities (Dudley, 2008; Phillips, 2003).

National parks, where are an economic landscape based on knowledge and innovation; being more efficient, environmentally, and competitive in terms of resource use; facilitates social and regional integration by encouraging a high employment rate within inclusive growth principles, are considered not only ecological factors but also an important element of the planning system. The changing meaning of national parks can be shaped by three main ideas: viewing from the upper scale, change in ecological perspective, and location-specific differences. Upper-scale approaches are evaluated as the density of networks and connections of national parks, integration of national parks into regional and national economy and politics, and their importance in terms of a national conservation strategy. From an ecological perspective, ecosystems are exposed to diverse influences, destructions, and an adaptive process strongly linked to local biological history and context. In terms of location-specific differences, working with local communities, NGOs and the private sector is an emphasis on place-specific differences based on the fair sharing of benefits arising from the creation of a governance structure, preservation of biodiversity, sustainable use and use of genetic resources and advantages among social actors.

Within the framework of the new paradigm, national parks have been defined as an element of the national and international system, beyond being an isolated area from their surroundings. This perspective has made national parks part of non-local relationship networks through various networks and links. National parks are not only protected due to their natural beauty and resources but also seen as a mechanism to stimulate different economic activities locally. Therefore, it is necessary to define a multidimensional and layered actor management system in the management, which was handled in a complex structure. While the national parks are considered as landscape area that provides sustainability of the local in line with the socio-economic and cultural goals, it started to be seen as a structure dominated by the understanding of being governed according to the decisions taken based on the consultations of different actors. In this framework, the shifts in the meaning imposed on national parks are summarized in Table 1.

Table 1. Paradigm shift in perspective toward national parks (Borrini et al., 2004; Phillips, 2003)

Traditional understanding of protected areas	Emerging understanding of protected areas
They are considered isolated separate spatial units.	National parks have started to be considered as a part of national, regional, and international systems.
National parks have their own way of governing.	It has come to be seen as part of spatial relationships (protected areas associated with "corridors," "steppingstones" and biodiverse areas).
There is an understanding of decision-making against the specific situation instead of using past experiences in the management of national parks.	Long-term governance and decision-making mechanisms are established using the advantage of continuous learning and experience.
There is an understanding of a strict protection of natural and landscape assets.	In addition to the protection of assets, there is an understanding of the rehabilitation of the region and the restoration of its cultural assets.
There are perspectives to sustain the functioning of the ecosystem beyond the efficient use of the national park.	It is about ensuring the sustainability of national parks from a perspective of interactive and relational use in accordance with socio-economic and cultural goals.
A technocratic and bureaucratic management approach dominates in national parks.	National parks are managed according to the decisions taken based on the consultations of different actors.
There is an understanding of management that does not consider the activities, needs, and participation of local people.	There is an understanding of negotiation-open governance that is sensitive to the concerns of local communities.
The management responsibility is centralized.	There is an actor-driven management approach, including different layers of governance, local communities, the private sector, NGOs, and others.
There is an understanding of prioritizing benefits for visitors and tourists.	The interests of local communities take precedence.
National decisions take precedence over local needs.	It is seen as a community heritage and national.

METHODOLOGY

This study aims to reveal the effects of BLNP on the local economy. It is aimed to reveal clues about how to treat national parks as an actor in terms of local development by focusing on the possible effects on the social and economic development of the locality, especially against the literature focusing on the ecological diversity of national parks. Especially in recent years, considering the theoretical approach and social and economic dimensions of national parks within the framework of development paradigms, which forces them to think within the framework of conceptual approaches such as sectoral diversity, economic resilience, and ensuring local competitive conditions make the study unique. In this framework, a qualitative study method based on in-depth interviews was adopted in the study, and the opinions of the relevant actors regarding the effects of BLNP on the local economy were determined.

BLNP is in a transition area between the Central Anatolia Region and the Taurus Mountains within the borders of Konya and Isparta provinces and is located on an area of 86,855 hectares within the borders of Beyşehir province in Konya. The area covering a part of Beyşehir Lake was declared a National Park with the decision of the Council of Ministers numbered 93/4020 on January 11, 1993. However, the borders of the BLNP were revised by the decision dated November 27, 2018, and numbered 30608. As a result of this change, agricultural and forest areas, and settlement areas were excluded from the borders of the national park (Table 2 and Figure 1).

According to the border changes, while the settlements and agricultural areas around Beyşehir Lake were taken out of the national park border, Dedegöl Mountains, which have rare mountain ecosystems, were included in the national park borders to protect the ecosystem integrity. It can be said that the reason for the border change is the problems arising from the legal status of the national parks of the inhabitants of the settlements around the lake. The National Park includes a large part of Beyşehir Lake, Turkey's largest freshwater lake. There are 33 large and small islands in the lake. The presence of Byzantine monasteries on some islands caused the region to gain the importance of faith tourism.

BLNP is a region with an extremely important advantage for tourism with its natural areas, scenic spots, and trekking, hiking, biking, safari areas, and camping opportunities. Also, it has the potential to offer significant advantages in terms of the socio-cultural and socio-economic development of the region in terms of its ecological values and cultural depths. However, the disadvantages brought

Table 2. Land use in BLNP (National Park Regional Directorate, 2019)

Land Use	According to the old boundaries (ha)	%	According to the new boundaries (ha)	%	Range (ha)
Grassland and steppe areas	1.316,89	1,52	592,14	0,72	–724,75
Rocky areas	51,47	0,06	51,47	0,06	-
Forest areas	16.802,79	19,35	22.083,33	26,88	5.280,54
Reeds-swamp areas	1.600,15	1,84	1.654,11	2,01	53,96
Agriculture areas	13.270,48	15,28	2.018,60	2,46	–11.251,88
Lake areas	53.302,29	61,37	55.726,56	67,83	2.424,27
Settlement areas	510,93	0,59	30,56	0,04	–480,37
TOTAL	**86.855,00**	**100,00**	**82.156,77**	**100,00**	**4.698,23**

by the protection status in rural economic activities have caused the national park areas to be seen as regions with a problematic status for the inhabitants of the region.

Studies on national parks are generally based on quantitative analysis. However, it is known that the explanatory level of quantitative analysis is insufficient in determining the problems related to user behaviors, the realization of the economic and spatial demands of the local people, and the conflicts between the user-local people-government. In recent studies, information about the behavior, motivations, and opinions of visitors and users is considered critical for the effective planning and management of protected areas (Griffin et. al., 2008; Antonio, et. al., 2013). At this point, qualitative research methods are preferred in efforts to understand the existence of a complex and layered social, personal, and relational world and how it is created (McLeod, 2001). This study conducted in-depth interviews with visitors (383 visitors), local people (a focus group discussion with the village community in 12 rural areas), and various institutions (3 citizen associations, 2 voluntary organizations, and 2 associations), for revealing the areas of conflict between the strict principles/rules for the protection of the national park and the local people and economic actors in 2019 July. It is aimed to access information such as how approaches to the protection of national parks have evolved to ensure the economic sustainability of the locality, how BLNP has led the development of various economic and social relations networks around the region, how BLNP contributes to the transformation of rural areas in in-depth interviews. Furthermore, it has been discussed how to put forward innovative approaches to national parks within the scope of both urbanization and conservation understanding and policies by questioning the effects of trends such as suburbanization or counter-urbanization, tourism, and secondary housing development on the social structure.

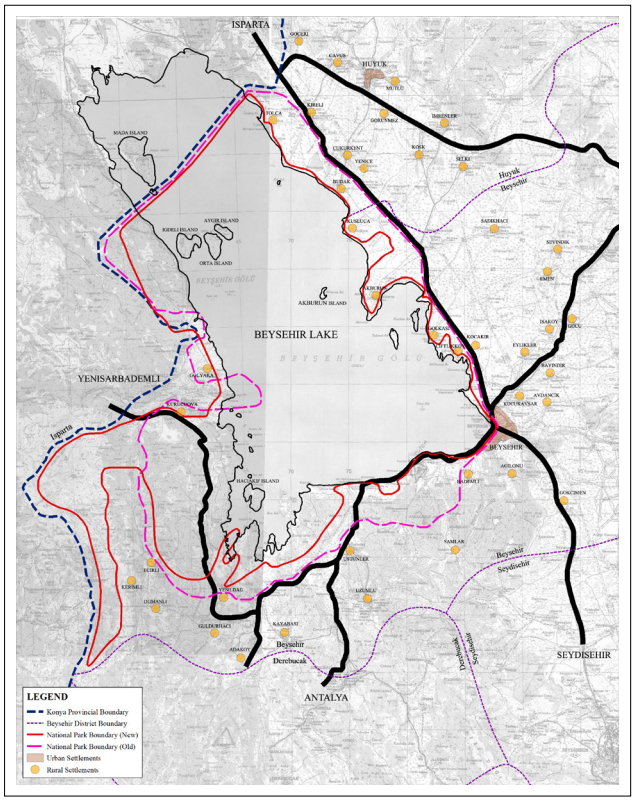

Figure 1. Old and New Boundaries of BLNP.

Finally, to reveal the effects of BLNP on the local economy are analyzed by the diversity of opportunities provided to economic sectors, and the processes producing economic value are analyzed. It has been questioned how the social relations emerging between the local people, visitors, and investors affect the adaptation of the local people to processes such as qualified agricultural production and access to foreign markets that are not easily articulated. It has been investigated whether there is a mechanism to reveal new ideas in mutual learning processes regarding the region of the relations between the local people and the visitors because of long-term stays in camping areas and secondary housing. All these analyses are discussed under three main topics: evaluations on the social dimension, economic dimension, and governance dimension.

EVALUATION OF BLNP WITHIN THE FRAMEWORK OF REGIONAL DEVELOPMENT PARADIGMS

Social Dimension Evaluations of BLNP in Regional Development

The regional development literature, which has undergone a paradigm shift in the past 30 years, has also brought important differences in the strategies for protected and sensitive areas such as national parks. Assessments of the role of national parks in the local economy are fed by approaches such as ecosystem (Wall-Reinius and Fredman, 2007), evolutionary economic geography's path dependence (Boschma, 2015; Martin and Sunley, 2015), governance theory (Borrini et al., 2013; Getzner, 2010; Laing et al., 2009), and institutionalism and social capital theories (Bathelt and Glucker, 2003; Amin and Thrift, 1995; Halfacree, 1993). From the traditional point of view, evaluations aimed solely at conservation perceive the areas where agricultural production takes place as non-production areas.

This paradigm shift has led to the social and political concerns of national parks at the local level. With the dominance of liberal economic view that emphasizes the economic importance of national parks, the declaration of the BLNP as a national park has made it necessary to evaluate it through a series of social relations networks, until it is seen as the engine of regional development.

Emphasizing that the local social and economic context in which national parks are embedded should be considered when analyzing their economic relations, this theoretical framework pioneers the consideration of protected areas in a relational whole within the framework of the new paradigm. The perspective emphasizes the whole of local dynamics and social relations of the space, and strives to address the relationship between areas with strict protection rules such as national parks, and residential areas, and development with their social dimensions. While this approach provides an important opportunity for the functionalization of areas with protected status, it creates an opportunity for the elimination of social conflict areas, especially with new dynamics emerging in rural settlements. The problems caused by using the national park in restricting the economic activities of local landowners and in the adoption of the principles of protection of the natural structure and the relevant land management have brought about the deterioration in the social structure. The negative attitude of these locals toward national parks is an indication of their limited awareness of protection.

This approach has significantly affected rural settlements and local people in BLNP, just as is the case in national parks generally. Strict principles and rules for the protection of the national park have been the main dynamics of the conflict between locals and protected areas. In this context, it can be said that approaches to the protection of national parks from a traditional point of view have evolved in recent years to be seen to ensure the economic sustainability of the local. The protective regime of BLNP pioneers the development of various economic and social relations networks not only in the region but also in its surroundings. Restrictions arising from the protection priorities of BLNP are seen by local communities in the region as an obstacle to local development and lead to various conflicts. The social and political resistance to overcome this situation has not yet developed in rural Beyşehir.

The contribution of national parks to the functional transformations of rural areas within its vast area has been the focus of economic geography discussions. Trends such as the decline in traditional agricultural employment, suburbanization or counter-urbanization, the development of tourism, and the development of secondary housing have a strong impact on the direction and speed of functional changes in the buffer zones of national parks. These changes have occurred rapidly in rural areas within BLNP, and this trend continues to increase.

> Beyşehir is very close to where we live, we can come in about 1–1.5 h. Because of the natural beauty and geography of this place, we would like to have a place to stay on weekends. However, the fact that various opportunities in the region are not yet at the desired level causes some reservations. In fact, from this point of view, the demand for the region will grow with the restoration and functionalization of secondary residences, camp areas supported by various services and historical residences in rural settlements. These developments will lead to the development of ties between locals and visitors. Now, we can say that BLNP lacks these features. The only thing that attracts us here is the natural beauty and the presence of the lake. (It was compiled from interviews with 383 visitors in the BLNP).

Although the national park led to an increase in social diversity in the region and feed the learning processes through networks of relations, the inadequacy of infrastructure and the inadequacy of local organizational in BLNP prevent the development of these opportunities. As can be understood from the information obtained from the interviews in the field study, the inadequacy of physical facilities in the region and the lack of organizational activities to eliminate the inadequacy of the awareness level of the local people about the impact of the national park on social development reveal that it is an obstacle to the development of social diversity. They consist of similar social or countryfolk groups who have migrated from the region where coming from outside the region proves this situation.

The first measure for the protection of Beyşehir Lake began in 1957 when the forests south of the Lake were

given the status of "Conservation Forest." Beyşehir Lake was accepted as "Drinking Water Reserve" pursuant to the Water Pollution Control Regulation, which came into force in 1988. In 1989, Beyşehir Lake and its surroundings were declared first and second-degree natural sites. Later, due to the reactions of the people in the settlements, the settlements were changed to a grade III natural site in 1991. In addition, there are archaeological sites in various locations around Beyşehir Lake, and the area where Eşrefoğlu Mosque Complex is located on the lakeshore of Beyşehir District has been declared as an urban site area. With the decision dated February 20, 1993 numbered 21502, the part of Lake Beyşehir within the provincial borders of Isparta; due to its land structure showing a different topography, the spread of plant and animal communities on it, rare natural resources and historical features have been declared "Kızıldağ National Park;" while the part remaining within the provincial borders of Konya has been declared as "BLNP" due to its historical remains, geomorphological formations, natural plant communities, rich bird communities, and hydrological features. The park boundaries have taken their current form (Figure 1).

BLNP should be considered not only as a physical environment but also as a social environment that adds meaning and value to this environment. The fact that the national park is intertwined with urban and rural settlements also contributes to the social and cultural development of the city. Urbanization and changes in legal regulations have increased the pressure of the city on the national park and there have been disputes between local governments and administrations regarding the national park. In this sense, it has been necessary to adopt innovative approaches to national park areas. In this process, in addition to the conflict of authority between institutions, the understanding of the way rural residents use natural resources and the behaviors related to agricultural production was seen as a problem area beyond evaluating the national park as a potential. It, also, has been determined that the BLNP does not make an effort to strengthen social interaction and that the national park has a point of view only to protect natural beauties and prioritize policies for daily tourism when the studies of the institutions responsible for developing policies and strategies related to the national park are examined.

Economic Impacts of BLNP

The effects of national parks on the local, regional, and national economy are often explained through the lenses of the tourism sector (Byström and Müller, 2014; Eagles and McCool, 2002; Getzner, 2003; Huhtala, 2007; Mayer et al., 2010). The multiplier effects of economic dynamism brought about by tourists visiting national parks are considered an important factor in the economic development.

In line with the principle of free access to natural values, the entry and use of facilities in most national parks in Europe are offered free or at a relatively low cost (Mayer and Job, 2014). It is difficult to estimate the actual number of visitors required to calculate total visitor expenditures in national parks where admission is free or entrance fees are seasonal or charged (Job, 2008; Mayer and Job, 2014). The expenditures of the national park visitors, the return from the goods and services offered, and the changes in employment and wages have been the subject of quantitative research to evaluate the economic role of the national parks based on the income growth of the region. Such studies fail to make contributions in determining the local links between national parks and the way in which the park is embedded in the local economy.

The economic relations established by the BLNP should be handled within the whole body of direct and indirect relations that generate economic value. In this context, investment projects, management structure, various supports, and relations with the local are defined as the direct relations of BLNP that produce economic value. BLNP has enabled the development of fishing activities in rural settlements on the lakeshore. Secondary housing development and the presence of campsites in the region have contributed to the emergence of economic activities aimed at meeting the needs of visitors from outside the region. In some rural settlements, attempts to transform historical buildings into accommodation facilities pioneered the development of non-agricultural economic activities in the region. Touristic expeditions such as bird watching, hiking and photography to the islands within Lake Beyşehir allow the young population in the region to provide guidance, therefore contributing to the human capital development.

> I live in the town of Yeşildağ, and I do farm. In addition, I offer guidance services to visitors who come to see the Storks Valley and campsite in our town. Especially between April and July, there are intense tourist visits, and we sometimes go on 5–10-day expeditions. The job of guiding visitors to the national park for nature tourism has experienced significant development in Beyşehir in recent years. We have started having a second income (Osman İltar, The Tour Guide of Yeşildağ Settlement).

BLNP has the potential for economic development due to the characteristics that enable it to integrate various types of tourism. Besides nature-based tourism, it has important attractions in terms of culture and faith tourism. However, the inadequacy of necessary facilities and maintenance problems means that BLNP is preferred at the regional level and is mostly for day-to-day use. This has resulted in an inadequate economic assessment of the potential of BLNP (Table 3).

When Table 3 is examined, it is determined that most visitors come from surrounding settlements within a 100 km distance. In addition, it has been determined that as the

Table 3. Visitor views on the tourism potentials of BLNP

Distance Travelled by Visitors	No.	How long Have You Been Coming to the National Park? (%)		Would you recommend the National Park to those around you? (%)		Purpose of Visit [1]			
						Ease of Access	Resource Values	Quality of Service	Interest and Curiosity
0–30 km	58	First Time	3.4	Yes	8.6	2.06	2.74	0.96	1.93
		1–3 Year	13.8						
		4–6 Year	10.3	No	91.4				
		7–+ Year	72.4						
31–50 km	32	First Time	15.6	Yes	6.3	1.93	2.13	1.00	2.00
		1–3 Year	6.3						
		4–6 Year	6.3	No	93.8				
		7–+ Year	71.9						
51–100 km	175	First Time	28.0	Yes	8.6	2.06	2.12	1.15	2.21
		1–3 Year	29.1						
		4–6 Year	13.1	No	91.4				
		7–+ Year	29.7						
101–200 km	74	First Time	31.1	Yes	6.8	1.76	2.40	1.13	2.34
		1–3 Year	27.0						
		4–6 Year	14.9	No	93.2				
		7–+ Year	27.0						
201–+	44	First Time	27.3	Yes	4.5	1.69	2.16	1.56	2.14
		1–3 Year	18.2						
		4–6 Year	18.2	No	95.5				
		7–+ Year	36.4						
Total	383	First Time	23.8	Yes	7.8	1.95	2.27	1.15	2.17
		1–3 Year	23.2						
		4–6 Year	13.1	No	92.2				
		7–+ Year	39.9						

arrival distance increases, the desire of visitors to visit the national park increases due to their interest and curiosity. Therefore, visitors may not have the desire to visit the national park for a second time. The main reason can be cited as the lack of a variety of services. The main reason why a significant number of visitors do not recommend BLNP is again cited as inadequate services.

BLNP enables the establishment of social relations between the locals and visitors, depending on the time visitors spend in the region. It has been determined that the social relations between the locals and the visitors are because of long-term stays in the campsites and secondary residences, thus contributing to a mutual learning process. The strong relations that emerge between the tour guides in rural areas and the groups that visit the region have led to a mutual exchange of ideas on the development of economic activities in the region.

Indirect relationships include tangible and intangible resources arising from the natural value of the park and related to the social and cultural sphere. There are several potential forms of the indirect economic impact of national parks. For example, sustainable agriculture depends largely on the qualitative factor that arises directly from the value of the natural environment of the national park. The presence of a national park in the context of increasing counter-urbanization movements makes neighboring rural areas an attractive place for tourism and second homes (Mika et al., 2016), this stimulates demand. In addition, owing to the proximity of a national park, local governments, and institutions can apply for and receive funding for "ecological" projects. As a result, the indirect economic function is defined by its natural values in intangible aspects, as a factor that stimulates economic activity, and an increase in the economic value of areas beyond the park.

It has been observed that the adoption of the form of agricultural production, like organic farming and good agricultural practices, has begun. After tourism activities, qualified agricultural production, which emerged because of learning processes and the demands of visitors, led to positive developments in the economic income of the region. It can be stated that agro-tourism in BLNP, which is seen as an important strategy, especially for the protection of agricultural land, will play a critical role in eliminating the spatial disadvantages of rural settlements, and low income. The successful agro-tourism systems in rural areas have the potential to reverse negative economic trends by bringing in visitors and creating new jobs and local business ventures (Topçu, 2016).

BLNP have various directional and density relations with the regional social and economic systems in which they are located. The economic relations are based on the relations between different actors, including elements of the local economic system, administration, visitors, local authorities, and the residents (Figure 2).

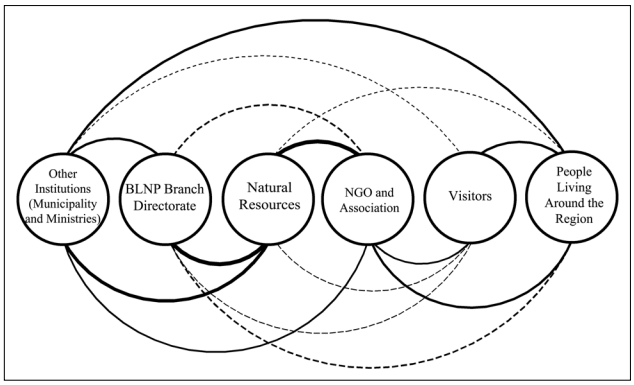

Figure 2. Relationships between Actors in BLNP.[2]

A strong relationship exists between the natural resources of the BLNP and the BLNP Branch Directorate under the 8th Regional Directorate of Nature Conservation and National Parks. While the authorities arising from the legal regulations are a determining factor in the decisions of the institution within the national park, local conflicts could also arise from rigid behavior. The physical development of the national park has been realized through investments made with the shares allocated from the central budget. Preparations for 1/25,000 scale planning work in BLNP can be seen as an initiative toward harmonization with the local.

The relations between the BLNP administration and the residents of the region are seen as the most important obstacle in the development of the local economy. The parallel understanding of strict protection by the administration, and the local people understanding of the resource use concepts constitute the main starting point of the conflict. This problem brought along a political process until the determination of new boundaries in 2018 that excluded rural settlements from the park boundary. In addition, the sales carried out by the national park administration, especially for local businesses, created more employment opportunities in the region. It causes dynamism in this region.

One of the important reasons why the BLNP cannot contribute sufficiently to the local economic development process is the existence of different institutions' authorities in the region, which has become a source of conflict. Apart from the General Directorate of National Parks in the region, the different powers, and responsibilities of institutions such as DSI, Konya Metropolitan Municipality, Beyşehir Municipality, and the Ministry of Environment and Urbanization are seen as one of the disadvantages in the development of policies and strategies. Particularly, the decisions taken by the national park administration from a centralized point of view may not reflect the demands and expectations of local. In studies conducted, the lack of various facilities in campsites, beaches, hiking routes, historical sites to be visited, and the poor maintenance of the surroundings lead to a decline in the demand for

the region. With various funds provided by national and international organizations, efforts to develop different projects related to protected areas have gained momentum in recent years. However, it can be said that even with the various actors working together and with the support of national and international funds, the deficiency of human and social capital potential in the Beyşehir region could not solve the problems of the national park. Efforts aimed at prolonging visitors' stay in the region have not reached the desired level.

The dominant position of the elements restricting the role of BLNP in regional development has caused the rural population not to gain sufficiently from the economic benefit of the national park. While protecting the resources of the national park, which is not seen as a means of economic income, has lost priority, it has become more important to create new agricultural production areas and to uncover the pastures for grazing.

Therefore, the impacts of the BLNP on regional economic development are handled in the context of the relations between the actors. Along with the economic value produced by the functioning of the national park, the realization of projects and investments with the roles assumed by various institutions will be one of the elements that will revive the economy.

A Regional Approach to BLNP

The possible impacts of national parks on the regional economy will vary based on the potential of each national park, as well as the community and social structure in the region. In this context, the most distinguishing aspect of BLNP is that it is integrated with Kızıldağ National Park located within the borders of Isparta Province. In other words, Beyşehir Lake and Kızıldağ National Parks, which have the same morphological and ecological features, are perceived as parks with different characteristics due to the administrative boundaries determined in a normative way.

It is necessary to develop a regional perspective in terms of the size and features of the BLNP. Accessibility opportunities in the region, along with significant potential in terms of accommodation facilities and tourism activities in the region, constitute the dynamic of local development. Although BLNP has significant potential for the development of different economic sectors, other industries based on tourism, agriculture, and forestry have had a low impact on local development.

High unemployment rates in rural settlements can be considered significantly eliminated through the development of local businesses in BLNP. Lack of support by the society that cannot perceive the benefits obtained from the national park is seen as one of the important problem areas of insufficient understanding of the national park and low social value level in the region. With the declaration of the national park, there has been a significant impact on the people of the region regarding the development of their understanding of nature conservation, their perception of the region, and their lives and quality of life. This demonstrates what BLNP can offer regarding both conservation and tourism infrastructure.

It should be emphasized that there are some issues that national parks must face within the framework of new paradigms. In the context of new discussions, the issues that are difficult to operate or apply in the BLNP in a regional approach lens are listed below.

- Resolution of Political Structure: The management of protected areas requires the consideration of protected areas together with their close systems (Tomaskinova and Tomaskin, 2013). Protected areas, together with their ecological structure, economic resilience, and interaction between stakeholders, must establish a sustainable management agreement by establishing strong networks with their environment. Especially in the new paradigm, perspectives aimed at reducing the impact of the centralized management system risk bringing with it the problem of faster destruction of protected status. Along with the incompatibility between local institutions, local pressures can bring a series of destruction to the BLNP. An asymmetric force can be formed against the local political climate.
- Pressure from Stakeholder Participation: Although discussions on participatory and governance-oriented decision-making processes have intensified in the new paradigm, the problem of "stakeholder fatigue" (Phillips, 2003) may arise in the decision-making process for BLNP, which has a constraining effect on local economic activities. It is not possible to claim that BLNP is made of local capabilities that can make fine political decisions about the composition of stakeholders, and how the conflicting interests would be reconciled.
- Conservation Awareness Problem: Understanding national parks evaluation as an element of the local economy, while factoring in the balance between sustainability and conservation use, can be considered a difficult process to implement due to the conservation awareness problem in the Beyşehir region. In particular, the decline of the fish population in Beyşehir Lake and the change of the national park boundary because of local pressures present the problem of local conservation awareness. Beyşehir countryside lacks responsible traditions for the use of natural resources.

On the other hand, a strict understanding of conservation continues to be the cornerstone of the national parks protection system. The new paradigm does not intend to undermine the value of such places, but to show how their management has radically changed (need to change), and to emphasize the contribution that can be made by the other

protected areas of equal importance. Institutional capacities and capabilities in the region do not have the flexibility to conduct the negotiation process healthily.

- The Normative Perspective Problem: The new paradigm mandates an approach beyond the boundaries of the protected area. BLNP planning approach should be done in a way that includes interactive areas and settlements outside the normative boundaries. The bureaucratic structure and legal framework are seen as the main obstacles to the implementation of this approach.
- Regional Planning: The roles of national parks in the regional development within sustainable principles can be realized by creating alternative scenarios, not ignoring the contribution of dynamic spatial urban models, and considering the possible effects on the environment (Unverdi and Unverdi, 2016). Continuing in a balanced manner between the legal status of BLNP and the agricultural areas, which are defined as the economic income source of the rural areas, requires the implementation of long-term regional plans. It can be realized with the "inclusive area management" functions that will emerge among the actors for developing an important sustainability policy.

CONCLUSION

The economic impact of a national park is determined by the central government's policy for the conservation of nature and the attractiveness of the national park area. National parks vary due to differences in countries' legal regulations, conservation regimes, and certain local conditions. The increasing social demand on natural resources have given rise to various pressures on the areas surrounding national parks.

The impact of national parks on the local economy is not only about increasing their attractiveness as a tourism destination but also how and to what extent they are made accessible to the public. Conservation of the BLNP with a strict understanding curbs tourism development. It is inevitable to establish an innovative and viable governance system for the Beyşehir settlement to benefit from the national park socially and economically. To achieve this, it is necessary to develop a mechanism in which all stakeholders in Beyşehir will cooperate within the common goal. The initiation of various projects to mobilize local resources and the efforts to increase the potential for social-human capital may eliminate numerous obstacles to the cooperation in the process of transforming the national park into an important element for local development.

On the other hand, beyond characterizing national parks as areas where natural resources are protected with a traditionalist approach, it is necessary to consider Beyşehir urban and rural areas as a critical element in terms of economic development and competitive structure, as emphasized in economic geography discourses. BLNP has significant potential to transition from local to global, establish relations with different economic actors, attract investors, and put in place measures aimed at improving the quality of life through funds.

NOTES

[1]3 very important, 2 important, 1 not important.

[2]The thickness and discontinuity of the links between the actors illustrate the strength of the relationship. Thick lines indicate strong relationships, while dashed lines indicate weak relationships.

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Article

Untapped potentials of governmentality perspective for urban planning studies that focus on the dynamics of health care in contemporary Türkiye

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ABSTRACT

In this article, we provide a summary of the theoretical explorations that our research has invited us into. The need for such a multi-layered literature review stems from our depiction of the theoretical limitations of contemporary urban planning studies that focus on the experiences of Türkiye in the face of complicated urban problems, among which urban health care challenges stand out. By considering urban health care as a form of social infrastructure along the lines of efficiency, accessibility, design, and sustainability of social rights, contemporary urban planning studies still make use of mainstream social scientific lenses. We suggest an alternative analytical toolkit, namely the *analytics of government drawn on the Governmentality Perspective as* one of the prospective ways to go beyond such limited analysis.

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INTRODUCTION

Today's rapid and interconnected changes in both the natural and human realms pave the way for ever-complicated issues in cities all over the world. In fact, in 25 years, cities are expected to be hosting 70% of the world's population (World Bank, 2018). Such a rise in urban population will bring about tremendous difficulties for urban contexts. For the concerns of our research, these difficulties will revolve around the provision of health care in cities as made apparent once again by the COVID-19 pandemic. To come up with well-founded decisions in the face of this huge transformation and to adequately address these complex urban problems, studies that focus on resolving them better update or diversify their analytical lenses. In this context, as one of the fields that focus on the complex problems of contemporary cities, urban planning studies – a field that works with the design, management, and development of cities and urban regions, and that frequently entails questions of governance, power, and social control– would benefit from repurposing an alternative analytical toolkit as well. This is mainly because

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the repertoire of urban planning studies' analytical toolkits is limited when it comes to analyzing the dynamics of health care in Türkiye. Taken-for-granted presumptions in mainstream social sciences are echoed in contemporary urban planning studies. This article attempts to suggest making use of an alternative toolkit instead: *Analytics of government* drawn on the *Governmentality Perspective*.

DISCUSSION I: URBAN PLANNING STUDIES FOCUSING ON THE DYNAMICS OF HEALTH CARE IN TÜRKİYE

When it comes to analyzing the dynamics of urban health care in Türkiye, contemporary urban planning studies view these dynamics as elements of social infrastructure designed for the secure flow of urban life (Berkman, 1992; Çetiner, 1972; Çiftçi, 1999; Ershova et al., 2018; Latham and Layton, 2019; and Şahin, 2018). In this respect, health care is not only taken into consideration within a hierarchy of locations (stretching from wards to districts and cities and regions) but also within frameworks of planning models. As a result, contemporary urban planning studies defining health care primarily as an ingredient of social infrastructure explore the dynamics of health care in Türkiye with respect to four main criteria: *Efficiency* (relations between areal efficiency and service quality), *accessibility* (economic, social, and spatial conditions), *design* (comprehensive flexibility in the sense of multi-functionality), and *sustainability of social rights* (Boyacı, 2021; Gökkaya and Erdem, 2021; Kemeç et al., 2019; Paköz, 2014; and Yılmaz and Kamacı Karahan, 2020). In doing so, urban planning studies largely focus on the historical, legislative, technical, and representative aspects of governing health care in single or dual scales, and mostly for a single/central actor. Such a focus provides analyses more often than not on a macro scale, leaving aside interactions among micro-meso-macro scales. This research hypothesizes that a multi-scale analysis with an eye on the interactions of multiple actors will better serve the needs of the discipline in the contemporary world. Given the epidemics of health-care reforms all around the world in parallel with the urban population anticipated to rise to 70% of the world population in just a quarter century, a theoretical revitalization is out of necessity in contemporary urban planning studies when it comes to analyzing the dynamics of urban health care in Türkiye.

CONTEXT: EPIDEMICS OF HEALTH CARE REFORMS AND DIFFERING CONCEPTUALIZATIONS OF NEOLIBERALISM

Since the 1980s, there has almost been an epidemic of health care reforms all around the world. Stretching from England to New Zealand and Australia, from the United States to Europe and East Asia, in various countries, health care reforms are initiated, and accompanying analyses since the 1990s have surfaced as well (Ashton et al., 2009; Giaimo, 2002; Marmor, 1994; and Twaddle, 2002). The prevalent perspective in these analyses associated this epidemic of health care reforms with the broader framework of neoliberal policies, which are assumed to accomplish the goal of limiting the state's involvement in society's operations on the principle that less government is better (Prince et al., 2006, p. 256). Among the critics of this association between less government and neoliberal policies, studies that have drawn upon the Anglo-Foucauldian governmentality studies (Coveney, 1998; Işın, 2000; Larner, 2006; Marchand et al., 2020; Prince et al., 2006; and Rose and Miller, 1992) argued that health care reforms are rightly associated with neoliberalism, yet, neoliberalism "is not an ideology or policy (as mainstream perspectives suggest), but a new round and mode of restructuring the social, political, economic contexts, and subjects and their relations all at once to regulate the society as a whole" (Prince et al., 2006, p. 256). Therefore, in this view, as coined by Prince et al. (2006, p. 256), neoliberalism is not an enforced or completely pre-conceived project, but rather an emergent plan of action that develops as a result of providing programmatic coherence to certain technologies and rationalities that were already evolving in social and governmental structures.

Such an understanding of neoliberalism as a new mode of governmentality required a novel way of conceptualizing the state as well inviting other influential actors who are engaged in governing urban health care under scrutiny. In fact, Kohlwes (2014, p. 19) underlines that according to Michel Foucault, the state is a non-essentialized system of political relations, rather than a universal, stable, unchanging phenomenon that is reconstructed as government practices change. Yet, this does not mean that Foucault suggested ignoring the role of the state in government, rather warned us about the unintended consequences of solely focusing on the role of the state in government, turning a blind eye on other agents and mechanisms of power operating in actual governing. As such, when it comes to associating health care reforms around the world since the 1980s with a differing understanding of neoliberalism, the *Governmentality Perspective* proved to be useful in abstaining from mainstream analyses and allowing us to focus on agents other than state apparatuses that are engaged in the processes of governing health care.

BRIEF I: GOVERNMENTALITY PERSPECTIVE

In exploring *governmentality*, Foucault gives us a dense conceptual treasury and accompanying methodological trajectories (Yalta Yandaş, 2010). This strand of work

in Foucault's studies has been soundly investigated all around the world by miscellaneous studies that reside beneath the broadest umbrella of the Governmentality Perspective, which was sparked by the Anglo-Foucauldian governmentality studies at the beginning of the 1990s, and then followed by a series of critiques (Yalta Yandaş, 2010). Following Foucault's definition of "*government* as the conduct of conduct" (Foucault, 2007, p. 389), at the beginning of the 1990s, the Anglo-Foucauldian governmentality studies were distinctive as they acknowledged *government* to be diffused throughout all social interactions. This was an assumption that enabled social scientists to depart from the mainstream readings of neoliberalism as an ideology or policy derived from "the deep-rooted tripartite of state, economy, and civil society when analyzing society and politics" (Foucault, 2008, p. 77-78; Prince et al., 2006, p. 255). As such, these studies provided health-care scholarship with the possibility to comprehend the structure of the health-care system as deriving from a series of *political rationalities and practices of government* rather than top-down impositions of the state on civil society (Prince et al., 2006, p. 256).

Even though such a recalibration of the analytical tools of mainstream analyses brought about significant improvements in research, soon, these pioneers also faced various productive critiques. From within the Governmentality Perspective, Jacques Donzelot and Colin Gordon (Donzelot and Gordon, 2008) asserted that the Anglo-Foucauldian school of governmentality ended up rationalizing the political rationalities it examined rather than criticizing them because their studies reduced Foucault's governmentality studies to a discourse analysis of experts' goals in government, making these descriptions appear more orderly and comprehensive than they are. Moreover, O'Malley et al. (1997, p. 504) highlighted yet another flaw in the Anglo-Foucauldian school of governmentality studies that they can occasionally come out as apolitical due to their near-blindness to power relations. Bröckling et al. (2011, p. 20) also underlined their silence about power relations and social movements.

For the concerns of our research, the most striking critique came from Dean (2006), who criticized the Anglo-Foucauldian school of governmentality studies for focusing solely on the questions of "*how*," leaving aside the questions of "*where*" Dean suggested that *analytics of government* focused on the changing configurations of power relations better take questions of "where" alongside the questions of "how" into account. Moreover, a political geographer, Margo Huxley (2007, p. 190) also warned us that even though *the conduct of conduct* is essentially spatial: "...much of the development of governmentality in sociological and political frames barely touches on the question of space, possibly because of these disciplines' long-standing ambivalence about the place of space in social and political relations." In this respect, critics of the Anglo-Foucauldian governmentality studies as those of Dean (2006) and Margo Huxley (2007) called for putting the onus on the ground functioning of power relations in their *actual spatiality*.

This particular critique is the main theoretical stretching board for our doctoral research. In the light of above-mentioned critics, we intend not only to focus on "*how*" *questions* by concentrating on the real functioning of power relations in their *actuality/present mechanisms* (an assumption that both the Anglo-Foucauldian governmentality studies and their critiques share and that is actually why we consider both under the broadest umbrella of *Governmentality Perspective)* but also "*where*" questions, therefore, the *spatiality* of these present mechanisms of power relations (stressed by the critiques of governmentality studies). Thus, not to fall prey to the lack of spatiality in Anglo-Foucauldian governmentality studies highlighted by Dean (2006, 2009) and Huxley (2007), we also seek to carve out the *spatiality of the present mechanisms of power relations when it comes to analyzing the dynamics of health care in Türkiye*.

Our study, moreover, underlines the need to focus on the actual spatial interactions between multiple actors/agents on micro-meso-macro scales as the untapped potential of the Governmentality Perspective for urban planning studies that focus on the dynamics of health care in Türkiye. Indeed, to have a better grasp of these interactions, we start with the meso scale of this spatiality and focus on *the dynamics of health care in an urban context*. In this respect, our research focuses on the experiences of contemporary Istanbul to depict some of the meso-scale dynamics of health care in Türkiye. The actuality better said the real, on-the-ground functioning of present mechanisms of power relations is aimed to be grasped by *analytics of government* with regards to a mesoscale agent other than a central/macro one. Thus, this research aims to underline the untapped potential of the Governmentality Perspective, namely its multi-scale focus keeping the critiques of the Anglo-Foucauldian governmentality studies in mind makes use of the data-driven from an examination of the activities and discourses of Istanbul Metropolitan Municipality with regards to urban health care since the beginning of the 2000s as a practical stretching board.

Even though tables oversimplify dynamics, making use of them may help us picture and clarify ideas. To this end, the following table (Table 1) compares mainstream perspectives with that of governmentality their differing conceptualizations of power, subjects/agents, city/urban context, and neoliberalism.

Table 1. Mainstream perspective versus governmentality perspective

	Contemporary urban planning studies on urban health care (taken-for-granted presumptions of mainstream social sciences)	**To upgrade contemporary urban planning studies on urban health care by governmentality perspective**		
		Tapped potentials		**Untapped potentials**
		Anglo-Foucauldian governmentality studies	**Critiques of Anglo-Foucauldian governmentality studies**	
Power	Analysis of power in its institutional and central forms	Analysis of power in it positive/present mechanisms		
	Representations of power relations legislative aspects	Political Rationalities and Practices of Government	Analytics of Government Problematizations, Subjectivities, Technologies	
	Telling the story of dominant sovereign power or democratic party politics	Focusing on "how" questions	Focusing on "how" and "where" questions	
Subjects/Agents	State-centric Tripartite of state, economy, and civil society when analyzing society and politics	Centrifugal/multiple actors Unintended consequences of solely focusing on the role of the state in government are turning a blind eye to other agents and mechanisms of power operating in actual governing.		Multiple Scales/ Interactions between Multiple Actors Governing is not exclusively performed by state apparatuses but occurs when on-the-ground reforms and practices come into view during interactions between micro-meso-macro scales.
City	City as merely a physical space or an administrative unit	City as a complex site where diverse strategies of governance are deployed to regulate and manage populations		City as a dynamic, interconnected, heterogeneous assemblage
Neoliberalism	As an ideology or policy, an imposed or entirely pre-conceived "project" that limits the state's involvement in society's operations on the principle that less government is better	As a new round and mode of restructuring the social, political and economic contexts, and subjects and their relations to, regulate the society	As an emergent strategy due to giving programmatic coherence to particular technologies and rationalities that were developing in social and governmental bodies	

DISCUSSION II: HOW TO MAKE SENSE OF THE UPSURGE IN HEALTH CARE REFORMS IN TÜRKIYE SINCE THE 2000S IN LIGHT OF THE CRITICS OF ANGLO-FOUCAULDIAN GOVERNMENTALITY STUDIES

Near the end of the 1980s, Türkiye joined in the epidemic of health care reforms as well. Yet, after the turn of the new millennium, there has been a considerable surge in such reforms. This paved the way for various analyses from numerous disciplines, mainly from social sciences. Following the trajectory of the academic discussions around the world, the related literature in English on health-care transformation in Türkiye mainly associated it with a more comprehensive framework called neoliberalism, once again viewed as an ideology or policy that is assumed to limit the state. This mainstream approach was soon criticized.

To have a better grasp of the critique put forth by the Governmentality Perspective with an eye on the experiences of Türkiye, the main discussion points between these two approaches can be revealed by way of examining the latter's critique of the former. Indeed, Kohlwes' working paper (2014) provides us with a convenient summary to this end. By making use of the conceptual treasury and methodological toolkits of Anglo-Foucauldian Governmentality Studies, Kohlwes (2014, p. 67) presents a concise literature review of the mainstream health care scholarship on Türkiye-which is echoed in urban planning studies as well within the English social scientific literature as follows:

The body of English social scientific literature particularly dealing with the Turkish health system (Buğra and Keyder, 2006; Coşar and Yegenoğlu, 2009; Grütjen, 2008; Keyder, 2005) has been expanding with the Health Transformation Program (HTP) (such as Ağartan, 2008; Günal, 2008; Kısa and Younis, 2006; Sarp et al., 2002; Tatar and Kanavos, 2006; and Yılmaz, 2013) but remained relatively scarce. The existing sources are for the large part concerned with assessing the health or welfare system for example concerning its "maturity," "inclusiveness," "universality," or "social rights." Others focus their analysis on the deteriorating impact of neoliberalism on social policies and the welfare state at large or attempt to "integrate" the Turkish "welfare regime" into existing cross-national typologies.

Kohlwes (2014) contends that such research is still enmeshed in modernization theories, and that is why the conclusions of such research do not hold up when it comes to understanding the experiences of Türkiye in health care. According to Kohlwes (2014), Türkiye has never had a fully developed welfare system in the first place an idealized model of it as a point of reference. Underlining the unique characteristics of this country and the influences that have been exerted upon it, Kohlwes (2014, p. 34) claims that the health care transformation in Türkiye has taken a different course, mostly shaped by the influence of new international institutions such as the World Health Organization (hereinafter, WHO), policy consultancy by international experts, and the entry of Turkish experts educated abroad into the bureaucratic apparatus further promoted the transfer of knowledge and experience. In this respect, rather than telling the story of "dominant sovereign power or democratic party politics" (Kohlwes, 2014, p. 18), Kohlwes (2014, p. 18) makes use of the analytical toolkit provided by the Anglo-Foucauldian governmentality studies that investigate a range of discourses and practices: "…tactics, strategies, techniques, programs, dreams and aspirations' of those authorities, experts, doctors, patients,...etc. who attempt to shape beliefs and control of the population, subjects, or citizens." In this respect, the suggestion proposed turns out to be historicizing and contextualizing these processes to distance analysis from the premises of mainstream analyses, and modernization theories that require linear readings.

Apart from Kohlwes' research (2014) that remains within the framework of Anglo-Foucauldian governmentality studies-therefore, subject to the critiques that these studies have faced when it comes to *actual spatiality*, there are a few studies that focus on health care transformation in Türkiye through the lenses offered by the works of Foucault and/or the critiques of Anglo-Foucauldian governmentality studies. This strand of research historicizes and contextualizes the *subjects* and *technologies of health care transformation* in Türkiye, therefore, these studies mainly shine a light on the interactions between micro and macro scales of governing health care (Aykan and Güvenç Salgırlı, 2013, 2015; Bilge-Ülker, 2019; Günok, 2018; Uluçay, 2016). In this respect, Aykan and Güvenç Salgırlı (2013, p. 306) analyze public spots as a technique of neoliberal governmentality, which, in their words (2013, p. 306), "…works primarily by responsibilizing individuals as health entrepreneurs investing in risk-free lifestyles;" that is, "by conceptualizing health as a matter of self-conduct where personal responsibilities are emphasized" (Aykan and Güvenç Salgırlı, 2015, p. 71). Furthermore, Günok investigates "three phenomena in post-1980 Türkiye by using the concept of neoliberal governmentality that is handled about processes of securitization, economization, and subjectivation" (Günok, 2018, p. iv). Moreover, Bilge-Ülker (2019) attempted to highlight the unfoldings of neoliberalism with an eye on health-care reforms, primarily focusing on the subjects this mode of governmentality produces.

The above-mentioned studies have been quite useful as we share the broader context of the same research subject, namely the dynamics of health care in Türkiye since the 2000s. However, we intend to start out investigating multi-scale interactions on a *meso level of analysis*. Moreover, the above-mentioned studies focus on the actual functioning

of the government of health care in positive power mechanisms by making use of various tools provided by the Governmentality Perspective. Yet, even though they do take 'how' questions into account, they also seem to set aside "where" questions, therefore, the actual spatiality of governing health care remains unexplored if not merely studied with regards to the interactions between agents on macro or micro scales.

There is only one study along the peripheries of social and political theories that we have come across during our literature review which particularly put forth an *analytics of government*, and on a meso scale, in an urban context, indeed, on contemporary Istanbul. Yalta Yandaş (2015) focused on Istanbul, by making use of Foucauldian lenses, especially those of the critiques of Anglo-Foucauldian Governmentality Studies, in particular Dean (1999; 2002; 2006) and Dardot and Laval (2012). To inspire similar studies concerned with other regimes of government such as education, crime, security, health care, etc., and to emphasize the decentralized nature of power, the management of populations, and the active role of individuals in governing themselves, Yalta Yandaş examined urban regeneration processes in Istanbul in the 2000s. This study (Yalta Yandaş, 2015) intended to highlight various rationalities, technologies, and subjectivities of government that paved the way for neoliberal governmentality to reshape Istanbul by prioritizing procedural values against politico-ethical ones and limiting politics to a matter of technicality.

Following Yalta Yandaş's footsteps, our research makes use of *analytics of government* proposed by Dean (1999; 2006; 2009) as well. Yet, while Yalta Yandaş focused on *urban regeneration processes* in *Istanbul in the 2000s*, we intend to focus on another *regime of government*, namely the *dynamics of health care in Istanbul in the 2000s*. This is to take into account not only the "where" questions but also the meso-scale interactions of actual power relations. In this context and concerning our research subject, the unique contribution of our research derives from its stress not only on the actual functioning of the government of health care in its positive power mechanisms but also on the *spatiality* of such mechanisms by focusing analytical lenses on a meso, urban context, which is an avenue of research still not pursued fully to this day and with respect to health care. In this respect, we argue that we should not suffice with historicizing and contextualizing regimes of government but also spatializing them soundly on multiple scales and for multiple agents. To this end, we put the onus on the *meso scale of Istanbul* as a cornerstone, hoping that such recalibration will help us better grasp *the interactions between multiple agents on macro-meso-micro scales* all at once.

BRIEF II: TAPPED POTENTIALS OF GOVERNMENTALITY PERSPECTIVE IN URBAN STUDIES

The Governmentality Perspective has been used not only by social scientists but also by geographers and urban planners to better understand how cities are governed and how power dynamics impact urban contexts and populations. To start, governmentality studies have been useful in illuminating how decisions are made, policies are created, and urban spaces are governed via methods and technologies of power used by various governmental and non-governmental actors (McFarlane, 2011; 2021). On a parallel front, it has been used in urban planning studies to investigate problems with sanitation, public health, and the provision of health care in urban areas (McFarlane et al., 2011). Furthermore, as technology is increasingly used to manage metropolitan areas, issues about surveillance and control have also surfaced (Lyon, 2007; Monahan and Murakami Wood, 2018). Moreover, studies on governmentality have also looked at how urban planning affects the subjectivities and identities of urban residents (Peck and Tickell, 2002; Simone, 2018). What is more, governmentality research has been used to better understand the roles of developers, planners, legislators, and community members in influencing urban landscapes and resource distribution (Brenner, 2016; 2019). Overall, the notions of governmentality have provided essential tools for scholars to critically study and comprehend the power dynamics, social processes, and governance mechanisms at work in urban contexts.

Given the above-mentioned multiplicity of research avenues that the governmentality perspective has proliferated, it is hypothesized to provide contemporary urban planning studies with an alternative multi-scale analytical tool kit when it comes to analyzing the dynamics of urban health care in Türkiye as well. A possible key to unlocking such potential is to concentrate on these processes at the meso scale in *Istanbul* and the *discourses, practices*, and also the *interactions of the Istanbul Metropolitan Municipality* in the 2000s.

RECALIBRATING ANALYTICAL LENSES: RESEARCH QUESTIONS AND INITIAL FINDINGS

Kohlwes appears to be valid in stressing "the influence of new international institutions such as the World Health Organization, policy consultancy by international experts, and the entry of Turkish experts educated abroad into the bureaucratic apparatus…" (Kohlwes, 2014, p.34). Since the 1980s, there has been an increase in global interactions, as a result of which cities and health care are now more significantly impacted by global political and economic processes as well as those at the individual, municipal, and

national levels. Global conceptions and representations of bodies, health, and illnesses are having an increasing impact on local and individual discourses as well as international financial and health organizations, which in turn have an impact on national health policies. Numerous organizations that concentrate on global health challenges, such as contagious illnesses, sanitation, nutrition, housing quality, and access to health care services, flourished on the *macro scale*. For example, the WHO (2006, p. 1) defines health on holistic grounds: "not only as the absence of illness, disability or weakness but a state of physical, mental, and social well-being." In light of this definition, it has enforced programs such as *Healthy Cities 2010* for local governments to improve the quality of life in their cities (Vlahov et al., 2004). As Navarro (2007) indicates, additionally, the World Bank and International Monetary Fund have suggested a standard model of privatization for developing countries' health sectors, and most of these countries have followed their advice.

As a result, *on-the-ground reforms* have soon emerged in *macro-national* contexts as the actual reflections of these *macro-international* discourse sets. In fact, one encounters a terminology similar to that of the WHO after studying the Justice and Development Party's (hereinafter, JDP) discourses and practices on urban health care, the Parliament's related discussions of urban health care, the Ministry of Health's discourse and practices in the context of Istanbul, Turkish Industrialists' and Businessmen's Association's reports (hereinafter TUSIAD) since 2003. This was indeed the result of the political and economic collaborations that had previously been started: Since the 1980s, Türkiye has implemented two WHO-sponsored health initiatives (Sur and Atlı, 2001; Yıldırım, 2001). The most comprehensive of these reforms, the *Health Care Transformation Program (2003, hereinafter* HTP) has been initiated with the support of the World Health Organization as well, which was designed in two phases: *Program for Transformation in Health (2003–2009) and Health Transformation and Social Security Reform* (2009–2014).

These reforms have had direct influences on the *micro scale* and they were mutually shaped by the conduct of various agents stretching from patients and doctors to health care management and staff, as well. On the one hand, a consumerist form of the patient, better said, *patient as user* evolved (Bilge-Ülker, 2019, p. 65-78); on the other hand, in the digital age, this *patient-consumer* started to be expected to take ever more responsibilities and be the co-manager of his conditions (Crawshaw, 2012; Lupton, 2014; 2016). Doctors, nurses, and health-care staff along with the management, all had to acclimatize to the reorganization of their field as well.

In this context, we depicted that the untapped potential of the governmentality perspective when it comes to analyzing the dynamics of health care in Türkiye can be unlocked by focusing on the missing scale of analysis in the face of the above-mentioned interactions: the meso scale. Reflected on the mirror of *Istanbul* – an ever-expanding *ecumenopolis (Ecumenopolis: City Without Limits*, 2012), a product of ample forms of power investments – and the discourses and practices of its metropolitan municipality as an actor engaged in the regulation of urban health care (hereinafter *IMM*) and with an eye on its actual and spatial interactions with other agents on micro and macro levels, our research intends to carve out the tactics and strategies employed in governing health care in Türkiye along the lines of *territory, capital, architecture, distribution, hierarchy, circulation, events, and risks* as required by analytics of government[1]. In this context, the following research questions emerged in guidance of Dean's related work (1999, p. 21-31):

- (Techne of governing health care) Which t*ools, mechanisms, procedures, and techniques that multiple agents use*, for the concerns of this research, as a start, particularly the IMM, to set authority on meso-scale/ urban health care?
- (Episteme of governing health care)
  - Which *problematizations* gave rise to the *discourses* and *practices* but also the *interactions* of IMM with other agents from various scales when it comes to governing health care in the meso context of Istanbul?
  - On what kind of *thought processes* (calculation and strategy) that these tools, mechanisms, procedures, and techniques are built upon?
- (Fields of visibility) How goals in urban health care are visualized in IMM's power and *authority diagrams* (for instance, in its Activity Reports and Bulletins)?
- (Spatiality of governing health care) Not only how, but also where do the elements of the health care regime in Istanbul operate? To this end, this research hypothesizes that focusing on city hospitals along the lines of *territory, capital, architecture, distribution, hierarchy*, and the health care system during pandemics along the lines of *circulation, events, and risks* provide us with convenient stretching boards.
- (Ethos of governing health care)
  - What kind of *subjects* is aimed to be produced as a result of the goals set by IMM for urban health care?
  - What kind of power relations are involved in governing health care in Istanbul in the 2000s?

This mid-range analytical tool along the lines of the above-mentioned themes and research questions proved to be more than useful in capturing the swift transitions between micro-meso-macro scales stretching from self and populations to local, national, regional, and international organizations and communities clustering around the theme

of health care in Istanbul. Our initial findings which are still in the making revealed interactions between diverse agents that problematize the current system and offer a solution within a… "business" rather than "public service culture" (Prince et al., 2006, p. 258). This seems to be the emergent plan of action that gives coherence to other already present actual and spatial power mechanisms (Prince et al., 2006, p. 256). A socio-political rationality that deems the market as the best distributor of health care appeared to underlie on-the-ground reforms when we focus on the meso scale of contemporary Istanbul. Furthermore, market principles appeared to decide on "the degree and type of governmental intervention" (Dean, 1999; Foucault, 2008; and Petrakaki et al., 2018) when it comes to urban health care, which is an indication for the actual and spatial functioning of neoliberal governmentality in Türkiye through Istanbul.

CONCLUSION

Due to the epidemic of health care reforms all around the world in tandem with the urban population expected to rise to 70% of the world population in just a quarter century, a theoretical revitalization in contemporary urban planning studies is necessary to analyze the dynamics of health care in Türkiye. To adequately address ever-more complicated urban problems and to go beyond descriptions of the status quo, contemporary urban planning studies, especially those that focus on the dynamics and challenges of urban health care better rearrange and diversify their analytical tools. In this context, this article attempted to suggest making use of a practical, analytical, and hopefully critical toolkit to this end. Upgrading the major lenses used by contemporary urban planning studies *efficiency, accessibility, design, and sustainability of social rights* – with those of analytics of government-te*rritory, capital, architecture, distribution, hierarchy, circulation, events, and risks* – has the potential to shine a light on the government of contemporary health care in Istanbul operating on multiple scales all at once. By making use of governmentality perspectives, urban planners can gain critical insights into the actual spatiality of regimes of government in cross-cultural urban contexts.

NOTE

[1]Putting the onus on the spatial dynamics of healthcare via IMM's online publications, namely it's Activity Reports and Bulletins indeed, opened up a wealth of research avenues which is the subject of the dissertation we currently work upon, therefore, also the subject of another article on methodological explorations. In this article, we suffice to lay out the theoretical groundwork.

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Article

Urban transformation in the context of the right to the city and citizens' rights: The case of Trabzon Beşikdüzü

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ABSTRACT

While cities make decisions regarding urban space, citizens who experience effects of decisions are excluded from decision-making processes. Urban plans are generally designed regardless of residents. The pursuit of searching for answer to the question: "Who are managing cities?" by urban politics, necessitates both neo-liberal urbanism and answer to the question "to whom cities belong." Since the 2000s, the concept of "right to the city" has been frequently brought to the agenda in the search for an answer. The problem of the study is "What are the results of urban transformation practices in the context of the right to the city and the rights of the citizens? In this context, the aim of the study is to discuss the results of urban transformation practices to produce urban space in relation to the violations of the right to the city and the right of the citizens, through the example of Beşikdüzü. The study was prepared with knowledge that urban transformation and spatial changes in Beşikdüzü led to the desire of citizens to own the in 2014-2019. Study reveals that the participation of city residents in the decisions taken regarding the production of urban space hasn't been enabled, there have been implementations that violate the rights of city residents, and the decisions have resulted in the destruction of the spaces which represent the identity of city, have led to the demand for conservation of city-by-city residents.

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INTRODUCTION

The urban built environments of cities are subject to a constant change. Rent potentials of aged living spaces in city centers have emerged concurrently with the neoliberal transition. Space has evolved into a marketable commodity. As a result, urban areas have become the primary focus of headquarters (Kuran, 2021: 177). On the other hand, for each political government to express itself corporally is possible by leaving a mark on an urban built environment. Thus, capital accumulation is achieved via the production of an urban space. Along with this, the channels, in which the changes within the urban built environment of cities could take place with the consent of the residents of a city, are restrained. This restraint leads the administrators, who hold a permeable force against the demands of capital accumulation and current conditions, to make decisions regarding changing the urban built environment despite

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the sensitiveness of residents. As neoliberalism, market and change-oriented intervention, spatial inequalities, and displacement processes, urban administrators change and the understanding of urban entrepreneurship, which tends to draw the investment onto itself during an intercity competition, evolves; the suppression for a change upon the urban built environment increases, therefore, resulting in changes that would destruct the memory of a city. These changes, in turn, lead to urban social movements by bringing about violations of rights. "Right to the city," which suggest residents having a voice on the changes occurring in cities, and "urban rights," which is expressed in detail in various international documents, are used together with the understanding of participation, when we examine today's practices. The right to the city is a struggle of individuals and communities (Balzarini and Shlay, 2015: 505). However, right to the city prescriptions lack any political component that ensures that the outcomes of such battles will either challenge neoliberalism or be redistributive. Without any political content, the right to the city generates competing claims on the community (Kartal and Gençtürk, 2022: 75).

This study touches on the right to the city and urban rights, and therefore provides information on city councils, which are considered to be one of the limited methods of participation in urban policy in Turkey. The fact that "right to the city" in the recent years have been used often in international agreements, academic literature, alternative policy pursuits and for public opposition, have led this concept to expand as to embody many distinct references. Purcell (2014: 142), stresses that despite the expansion of the content of this concept, Lefebvre considers right to the city a fundamental component of a wider political conflict for revolution, rather than an addition to current liberal democratic rights. This emphasis also constitutes the main reason for the need to consider the concepts of "the right to the city" and "the urban rights" apart from each other. The reason why the history of Beşikdüzü County's Village Institute is included in the study is to reveal the emergence of objections toward urban transformation practices in Beşikdüzü, in relation to the spatial changes in the city, as well as social and political reasons and the existence of citizens with urban ethics. Based on environmental ethics, Akkoyunlu Ertan (2008a) analyzes urban ethics under two headings: the practical level, where decisions are made on how we should live in the city, and the abstract and academic level, which involves thinking about how we make decisions regarding the future of the city, what we value, and how we carry urban values into the future. In the same study, he also states the necessity of urban ethics being at the basis of the cooperation efforts of managers and individuals who produce spatial and urban structures for the benefit of society. Through this, individuals who are raised with urban awareness will realize the problems in their urban environment and make cooperative efforts to produce solutions to these problems for present and future generations (Akkoyunlu Ertan, 2008a).

NEOLIBERAL URBANIZATION: THE RIGHT TO HAVE A SAY IN THE PRODUCTION OF URBAN SPACE AND URBAN TRANSFORMATION IN THE CONTEXT OF "THE RIGHT TO THE CITY" AND "URBAN RIGHTS"

Each type of society and each form of design has its own specific type of a city (Lefebvre, 1996). We are in a phase, which has been called "neoliberal" since 1980s, in which corporatization, liberalization, implementing private sector approaches in public sector as well, have been related to efficiency, and localization and globalization have been focused on. In this phase in question, the growth in building trade due to production of space, establishment of cities, and even establishment of new cities, and large-scale mega-projects have been carried into effect. Neoliberal urban policies are performed through a constant building and destruction and reconstruction of urban built environment, for accumulation of capital, and the most prominent one of these implementation tools is called "urban transformation."

Secondary circuit of capital is based on the investments made on urban built environment. For capitalism to expand and for capital accumulation to disentangle the crises/conflicts which it involves in, there has been changes experienced in urban built environments of cities from past to present, hence, urban housing and infrastructure investments play a determinant role in capital accumulation (Harvey, 1982). In this aspect, the roles of state and finance are of remarkable importance as well. Within this dominant urbanization model, urban managements that are in a competition with one another attempt to implement urban plans that are to draw the investments to themselves through an entrepreneurship suppression. Cities are renovated by change values rather than value of use. One of the most important urban policy tools in this renovation process is urban transformation applications. At the same time, one of the most commonly utilized conceptualizations of the capital-space interaction under neoliberalism is the concept of urban transformation (Kuran, 2021: 175). Urban renovation practices date back to the process that started with the industrial revolution, and today's practices are based on an economic-centered approach that includes urban revitalization (Özden, 2016: 49-50). In this context, in today's world, urban transformation policies are attributed an important role with the reasoning that the transformation of the urban built environment will attract international capital and revitalize many sectors and consequently create social welfare. In addition, the preservation and maintenance of historical areas through the urban transformation policies are aimed (Türkün, 2014: 5-8; Öktem Ünsal and Türkün, 2014). While old city

centers undergo urban transformation under the name of urban renovation, the necessity of preserving their original identity requires "renovation by preserving," that is taking urban conservation principles into account (Özden, 2016: 47). However, when we look at the urban transformation practices, it is seen that these principles have not been carried out. At the same time, all segments of the society cannot benefit equally from the urban rent generated by urban transformation practices. In addition to this unequal distribution, the fact that urban transformation decisions are carried out together with free market actors in practice and that urban residents are excluded from decision-making mechanisms also deepens the unequal power relations. Although any change to be made in the urban built environment determines the future of the people living in the city, these decisions are determined by a group of central and local administrators and potential investors, and the people living in the city may be left out of the decision-making processes (Türkün, 2014: 5-8; Öktem Ünsal and Türkün, 2014).

Urban built environment holds the fundamental role in disentangling-although temporarily-the over-accumulation crisis of capital through *spatial expansion* and *temporal shift* (Harvey, 1989). Urban transformation practices function as production inputs for capital accumulation in the commodification of cities in global capitalism (Şahin, 2015: 85). Although the city governments which aim to draw the investment into their side, make decisions regarding urban spaces, the citizens, who are to experience all the outputs and impacts of the decisions in question, are excluded of these decision-making processes. In addition, urban plans are designed and implemented without the participation of the people of the city and without being fully discussed. The pursuits of searching for an answer for the question: "Who run cities?" by urban politics, necessitate both neo-liberal urbanism practices and an answer for the question "to whom cities belong" through putting it on the agenda. Within this context, the recent practices in 30–40 years have put the concept "right to the city" on the agenda of the search for answer in question, since 2000s.

The concept "right to the city" is theocratized by Lefebvre. Lefebvre (1996) who considers city as a work close to a work of art rather than a material product, regards production of city as a human production and reproduction. According to Lefebvre, production of urban space necessarily includes the reproduction of social relations related to the space to be produced. Production of urban space, therefore, requires much more than planning material space of a city, hence, includes production and reproduction of entire aspects of urban life. According to Lefebvre (1996) *the right to the city is like a cry and a demand...* Through right to the city, individuals will therefore transform their own daily lives by having a voice on the decisions to be made in regard to city. Harvey (2012), suggests that right to the city is one of the most neglected fundamental human rights and defines the rights in question as a set of rights that is beyond an individual freedom of accessing resources, and rights for *changing the city, thus, changing one's own self* reinvention of city. In this sense, since the demands of dissentient movements, which are to congregate under right to the city slogan, are one of the primary channels of urban process plus production and use of product, there needs to be more inspections with respect to maintaining democratic control on plus value via urbanization. Harvey, (2012), stresses that right to the city needs to target the capital accumulation that exploits collective spaces, and, that it needs to be understood as a set of rights purposes of which is reproduction through a completely different model, which is to eliminate poverty and inequality, to repair the destruction imposed on the environment, rather than being a set of rights on something that currently exists.

The "right to the city" cannot be put into reality in concrete terms in the capitalist system, which is nourished by unequal relations and can only survive because of these unequal ties. In other words, due to the unequal nature of capitalism, it is impossible to realize a "urban administration" in which everyone is at an equal distance, individuals have a say in all city decisions, and all urban resources and opportunities are distributed equally and fairly to the people of the city (Şahin, 2015: 76). Accordingly, Purcell (2002), who regards right to the city not as a completed resolution, but as a movement towards a new urban policy, hence, describes as urban politics of citizens, suggests that global reconstruction processes after the year 1970 led to changes on urban management models, and, in addition to this, residents are excluded from the decisions that shape cities. Local administrations that move from demand-oriented redistribution to supply-oriented competition perform the practices, which are to draw the capital accumulation onto themselves, together with non-governmental organizations via efficiency pursuits. Therefore, this leads to the decisions of actors other than local governments, who are not elected, thus, are not subject to democratic control, shaping cities. Purcell, (2002: 101-103) positions right to the city towards production of urban space, by moving decision-making away from the state. Purcell highlights the necessity of shifting the control on all the decisions that contribute to production of urban space from capital accumulation and the state to city residents, with reference to Lefebvre. Right to the city contains the voices of residents of cities in areas related to nonstate decisions that produces urban space, as well. Right to the city which includes the right for participation and residence, embodies the direct contributions of residents to entire decisions that produce urban space in their cities. In addition to this, Purcell (2002: 104), expresses that citizen live in intertwined concrete scales that restrains their participation and these

scales are formed in a hierarchical relation. Therefore, it is possible to come into question that decisions made through participation in lower scales could deteriorate on higher scales.

Marcuse (2014), in evaluating different readings of the right to the city in the context of its relationship with the struggles for the right to the city, states that the strategic reading of the right to the city is seen as an umbrella concept by many different social segments that are dissatisfied with their living conditions and disadvantaged in today's urban society and that alliances are formed accordingly. Marcuse interprets the content of this use of the concept in the direction of the demand for inclusion in the city as a step with more limited claims rather than contradicting the content used by Lefebvre. The discontented reading of the concept, on the other hand, involves the demand for rights by people who think that it is not enough to just be included in the current city, and that they feel incompatible in a society over which they have no control. The spatial reading of the concept, while having a narrower scope in practice, includes the efforts to design and manage a better city. Marcuse argues that a spatial reading of the right to the city-because it is likely to show alternatives for the disaffected rather than changing power relations that lead to further exploitation and exclusion-distracts from the broader goals of struggles for the right to the city, and that in this context it can only be seen as an addition to the right to the city movements. The collaborationist reading of the concept has a content in which radical content is warped in the context of its support for moderate reform efforts. When the concept is included in a condition that is recognised officially, it takes on a content that supports the search for rationality and consensus, where the inevitability of conflict and the necessity of struggle are explicitly rejected. The subversive reading of the concept, on the other hand, refers to demands and actions that can produce transformative results. This reading points to the radical goals of Lefebvre's original work and the related aims of social movements and economic struggles that have inspired and continue to inspire political protest movements throughout history (Marcuse, 2014).

Policies and practices for participation in urban decisions have been developed along with the governance approach after 1990. In relation to this context, we see that the right to the city has been removed from its revolutionary content and included in international documents as "urban rights" in a way that includes a collaborative and spatial reading of the right in question. In various international documents such as European Urban Charter and European Urban Charter II, the "right to participate" as a citizen, is regulated among the fundamental rights, grounding on consulting with citizens in all the decisions that are to affect the future of a society (Pektaş and Akın, 2010; Akkoyunlu Ertan, 2008b: 9; Çelik, 2013: 220). The right to the city as an urban right is considered within the third generation of human rights and at the same time makes it possible to achieve urban social sustainability (Akkoyunlu Ertan, 2008b: 126, 135). However, city rights are linked to first- and second-generation rights. "Right to settle" is one of the first generation rights that can be considered basic human rights. The "right to settle" in first generation rights evolved into "The right to housing" in second generation rights. Urban rights are one of the most significant aspects of this stage, which encompasses rights such as the right to the environment, the right to peace, and the right to profit from humanity's collective heritage. As previously indicated, "right to settle" in the first generation rights becomes "right to housing" in the second generation rights, and "quality of life" in the third generation rights (Arslan, 2014: 34). Urban rights include, in relation to human rights, because a citizen is a member of the city they reside in as well as all the rights they have as a human being, a citizen's having voice on all urban and environmental values and decisions in the city (Karasu, 2008: 38).

And right of participation includes right to the city context, which includes not only an individual's participation in decision-making processes of managements, but also participation in processes of production of urban space. Enabling participation of public in decision-making processes, which is one of the steps to carry right to the city into effect, will decrease the crimes committed against cities as well (Karasu, 2012: 524). The right to the city entails the creation of an urban environment for everyone, taking into account the requirements and expectations of all city segments. However, in such an urban area, there can be civic freedom, an environment of involvement and negotiation, the preservation of personal distinctions, and the reduction of poverty, social isolation, and urban crime (Bahçeci Başparmak, 2020: 228-229). The process of designing urban space is accomplished by technical and political personals due to the consensus on that the balances between two parties could change. On the other hand, results of spatial changes have the potential to affect all residents of cities.

Interventions against urban built environments in many different cities are performed through urban transformation projects and gentrifications. Nonetheless, residents of cities, conserving their living environments, intending upon having a voice on spaces being shaped in different forms is related to that citizen may have adequate physical, economic, social and cultural conditions (Akkoyunlu Ertan, 2008b: 2). In order for right to the city to be performed within the frame of conserving and improving urban environment, it requires to accord the right for citizens to be informed of plans, projects and implementations which can deteriorate urban environment, the right for participation which enables individuals and communities to participate in decisions regarding their cities, the right for resort which enables individuals and communities to

resort to the jurisdiction in case of deterioration of urban environment. Akkoyunlu Ertan (2008a), who regards citizen ethics a significant support in accomplishing right to the city, regards citizen ethics as a moral responsibility for production of an urban environment, in the way of conscious and responsible individuals who are aware of the problems occurring in their cities, conserving the rights of future generations, befitting to human dignity (Akkoyunlu Ertan, 2008b: 3-4, as cited in Kaboğlu, 1994).

The concept of the right to the city, which Lefebvre views as the fundamental component of a political struggle, is expanded by Harvey (2012) who adds the content of "social justice" to it, emphasizes its use value and radical revolutionary content, and then uses it to describe a variety of struggles. They have their reading. With more people residing there, cities have transformed into fundamental living areas and have emerged as structures where rights will be upheld. Therefore, the right to the city has been used in multiple contexts to fight for rights and end inequalities rather than just in the context of actions in the urban environment.

RESEARCH

In the research chapter of the study, firstly, the information which are remarkable in the sense of being illustrative with the research findings regarding county of Beşikdüzü, following that, the research method and the findings obtained with respect to field survey specific to Beşikdüzü will be presented afterwards.

Methodology

In the study, qualitative research methodology was employed. The qualitative research process is divided into seven steps: Topic selection, focus question, study design, data collection, data analysis, data interpretation, and informing others (Neuman, 2010a: 22). These steps were carried out within the parameters of the study. Furthermore, many methods have been used during the data collection step (Neuman, 2010b: 548). Field study is one of them. The study included field study as well.

Beşikdüzü Municipal Council consists of 16 members including the mayor. Within the scope of the study, semi-structured interviews were conducted with the mayor of Beşikdüzü County and 9 municipal council members: 5 from CHP (Cumhuriyet Halk Partisi, Republican People's Party), 2 from AK Party (Adalet ve Kalkınma Parti, Justice and Development Party), 1 from MHP (Milliyetçi Hareket Partisi, Nationalist Movement Party), and 1 from İYİ Party, about the problems of the county.

Standard questionnaires were sent to the members of BDK (Beşikdüzü Düşünce Kulübü – Beşikdüzü Think-Tank)[1] in order to understand the reasons for their gathering, their demands, and the main reasons for these demands. The answers given by 38 members were evaluated through content analysis.

Moreover, an in-depth interview was conducted with the member (Interviewee 3; Table 1) who provides the communication and coordination that brings together the members of the BDK.

This study has been prepared in accordance with the Ethics

Table 1. Profile of interviewee council members

Interviewees	Duty	Term	Party	Place of Birth	Age	Education
Interviewee 1	Mayor	2. Term 2009-2014/ 2019-	Republican People's Party (Chp)	Beşikdüzü	65	University-Agric. Eng.
Interviewee 2	Member of Assembly	1. Term 2019-	Republican People's Party (Chp)	Vakfikebir	65	University-Teacher
Interviewee 3	Member of Assembly	1. Term 2019-	Republican People's Party (Chp)	Tonya	65	University-Teacher
Interviewee 4	Member of Assembly	1. Term 2019-	Republican People's Party (Chp)	Beşikdüzü	57	High School-Businessperson-Building Trade
Interviewee 5	Member of Assembly	1. Term 2019-	Iyi Party	Trabzon Merkez-Ortahisar	40	University-Businessperson-Building Trade
Interviewee 6	Member of Assembly	1. Term 2019-	Republican People's Party (Chp)	Beşikdüzü	65	University-Teacher
Interviewee 7	Member of Assembly	1. Term 2019-	Republican People's Party (Chp)	Akçaabat	64	University-Teacher
Interviewee 8	Member of Assembly	1. Term 2019-	Nationalist Movement Party (Mhp)	Beşikdüzü	52	High School-Business Owner (Bakery)
Interviewee 9	Member of Assembly	-	Ak Party	Trabzon Merkez-Ortahisar	55	-
Interviewee 10	Member of Assembly	1. Term 2019-	Ak Party	Tonya	44	-

Committee Approval Certificate dated August 13, 2021 and numbered E-82554930-050.01.04-158895-300-1358 and the rules of scientific research and publication ethics. The questions of the study are detailed below:

Table 2. Profile of interviewees - members of Beşikdüzü Think Tank

Gender	
Female	12
Male	26
Place of Residence	
Beşikdüzü	24
Outside of Besikduzu	14
Level of Education (Graduation)	
Primary School/Secondary School	1
High School	7
University	21
Master's Degree	8
Ph.D. Degree	1
Age Range	
Between 18–24	-
Between 25–31	4
Between 32–38	3
Between 39–45	-
Between 46–64	22
Over the age of 65	8
Occupation	
Archaeologist	1
Attorney at Law	1
Bank Employee	2
Student	1
Electricity Sector Employee	1
Retired	1
Teacher	12
Healthcare Worker	1
Self-Employed	1
Graphic Des.	1
Engineer	2
Urban Planner	1
Journalist	1
Psychologist	1
Tradesperson	1
Private Sector	1
Tourism	1
Academic Member	1
Financial Consultant	1

Questions for the mayor and council members of Beşikdüzü district

Questions to learn about the interviewer's age, style of council participation, political affiliation, and occupation (Table 2).

What are your thoughts on city councils?

Do you believe that Beşikdüzü requires a city council?

What do you expect from the Beşikdüzü city council?

What are the potential issues for Beşikdüzü?

Because this was a semi-structured interview, it was allowed to address other sub-topics in addition to the primary questions.

Questions for Beşikdüzü think tank members

Questions to learn about the interviewer's profile, such as e-mail, gender, educational background, high school graduation, age, occupation, and domicile.

What do you think about the Beşikdüzü Thought Club's (BDK) founding mission?

What motivated you to join BDK?

How did you become a member of the Beşikdüzü Thinking Club (BDK)?

What do you hope to get from BDK?

What are your thoughts on city councils?

When and where did you first become aware of City Councils?

What do you expect from the Beşikdüzü city council?

Do you believe Beşikdüzü requires a city council?

Aside from City Councils, do you have any alternative alternatives for Beşikdüzü's spatial growth, and if yes, what are they?

About County of Beşikdüzü

Trabzon is the Eastern Black Sea Region's oldest and most important port city, as well as the province with the largest population density. During the Russian occupation, Trabzon witnessed its most intensive spatial alteration on a city-wide scale. Along with the Republican era's modernisation efforts, city planning studies gained traction throughout Turkey. In 1937, J.H. Lambert, the French urban planning specialist, received the most important development in Trabzon's urban planning. The authorities linked to plan making were passed from the central government to the local government with the passage of Zoning Law No. 3194 in 1984. As a result, the Trabzon Municipality began work on the development of an additional revision zoning plan in 1987 (Akkaya, 2018: 49-54). Trabzon has undergone a new structuring process in recent years, with urban transformation works, relocation

of public institutions, large-scale investments, and the development of high-density residential areas that create attraction in the city's east-west-south direction. Under urban transformation, the geographical consequences of globalization and neoliberalization on the city, as well as the projects that promote change, are investigated. Along with the globalization process and the consequences of neoliberalization, urban transformation projects, which are one of the most effective studies in city restructuring processes, began to exhibit major effects in Trabzon around 2000 (Özlü et al, 2018: 198). Trabzon's historical texture has been altered throughout time, as it has in many cities, as a result of rapid and unregulated construction (Akkaya, 2018: 49-54). Trabzon's first urban transformation case was opened in 2007. There were 24 cases under the subject up until 2015. The cases are titled as follows: appeal action (14) and annulment action (10). The lengths of the aforementioned cases are as follows: <1 year (7), 1 year (1), and 2 years (16). Acceptance (2) and rejection (22) are the outcomes of these cases (Aghabalaei Fanid and Kavacik, 2019: 805).

Within the frame of this study, in the context of the reason for preferring county of Beşikdüzü which constitutes the research subject and that the obtained findings give explanatory results, topography of the place in question, population, political identity and the urban transformation project launched in 2015 are mentioned below about county of Beşikdüzü.

County of Beşikdüzü is an Eastern Black Sea coastal residential area and the border of west coast of Trabzon. On the north Black Sea, on the east and south Vakfıkebir, Şalpazarı and Tonya counties of Trabzon, and on the west Eynesil county of Giresun are located. The total population of Beşikdüzü as of 2021 is 23,594. 50.28% (11,862 people) of the population is male and 49.72% (11,732 people) is female (Nufusu).

The instructor course, which was established in 1939 in Beşikdüzü via the process of revitalizing the villages through educational institutions in the Republican period and was transformed into a village institute a year later, made significant contributions to the development process of Beşikdüzü (Zaman and Birinci, 2009: 150). In the 1940s and 45s, despite the low male population after the Second World War, Beşikdüzü did not experience the expected decrease in the male population due to the effective establishment of the village institute in these years. The name of Şarlı, the center of settlement of Beşikdüzü, was changed to Beşikdüzü in 1939 and it was accepted not as a village but as a neighbourhood of Beşikdüzü County, within the municipal organization established in 1949, which was one of the reasons for the significant increase in the population graph of Beşikdüzü in this period. One of the important reasons for the population increase until 1975s is that Beşikdüzü, which wanted to become a center of the county, has given an effort to include some villages in the population of the sub-district centers. As a matter of fact, the population of Beşikdüzü decreased in 1980 when the population of these settlements was excluded from the center. After Beşikdüzü became the center of the county, Adacık, Çeşmeönü, and Vardallı neighbourhoods were connected to Beşikdüzü in 1992 and the horizontal development of the settlement, which was developing toward East and West, accelerated even more after the establishment of the municipality. It is also observed that population growth accelerated in these years. The population decrease in 2007 is due to the fact that before the address-based population registration system, people who did not live in Beşikdüzü were shown as if they lived here (Zaman and Birinci, 2009: 151, 153-154). In 2012, due to the legal regulation numbered 6360, Beşikdüzü experienced another significant population increase in the following years when the Law was put into practice (T. C. Resmi Gazete (2012). Thus, while Beşikdüzü county was a settlement area with 11 neighbourhoods, seven of which were central neighbourhoods and four of which were neighbourhoods under the municipalities of the towns affiliated to Beşikdüzü county before the relevant regulation, it became a settlement area with 34 neighbourhoods after the regulation.

Considering the historical and sociological developments, it is possible to evaluate Beşikdüzü politically as the "leftmost" district of Trabzon. The results of the local elections held since 1987, when the county was separated from Vakfıkebir and became an independent county, justify this assessment. Especially after 2007, Beşikdüzü became one of the rare settlements in Trabzon politics where social democratic parties and candidates were able to make a political presence against the conservative Justice and Development Party (AK Party) (Düzenli, 2021).

Urban Transformation in Beşiküdüzü District and its Social and Spatial Consequences

In 2015, county of Beşikdüzü was announced as area of urban transformation and development projects, within the borders of Fatih and Cumhuriyet districts (T. C. Resmi Gazete (2015). Beşikdüzü Urban Transformation Project, which was launched in 2015, designed as 4 stages and is to be conducted in the county town has brought along many disputes: The matter caused heated debate in the Trabzon Metropolitan Municipality Council. One of the criticisms is that the difficulties raised in the expert reports or in the stay of execution have not been properly resolved. The decision "to sell the parks" was rejected. Another criticism leveled at the council members who opposed the decision was based on ethical and legal grounds. Another of the criticisms made was related to the extortion of the area belonging to the city council member due to the zoning arrangement (61saat, 2018a, 61saat, 2018b). 11 complaints were filed for

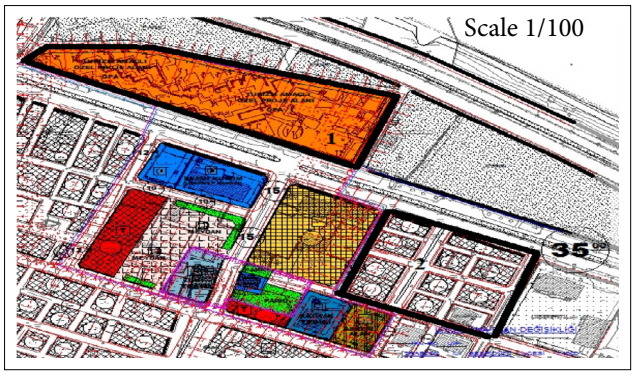

Figure 1. Beşikdüzü urban transformation and development area.

the first phase of the Beşikdüzü urban transformation and development project. The complaints to the commission were put to the vote of the council members. However, the majority of council members disregarded the complaints (61medya, 2016).

In Figure 1, the locations where Beşikdüzü Urban Transformation and Development Area has taken place are shown in red and yellow colours. In the picture in Figure 1, the area numbered with 1 shows the area where Şehit Erdal Kurtoğlu Park is located and the area numbered with 2 shows the area where the village institute building is located.

In 2016, 1/5000 scaled Master Zoning Plan and 1/1000 scaled Implementation Zoning Plan amendments for the 1st Implementation Phase of the Beşikdüzü Urban Transformation and Development Project were the subject of a lawsuit for the cancellation of the amendments in question and various grievances were reported to arise. Some of the grievances experienced are as follows: With the zoning plan amendments subject to the lawsuit, the functions of the real estate owned by the person (the plaintiff), where the independent sections with the function of housing and shops are located, are transformed into park and square areas, by the consequence of which, housing and the right to housing are harmed. The public area where the Village Institute Park is located, which has been used by the citizens for many years as a park area, is transformed into housing and commercial area; the function of the real estate where Şehit Erdal Kurtoğlu Park is located is transformed into tourism and commercial area, violating the environmental rights of the people. On the other hand, residents' rights to use these areas socially and physically are also restricted. In accordance with Article 8 of the Spatial Plan Construction Regulation, necessary analyses, surveys, research, and studies should be carried out by obtaining data, opinions, and suggestions from relevant institutions and organizations on the issues mentioned in general headings. However, the research, analysis, and consultation processes in question were not carried out, and zoning plan amendments were prepared without ensuring the participation of institutions and organizations, especially citizens. In addition, the fact that the zoning plan was not announced to the public within the legal procedures violated the citizens' right to information.

As can be understood from the content of the aforementioned grievances, Beşikdüzü urban transformation practice includes interventions aimed at the exploitation of common spaces in the context of the right to the city and the elimination of the memory spaces of the city. The citizens of the province, who are the real owners of the city, have not been able to have a say in the use of urban space and changes in the city. In the context of urban rights, this practice has a content that limits participation and the use of judicial remedies during the planning process due to the failure of timely and accurate processes regarding information. Therefore, it can be said that the urban transformation practice creates both a violation of the right to the city and a violation of urban rights. During the implementation period, the lack of consultation and agreement with the people living in the city during the preparation of the project and the emergence of grievances caused the project to be reacted by the public. The residents of Beşikdüzü, who came together around the Beşikdüzü Urban Transformation Platform, have shown their efforts to own the urban space with frequent public informative activities and meetings. According to the Beşikdüzü Urban Transformation Platform, "a socialist and populist local government approach has been moved away from Beşikdüzü with the help of municipal council decisions that do not include democratic participation and a modern management approach. As a result of these judgements, the inhabitants lost their right to be considered city owners and became merely residents of the city" (Gündoğdu, Ö., 2017).

Despite the motion for stay of execution, the changes of city development plans were put on the agenda of municipal council again in 2018. Inefficiency of the changes made in the project which included transforming park zones into housing zones as well, the objections from residents (781 objections), 45 files claimed against the plans led to a polemical process of voting among the members of the Council of Trabzon Metropolitan Municipality, hence, the project was approved along with its plan changes, despite the dissenting votes from some council members from AK Party (61saat, 2018).

Due to the fact that municipality mayor ship relayed with 2019 elections and that Beşikdüzü municipal administration progressed in the 1st stage to a certain extent and hence this etape was completed, the claim of cancellation of 2nd, 3rd and 4th stages was put on the agenda of Trabzon Metropolitan Municipality Council in the year 2019. Beşikdüzü Mayor Ramis Uzun expresses that with its status quo, urban transformation projects lead to

numerous aggrievements, therefore, is not conducive to implement (Altıntaş, Ö., 2019).

A 15.3-hectare section, falling into the 2nd, 3rd and 4th stages of the Urban Transformation and Development area-located within the borders of Cumhuriyet and Fatih neighbourhoods of Beşikdüzü County-was removed from the Urban Transformation and Development area in 2019. The annotations on the deeds of the citizens within this area have been removed (T. C. Beşikdüzü Belediyesi). The amendment of the 1/5000 scale Master Development Plan and the 1/1000 scale Implementation Development Plan for "Commercial and Housing Area" for the 1st Implementation Phase of the Urban Transformation and Development Project in Beşikdüzü county of Trabzon province was approved by the Ministry of Environment and Urbanisation on August 14, 2020 (T. C. Çevre ve Şehircilik Bakanlığı, 2020).

One of the main problem areas related to Beşikdüzü county is that the county is experiencing financial problems from debt. In addition, it has been observed that the decisions taken in the previous period regarding the transformation of the urban built environment and the attempts to carry out the implementations despite the objections of the city people constitute the definition of a problem for the current administration. The mayor of Beşikdüzü makes the following statements about the problems faced by the current administration:

"*Since the moment we took office, we have been facing an intensive process regarding the application of urban transformation. There were problems with zoning, we are currently dealing with zoning. Decisions on zoning and urban transformation have been taken far beyond the expectations of our citizens, and we are trying to change these decisions in favour of the citizens*" (Personal interview with Interviewee 1).

The city council is regarded as an important formation for the Mayor of Beşikdüzü in terms of knowing what the citizens think and taking into account the citizen's suggestions and warnings, and the Mayor's positive attitude toward the establishment of the city council draws attention:

"*Beşikdüzü is inhabited to people from various walks of life. Their suggestions will be valuable and helpful to us. It will serve as a roadmap for our future efforts. I am concerned about the light*" (Personal interview with Interviewee 1). Indeed, Municipal Law No. 5393 specifies that "everyone is a citizen of the town in which they reside." As a result of this, "*citizens have the right to participate in municipal decisions and services, to be informed about municipal activities, and to benefit from municipal administration assistance.*" Again, this Law informs towns recognize that establishing a city council is required under Article 76 of the same Law and the City Council Regulation. The law does not mandate the creation of city councils in district municipalities other than metropolitan municipalities, notwithstanding the instructions in the law and regulation. Due to this, the election of the mayor and the council of the time determines the composition of the city council in the district municipalities. In Turkey, the city council has actually been established on a very limited scale at the district level.

In Beşikdüzü, 3 stages of the urban transformation, which was planned to be carried out in 4 stages, have been cancelled by the current administration and one stage is still ongoing. However, the powers of the existing county municipality being limited, budget insufficiencies, and the reluctance of Trabzon Metropolitan Municipality and TOKİ cause the urban transformation to be incomplete.

In the interviews with the municipal council members, it is noteworthy that the mistakes made by the municipality in the previous term and the damage caused to the county come to the fore among the council members' wishes to be involved in the field of urban politics (Figure 2). The interviewed CHP municipal council members emphasized this point in particular. It is seen that the belief that the changes in the built environment of the county in 2014-2019 destroyed the history and memory of the city, thus changing the social structure, motivated the members to take responsibility for protecting the city. When viewed in the perspective of the right to the city, it becomes clear that multidimensional and multi-stakeholder decision-making is required due to the fact that decisions regarding the production of urban space produce and reproduce all facets of urban life as well as modify daily life (Lefebvre, 1996). There is a prevailing view among the members that the changes in the city are not only limited to the built environment, but they also have

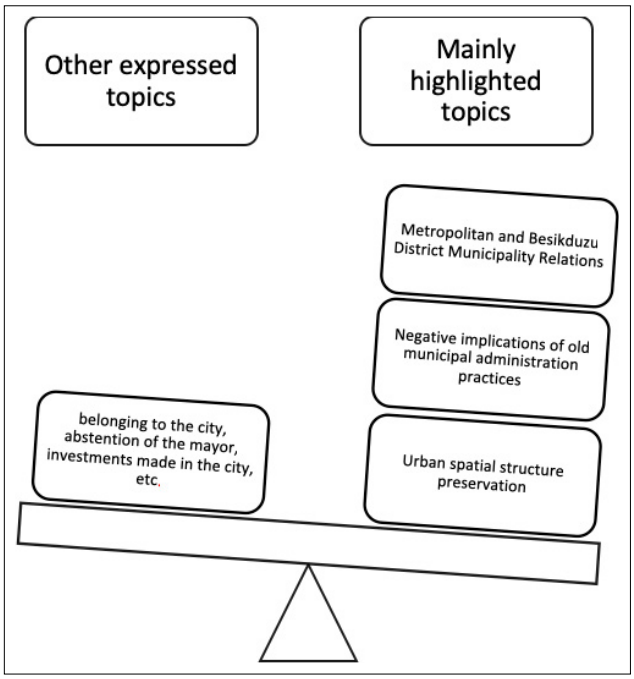

Figure 2. Common perspectives of municipal council members on Beşikdüzü.

an impact on the local development of the city. One of the comments on this is as follows:

"*Our county is the most educated and enlightened county of Trabzon. It is famous for its teachers. We are now disconnected from education, but unfortunately, we are on the agenda with strange projects, zoning plans, and prisons, unfortunately. We have become an ordinary county, people from different counties used to come here and want to move here, but now everything has changed*" (Personal interview with Interviewee 2).

Beşikdüzü Municipality Council members state that the fact that the local administration of Beşikdüzü district belongs to a different political party than the central administration and Trabzon Metropolitan Municipality leads to the investments made in the county to be insufficient nowadays and that the area to be served by the county municipality has expanded as the province of Trabzon became a metropolitan city, however the resource problem causes disruption in services. It is stated in the interviews that the practices carried out by the municipality in the previous period (2014-2019) have also made the municipality unable to perform today.

It is clear that the members of the municipal council have an opinion on whether a city council is necessary. Members of the city council have a favourable attitude about the city council. However, there are disagreements about the efficacy of the city council (Figure 3).

The spatial changes experienced in Beşikdüzü district also paved the way for the establishment of BDK, which was founded as an informal group in the form of a flexible organization with different profiles that has not yet gained legal personality. Interviews were held with 38 members of the BDK, which has 115 members as of May 2021, defines itself as a flexible, informal group and that has brought up the demand for the establishment of a city council in the district.

When we look at the answers given by the members to the question asked about the purpose of establishment of BDK; the belief that the problems experienced in the district will be overcome with cooperation and by acting mutually with BDK, the belief in the importance of the existence of a civil society that will act together for participation in the local decision-making process, and the idea of contributing to the economic, cultural, and social development of Beşikdüzü

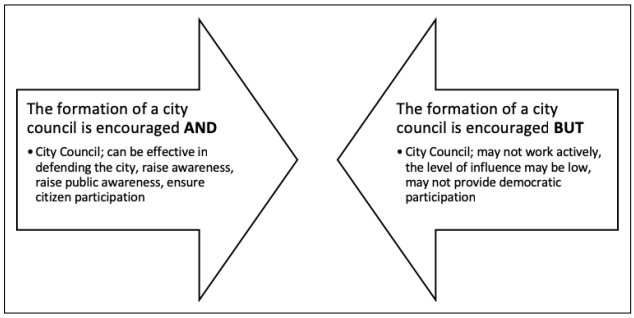

Figure 3. The members' perspectives on the city council.

come to the fore from these answers. In this context, BDK members explain the purpose behind the establishment of their foundation with the necessity of the existence of a supra-political, all-encompassing, and representative civil society that will protect the values of the county by creating a common mind, support local governments in producing new values, be active in decision-making processes, participate, contribute to the creation of social awareness about the future of the city and issues related to the district.

When we look at the answers to the question asked to the members about their reasons for joining BDK, it is observed that producing benefits for the county, supporting a civil formation, the belief in achieving together, and the desire to influence the city administration are prominent. Again, the members frequently emphasise the importance of protecting the district and leaving a liveable, developed, and at the same time, historical Beşikdüzü for future generations. The expectations of the members from BDK are concentrated on working for Beşikdüzü, building a common mind, and contributing to the raising of public awareness on local problems. It is seen that individual reactions to the idea that the changes experienced in Beşikdüzü cause the loss of the identity of the county have turned into the expectation of taking measures, contributing to the future of the city, protecting common living spaces, and sharing ideas with the administrators on all issues concerning the county.

Therefore, it would not be wrong to say that the demand for not to experience the destructions occurred between the years 2014-2019 in county of Beşikdüzü once again, constitutes the basis of BDK's congregation. Inasmuch as that the interviewer who is in charge of communication and coordination of congregation of members of the club suggests that people are responsible of what they do not manage to do as much as what they do manage to, and that despite belonging to different political approaches, it could have been effective to prevent the destructions in question if they had congregated before, and emphasizes that they structured BDK in order to at least avert the possible future incidents through co-operation and if a city council is established, they may use this as a tool to express themselves (personal interview with Interviewee 3).

We can consider the public reaction to the urban transformation in Beşikdüzü in relation to the spatial and collaborationist readings of the right to the city. In particular, the fact that the Beşikdüzü Urban Transformation Project and its implementation has revealed the demand for participation in the governance process in terms of of the ability to influence the spatial changes and the decisions taken regarding the city can be understood through a spatial reading of the right to the city, moreover, as Marcuse (2014) states and like we see in the Beşikdüzü example, we observe that the reactions are not aimed at transforming the underlying power relations. The lawsuit processes of people who are dissatisfied with

the current transformation, especially in terms of violations of rights to private property and interventions in common spaces, can be evaluated in this context.

The collaborationist reading of the concept is seen in the Beşikdüzü example in the reaction toward the urban transformation by the demand to come together under a club (BDK) in search of consensus and to be involved in the governance and decision-making process with the demand for a city council, rather than the reaction turning into an urban social movement. However, it should be especially noted here that the criticisms that the urban rights have a content distancing from the context of the right to the city are valid for both the collaborationist and spatial reading of the right to the city. As stated in the content of the study, the search for rationality and consensus of the collaborative reading distances the right to the city from its radical content; the spatial reading causes the right to the city to distance from its broader objectives; and the urban rights cause the right to the city to be absorbed by the liberal discourse and included in the third generation of human rights, thus distancing it from the context of struggle. The two different readings of the right to the city and the content expressed in international conventions as urban rights cause the struggles of urban residents against capital and the governance process, especially urban transformation, to be limited to the context of participation in urban decisions. In this study, it was observed that urban residents evaluated the struggle for the ownership of the city in the context of participation in urban decisions and that in this context, they have brought up the demand for a city council.

CONCLUSION

Urban spatial structure is exposed to transformation by different actors. Urban investments that have increased in recent years change the spatial structure, including small settlements. These spaces which represent the city's identity, memory and history are subject to destruction through these transformations, from time to time. In such schema, a system in which the city residents are the most affected ones by the destructions and transformation in question have the least voice maintains continuity.

The concept of right to the city which was conceptualized by Lefebvre has found itself an area of use to make sense of many different struggles, together with Harvey's principle of social justice and its contribution in regard to that it is a common right for the struggles maintained for shared spaces. Right to the city, which we elaborate on within the context of city residents having a voice on the decisions made in relation to their cities, has been clarified in international agreements through "right to participate" in relation with human rights.

The urban transformation projects in Beşikdüzü county and the spatial changes in the city, including the demolition of the Village Institute building, which is one of the places representing the identity of the city, the demolition of the parks, which are the gathering places of the people, and the execution of the urban transformation projects without the consent of the residents and in a way that causes grievances regarding the private properties of the urban residents have sparked reactions from the people of the city. Objections to urban transformation projects, the filed lawsuits, and the stay of execution decisions can be shown as concrete evidence of this.

For Beşikdüzü district, it has been observed within the scope of the research that the fact that the practices of the municipality during the previous administration period resulting in the dissatisfaction of the people is reflected on the political preferences of the citizens and the efforts of the people to own the space influence the new administration period's municipality to take this dissatisfaction into consideration. When we look at the urban transformation practices, it can be said that there are many violations of the basic principles of urban rights. In 2019, one of the first actions of the new municipal administration that took office was to attempt to cancel the 2nd, 3rd, and 4th stages of the previous urban transformation project.

In conclusion, the fact that the changes occurring through the decisions made in regard to urban transformation projects and urban space, have taken place in a way that they violate the urban rights in the city, eliminate the city's identity, and destruct the spaces in the city, has led the demand for conserving the city to become prominent. Nevertheless, the formal ways of being able to have a voice on the decisions made in relation to the city, the most effective construct in this restraint is city councils (along with the disputes on their effectiveness), are limited. Therefore, discontent, one of the results which are driven by the fact that citizens of Beşikdüzü, Trabzon do not have a voice on the decisions made in the city, has put the efforts for congregation of civil society and the demand for establishment of a city council on the agenda. Decisions made by city administrations regardless of residents of cities, have made the demands of residents for participation and conserving their cities become prominent, hence, efforts to pass on the city's identity and memory to future generations have been set forth.

NOTES

[1]BDK does not have a website or a social media presence. It is widely recognized due to information obtained from BDK members. BDK defines itself as a flexible and informal group with 115 members as of May 2021. BDK is a group that does not take any interest, does not expose its political side, and where people gather together. It is a supportive and exciting working group that effectively produces ideas

for besikdüzü local governments and decision makers. As a result, the members' involvement with the BTK was primarily informal (through acquaintances).

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