

SUSTAINABILITY OF TRADITIONAL HOUSING AND WAY OF
LIFE IN ANATOLIA: A CASE OF KORKUTELI-BOZOVA*Aslı ER AKAN***Neşe DİKMEN****Hilal Tuğba ÖRMECİOĞLU*****Pervin ŞENOL*******Abstract:**

Cities and towns are characterized by various types of buildings constructed with local materials, specifically detailed for indigenous conditions. In addition to environmental circumstances – such as climate, topography etc.- and availability of the materials, local cultural practices determine both housing types and architectural styles of the regions. Vernacular buildings in Anatolia typically were designed and constructed by residents of the regions who utilized traditional building techniques for their own types of daily life.

In this context, this study investigates the general characteristics and sustainable properties of traditional residential buildings in Korkuteli region of Antalya, Turkey. Three different traditional structural systems of the region are selected to examine in terms of spatial organization, building type and material, and structural properties in relation with existing user profile. For this purpose, along with the measurements and drawings of these three houses, face to face interviews with residents of the case buildings were conducted. The data gained through the process are evaluated in terms of sustainability of traditional structural systems and way of life.

Key words: Traditional Residential Building, Traditional Way of Life, Korkuteli, Sustainability.

1. Introduction

“Rural settlement” refers to a community in which the division of labor has not been developed, having agriculture based economy, extended family structure, face-to-face neighborhood relations, and thus differs from those of the urban communities. Besides, these communities are the units of society

* Dr., Ministry of Science, Industry and Technology – Ankara/Turkey asli.akaner@gmail.com

** Assoc. Prof. Dr., Süleyman Demirel University Faculty of Architecture Department of Architecture – Isparta/Turkey nesdikmen@gmail.com

*** Assist. Prof. Dr., Akdeniz University Faculty of Fine Arts Department of Architecture – Antalya/Turkey ormecioglu@akdeniz.edu.tr

**** Assist. Prof. Dr., University Faculty of Architecture Department of City and Regional Planning – Isparta/Turkey pesenol@gmail.com

with less population than that of the city, which have settled in a specific geographical and ecological area and have their own labor force, social organization, culture, specific title and past (Keleş *et al.*, 1978). Rural settlements are the environments which reflect the physical conditions, cultural structure, lifestyle of the age that they belong in their residences and, in which, the vernacular architecture is widely observed. On the contrary of the routinized urban patterns in our age, which look more similar day by day; the rural settlements, being shaped by the physical environment and socio-cultural life within the cultural richness of the Anatolian society, differ from region to region, even, from village to village within the same region. The settlements are formed depending on their topographical structure and cultural and physical environmental conditions. (Eminağaoğlu and Cevik, 2007). The formation of the rural settlements are affected by natural (climate and topography), cultural and economic factors (Karabulut, 2007).

For the villages, the house has the position of a production center. For that reason, the residence contains many usages and activities. In addition to the daily activities such as resting-sitting, storing, cooking, drying (of vegetables, fruits etc.), collection – distribution – sorting of the products, animal feeding, salt pounding etc., special activities such as wedding, engagement and circumcision ceremonies can also be stated in the house. (Eminağaoğlu, 2004). For the rural settlements, the houses are the buildings, in which, production, consumption and many more vital activities develop. At this point, besides the measurable factors, also the imponderable factors such as usage, life style, cultural structure, social relations, and historical relations are becoming the topic (Özgüner, 1970). The rural house is mostly formed with indigenous materials that can easily be reached and those that are not economically compelling. For that reason, they are directly related, aesthetically, climatically and technologically, with the habitat they live in (Gürer, 2003).



Sustainable architecture can be described as total sum of the activities that adjust to the habitat in which the structure is located; provide the historical continuity; consume the minimum energy and water during the construction and usage; environmentally conscious about the usage of natural and local materials and about the recycling of the used material; that are participative in the cycle of ecosystem; and that produce buildings, protecting the human health and comfort (Özek Karadeniz, 2010). The design and manufacturing methods of the buildings are being re-questioned, considering the concept of sustainability (Celebi, 2003 cited in Harputlugil and Cetinturk, 2005). At this point, it is accepted that the best start shall be finding clues from the local architectural data and reinterpreting them, regarding to the expectations of the contemporary user (Harputlugil and Cetinturk, 2005).

Sustainability, which is perceived as a new concept, actually sets up the unnoticed common denominator of traditional architecture on the geography of the world (Özkan, 1992 cited in Bakır, 2007). Traditional residential architecture in Anatolia reflects spiritual values like way of life, custom and feelings. Traditional houses carry traces of social, economic and cultural life of the communities in the consideration of the periods with the formation of street-quarter, room-*sofa* relationship, façade elements, construction material, roof, structure etc. (Sezgin et al., 2007). In this study, three traditional houses in Bozova village of Korkuteli District in Antalya is examined from the point view of sustainability in the context of following criteria: building material, construction system, construction process, continuity of way of life.

2. Material and Structural Features of Traditional Housing in Anatolia





There are diverse architectural and structural types in traditional housing resulting from cultural characteristics related to topography, material availability, and climatic and environmental forces of Anatolia. General characteristics of these structures are compatibility with the site and microclimate; respect for other people and their houses and hence for the total environment, man-made as well as natural (Tosun, 1983). Building materials and construction systems of these structures are concisely described below (Table 1).

Table 1. Construction System Types of Traditional Housing in Anatolia

| | |
|---|--|
|  | <p>Timber Masonry Buildings: Timber masonry buildings are constructed with logs of diameters 20-25 cm., laid side-by-side and one on the top of the other (Aytun, 1973, Author and Author, 2005).</p> |
|  | <p>Stone Masonry Buildings: There are examples of stone masonry buildings constructed with field or hewn stone. Field stones are used without shaping and the walls are built with or without mud or mortar in between the joints (Aytun, 1973, Author and Author, 2005).</p> |

Düzce, Hacı Musalar Village (Author, 2003).

Isparta-Gönen, Kızılcık Village (Author, 2010).

| | |
|---|---|
|  | <p>Brick and Briquette etc. Masonry Buildings:</p> <p>In this type walls are made of brick, blocks, etc. and the mortar can be either sand, cement or lime (Aytun, 1973, Author and Author, 2005).</p> |
|  | <p>Adobe Masonry Buildings:</p> <p>Adobe is made locally by mixing earth or mud with hay. Although it is not as strong as clay brick, it is light, easy and cheap to produce. Heat insulation is excellent in such structures (Aytun, 1973).</p> |
|  | <p>Hımsı Buildings:</p> <p>The infill material in timber frame structures can be stone, brick and adobe. Timber is a very difficult material to hold plaster so the joints between timber and the masonry blocks can be weak. Connecting wires are nailed to the timber to hold the infill (Author and Author, 2005; Author, 2004; Işık, 2009).</p> |
|  | <p>Bağdadi Buildings:</p> <p>The studs, posts and diagonal members are connected by nailing wood-lath siding. This is done at both inner and outer surfaces of the walls. The space between the sidings is filled with loose material such as earth or gravel for insulation, or left empty. The sidings are covered with plaster (Gunay, 1998).</p> |

3. Case Study: Korkuteli Houses

During the Ottoman period, self-building under supervision of local master builders was the principal form of housing provision in Anatolian countryside. Thus, an organic relationship between builder and user was constructed on specific demands and needs of the user emerged from his/her rural daily life rituals (Bektaş, 1996). Moreover, participation of user in




construction process was also beneficial for users to learn how to maintain and repair the building they live in; and to make renovations for future spatial needs. Hence, buildings not only meet traditional needs in relation with local cultural life, but also create a sustainable vernacular architecture which can be maintained by the users who are also involved in building process.

Since socio-economical dynamics shaping daily life altered very slowly in rural areas, the traditional spatial typology, configured upon principle of functionalism, had perpetuated its effectiveness for centuries. Nevertheless, with the rapid rise in land prices under the effects of high rates of urbanization in especially Western Anatolia, housing typology inevitably transformed into apartment dwellings after 1960s (Türel, 1988; Türel, 1993). In spite of their disadvantages, multistorey housing blocks were preferred over traditional houses in every region of the country; as it was considered to be the precondition of a comfortable modern life. Soon after smaller cities followed the tendency and apartments became popular even in small towns and villages. This transformation eliminated vernacular architectural characteristics, led to uniformization in build environment.

The case buildings studied in the paper were chosen from Bozova-Korkuteli, about 56 km north-west of the city of Antalya, which is a popular coastal city in Southern Anatolia. Since the village lies on a high plateau overlooking the Mediterranean Sea and the district is surrounded with Western Taurus Mountains, it was protected from destructive urbanization process under massive migration as the rest of the city experienced. Hence, as one of rare villages survived from this urbanization process, Bozova still has vernacular pattern. Besides, it has a rich historical background dating back to antiquity. The ancient name of the settlement was Sibidounda and it was a city of Pisidia (Von Lanckoronski, 2005). After the Pisidian period, it was occupied first by Persians, then by Romans, and finally became a province of Byzantine Empire. During Byzantine period the village was a province called Zivint. Later in 13th century Seljuks took the area and finally it became an Ottoman land in 1392. The Byzantine name Zivint had been used until early 1960s¹. Under these circumstances following three cases (Table 2) which represent traditional housing characteristics in Anatolia are studied.

¹ <http://www.zivint.org> and www.wikipedia.org

Table 2. Cases from Bozova Village of Korkuteli

| Materials of the cases | Case I: Ahmet Sivri House | Case II: Mehmet Topal House | Case III: Şadiye Köken House |
|-----------------------------------|--|--|--|
| | <i>Stone</i> | <i>Wood and Adobe</i> | <i>Wood and Stone</i> |
| Construction Systems of the cases | <i>Stone Masonry</i> | <i>Wooden Skeleton and Adobe Infill</i> | <i>Ground floor: Stone Masonry First floor: Wooden Skeleton</i> |
| |  |  |  |

180

3.1. Case I: Ahmet Sivri House

The owner of the first house is Ahmet Sivri, an eighty-five year old retired farmer, father of three daughters and a son. His daughters are married and living away, hence he lives in the house with his wife and son. His wife is a housewife and also a retired farmer, while his son is working as shepherd of the village but his profession is welding.



Figure 1. Ahmet Sivri, his family and his house. Side Façade (Photo by Author, 2011)

As far as we learn from Mr. Sivri, the house was built by his father when he was four. Therefore he lived almost his entire life in it and he has close intimacy and loyalty upon his house. In spite of the economic situation of the family which is a bit below middle class, the family takes good care of the building and maintained it regularly thanks to the emotional attachment. Besides, the stone masonry structure of the house also helped it to remain well owing to its robust characteristic.

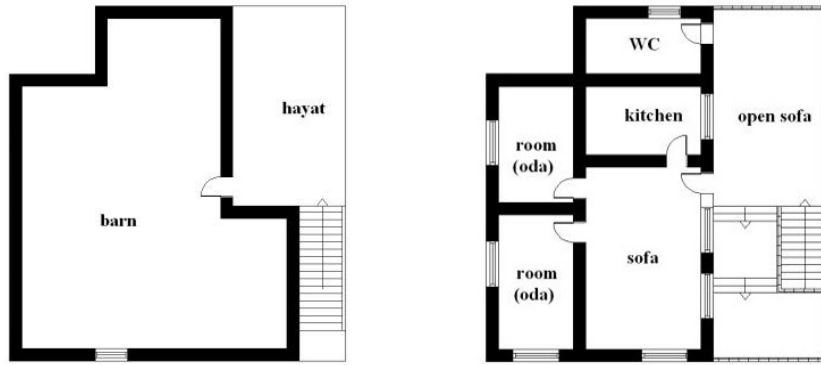


Figure 2. Ground and first floor plans of case-I: the Ahmet Sivri House (Drawings by Author, 2011).

The case-I house is situated on the corner of two minor streets; hence it faces the streets with two side façades, while facing neighboring site with the other and the garden with the front façade. The primary entrance of the house is, from the garden enclosed with three meters high stone walls, indirectly connecting with the street due to privacy reasons as common in traditional houses of Anatolian Muslim communities. In common typology, the ground floor of the house is totally devoted to various agricultural services such as chaff-house, granary, stable, byre, barn, etc. separated with masonry walls, and the living floor is placed above these loadbearing elements. Unlikely in the studied case-I house, all space in the ground floor used as total storage space without separations. Hence, the upper floor sits mainly on peripheral stone masonry walls.

After entering the garden through wooden garden door, the living floor is reached through a wooden outer staircase. At the top of the stairs a semi-covered area which can be interpreted as a kind of *hayat*² serves as a patio in the upper floor. The main living area which is called *sofa*³ is entered through this patio. The *sofa* is surrounded with three rooms and the rooms were

² Hayat is a semi-covered part in Turkish House on the first floor, used as a kind of patio on the first floor.

³ Sofa is a gathering area in Turkish House where all rooms on the first floor open to.

connected to each other by means of the *sofa*. One of the rooms with an *ocak*⁴ was converted to kitchen. And a WC on upper floor was added. In recent time, the kitchen is enlarged by the users with an additional part, made in different structural system.

3.2. Case II: Mehmet Topal House

The owner of the case-II house is Mehmet Topal, a seventy-one year old retired farmer. He has two children and they are living in the downtown of Antalya. He is living in the house with his sixty-five year old wife, who is also a retired farmer and a housewife. Moreover, they are both literate.



Figure 3. Mehmet Topal and his house. (Photo by Author, 2011)

Unlike other cases which belong to the families since they were built, the case-II house is not an heirloom. Mr. and Mrs. Topal bought the house three years ago and they don't know much information on history of the house, such as the builder(s), first owner(s), actual building time etc. But they conveyed that the house is almost two-hundred years old. For that reason this is the oldest house among the case studies.

The building underwent major renovations after Mr. Topal bought it. There were vital problems especially in roofing; hence, he first replaced ceiling covers, but the earthen flat roof is still in need of repair. The earthen walls are also repaired and painted as a part of regular maintenance. Except for the roofing, the main structure is in good condition with respect to its age. Especially the wooden structural elements made up of a local quality hardwood are still standing flawless under climatic and verminous effects.

⁴ Ocak is a part of Turkish House used as fire place for cooking.

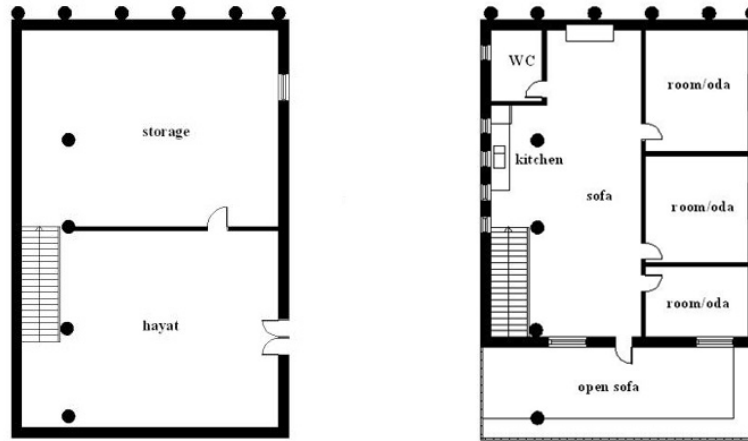


Figure 4. Ground and first floor plans of Mehmet Topal House. (Drawings by Author, 2011)

The house is located on its plot detached with neighboring buildings. One of the sides is facing the street while the rest are facing the garden. As in the case-III house, the main entrance from the street is directly to the ground floor which is designed as a total storage space. A part of this area was separated with temporary wooden elements as *hayat* of the house, which is also used as *ekmeklik*, a specific place for cooking bread. A wooden staircase connects the *hayat* with *sofa* of the upper floor. Unconventionally, there is a fire place (*ocak*) in the *sofa*. There are three rooms located next to each other in one side of the *sofa*, facing the street, while staircase and toilet are on the opposite side. The *ocak* and balcony are also facing each other on other axis of the *sofa*.

The building has unique features not only in spatial organization but also in its composite structural system combining adobe and rubble stone masonry with wooden frame. Main load bearing system is the masonry walls made with rubble stone in ground floor and adobe in upper floor. However, in the absence of masonry separation walls on the ground floor plan, the span between peripheral walls turns out to be wider than typical masonry limits. Hence, unconventionally, it is supported with wooden frames made up of ten giant cedar logs, six on the side façade and four inside the volume. The outer columns on the façade are continuously standing between ground floor and rooftop, while columns inside are supporting the staircase and the first floor. The reason of preference of cedar wood is not only due to its load bearing capacity as a kind of hardwood, but also because of being the most suitable local wood in the region which is one of the widest cedar forests in the world since the antiquity.

3.3. Case III: Şadiye Köken House



Figure 5. Şadiye Köken and her house. (Photo by Author, 2011)

The last case is the most typical house among the cases. The owner of the house is a seventy year old woman, Şadiye Köken. She is daughter-in-law of one the wealthiest families of Bozova. She started living in the house after her marriage and she has been living there since then. After the death of her spouse, the property was inherited to her from her husband's family. Although Mrs. Köken has four daughters and a son, none of them lives with her. Like other house owners, she is also literate.

As we learn from the interview held with her, the house is a bit less than eighty years old. Although it is the newest, when compared to other cases, the house was made up of not so durable materials such as timber and adobe. Nevertheless, it is in very good condition and the best-cared among the studied houses. The structural system of the building is timber frame filled with adobe blocks which is called *Hımış*. Walls are coated with earthen plaster except for the *cumba*⁵ on the front façade.

⁵ Cumba is a projection part of Turkish House on the upper floor cantilevered from the wall of the ground floor; allowing view and ventilation.

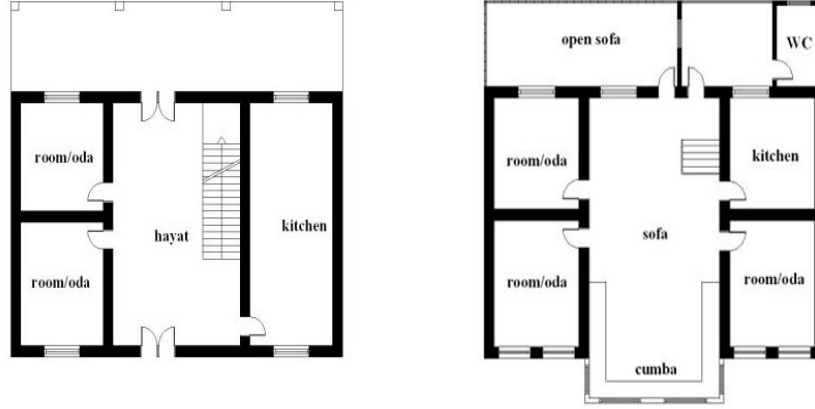


Figure 6. Ground and first floor plans of Şadiye Köken House. (Drawings by Author, 2011)

The house is located adjacently with the neighboring buildings. The front façade facing the street is made up of stone masonry with a wooden *cumba* in the middle. It is one of the significant houses of the area belonging to an upper class family. This is visible not only in design of the front façade, in ornamentations and in wooden fixed furnishings, but also in planimetric features.

As in the other cases, the case-III house is also two stories high as ground floor and living floor; and the ground floor is designed as service space. Nevertheless, the space is divided with walls and specialized for specific functions. *Ekmeklik* and two other service rooms which can be used for storage, cellars, or stables are connected with the main entrance area called *taşlık*⁶. A door was also opening to the garden from the *taşlık*. The wooden staircase connects *taşlık* and the upper floor. Upper floor has similar plan with the ground, it has a central *sofa* surrounded with four rooms in both sides, one of which was converted to a kitchen. There is a *cumba* projecting above the main entrance door in one side, a balcony and terrace on the other. In recent decades, a WC was added to the terrace and one of the rooms with *ocak* converted to a kitchen. The rooms were decorated with wooden furnishings. Other wooden elements such as doors, claddings and ceiling coverings were also decorated. Another specific feature of the building is the roof. Unlike flat roofs of other cases, which are traditional in Turkish rural landscape, the house has a saddle roof covered with tiles.

⁶ Taşlık is a part of Turkish House where open space extending beneath the house on the ground floor, a paved courtyard.

4. Conclusion

Table 3. Comparison of the cases

| | Case-I House | Case-II House | Case-III House |
|-----------------------------------|--|---|---|
| Number of inhabitants | 3 | 2 | 1 |
| Inhabitant(s) | <i>Mr. and Mrs Sivri, and their son</i> | <i>Mr. and Mrs Topal</i> | <i>Mrs. Köken</i> |
| Profession(s) of inhabitant(s) | <i>Farmer, housewife and shepherd</i> | <i>Farmer, housewife</i> | <i>Housewife</i> |
| Education of inhabitant(s) | <i>Literate</i> | <i>literate</i> | <i>literate</i> |
| Family members who left the house | <i>Three daughters</i> | <i>Two sons</i> | <i>Husband and four daughters</i> |
| Reason of leaving the house | <i>Marriage</i> | <i>Moved to city after marriage. Found new jobs rather than agriculture.</i> | <i>Husband dead, daughters married</i> |
| Age of the house | <i>81</i> | <i>More than 200</i> | <i>Less than 80</i> |
| Economic status | <i>Below middle</i> | <i>Middle</i> | <i>High</i> |
| Ownership | <i>First hand</i> | <i>Second hand</i> | <i>Inherited</i> |
| Physical condition of the house | <i>Maintained regularly by the user</i> | <i>Renovated recently</i> | <i>Maintained regularly</i> |
| Renovations | <i>Painted walls</i> | <i>Replaced ceiling covers, repaired earthen walls, painted walls</i> | <i>Painted walls</i> |
| Structure | <i>Masonry</i> | <i>Masonry and frame composite system</i> | <i>Hımsı</i> |
| Material | <i>Stone</i> | <i>Stone, adobe blocks and cedar logs</i> | <i>Timber and adobe</i> |
| Alterations on spatial structure | <i>WC added, a room with ocak converted to kitchen</i> | <i>Ground floor is divided into storage and hayat. A WC added on the upper floor and a kitchen counter was added to sofa.</i> | <i>WC added on the upper floor, a room with ocak converted to kitchen</i> |
| Main status | <i>Good</i> | <i>Medium</i> | <i>Good</i> |

After industrial revolution, the economic, social and cultural spheres were radically altered under new technologies. Accordingly, daily lives of every class of the society were irreversibly modernized. While fast urbanization processes had been creating new living patterns through

modernism, spaces also got affected by these patterns. In addition to spatial demands, traditional building methods, materials, and the traditional user-builder relationship performed during the production of space were also altered. With few decades delay, the urge for spatial transformation in urban house transferred to the rural and effected space formation and building production practices in rural areas since the end of the last century.

The cases of the study chosen from Bozova village of Korkuteli District, Antalya demonstrate such kind of rural transformation that, while the traditional societal life styles are changing, production and consumption processes of living spaces are altering. So, the relationship of individual and societal structure with built and natural environment is also altering. In spite of the socio-cultural transformation which threatens the houses through flitting of the inhabitants, the houses are still resisting on process by their sustainable qualities. Material qualities are the most helpful among these. The building materials of three cases investigated in this study consist of ecologic and local materials such as cedar wood, adobe and stone which are common in Anatolian geography. Unlike reinforced concrete, these inartificial materials can be easily found, available and recycling in nature. Therefore they are obviously ecological and sustainable. The traditional construction systems are also advantageous. The systems such as stone masonry and *hımış* are well-known and practiced in rural areas. Even the constructions are realized by the owners of houses. Therefore, as seen in Table-3 apart from their economic conditions, users who are familiar with construction systems can repair small problems and maintain their houses on their own. This is also useful when spatial needs of users transformed in time such as including service spaces such as kitchen, bath, WC etc. in the house by developing plumbing systems. As in the case of the Sivri House, users even can make minor alterations in space due to their change in family structure or their need for additional spaces. However, such kind of sustainable maintenance and transformation potential is not valid for reinforced concrete houses and apartments. The user participation in traditional design/construction process also helps the spatial organization be fitted to user demands. As seen in the Table-3 except for the Topal family who owned the house after construction, users did not interfered in spatial organization unless they don't want to adopt new technologies.

Sustainability in traditional houses can be evaluated in terms of construction system, construction material and construction process in relation with user participation. These can be encapsulated in the following principles; loyalty to nature and environment, flexibility and practicality. In the absence of such kind of intensive approach to housing, recent constructions in rural areas not only caused problematic individual spaces but unfortunately lead also to lose of local identities and traditional characteristics of vernacular architectures. Now, evoking traditional

structural systems once again might be the most appropriate way in order to have sustainable cities and towns.

REFERENCES

- Aytun, A. (1973). "Earthquake Safety of rural housing in Turkey". *CENTO Scientific Programme Symposium on Rural Housing*, Ankara: State Institute of Statistics, pp. 115-132.
- Bakır, İ., Canan, F. and Kalfaoğlu, S. (2007). "Geleneksel Kırsal Mimarinin Ekolojik Duyarlılık Açısından Değerlendirilmesi". *Proceedings of Ecological Architecture and Planning Symposium*. 27-28 April 2007, Antalya: Turkish Chamber of Architects, pp. 140-146.
- Bektaş, C. (1996). *Türk Evi*. İstanbul: Yapı Kredi Yayınları.
- Author and Author (2005).
- Eminağaoğlu, Z. (2004). *Kırsal yerleşmelerde Dış Mekan Organizasyonu İlgili Politikalar ve Değerlendirmeler*, Unpublished PhD Thesis. Karadeniz Technical University Graduate School of Natural and Applied Sciences.
- Eminağaoğlu, Z. and Çevik, S. (2007). Kırsal Yerleşmelere İlişkin Tasarım Politikaları ve Araçlar. *J. Fac. Eng. Arch. Gazi Univ.* V. 22/1, pp. 157-162.
- Author, (2004).
- Gunay, R. (1998). *Tradition of the Turkish House and Safranbolu Houses*. İstanbul: Guzel Sanatlar Matbaası.
- Gürer, N. (2003). *Kırsal Geleneksel Konut Dokusunun Turizm Bağlamında Değerlendirilmesi, Cumalıkızık Örneği*, Unpublished Masters Thesis. Gazi University Graduate School of Natural and Applied Sciences.
- Işık, B. (2009). "Seismic Rehabilitation Study in Turkey for Existing Earthen Construction". *Proceedings of the Getty Seismic Adobe Project 2006 Colloquium*. 11-13 April 2006, LA: J. P. Getty Trust, pp.93-100.
- Karabulut, İ. (2007). *Çoruh Vadisi Kırsal-Köy Yerleşim Örnekleri ve Sanat Yapıları*, Unpublished Masters Thesis. Yüzüncü Yıl University Graduate School of Natural and Applied Sciences.
- Keleş, R., Yavuz, F. and Geray, C. (1978). *Şehircilik Sorunlar-Uygulama ve Politika*. Ankara Üniversitesi Siyasal Bilgiler Fakültesi Yayınları: 412, Ankara: Ankara Üniversitesi Basımevi.
- Özek Karadeniz, Y. (2010). *Geleneksel Afyonkarahisar Evlerinin Sürdürülebilir Mimarlık İlkeleri Bağlamında Değerlendirilmesi*, Unpublished Masters Thesis. Mimar Sinan University Graduate School of Natural and Applied Sciences.
- Özgüner, O. (1970). *Köyde Mimari Doğu Karadeniz*. Ankara: ODTÜ Mimarlık Fakültesi Yayınları.
- Author, et al (2007).
- Tosun V. (1983). *Environmental Forces that Influence Form in Vernacular Architecture "A Case Study in the Eastern Black Sea Region"*, Unpublished Masters Thesis. METU Graduate School of Natural and Applied Sciences.
- Türel, A. (1988)." Türkiye'de Konut Stoku". *KAM 1988 Sempozyumu*. Yayınlanmamış Bildiri, ODTÜ Mimarlık Fakültesi, Ankara.

- Türel, A. (1993). "Housing Provision in Turkey with Limited Credit Support". *ENHR Conference*. Budapest, Hungary.
- Ulukavak Harputlilgil, G. and Çetintürk, N. (2005). Geleneksel Türk Evi'nde Isıl Konfor Koşullarının Analizi: Safranbolu Hacı Hüseyinler Evi, *J. Fac. Eng. Arch. Gazi Univ.* V.20/1, pp. 77-84.
- Von Lanckoronki, K. G. (2005). *Pamphylia ve Pisidia Kentleri*. Antalya: Akmed.
- Author, A. (2010). Personal photograph archive.