ICONARP
International Journal of Architecture and Planning
Received: 20.01.2022 Accepted: 07.06.2022
Volume 10, Issue 1/ Published: 30.06.2022
Research Article *DOI: 10.15320/ICONARP.2022.204 E- ISSN:2147-9380*
ICONARP

Examination of the Diversity in Rural Architecture in Kırklareli Through Factors

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Abstract

The study aims to document the settlement, spatial, constructional, and cultural characteristics of Kırklareli rural area to reveal the variations of the region. In addition, the region is a hybrid location with elements from both the Black Sea and inner Anatolia. So, the characteristics of the region are compared with the Black Sea and inner Anatolia.

The method of the study is composed of two phases, first, the effect of environmental features such as natural environment, topography, climate, and the economic situation on settlement and plan and constructional characteristics and material usage of the houses in Kırklareli were documented. Second, the Thrace region's rural characteristics were compared to those of the Black Sea and inner Anatolia.

As a result, the natural environment, geography, climate, and culture all had a role in the formation of rural settlements and houses. (1) Topographical features influenced daily living and agricultural productivity, resulting in changes in settlement structures. (2) The differences in plan characteristics of rural dwellings were mostly influenced by regional climate conditions. The presence, form, and size of common places and open spaces varied based on climate conditions. (3) Local materials used in house construction were influenced by landforms and the natural environment. It has been observed that house construction strategies have altered as a result of the most widely accessible material from the surroundings. (4) Even though there were physical variances between houses due to topographical changes in the area, Turkish people's nomadic culture and Islamic beliefs provided certain similar elements in the houses, such as introversion and privacy. Thrace Rural area contains different settlement, spatial and constructional characteristics due to the differences in its geography. Many rural homes have been abandoned, and there is a risk of becoming lost. Therefore, documentation of authentic characteristics of the rural houses and sites considering environmental features will provide a base for the sustainability of original rural houses and areas.

Keywords:
Comparative study, construction system, rural settlement, spatial organization, thrace

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To cite this article: Gençer, F., & Yüksek, İ. (2022). Examination of the Diversity in Rural Architecture in Kırklareli Through Factors. *ICONARP International Journal of Architecture and Planning,* 10 (1), 299-324. DOI: 10.15320/ICONARP.2022.204

INTRODUCTION

The rural heritage reflects the culture of the people who live there, as well as their relationship with the environment (Icomos, 1999). Rural settlements are symbolic of the geographical, climatic, economic, social, and natural qualities of the sites. These different features cause different settlement morphology, house positions, plan types, construction techniques, and material usages. Research and documentation are the initial steps in preserving the rural heritage's long-term sustainability. As a result, it is necessary to do study and documentation settlement characteristics, building groups, and traditional construction systems (Icomos, 1999).

The documentation of each rural area's characteristics highlights the area's uniqueness. Most of the studies focused on settlement characteristics (Fuentes, 2010; ECOVAST, 1996; Ruda, 1998). Vernacular or rural houses have long been the subject of research carried out in different parts of the world with different approaches to the built environment in rural areas. In some studies, settlement and housing types in specific regions are focused (Dickinson, 1949; Enhayat, 1952, Kaushik, 2020). There are studies about the environmental sustainability of rural settlements and houses (Vissilia, 2009; Cardinale et al., 2013; Oikonomou and Bougiatioti, 2011, Quintana et al., 2022). Construction techniques and material usage in rural houses are another common study area (Ngowi, 1997; Delgado and Guerrero, 2006; Ottoni and Borghi, 2016). There are also lots of studies about reusing rural houses (Fuentes, 2010; Alcindor and Coq-Huelva, 2020; Philips, 1993; Gonzales, 2017).

In Turkey, there are many studies about rural houses in towns, cities, and regions. Aran (2000) Batur and Gür (2005) compared rural regions. Postalcı-Altınkaya, et al (2011) and İner and Erdoğan (2007) studied towns in Marmara Regions; Akış et al (2013), Akyüz-Levi and Taşçı (2017), Deniz (1992), Etlacakuş and Turan (2016, 2017), Başoğlan-Avşar (2016), İşcanı and Eres (2017), Koca (2019) studied towns and cities in Aegean Region, Dağ-Gürcan (2017), Kurtuluş and Güçhan (2015), Kavas (2011) studied Mediterranean Region. Özgüner (1970), Batur (2005) and Zorlu and Faiz (2012) studied the rural architecture in villages of Eastern Black Sea; Samsun, Trabzon, Artvin and Giresun. Kafesçioğlu (1949) studied structural characteristics of Middle Anatolia Rural Houses; Eskişehir, Ankara and Kayseri. Studies on construction techniques, particularly in rural houses are rather scarce (Eriç, 1979; Batur and Gür, 2005; Sarıoğlu, 2017). There are also studies on the environmental performance of rural houses (Yüksek and Esin, 2013; Hasgül et al., 2021).

Different plan-type classifications of traditional Turkish houses have been done until today. Eldem (1968) classified plan types of Turkish Houses as houses without sofas, houses with outer sofas, inner sofas, and central sofas depending on the presence, position, and form of the sofas. Houses without sofas seen in hot climates are the simple and

DOI: 10.15320/ICONARP.2022.204

oldest types of Turkish Houses. These houses are composed of rooms lining up next to each other and opening a courtyard. In the houses with an outer sofa, the sofa opens each room. The houses with central and inner sofas are mostly seen in city centres (Eldem, 1968). Anatolian Turkish houses are also classified depending on climate conditions, landforms, and material usage. Kuban (1995) classified houses as stone houses (Southeast and central Anatolia), stone masonry houses with timber beams (Northeast Anatolia), timber-framed houses (East Black Sea Region), flat-roofed cubic houses (Aegean and Mediterranean Region), hımış houses (inner Aegean, northern slopes of Taurus mountains, Balkans).

Aran (2000) examined rural houses depending on location and climate, form and design, building form, materials, and workmanship. Batur and Gür (2005) determined the factors affecting rural house forms as climate, landform, material, and environmental factors including humans and nature. Also, they emphasized that cultural, social, and personal factors are also effective in determining rural house forms. However, cultural factors changed depending on geography, such as religions, beliefs, and lifestyles that provide houses having common characteristics.

There are also studies examining rural villages in Kırklareli in terms of architectural and settlement characteristics (Yeler, 2021; Polat-Pekmezci et al. 2013); cultural and natural landscapes (Kabataş and Kiper, 2021); and evaluating the identity of Kırklareli Rural area (Eres, 1999; Eres, 2014). Yüksek (2008) examines the environmental performance of the rural houses in Kırklareli.

Rural areas were explored in this research by focusing on a single feature, such as settlement features, plan organization, etc. However, the Thrace Rural area contains different settlement, spatial and constructional characteristics due to the differences in its geography in terms of topography, natural environment, and climate. It has zones with varying topographical characteristics such as mountains, plains, and hills, as well as flora and agricultural produce such as woods, sunflowers, and other crops. Both temperate and harsh climates are also seen in the region. People of various religions and civilizations have lived in Thrace Rural Area. Muslims currently make up the majority of the population. The houses mostly reflect Muslim customs and lifestyles.

Therefore, the study aims to document the settlement, spatial and constructional characteristics of Kırklareli rural area to reveal the variations of the region. Research and documentation of the rural diversity of Kırklareli are important for the sustainability of the identity of the area. In terms of terrain, natural environment, and climate, the region is also a hybrid location that combines elements of the Black Sea and inner Anatolia. As a result, the Thrace region's characteristics are compared with those of the Black Sea and interior Anatolia.

METHOD

The method of the study is composed of two phases. First, the impact of environmental factors such as terrain, climate, and economic condition on settlement, plan, and constructional characteristics, as well as material usage, of houses in Kırklareli, Thrace Rural Region, is documented. In the second phase, the Thrace region's rural characteristics are compared to those of the Black Sea and inner Anatolia to see if there are any common consequences of similar environmental conditions.

The research is mostly based on field observations and analyses of settlement morphology, house locations, house, garden, street, and neighborhood relationships, as well as the spatial and structural arrangement of Krklareli houses. The relationship between house, garden, street, and neighborhood, plan typologies, and structural elements and materials are documented during field observation. Visual observation and literature were used to collect data on the region's environmental characteristics, such as the natural environment, terrain, climate, socio-cultural elements, and economic status, as well as the materials and construction techniques used.

Visual analysis, photographic recording, and traditional measuring procedures were used in documenting the dwellings. Conventional techniques were used for the measurement of the plans. Steel tapes and survey rods were the conventional instruments used. To document structural system details, the walls and floors were visually analyzed; and the structural elements which could be reached were measured in detail.

CHARACTERISTICS OF KIRKLARELI, THRACE RURAL AREA

Kırklareli, Thrace Region, located in the northwest of Turkey, is on the transition zone connecting Asia and Europe (Figure 1). It contains different environmental features in terms of climate, topography, socio-culture, and natural environment. It has hosted many cultures such as Greek, Bulgarian and Turkish due to its strategic position. Today, the inhabitants of the rural area are Turkish. Spatial characteristics of the houses constructed by non-muslims were changed by the traditions and lifestyles of Turkish people. Thus, the houses represent the socio-cultural lifestyle and traditions of Turkish local people.

The area is divided into three areas in terms of topography: plain (south), mountainous and forested (north), and stony (central transition zone between plain and forested area). While flat plains, ridges, and hills are in the southern part, Yıldız Mountains lie in the north and northeast part of Kırklareli. The buffer zone between plain and forest are stony.

Both temperate and harsh climates are also seen in the region. The forested area is under rainy climate conditions due to the Black Sea, while in the south part, the continental climate is dominant. In the buffer zone, both the effect of continental and black sea climate is seen (see Figure 1). Winters are cold, and summers are dry and hot in the

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Thracian continental climate, while the Black Sea climate is mild and rainy in all seasons (Turikish Encyclopedia, 1982).

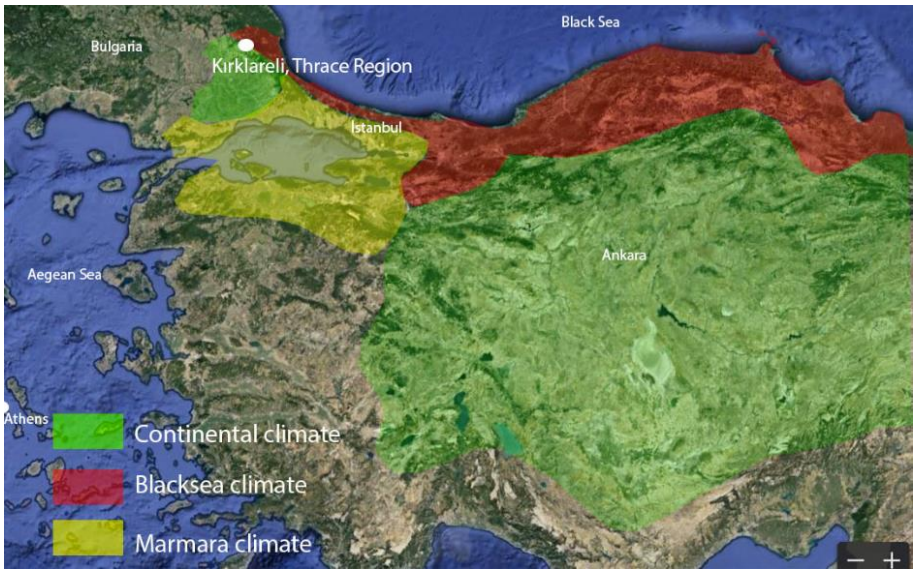


Figure 1. Location of Kırklareli and climate data of East Thrace and Anatolia (revised from Yandex Map)

Forests, sunflowers, and other types of flora and agricultural production are found in the area. Agricultural production is common in the area's south, with sunflowers being the most common crop. Sheep and goat farming is common in the north, whereas stock farming is common in the transition zone.

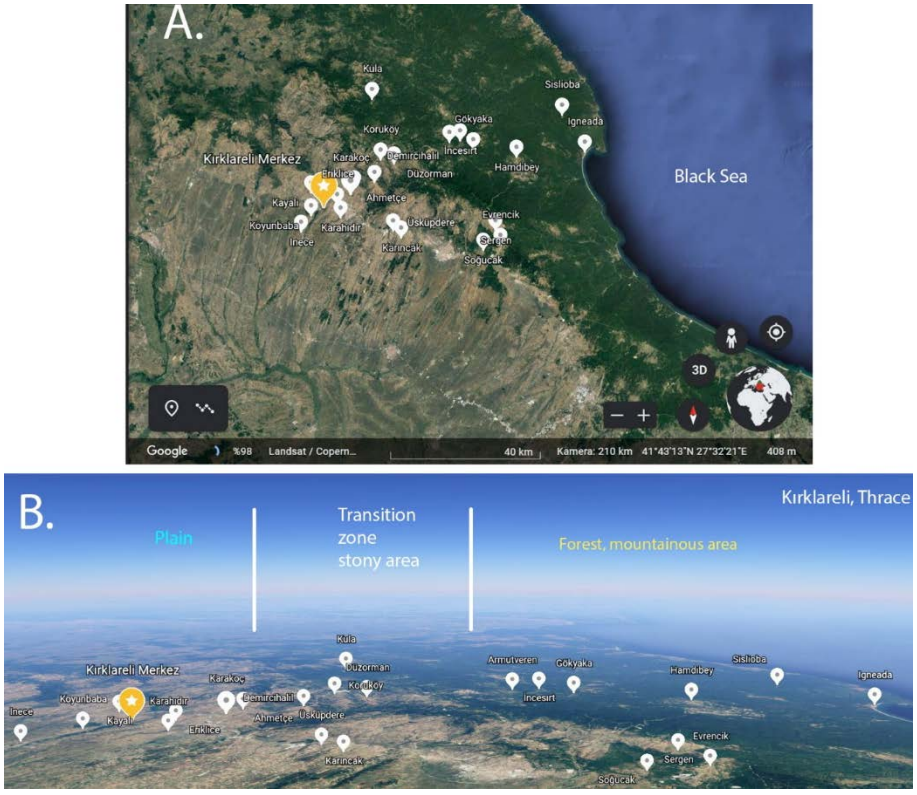


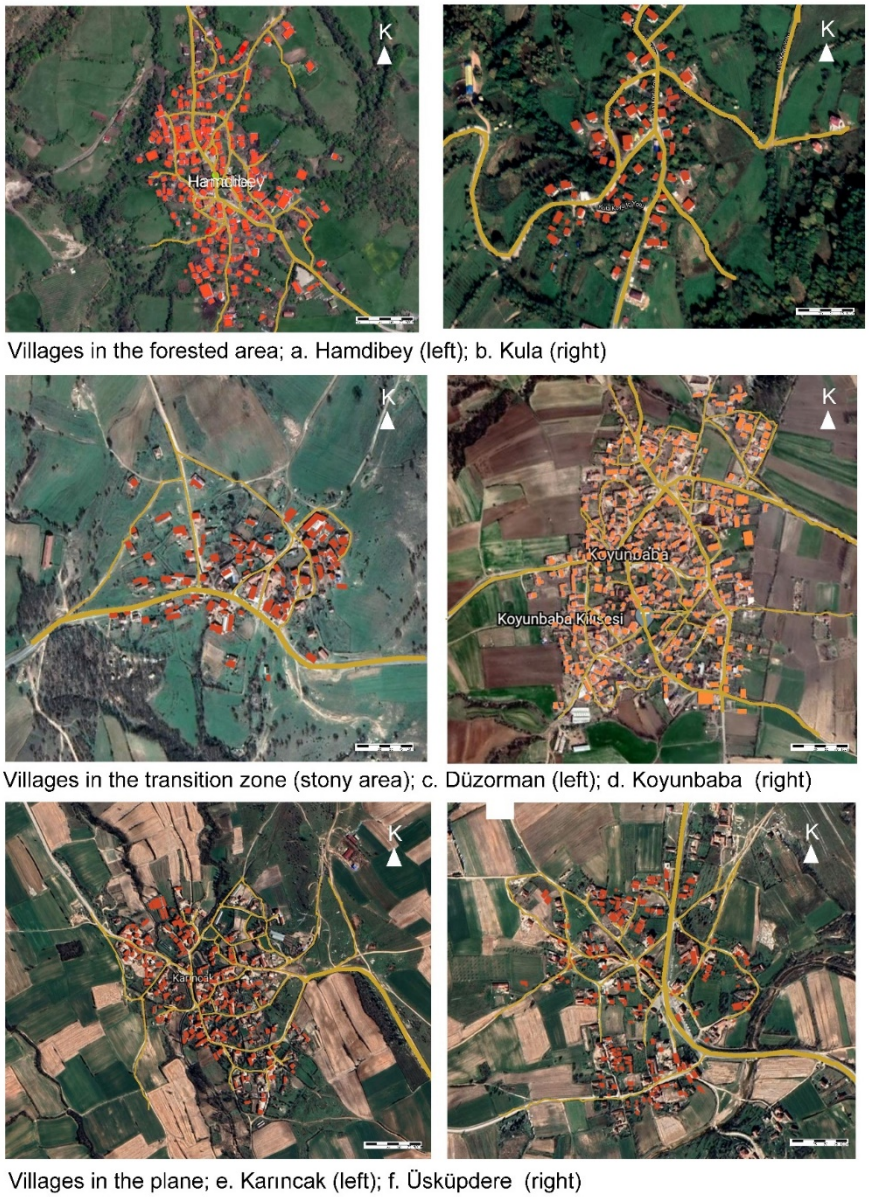
Figure 2. Kırklareli Rural Area a. Location of villages (revised from Google Earth) b. Topography differences in Kırklareli

The studied villages are in the plain of Ergene basin of Thrace (İnece, Karahıdır, Karıncak, Koyunbaba and Üsküpdere); in the forested area (Kula, Koruköy, Armutveren, İncesırt, Gökyaka, Kızılağaç, Sergen,

Evrencik, İğneada, Soğucak, Hamdibey and Sislioba) and in the transition zone between plain and hilly area (Ahmetçe, Eriklice, Demircihalil, Kayalı, Düzorman). Armutveren (Paspala) and Sislioba (Pılaça) were old Bulgarian villages, Hamdibey (Trulya) and Soğucak (Krionero) located in forested area were old Greek villages in the past (Figure 2).

Settlement morphology

There are two types of settlement patterns in the forest area. An organic settlement organization with buildings adjacent to each other is observed in regions where the slope is smaller, such as Hamdibey. Single buildings, organized according to the slope of the land, are positioned far apart in areas like Kula, which is situated between dense forests on mountainous terrain.



Villages in the forested area; a. Hamdibey (left); b. Kula (right)

Villages in the transition zone (stony area); c. Düzorman (left); d. Koyunbaba (right)

Villages in the plane; e. Karıncak (left); f. Üsküpdere (right)

Figure 3. Settlement morphology of the villages that have different topography and natural environment a. Hamdibey, b. Kula, c. Düzorman, d. Koyunbaba, e. Karıncak, f. Üsküpdere (revised from Google Earth)

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The density of dwellings varies depending on terrain and the natural surroundings. In the transition zone, villages have organic settlement organizations and houses that are near to one another. When a village is located in a hilly area, such as Düzorman, the distance between houses increases. The houses are located far from each other in the plain areas since there are fields or gardens between the houses for agricultural activities. The agricultural spaces between the dwellings are visible, especially in the southern part of the city, in villages like Üsküpdere. (Figure 3).

House positions

When looking at the positions of the houses on a larger scale, the houses on the hilly land of the forest are close together, and the plot borders are defined by garden walls. Each house has its barn. There can be two houses facing a garden or a courtyard. When looking at the mountainous area, it is clear that garden walls are not used between houses due to the dense forest, yet, like the hilly area, their barns are close to the houses. Barns were likely built close to the dwellings in this region, where sheep and goat farming is common. (Figure 4).

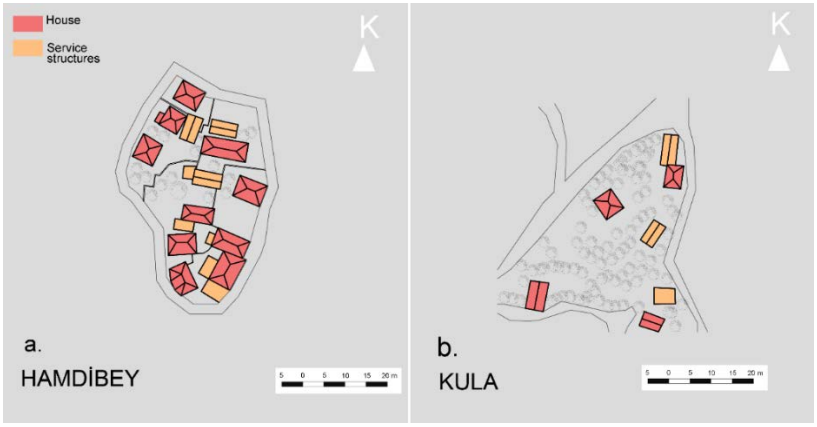

Figure 4. House positions in the villages of the forest area; a. Hamdibey, b. Kula

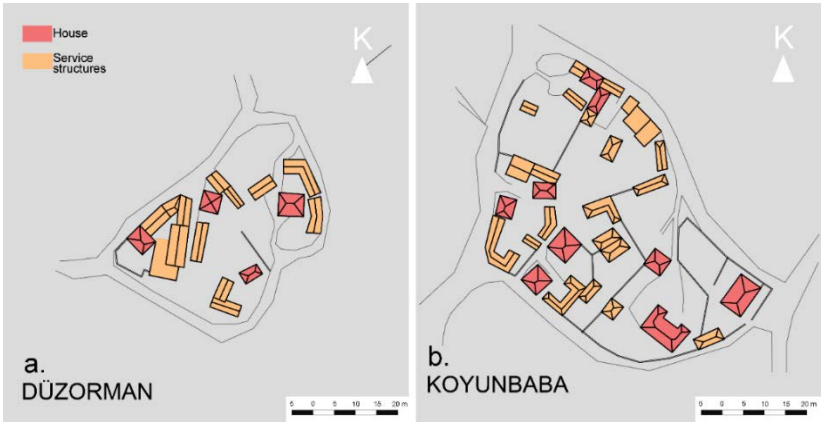

Figure 5. House positions in the transition area, a. Düzorman, b. Koyunbaba

When the villages in the transition zone (stony) are examined, the irregular plots consist of houses, barns, and warehouses surrounding a courtyard. Because the plots are smaller and the borders are designated by barns and warehouses, garden walls are used less frequently than in

plains villages. Each house-barn-storage group planned to create a courtyard within itself. These courtyards are directly connected to the streets. The layout was most likely shaped by the need for space for cow breeding. (Figure 5).

The layout of the villages is more regular in comparison to stony and forest areas. Houses, agricultural areas, and warehouse groups exist on the plains; however, due to the large agricultural grounds, these groups are separated from one another. Garden walls are commonly seen between agricultural areas on the plains, although there is no distinction between houses and streets. The majority of the houses are near the street, and plots are accessible directly from the street. (Figure 6).

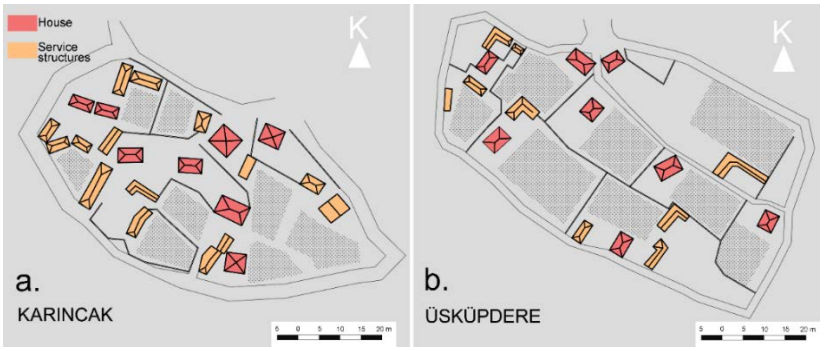

Figure 6. House positions in the plain area; a. Karıncak, b. Üsküpdere

House, garden, street, and neighborhood relation

Two neighboring houses with their barns and warehouses facing a courtyard are peculiar to the stony area. The plot boundaries are marked by U and L-formed barns that surround the courtyard. Paths connect the streets to the courtyard. The neighborhood relations are the strongest in this area. The buildings' sofas face the courtyard, while the facades facing the streets are more shuttered, making the houses introverted.

The position of the house on one side of the plot enables broad agricultural areas in the plain area, and the houses and their sofas always open the agricultural area, with massive facades facing the street. Each house has a rectangular or L-formed warehouse (Figure 7).

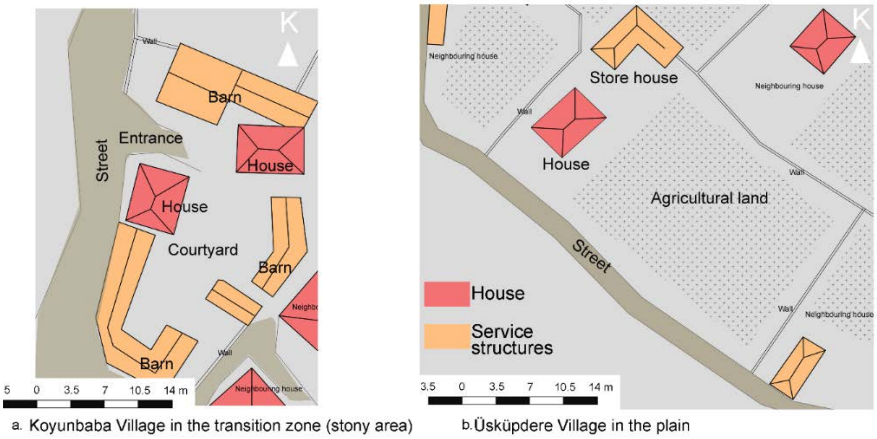

Figure 7. House, garden, street, and neighborhood relation of villages in the transition zone and plain; a. Koyunbaba, b. Üsküpdere

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In the forested areas, there are more modest houses and barns. A house and a barn are located in a small garden. There are trees in the gardens (Figure 8).

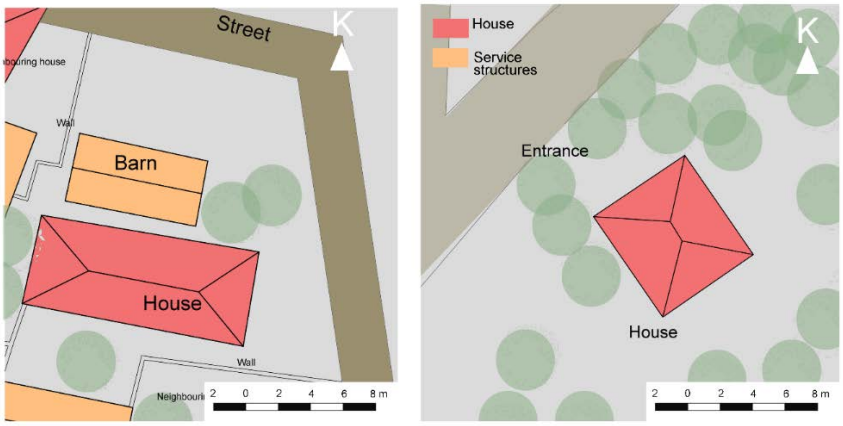

Figure 8. House, garden, street, and neighborhood relation of villages in the forest; a. Hamdibey, b. Kula

Spatial characteristics and architectural elements of the houses

When the rural houses in the region are classified depending on the position and relation of rooms, sofas, and open areas, four different plan types are determined (Figure 9).

Figure 9. The rural house examples in Kırklareli, Thrace Region; a. Armutveren House, b. Evrencik House, c. Sergen House, d. Demircihalil House, e. Soğucak House

In plan type 1, the houses are mostly one-storied, the rooms lined up to each other, and open sundurma (outer sofa). There is no relationship between rooms. This type of house is seen in both timber-framed or mud-brick masonry houses, in the Central and Demirköy Districts. While one-storied and mudbrick house examples of type 1 are seen in the plain areas (Üsküpdere Village); two-storied, timber-framed house examples of type 1 with three and four rooms are seen in the forested villages (Sislioba, Karakoç, and Ahmetçe) that are under the effect of Black Sea climate. Since the walls of one-storied and mudbrick houses are thick (app. 60 cm), there are cupboards and niches in the walls. Also, fireplaces and bathrooms can be seen in the solid north walls (Figure 10).

Plan type 2, composed of a closed sofa and rooms around it, is seen in one or two-storied houses. Ground floors are used as stable, hayloft, kitchen, or storage in two-storied houses. The sofa, located in the middle, opens the rooms on the first floor. Plans vary depending on the number of rooms. There are rectangular planned houses that have sofas opening two rooms, and nearly squared planned houses that have sofas opening four or five rooms (Figures 11 and 12).

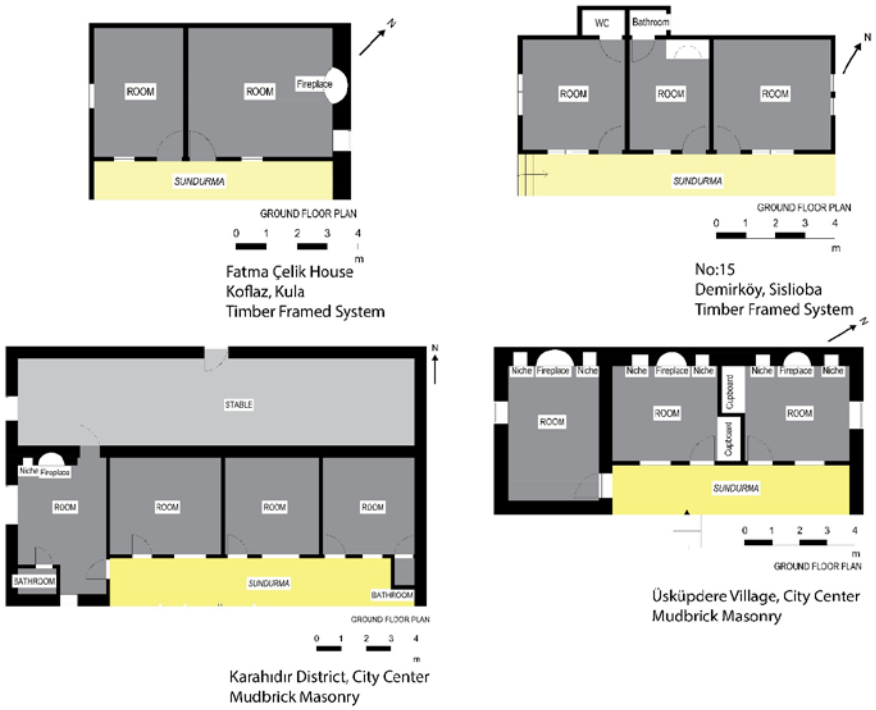

Figure 10. Plan type 1 opening outer sofa (sundurma)

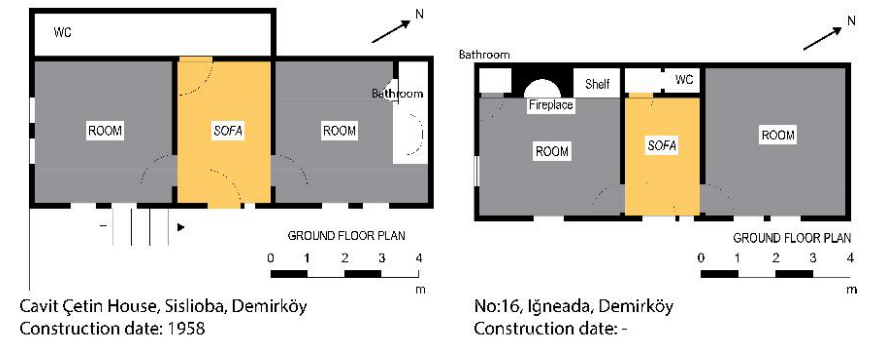

Figure 11. Plan type 2; Houses with closed sofas opening two rooms

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Sadık Arlı House, Armutveren, Demirköy
Construction date: app. 1900

Emin Aşut House, Soğucak, Vize
Construction date: app. 1850

Figure 12. Plan type 2; Houses with closed sofas opening four rooms

Raşit Duman House, Kızılağaç, Vize
Construction date: app. 1850

Güral Çalkan House, Soğucak, Vize
Construction date: app. 1800

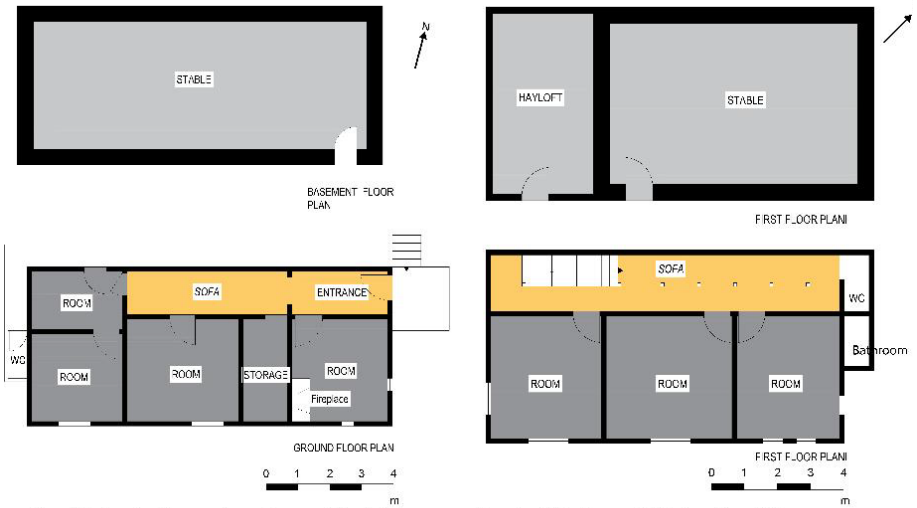
Figure 13. Plan type 3; Houses with closed corner sofa

Type 2, which is one-storied and composed of two rooms, is seen in lowland villages that are under the effect of continental climate as İnece and Karahıdır. One and two-storied houses with two rooms are seen in

villages that are forest or lowlands as Demircihalil, Koruköy, and Kula. Two storied houses composed of four rooms are mostly seen in forested villages that are under the effect of the Black Sea Climate as Hamdibey, Armutveren, and Soğucak.

Plan type 3, composed of a corner sofa and rooms, is seen in two-storied houses. Ground floors are used as stable, barn, or storage similar to plan type 2. On the first floor, a closed sofa is located at the corner of the house and rooms open the sofa. Type 3 with three rooms is mostly seen in Kızılağaç Village which is located in forested and hilly areas under the effect of the Black Sea climate (Figure 13).

Plan type 4, which is seen in two-storied houses, has a linear sofa or staircase landing opening three or four rooms. Ground floors are used as stable, barn, and storage similar to the other types. Even if the position of the sofa is similar to the outer sofa, it is designed as closed. This type is mostly seen in hilly and forested villages such as Sislioba and Armutveren (Figure 14).



Yusuf Habuşka House, Armutveren, Demirköy
Construction date: app. 1700

Pembe Atik House, Sislioba, Demirköy
Construction date: app. 1850

Figure 14. Plan type 4; Houses with closed linear sofa

Briefly, type 1 represents houses with an outer sofa. Type 2 is similar to the houses with an inner sofa. It is an important example representing the transition to a closed hall in a rural area. Type 3 represents houses with a closed corner sofa. Although type 4 is similar to the houses with the outer sofa, the sofa is closed. Since it is closed and narrow, it is probably used for circulation purposes rather than daily work (Figure 15; Table 1).

Most of the houses have similar architectural elements such as gusülhane (bathroom), cupboards, niches, and fireplaces on the solid of the houses, positioned in the north, however in some villages such as Soğucak and Armutveren (see Figure 12), there are not any cupboards in the houses or cupboards and gusülhane spaces were added later. These houses were probably belonging to the non-muslims in the past, they are altered with the lifestyle of Turkish local people.

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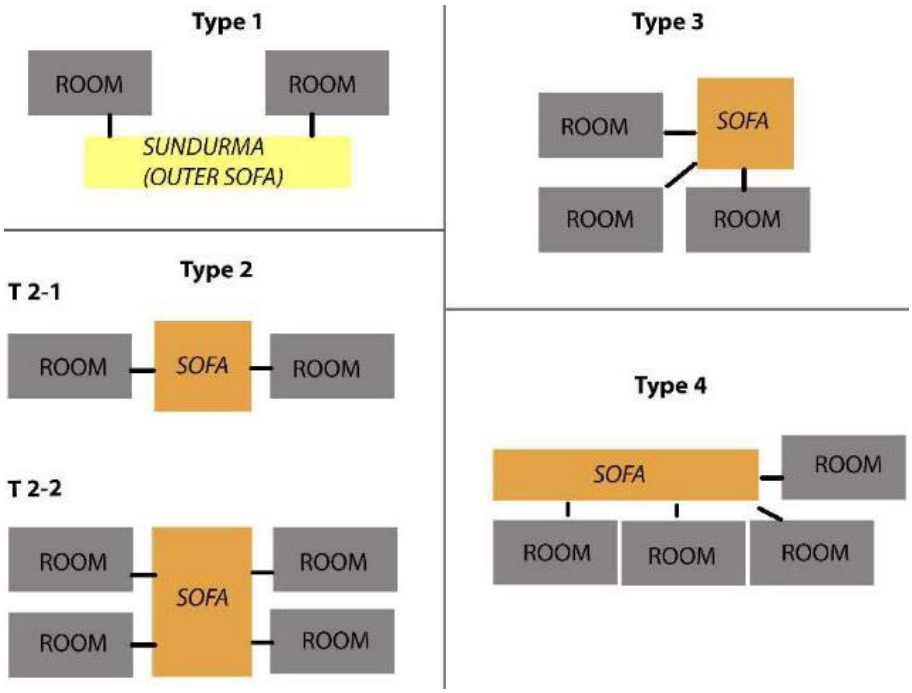

Figure 15. Plan types in Kırklareli Rural Region

Construction technique and material usage of the houses

Construction techniques and material usage of the houses are examined in terms of their roof, wall, and floor system, respectively.

Table 1. Spatial characteristics of the village houses

Villages	Land form	N. Of Story	Ground Floor Function	Plan Type Depending on *Sofa* or Hall	Open Space
İnece, Karahıdır, (Central)	Plain	1	Living	Inner closed *sofa* with 2 rooms	-
Demircihalil (Central)	Plain and hill	1-2	Stable, storage	Inner closed *sofa* with 2 rooms	-
Kayalı	Plain and hill	2	Stable, storage	Inner closed *sofa* with more than 2 rooms	-
Kula (Kofçaz) Koruköy (Central)	Forest	1-2	Stable, storage	Inner closed *sofa* with 2 rooms	
Hamdibey, Armutveren, (Demirköy)	Plain and hill	2	Stable, storage	Inner closed *sofa* with 3 or 4 rooms	-
Eriklice	Plain and hill	2	Stable, coop	Inner closed or open *sofa* with 3 or 4 rooms	*Sofa*
İnece, Karıncak (Central)	Plain	1	Living	Inner closed *sofa* with 3 or 4 rooms	-
Kızılağaç, Soğucak(Vize), Gökyaka	Forest	2	Stable, storage	Corner closed *sofa* or Inner closed *sofa* with 3 rooms	
Sislioba (Demirköy)	Forest	2	Stable, storage	3 or 4 rooms opening *Sundurma*	*Sundurma*
Karakoç, Ahmetçe (Central)	Plain and hill	1-2	Stable, storage	3 or 4 rooms opening *Sundurma*	*Sundurma*
Üsküpdere (Central)	Plain	1	Living	2 rooms opening *Sundurma*	*Sundurma*
Sislioba (Demirköy)	Forest	2	Stable, storage, hayloft	Linear closed *sofa* with 2 rooms	-

The timber-framed techniques have lots of different types depending on their infill material such as stone, and mudbrick. Timber framed systems are also combined with wattle and daub or timber laths. The variation in material usage increases based on the sources of the forested area (Figure 19).

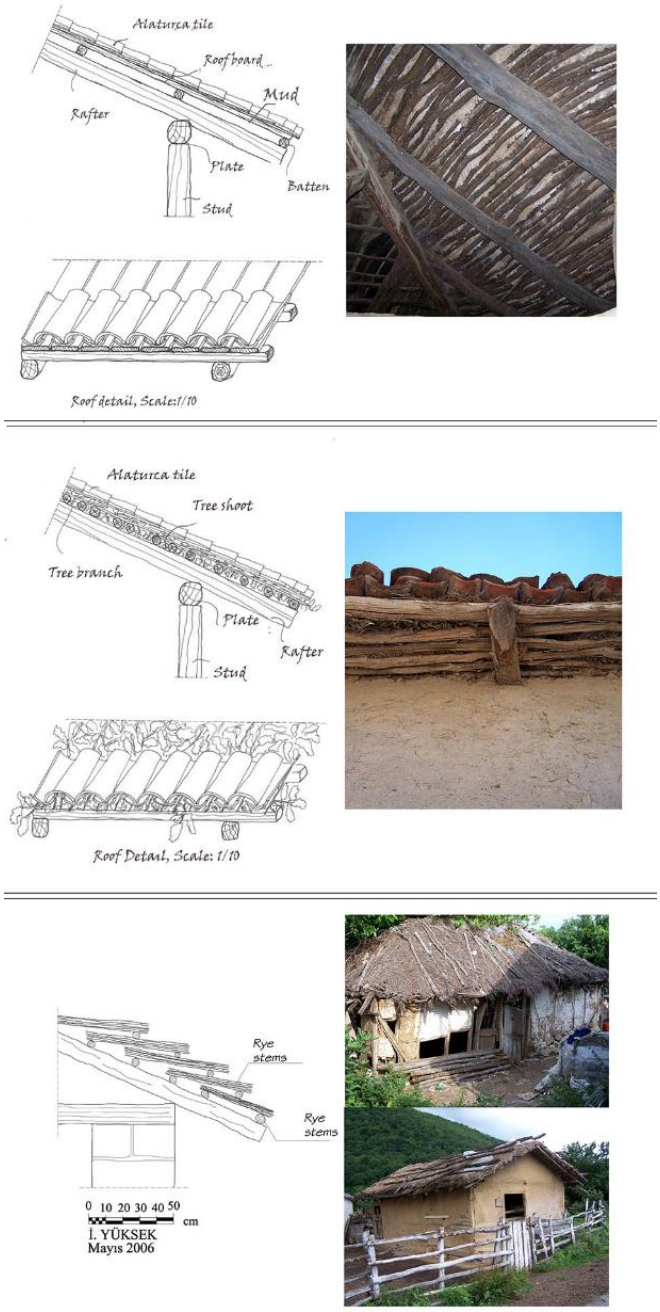

Figure 16. Timber framed roof system details (usage of mud, tree shoots, and rye stems)

Timber beam roof systems are observed in lowland, forested, and rock areas, but the isolation layers present differences in forested and plain areas. Mud is observed in plain areas, while tree shoots, tree branches, wattles, and ferns are used as isolation layers under the tile in the forested area. The roof systems that are out of totally rye stems were observed in the forested area. It was thought that rye stems are the

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original materials of the roofs in the Thrace Region, however, this material has been damaged and disappeared in time (Figure 16).

Construction techniques of the walls show certain differences depending on the characteristics of the regions. In lowland areas, mudbrick masonry is used, while in the buffer zone stone masonry is used. Mudbrick and brick can be used together; for example, to protect mudbrick from rain, the exterior layers could be brick while the inside layers could be mudbrick. The width of the outer layers is 25-30 cm, while the inner layers are 50 cm in width. The walls are supported with timber lintels at 150 cm intervals along with the height of the wall. Both timber-framed and combined construction techniques (stone masonry bottom floors and timber-framed upper levels) are seen in the forested area. (Figures 17 and 18).

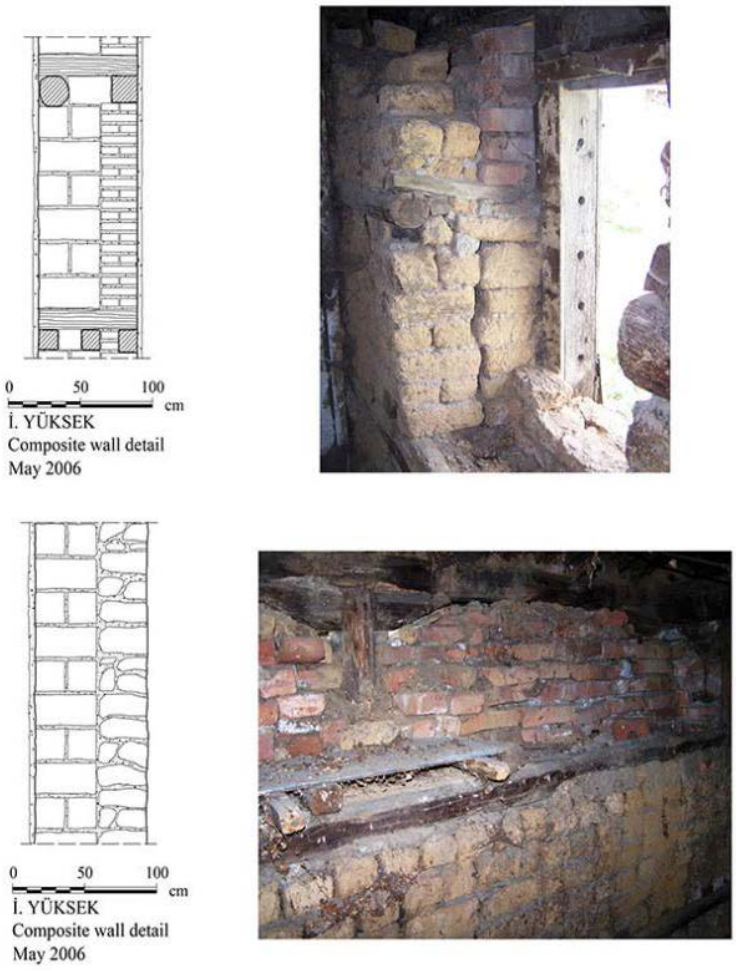

Figure 17. Composite masonry wall systems

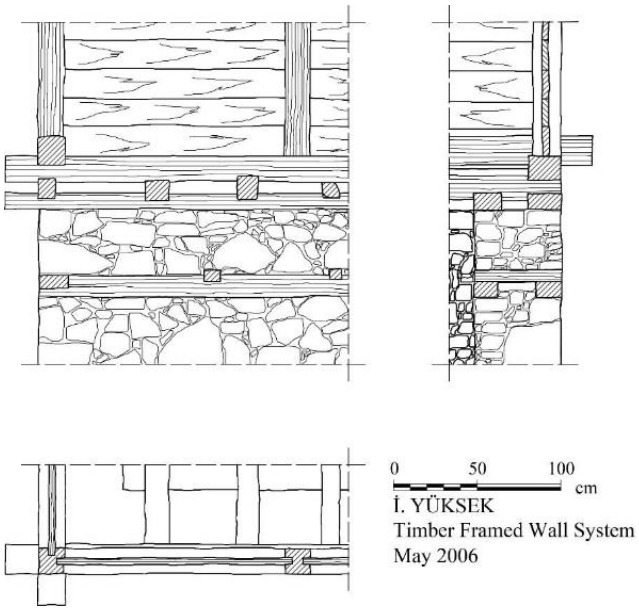

Figure 18. Timber-framed wall systems

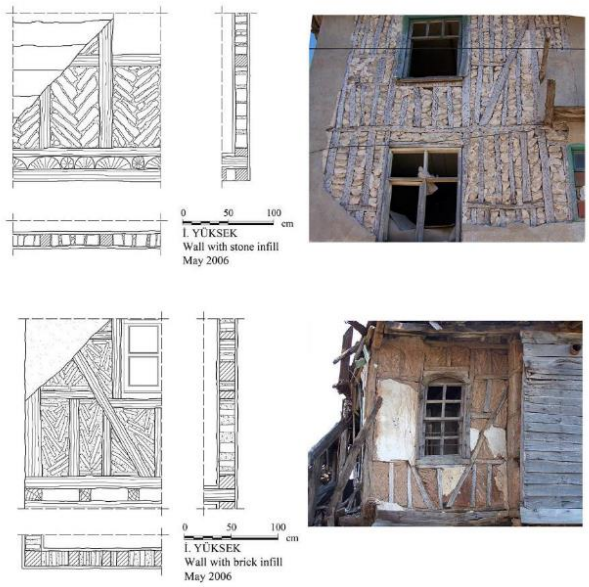

Figure 19. Timber-framed systems with stone and brick infill

The use of timber joist floor systems has been noticed. Floors are comprised of four main layers: timber beams, timber covers, soil, and straw covering; however, in forested areas, tree shoots can be used instead of timber floor covering. Sunflower stems grown in plain places are utilized to cover the roofs of lowland houses as ceiling coverings (Figure 20).

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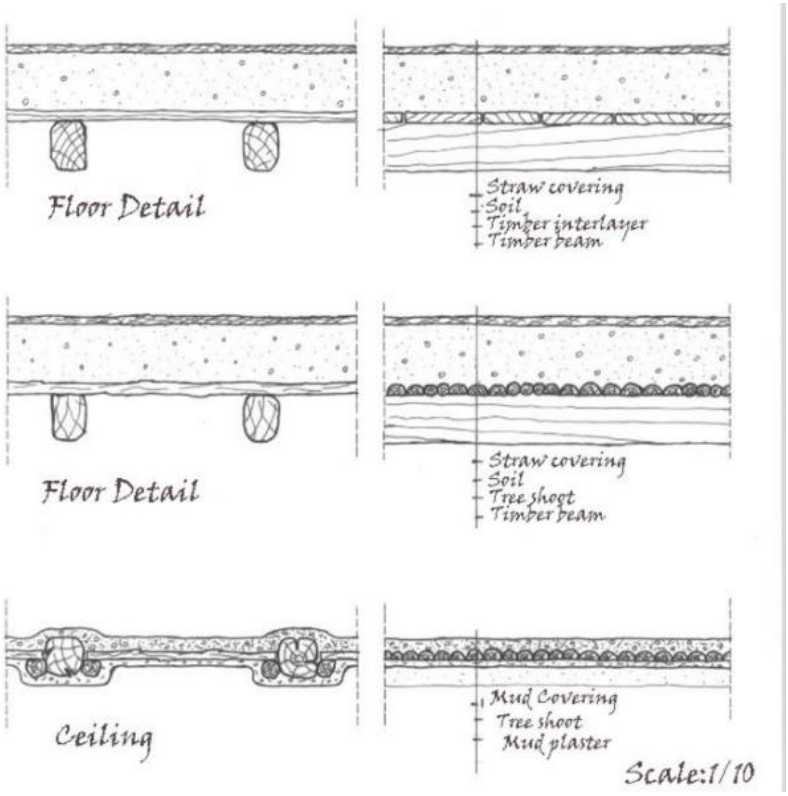

Figure 20. Timber floor system details

DISCUSSION

The Thrace region presents different climate and topography conditions, it is a hybrid area composed of features of the Black Sea and inner Anatolia in terms of topography, natural environment, and climate. As a result, in this section, the characteristics of the Thrace region are compared to those of the Black Sea and inner Anatolia to identify effective environmental factors influencing settlement and plan, as well as material usage. (Table 2).

Topography affects settlement characteristics and livelihood. While houses and warehouses are opening to agricultural areas, enormous barns and warehouses are being built in the stony area around the courtyard.

Agricultural lands and gardens surround the houses in the plain in the south of Krklareli, as they do in Central Anatolia (Eskişehir, Ankara, Aksaray). Stony areas (Kayseri) as the transition zone of Krklareli (Figure 21) show a more organic settlement organization, surrounded by barns and warehouses (Kafesçioğlu, 1949; Aran, 2000).

Table 2. Environmental, settlement, spatial and constructional characteristics of Kırklareli, Thrace Region

ENVIRONMENTAL FEATURES		REFLECTION ON ARCHITECTURE				
		Settlement	**Architectural features**	**Number of stories**	**Construction technique**	**Material usage**
CLIMATE	Continental climate		*Sundurma*, open *sofa* and closed *sofa*			Mud, straw covering, soil, sunflower stems
	Continental and black sea climate		Open and closed *sofa*			tree shoots, tree branches, wattles and ferns, straw covering
	Black sea climate		Closed *sofa*			Tree shoots, tree branches, wattles and ferns, rye stems, timber lath, wattle and daub straw covering, soil, tree shoots
TOPOGRAPHY	Plain	Houses, warehouses opening agricultural areas			Mudbrick Masonry	
	Transition zone (hilly)	Large barns, warehouses around a courtyard			Stone masonry	
	Mountainous (North)	Single houses were located on the slope or in the hilly area			Timber framed system	
NATURAL ENVIRONMENT	Soil, Agricultural areas (Sunflower, wheat, rye, corn, and grape gardens)	Agricultural areas between houses, Houses far from each other		One storied	Mudbrick Masonry	Mud, straw covering, soil, timber covering sunflower stems
	Stony hills	Houses located around a courtyard		One-Two storied	Stone masonry	Mud, tree shoots, tree branches, wattles and ferns, straw covering
	Forest	Houses far from each other		Two storied	Timber framed system	Tree shoots, tree branches, wattles and ferns, rye stems, timber lath, wattle and daub straw covering,
SOURCE OF INCOME	Agriculture	The agricultural areas between houses are far from each other				
	Stock farming	Houses with gardens and barns				
	Sheep and goat farming	Barns located near the houses, small-sized barn structures				
CULTURAL FEATURES						
ORIGIN	Settled					
	Nomadic culture		Usage of cupboards			
RELIGION	Muslims		Introverted house with fewer openings in the corner or outer lavatory			
	Non-muslims		Extroverted houses with more openings, projected lavatory			

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The forest area presented different settlement morphologies depending on its topographical features. Single buildings were located on the slope in the mountainous area, and an organic settlement with houses near one other was seen in the hilly area. Since the settlement area is limited; small-sized barn structures for small cattle were built near the houses. Houses on the Eastern Black Sea Region's slopes are far apart, surrounded by tea and hazelnut gardens, as they are in the north-eastern part of Krklareli (Özgüner, 1970). Organic settlements close to each other were found in the hilly area of the western Black Sea (Figure 22).

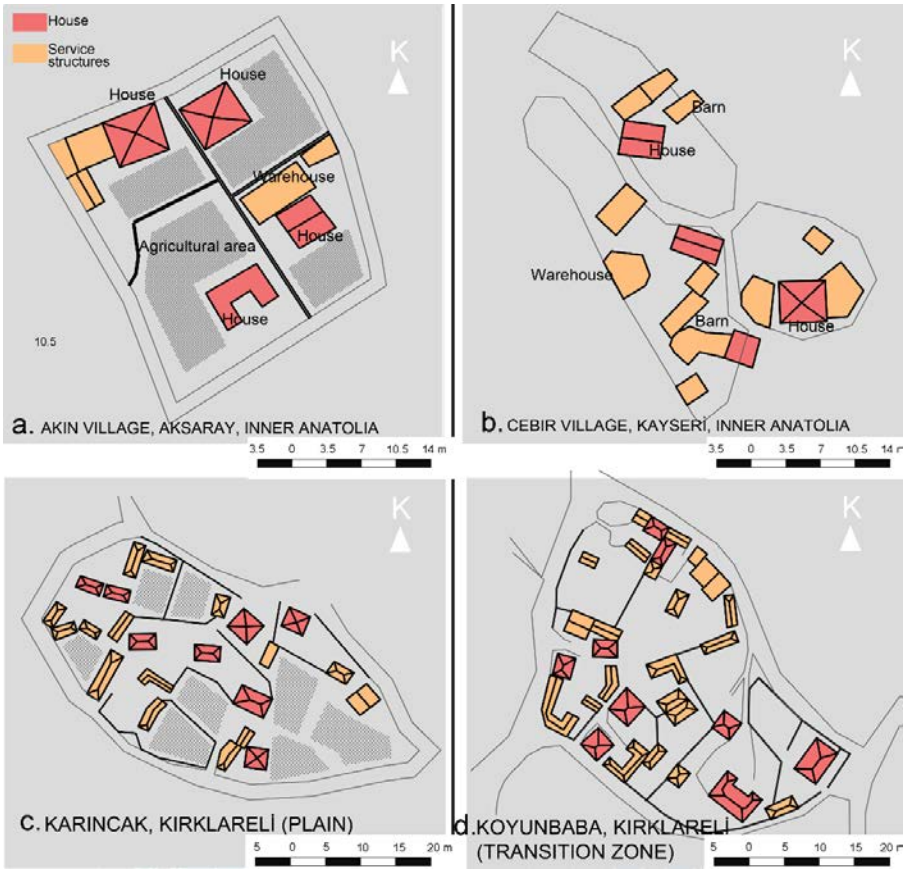

Figure 21. Comparison of settlement morphology between plain and stony areas of Kırklareli and inner Anatolia a and b: Inner Anatolia, c: Kırklareli plain region, d: Kırklareli transition zone

When the plan characteristics are discussed, it is seen that the houses with open sofas are preferred in the northern region of Thrace due to the mild climate. In the plain area, there are houses with a single story with an open sofa or inner sofa. By reducing the use of open space, houses were designed against the continental climate.

Closed or open and wide corner sofas were frequently seen in forest and mountainous areas of Kırklareli. Daily common activities were probably carried out in the sofas in forested and mountainous areas, while the houses, that have small sofas used for only circulation, were seen in forested and hilly areas.

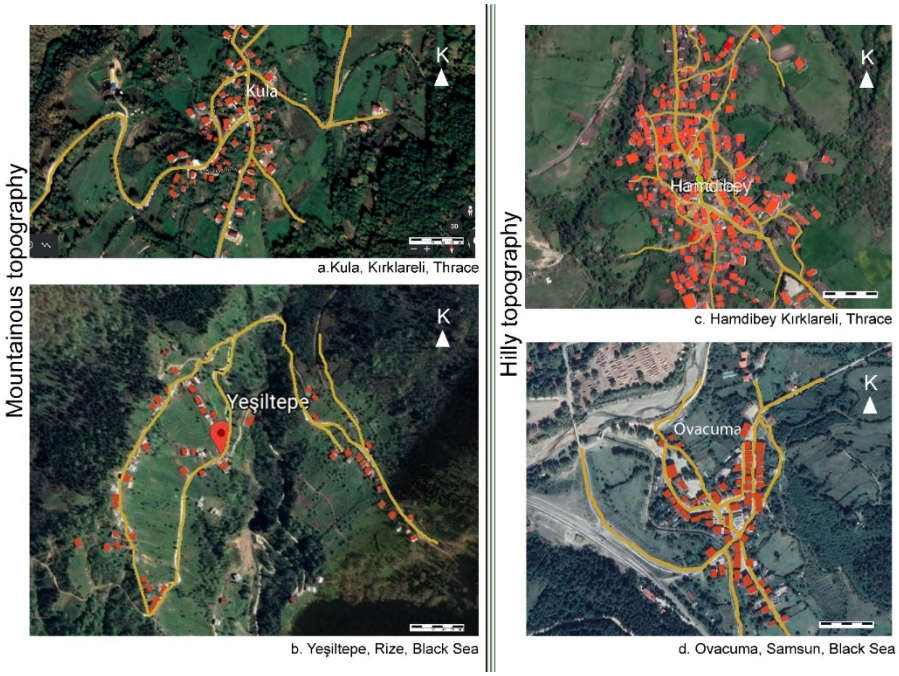

Figure 22. Comparison of settlement morphology between forest areas of Kırklareli and the Black Sea Region (revised from Google Earth)

There were two-story houses in both hilly and mountainous forest areas where the lower floors are used as barns. In the eastern Black Sea region (Samsun, Trabzon, Artvin, and Giresun), where the mild climate and hilly topography are dominating, there are houses with large sofas as north-eastern Kırklaeli, but in the western Black Sea region, houses have primarily narrow sofas (Zorlu and Faiz, 2012). As in northern Kırklareli, the houses are often two-storied, with the ground floors serving as barns. (Özgüner, 1970) (Figures 13 and 23).

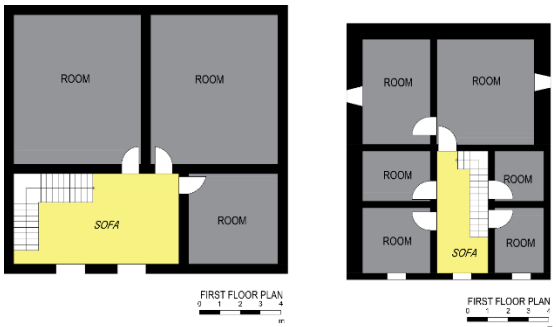

Figure 23. Spatial organization in Black Sea Region (a. plan drawn from Sümerkan, 1991; b. plan drawn from Gül and Batur, 2005)

In the Central Anatolia Region (Eskişehir, Ankara, Kayseri) where the continental climate is observed, single-story, closed-mass, adobe houses are seen, as in the south of Kırklareli. To protect houses against harsh weather conditions, open spaces are quite small, some houses have sundurma or closed inner sofas as Kırklareli plain region (Kafesçioğlu, 1949; Aran, 2000), (Figures 10 and 24).

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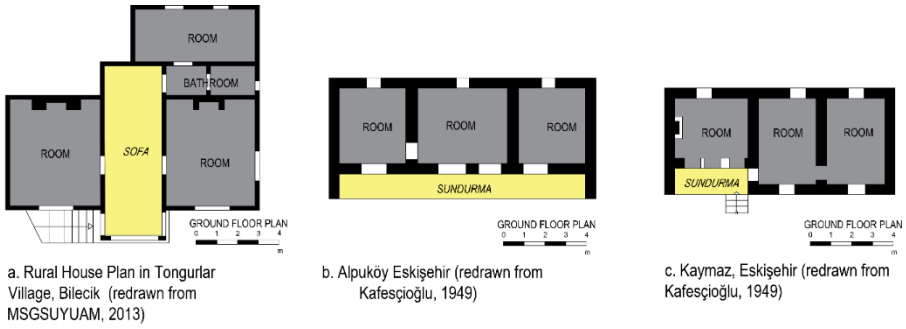

a. Rural House Plan in Tongurlar Village, Bilecik (redrawn from MSGSUYUAM, 2013)

b. Alpuköy Eskişehir (redrawn from Kafesçioğlu, 1949)

c. Kaymaz, Eskişehir (redrawn from Kafesçioğlu, 1949)

Figure 24. Spatial organization in inner Anatolia; a.Tongurlar Village, Bilecik (MSGSUYUAM, 2013); b.Alpuköy,Eskişehir (redrawn from Kafesçioğlu, 1949), c. Kaymaz, Eskişehir (redrawn from Kafesçioğlu, 1949)

Since soil material is much more in lowland villages (İnece, Karıncak, Üsküpdere, and Karahıdır), the houses are constructed with mudbrick masonry. Sunflower stems, that are grown up in this area, are used as ceiling coverings for the roofs. The tree shoots and branches are not seen on the floors and roofs, while mud is used in wall, floor, and roof layers. The flora of the area affected the material usage in the houses.

In the transition zone, a slightly more barren, and rocky land, the building material is stone. Stonemasonry houses are supported with a timber joist system. The ground floors do not have windows and are used as workshops, kitchens, cellars, or stables. In the layers of the roof and floor, tree shoots and branches are rarely seen.

There are timber-framed houses in the Istranca Forest starting from the coasts of the Black Sea to the city centers. Timber-framed houses are generally two-storied. The filling material of the walls is brick and stones. Also, combined techniques are seen, ground floors are constructed with stone masonry supported with timber beams or lintels; walls of upper floors are timber-framed. Local resources such as wood, rye stems, tree shoots and branches, wattles, and ferns are commonly used while constructing structures. Timber lath and wattle and daub techniques are also seen in the timber-framed walls. The vegetation of the area is completely seen as building construction material.

The usage of cupboards and niches is probably a physical reflection of the nomadic culture of the Turkish people. Some of the houses that belong to non-muslims in the past do not have any cupboards, or cupboard additions were seen later by Turkish local people (Kazmaoğlu and Tanyeli, 1979).

Soğucak and Kızılağaç have the same plan type that has a corner sofa, however, the number of openings in Soğucak is more than Kızılağaç, since the Soğucak was a Greek settlement. It is probably based on the religion of the Turkish people. In non-muslim houses, such as Soğucak (Figure 13 and 14), the lavatory is a projection on the second story, however, in Muslim houses, the lavatory is usually positioned on the courtyard or in the corner of the sofa or sundurma.

The architectural materials utilized in the roof, wall, and ceiling layers are largely made from locally grown plants and agricultural items like ferns, corns, sunflowers, and ryes. They were knitted using traditional techniques. Depending on the type of agricultural operations

in the area, the techniques change. Branch knitting techniques are most common in the forest, while stalks knitting techniques are more common in plain settings.

CONCLUSIONS

Rural settlements are constructed to meet the needs of local people with simple techniques and local materials depending on the environmental conditions of the regions. The results show that environmental factors have an impact on the settlement, spatial, and constructional characteristics of rural areas. The natural environment, terrain, climate, and economic position are seen as four key components that form rural settlements and houses.

- Topographical features such as mountains, slopes, and plains affect daily life and agricultural production, thus settlement organizations present differences. Because of the topography, houses in the mountainous area are far apart and there are no neighborhood relations; yet organic villages can be found on the slopes.
    - In mountains and forests, the natural environment and topography influence the source of income; for example, sheep and goat farming is prevalent in the north of Krklareli, therefore the houses are two stories, with the ground floors usually barns and stables.
    - Due to agricultural activity, most houses in plain villages in Thrace and inner Anatolia have larger plots, and there is also large-scale storage for agricultural products.
    - There are houses adjacent to each other and courtyards between houses in the transition zone (stony area).

- The differences in plan characteristics of rural houses are mostly influenced by regional climate conditions. Particularly, the presence, form, and sizes of common areas and open spaces present differences depending on climate conditions. The houses in the south of Thrace have been designed as enclosed without open areas in harsh hot or cold conditions.
    - The use of open spaces is determined by the climate; for example, in the Black Sea region, hot and humid weather conditions increase the use of an open sofa and Hayat space, because most activities are placed outside. Small, closed houses can be found in the harsh climate of southern Thrace. They do not have any large open areas.
- Landforms and the natural environment affect local materials used in the construction of houses. It has been observed that the construction systems of the houses have changed by the most easily obtained material from the nearby surroundings.
    - For example, there are mud-brick masonry rural houses in the plain areas, stone masonry houses in hilly areas, and timber-framed systems in the forested areas.

DOI: 10.15320/ICONARP.2022.204

- While tree shoots and branches were used as isolation in the forested areas, mud is used as a protective layer in the plain areas against harsh climate conditions.

- Even if there are physical differences between houses due to the geographical differences in the area, the nomadic culture of Turkish people and Islamic beliefs provide some common points in the houses such as introversion and privacy of the houses, usage of cupboards, gusülhane.

Comparison results also demonstrate that the differences in Thrace rural region are similar to the Black Sea and inner Anatolia depending on topographical features, climate, and source of income. Agricultural lands and gardens surround the houses in the plain in the south of Krklareli, as they do in Central Anatolia (Eskişehir, Ankara, Aksaray). Houses on the Eastern Black Sea Region's slopes are far apart, surrounded by tea and hazelnut gardens, as they are in the north-eastern part of Krklareli. In the Central Anatolia Region (Eskişehir, Ankara, Kayseri) where the continental climate is observed, single-story, closed-mass, adobe houses are seen, as in the south of Kırklareli. In the eastern Black Sea region (Samsun, Trabzon, Artvin, and Giresun), where the mild climate and hilly topography are dominating, there are houses with large sofas as north-eastern Kırklaeli.

As a result, rural settlements and houses have provided access to the different life habits and cultures of regions. Today, most rural houses have been abandoned and have the risk of getting lost. Therefore, documentation and analysis of settlement, plan characteristics and construction techniques of rural houses are critical to conserving the data about rural regions.

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DOI: 10.15320/ICONARP.2022.204