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The Evaluation of New Settlements in Rural Areas: Kalecik Village in Tercan District of Erzincan Province

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Abstract

In rural areas where modern residences are rapidly spreading, the local fabric and culture can be relegated to a secondary position, leading to the loss of traditional structures, lifestyles, and authenticity when establishing new settlements. This study aims to determine whether the expectations of the residents living in the new settlement areas built by public institutions in Kalecik village of Tercan district in Erzincan province are met and to assess their satisfaction. In this context, a literature review was conducted, and new settlement areas and residences were examined through on-site observation. Face-to-face surveys were also conducted. The findings indicate that most users have made changes to their homes by adding structures such as oven houses and barns, enclosing open spaces like balconies, and preferring reinforced concrete construction systems. The results emphasize that when planning new rural settlements, the region's climate, culture, and architecture should be taken into account, and the demands of the local population should not be overlooked.

Keywords: *Rural settlement, disaster housing, resettlement housing, housing satisfaction.*

Kırsalda Yeni Yerleşimlerin Değerlendirilmesi: Erzincan İli Tercan İlçesi Kalecik Köyü

Öz

Modern konutların hızla yayıldığı kırsal alanlarda, yeni yerleşim yerleri oluşturulurken yerel doku ve kültür ikinci planda tutulabilmekte ve böylece geleneksel doku, yaşam biçimleri ve özgünlükler kaybolabilmektedir. Bu çalışmada; Erzincan ili Tercan ilçesi Kalecik köyünde kamu kurumları tarafından yapılan yeni yerleşim yerlerinde yaşayanların beklentilerinin karşılanıp karşılanmadığı ve memnuniyet durumlarının belirlenmesi amaçlanmıştır. Bu doğrultuda literatür araştırması yapılarak, yerinde gözlem yöntemiyle yeni yerleşim yerleri ve konutlar incelenmiş, yüz yüze anket yapılmıştır. Kullanıcıların çoğunun konutlarına tandır evi, ahır vb. yapılar ekledikleri, balkon gibi açık alanları kapatarak değişiklikler yaptıkları ve betonarme yapım sistemini tercih ettikleri bulgularına ulaşılmıştır. Sonuçlar, kırsal alanlarda yapılacak yeni yerleşimlerde bölgenin iklimi, kültürü ve mimarisinin dikkate alınarak yerel halkın taleplerinin göz ardı edilmemesi gerektiğini vurgulamaktadır.

Anahtar Kelimeler: *Kırsal yerleşim, afet konutu, iskân konutu, konut memnuniyeti.*

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1. Introduction

Due to the advancements in technology brought about by the Industrial Revolution and rapid population growth, uncontrolled urbanization has begun in cities. This unchecked urban sprawl has led to a decrease in the quality of life in cities, as inadequate infrastructure and disappearing social spaces have resulted in the degradation of natural structures and caused ecological harm. The natural and cultural characteristics of cities have begun to fade away.

In Erzincan province, especially in the last 10 years, urban development has increased, leading to the creation of new residential areas on the eastern and western ends of the city. The widespread urban transformation projects have led to the rapid disappearance of the once-prevalent single-story, spacious residential areas with large gardens throughout the city. Single-story houses with gardens have been replaced by three to four-story apartment buildings with minimal or virtually no green space. Additionally, many mass housing projects have been implemented under the leadership of the Housing Development Administration of Turkey (TOKİ). Although these projects incorporate green spaces, they often overlook the region's local fabric and encourage apartment living, which is detached from the city's culture.

Despite being a city rich in water resources and green areas, Erzincan is gradually losing its green texture today. Consequently, the city center is losing its natural and cultural values. These issues in the city center are also beginning to threaten rural settlements. The urbanization of rural settlements leads to the disappearance of their unique characteristics and traditional ways of life. However, rural settlements, by bringing together various beliefs and lifestyles, using local climate data and indigenous building materials, offer a rich architectural diversity (Özgünler, 2017).

In the past 30 years, it can be observed that the uncontrolled urbanization carried out in rural areas of Anatolia, disregarding settlement patterns, local architectural features, and the needs of the local population, is incompatible with the region and culture. This situation leads to the deterioration and disappearance of both natural and built environmental heritage. Furthermore, the proliferation of urban-focused lifestyles also negatively affects the quality of rural construction and housing patterns (Özgünler, 2017). This rural development is sometimes the result of individual efforts and sometimes occurs through public projects.

Erzincan province is located in a region with a very high risk of disasters, particularly earthquakes. The city is situated on a first-degree seismic belt and has experienced numerous earthquakes in the past. Two major earthquakes have occurred in Erzincan, particularly in the years 1939 and 1992, in terms of both magnitude and intensity. Due to earthquakes, landslides, rockfalls, and flood disasters, the government in Erzincan has implemented many projects. Within the scope of Law No. 7269, the Provincial Disaster and Emergency Management Directorate (AFAD) takes measures to prevent disasters while also establishing new settlement areas in cases where disasters cannot be prevented by relocating existing settlements. Additionally, not only AFAD but also the Provincial Directorate of Environment, Urbanization, and Climate Change (ÇŞİDM) plans new settlement areas in rural regions. While Law No. 5543 is applied to regulate physical settlement in villages, Law No. 6306, concerning the Transformation of Areas at Risk of Disasters, is used to determine risky structures and areas and to implement new settlement areas. However, some aspects of these state-implemented initiatives are found to be inadequate. These settlements are established without adequately analyzing the original character of the settlements, and as a result, they fail to meet the needs of the inhabitants. These new settlement areas established by the government do not align with the traditions, lifestyles, and cultural, economic, and sociological structure of the region's rural areas; they exhibit differences and offer a more modern way of life. Based on this, this article aims to determine the satisfaction of inhabitants in newly established settlement areas in rural Erzincan, created by the government, through surveys.

1.1 Literature Review

This study primarily focused on reviewing the literature on post-earthquake new housing developments and user satisfaction in both Turkey and abroad.

Kamacı-Karahan & Kemeç (2022) focused on the satisfaction of residents living in permanent houses built after the 2011 Van earthquake and their previous neighborhood experiences, with a focus on their beneficiary status. They examined the differences in physical and social environments between the residents' previous and current living areas in Sihke permanent houses after the earthquake. As a result, factors influencing residents' satisfaction with the permanent houses built after the earthquake were determined. The study's findings highlight that residents' previous neighborhood experiences and beneficiary status are significant factors affecting their satisfaction with the permanent houses built after the earthquake. Other factors identified included differences in physical and social environments, house size, layout of living spaces, post-earthquake housing experiences, social and cultural needs, adapting to new neighbors, housing allocation process, distance between the new and old residential areas, and transportation options to the new residential area (Kamacı-Karahan & Kemeç, 2022).

Kürüm Varolgüneş (2021) aimed to determine the factors that increase housing residents' satisfaction and provided information about permanent housing practices after the 2003 Bingöl earthquake in Turkey. Surveys were conducted in four different villages in Bingöl, evaluating housing residents' satisfaction, housing environment, and factors such as the physical, social, and economic features of housing. The study's results revealed significant deficiencies in the planning and implementation of permanent housing production processes. Factors contributing to residents' dissatisfaction included insufficient local community involvement in the planning and implementation process, constructing houses in unsuitable locations with regard to environmental factors, inadequate physical features, lack of consideration for social and economic features, inadequate quality and durability of construction materials, insufficient research into construction sites, and inadequate consideration of environmental factors. The study emphasized that the housing environment was the most crucial factor in increasing residents' satisfaction. Furthermore, housing constructed using local materials and post-disaster education resulted in better economic outcomes and more effective community involvement (Kürüm Varolgüneş, 2021).

In a study concerning post-disaster permanent housing in rural areas, Dikmen (2005) conducted research in Çankırı to investigate the satisfaction of beneficiaries of disaster housing, aiming to uncover reasons for satisfaction or dissatisfaction. By taking measurements and surveys of the disaster housing, changes and additions made to these houses were identified. Based on the evaluations of modifications and additions, a model and design guide was proposed for permanent disaster housing in rural areas. The study highlighted those traditional houses better met local needs. İnhabitants of post-disaster housing sought to adapt these houses to their lifestyles, changing the spatial arrangements, altering the functions of areas, and adding extra spaces. İnhabitants expressed dissatisfaction with elements such as heating, daylight, layout, location, and barns; however, they were satisfied with the cleanliness of the houses and bathrooms.

In their study, Khorshidian and Fayazi (2023) aimed to identify critical factors for the reconstruction of housing in Iran after earthquakes. They examined three different housing reconstruction projects and, as a result of their study, identified 39 critical factors for the success of housing reconstruction projects in Iran. These factors were categorized under four main themes: "risk reduction," "community participation," "organizational design and supply," and "housing design and implementation." It was emphasized that reconstruction designs should be customized to the needs and conditions of affected households, taking into account factors such as psychological healing, transparency, and facilitation. These factors were suggested to enhance community satisfaction and the long-term sustainability of housing reconstruction programs (Khorshidian & Fayazi, 2023).

Bouraoui & Lizarralde (2013) conducted a study in Tunisia to examine the impact of centralized decision-making in the post-disaster reconstruction process on user participation and satisfaction. According to the study's results, centralized decision-making negatively affected the participation and satisfaction of inhabitants in the reconstruction process. To increase user participation and satisfaction, a more participatory approach was recommended, and inhabitants were advised to be more involved in the decision-making process. The study also highlighted the importance of different

stakeholders communicating and collaborating better with each other for a more effective and sustainable reconstruction process (Bouraoui & Lizarralde, 2013).

In Turkey, most of the studies related to rural settlements in the field of architecture focus on the examination and preservation of rural settlements' traditional fabric and traditional housing (Yalçıner, 2022; Örs, 2022; Dilaver, 2022; Koçoğlu, 2022; Göğebakan, 2022; Diker, 2022; Pilevne, 2022; Karadeniz, 2022; Genç, 2019; Güler, 2016; Eres, 2008), as well as the sustainability of rural settlements and rural housing (Korkmaz, 2007; Gülümser, 2009; Bedur, 2011; İner, 2013; Çetin, 2021; Bartu, 2020; Durak, 2019). The Ministry of Public Works and Settlement, Technical Research and Application Directorate, Rural Areas Department, and Mimar Sinan Fine Arts University have conducted two projects under the scope of "Determination of Regional Architectural Features in Rural Areas, Creation of a Guidebook and Sample Projects." These projects were carried out in Kayseri province in 2008 and Balıkesir province in 2011, resulting in the creation of a guidebook. The aim of both projects was to define and document the traditional fabric characteristics and rural housing architecture features of the provinces. Additionally, the projects aimed to identify the effects of economic, cultural, and societal changes on the formation of rural housing architecture (Çorapçıoğlu et al., 2008; Çorapçıoğlu et al., 2011).

No academic study related to housing projects carried out by the Provincial Directorate of Environment, Urbanization, and Climate Change (ÇŞİDM) in Turkey was found. When examining studies related to disaster housing, it is generally observed that the focus is on temporary housing implemented after disasters (Songür, 2000; Baradan, 2002; Arslan, 2004; Yalaz, 2012; Ünal, 2017; Koleri, 2020). In studies concerning permanent disaster housing, multi-story buildings constructed using tunnel formwork methods in urban areas have been mostly examined, with a significant focus on applications in the Marmara region after the 1999 Marmara Earthquake.

There have been studies that have examined the characteristics and issues encountered in permanent housing constructed after disasters in Turkey, particularly the 17 August Gölcük earthquake and the 1999 Marmara earthquake. These studies focus on the features and problems related to permanent housing built after disasters in Turkey (Kaya, 2001). Additionally, there are studies that emphasize the necessity and importance of sustainability in these housing projects and provide recommendations in this field (Bedur 2011).

Considering that 96% of Turkey's territory is within earthquake zones, Korkmaz (2007) advocated for increasing earthquake resilience in rural housing. He suggested an economic intervention to reinforce existing rural houses.

In international studies related to the sustainability of rural areas, Li (2013) aimed to identify the concept of sustainable rural development in impoverished rural areas in southwestern China. It was noted that green building practices in China generally focus on housing and public buildings in urban areas. However, with approximately 50% of the population living in rural areas, the presence of numerous unsustainable rural structures poses a potential threat to China's sustainable development (Li, 2013). X. Zhang & Zhang (2021) conducted a study on the sustainability of rural housing, analyzing embodied carbon emissions, cost comparisons, and sensitivity analysis related to rural housing construction in China. The results indicated that timber construction systems typically have lower carbon emissions and lower costs, while reinforced concrete construction systems tend to have higher carbon emissions and higher costs (X. Zhang & Zhang, 2021).

The literature review also included studies that investigated thermal comfort in rural housing. J. Zhang et al. (2023) examined factors affecting thermal comfort in rural housing in China. Another study conducted in China explored thermal comfort in rural housing at different latitudes in the cold north-eastern regions of the country. The research found that young individuals had a higher demand for thermal comfort compared to the elderly and that women tended to feel colder than men at the same temperature (Shao & Jin, 2020). In a study on how the thermal environment in urban and rural housing in a cold region of China affected the health and comfort of the elderly, it was determined that residents of rural housing had a lower perception of thermal comfort compared to those living in urban housing (H. Zhang et al., 2019).

Zhao (2015) conducted a study on Yanxia village in Zhejiang province, China, which lacked adequate public services. Following the "Construction of a New Socialist Countryside" policy issued by the central Chinese authorities in 2006, it was decided to relocate the entire Yanxia village to a remote settlement. However, this policy resulted in the destruction of historical and local houses, disruption of social relationships among residents due to displacement, and the loss of cultural traditions.

Regarding the rural settlements of Erzincan province, there is only one study available in the literature. In 1993, Parsamanesh conducted a study selecting various villages in the Refahiye district of Erzincan province as a pilot region. Research, examination, surveys, and interviews were conducted regarding the socio-economic life of the villagers and their housing conditions. The survey drawings of 15 selected houses were prepared, and schematics were developed for planning and improving the structures (Parsamanesh, 1993).

The literature review conducted highlights the lack of studies on rural housing and settlements in Erzincan province for approximately 30 years, underscoring the significance of this study.

2. Material and Method

In the scope of the study, a literature review was conducted as a primary step. For data collection, on-site observation and face-to-face survey methods were employed. The study area was determined as Kalecik village in the Tercan district of Erzincan province, influenced by the establishment of two new settlements on different dates by both AFAD and ÇŞİDM. The new settlement areas in Kalecik village were examined, and a total of 52 inhabitants were interviewed and surveyed. The survey data were analyzed using the Statistical Package for the Social Sciences (SPSS) program. This aimed to understand the needs of the inhabitants, assess whether the new settlements established by the government meet these needs, determine housing satisfaction levels, and gather information on changes or additions made or desired by residents in their homes.

2.1. Study Area

Erzincan province, located in the Eastern Anatolia Region, covers an area of 11,903 km² (Karadeniz & Altınbilek, 2018). According to the data from the Turkish Statistical Institute (TÜİK) for the year 2022, Erzincan has a population of 239,223 people, with 166,181 residing in the city center (TÜİK, 2023a). Meteorological data from the General Directorate of State Meteorology (DMİ) for the years 1991-2021 were analysed for Erzincan. According to this data, the lowest average temperature is -1.9°C in January, the highest average temperature is 24.5°C in August, and the highest amount of precipitation is observed in May (DMİ, 2023).

Tercan district, located to the east of Erzincan, is approximately 100 km away from the city center. Kalecik village, situated within the Tercan district, is approximately 43 km away (Figure 1). According to the Address-Based Population Registration System (ADNKS) data for the year 2022, the population of Kalecik village is 333 people (TÜİK, 2023b). Satellite imagery in Figure 2 displays the former settlement of Kalecik village, the location of disaster housing constructed by the Disaster and Emergency Management Authority (AFAD), and the location of housing projects carried out by the Ministry of Environment, Urbanization, and Climate Change (ÇŞİDM).

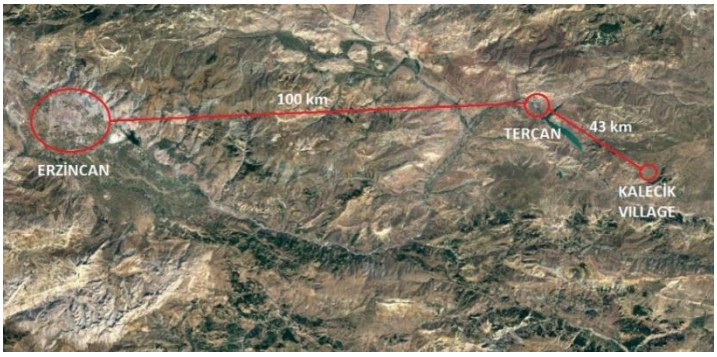

Figure 1. Erzincan-Tercan-Kalecik village satellite image (Modified by T. İnanç)

Figure 2. Kalecik village old and two new settlements satellite images (May 2022)

The old settlement area in Kalecik village was relocated due to rising groundwater and the potential threat of landslides. It was designated as a Disaster-Prone Area (Restricted for New Construction) and prohibited from habitation. Since the old settlement was abandoned for this reason, no one lived there, and most of the houses turned into ruins. Therefore, surveys could not be conducted in this area, and it was not possible to enter the houses. Only outdoor photography was carried out. Although the floor plans of these houses could not be obtained, observational inspections provided insights into the construction system and building materials. In the old settlement area of Kalecik village, houses were predominantly constructed using stone and wood as building materials with a masonry construction system (Figure 3).

Figure 3. Old settlement area of Kalecik village (T. İnanç photo archive)

According to the information obtained during the conversation with the village head of Kalecik village, all the village residents living in both the AFAD houses and the residential houses make their living through livestock farming and agriculture. Agricultural lands are mainly used for growing grass, wheat, and oats, primarily for livestock farming. The village is known for its traditional dishes; with soups, meat dishes, and bakery products being prominent. The villagers bake their bread in tandoors. Traditional family values and neighbourly relationships are highly important. Families generally have large structures, strong family bonds, and a strong sense of mutual assistance. The village adheres to the Islamic religion, with a mosque serving as a place of worship, which is an integral part of traditional life. The village hall, a service building in the village, is used for weddings and funerals. In the region with a continental climate, during the cold winter months, villagers with lower income levels use cow dung for heating due to its economic advantages (Yalçın, 2023).

2.1.1. Settlement area built by the Provincial Disaster and Emergency Management Directorate

Due to the dry streams in the upper part of Kalecik village turning into flowing streams during rainy seasons, the groundwater level rose in the lower part of the village (at elevations of 1950m to 1970m), affecting the houses. Considering that this situation could trigger the thick layer of soil over the basaltic ground, and due to the potential risks of landslide and rising groundwater levels, the decision was made to relocate the village. The new settlement area (Sırt Mevkii) was requested by the villagers who relied on agriculture and livestock breeding for their livelihoods. As a result of the study conducted in this area, it was determined that Sırt Mevkii was located at a higher elevation than the area declared vulnerable to disasters, thus eliminating the risks of rising groundwater levels, rockfall, flooding, and landslides. The area was found to be structurally sound, making it suitable for construction under the provisions of Law No. 7269. Consequently, disaster-resistant housing units were built in this area. The construction of 56 housing units was completed in 2008, and they were handed over to the eligible families. This project led to the creation of a new settlement area (Figure 4).

Figure 4. Kalecik village disaster housing settlement area (T. İnanç photo archive)

The site plan of the AFAD housing settlement area is provided in Figure 5, and unscaled floor plans are presented in Figure 6 (Erzincan Provincial Disaster and Emergency Management Directorate Archive, 2021). These houses were constructed using brick as the building material, employing a rubble construction system. They are single-story, uniform, with a gross area of 92 m^2, and consist of 3 bedrooms and 1 living room (Figure 6, 7). The new settlement area has an approximate slope of 10%, and the plot sizes vary between 588 and 637 m^2. Due to the continental climate prevailing in the region, the natural vegetation flourishes with spring rains and withers during the dry summer, consisting mainly of thorny shrubs, astragalus, and grasses.

Figure 5. Site plan of Kalecik village disaster housing location (Erzincan Provincial Disaster and Emergency Management Directorate Archive, 2021)

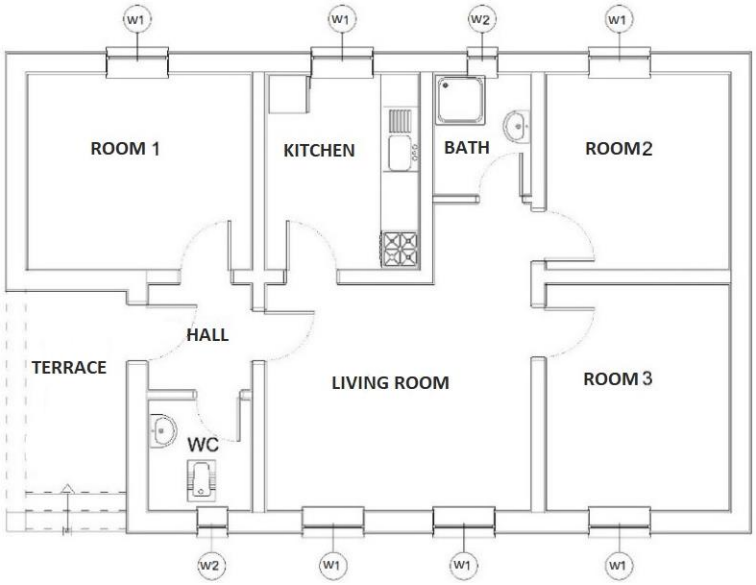

Figure 6. Kalecik village disaster housing (3+1) floor plan (Erzincan Provincial Disaster and Emergency Management Directorate Archive, 2021)

Figure 7. Kalecik village disaster housing (T. İnanç photo archive)

2.1.2. Settlement area built by the Directorate of Environment, Urbanization and Climate Change

To meet the housing needs of extended families accommodating their married children and for those who wish to return to their villages after migrating to big cities, as well as to consolidate Kalecik village and organize the physical settlement, a new settlement area (Figure 8) was established by the Ministry of Environment, Urbanization and Climate Change (Housing units) under the Law No. 5543 in a non-disaster risk area (with the opinion of AFAD) in accordance with the regulations. The construction of 33 single-story housing units and 33 single-story barns was completed in 2019. The layout plan of the settlement area for the housing units is shown in Figure 9, and the applied floor plan is provided in Figure 10 without scale (Erzincan Provincial Directorate of Environment, Urbanization, and Climate Change Archive, 2022). The houses and barns were built on plots ranging from 1017 to 1623 m2. The new settlement area has an approximate slope of 10%. The natural vegetation cover in this area has similar characteristics.

Figure 8. Settlement area of Kalecik village housing units (Photo Archive by T. İnanç)

Figure 9. Site layout plan of housing units and barns in Kalecik village (Erzincan Provincial Directorate of Environment, Urbanization, and Climate Change Archive, 2022)

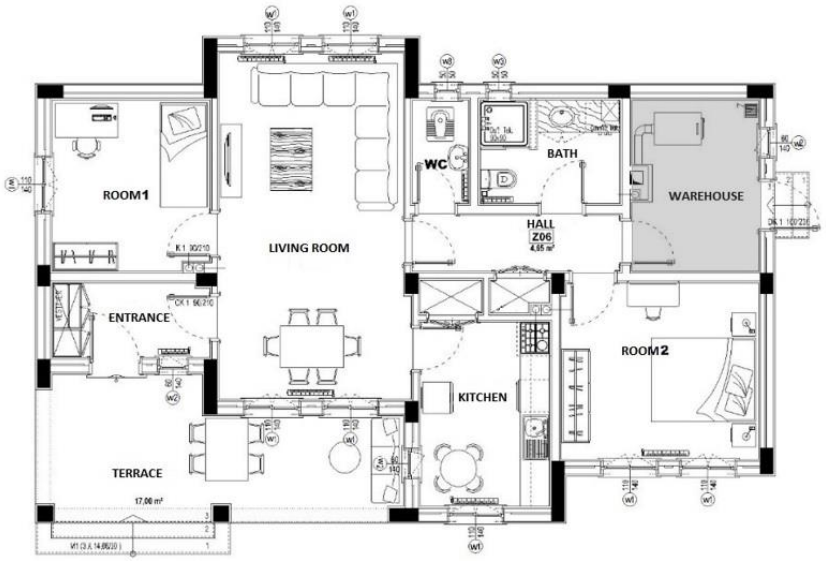

Figure 10. Floor plan of housing units (2+1) in Kalecik village (Erzincan Provincial Directorate of Environment, Urbanization, and Climate Change Archive, 2022)

The housing units were constructed using reinforced concrete construction system, standardized as 110 m^2 gross area, and designed as 2+1 layout. In the floor plan, the space originally intended for installing floor heating was designed as a storage area, but all inhabitants have converted it into a room for use. Therefore, the housing units can be considered as 3+1 layout.

Figure 11. Housing units in Kalecik village (T. İnanç photo archive)

3. Findings and Discussion

In the context of this study, observations were made in Kalecik village on the disaster and settlement housing units, and the following were determined:

- the terrace section was enclosed (Figure 12,13),
- additional structures were built in the garden, such as a woodshed/coal storage, oven house, storage room, poultry house, and garage (Figure 14, 15),
- a solar energy system was installed on the roof for hot water supply (Figure 12,14,15).

Figure 12. Examples of AFAD houses with enclosed terraces

Figure 13. Examples of enclosed terraces in resettlement houses

Figure 14. Examples of additional structures such as woodshed/coal storage, garage, tandoor house, etc. added to AFAD houses

Figure 15. Examples of additional structures such as woodshed/coal storage, garage, tandoor house, etc. added to resettlement houses

When examining the Google Earth satellite images of the resettlement area in Kalecik village carried out by AFAD for the years 2011 and 2022 (Figure 16), it can be observed that within the past 11 years, numerous additional structures have been constructed on the parcels by the residents of the houses.

Figure 16. AFAD housing complex satellite images (a) July 2011 (b) May 2022

Between July and September 2022, surveys were conducted with residents of 30 out of 56 disaster housing units in the AFAD settlement and 22 out of 33 housing units in the settlement area built by ÇŞİDM. Out of a total of 89 residents in both new settlements, 37 chose not to participate in the survey, and some were not available at home, resulting in interviews with a total of 52 participants. Survey data was entered into the SPSS program for analysis, and the results are presented below.

Descriptive statistics for gender, age, education, and occupation of the inhabitants who participated in the survey are given in Table 1 according to the type of housing. Among the 52 participants, 63.5% (33 individuals) were male, and 36.5% (19 individuals) were female. Regarding age distribution, it was observed that 4 individuals (7.7%) were between 18 and 30 years old, 18 individuals (34.6%) were between 31 and 45 years old, 17 individuals (32.7%) were between 46 and 60 years old, and 13

individuals (25%) were 61 years old and above. In terms of education, 55.8% of participants had completed primary school, while 28.8% had no formal education. Neither settlement area had individuals with a master's or doctoral degree. Among the 52 participants, 29 were farmers, and out of the 19 women, 17 were housewives.

Table 1. User characteristics according to housing type

User Characteristics		AFAD Housing	Resettlement Housing	Total	Percentage (%)
Gender	Man	18	15	33	63,5
	Woman	12	7	19	36,5
Age	18-30	3	1	4	7,7
	31-45	8	10	18	34,6
	46-60	7	10	17	32,7
	61 and above	12	1	13	25
Education	None	12	3	15	28,8
	Elementary	13	16	29	55,8
	Middle School	1	1	2	3,8
	High School	3	2	5	9,6
	University	1	0	1	1,9
	Master's and Doctoral Degrees	0	0	0	0
Occupation	Retired	2	0	2	3,8
	Housewive	11	6	17	32,7
	Farmer	15	14	29	55,8
	Livestock breeder	0	0	0	0
	Civil servant	0	0	0	0
	Other	2	2	4	7,7

The answers provided by the inhabitants to the question "What type of building material would you prefer for your house?" were examined according to the type of housing (Table 2). Among AFAD inhabitants, 60% prefer their houses to be made of reinforced concrete, while 40% prefer stone. All of the surveyed resettlement inhabitants expressed their preference for reinforced concrete as the building material for their houses.

Table 2. Participants' preference for building materials for housing

Building Material	AFAD Housing (n)	Resettlement Housing (n)
Reinforced Concrete	18 (%60)	22 (%100)
Stone	12 (%40)	0

According to the responses to the question "What changes have you made in your house?", out of 30 AFAD inhabitants, 28 have closed the terrace, and out of 22 inhabitants in the settlement area, 20 have closed the terrace (Table 3). In all AFAD houses, the terraces face the southwest direction (Figure 5), while in the resettlement housing, they face different directions (Figure 9). In the resettlement housing, eleven of the terraces face northwest, seven face southeast, seven face northeast, five face southwest, one faces north, and one faces south. According to the survey results, 26 of those who enclosed their terraces in AFAD houses did so to protect against the cold, one did so to protect against both the cold and the wind, and only one did it to gain extra space. Two inhabitants who wanted to enclose their terraces when possible also cited protection against the cold as the reason. In the resettlement houses, 19 inhabitants who enclosed their terraces did so to protect against the cold, one did it to protect against the wind, and one said they would enclose their terrace when possible to protect against the cold. When traditional houses were examined, it was observed that none of the houses had terraces.

Table 3. Distribution of inhabitants who have closed balconies/terraces in their houses according to housing type

	AFAD Housing (n)	Resettlement Houses (n)
Enclosed Balcony/Terrace	28	20
No enclosed Balcony/Terrace	2	2

When examining the answers given to the question "What changes would you like to make in your house?", it is observed that out of 52 inhabitants, only two AFAD inhabitants mentioned that they would like to shift the wall to enlarge the living room. Two AFAD inhabitants and one settlement housing user expressed their intention to close the terrace; seven AFAD inhabitants and three settlement inhabitants indicated they would like to renovate the plumbing of the kitchen, bathroom, and toilet; and 15 AFAD inhabitants mentioned their desire to install wooden parquet in the living room and bedrooms. 11 AFAD inhabitants expressed their intention to renovate the kitchen, 12 for the bathroom, and 11 for the toilet. Among the settlement inhabitants, three mentioned their intention to tile the bathroom and toilet with ceramic. Additionally, two AFAD inhabitants and three settlement inhabitants expressed their desire to change the bathroom tiles (Figure 17). Furthermore, one AFAD housing user mentioned building a garden wall, one user stated the intention to change the roof to metal sheets, three expressed their intention to renew kitchen cabinets, and two wanted to add a room to the house. Among the settlement inhabitants, one mentioned the intention to enlarge Room 1 (Figure 18).

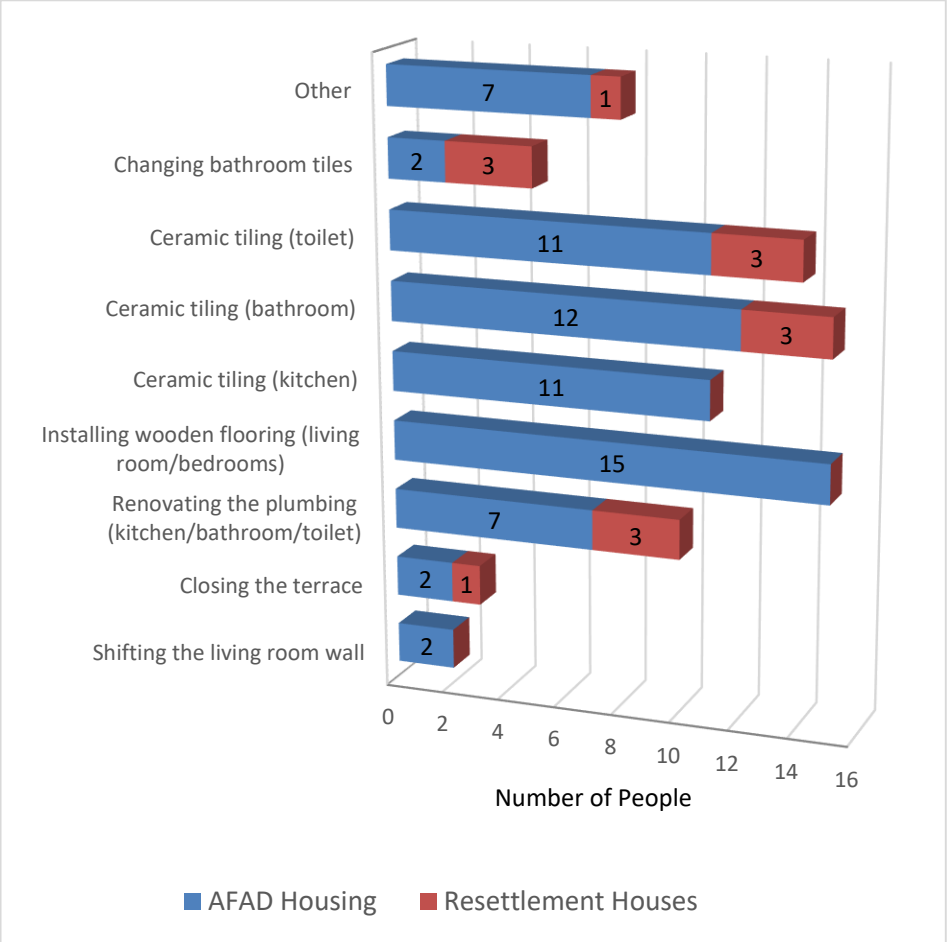

Figure 17. Distribution of changes residents want to make in their homes

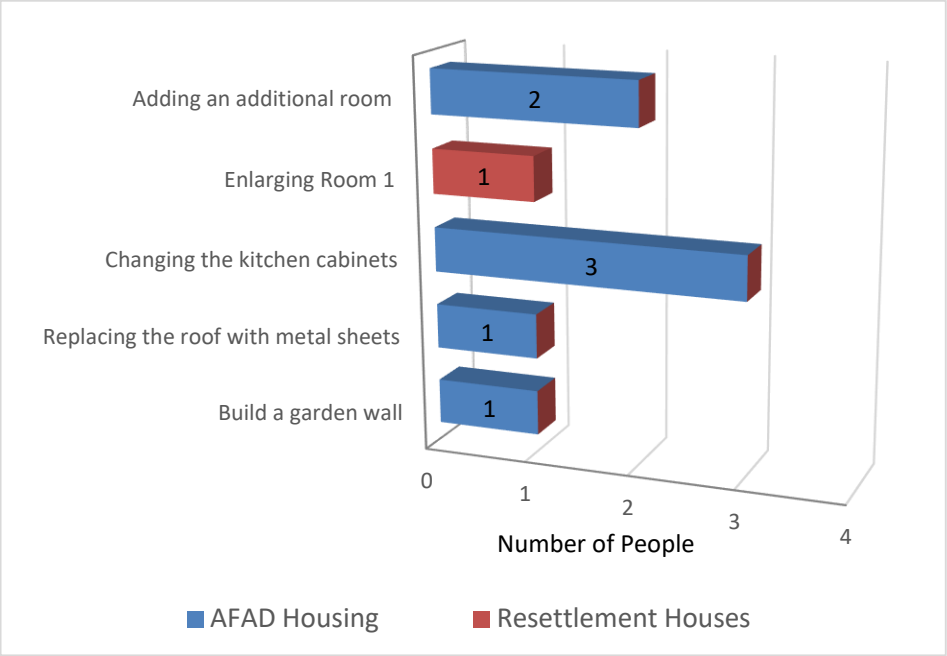

Figure 18. The distribution of changes that users who selected the "other" response wish to make in their residences

Both in AFAD housing and settlement housing, it has been determined that the majority of inhabitants have built additional structures in their gardens. These additional structures have been constructed either as standalone units in the garden or attached to the house/barn. Information about these structures in the gardens is provided in Figure 19 below.

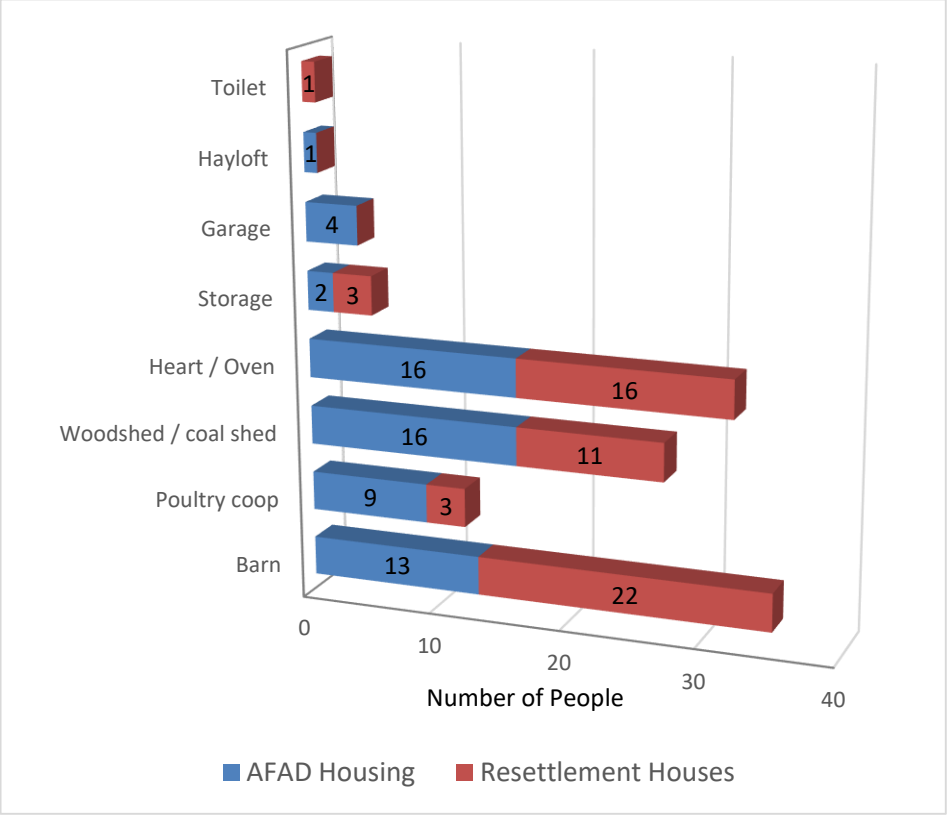

Figure 19. Information about the structures located in the gardens of the houses

The responses to the questions related to housing satisfaction in the survey are presented for AFAD (Disaster and Emergency Management Authority) houses in Figure 20 and for resettlement houses in Figure 21. In both residential areas, satisfaction with the dwelling, layout, lighting, and ventilation is

observed to be high. However, inhabitants' satisfaction with insulation and roofing is low. Eight individuals from AFAD houses and 17 individuals from resettlement houses expressed dissatisfaction with the roofing, while nine individuals from AFAD houses and 14 individuals from resettlement houses indicated dissatisfaction with the insulation of the houses.

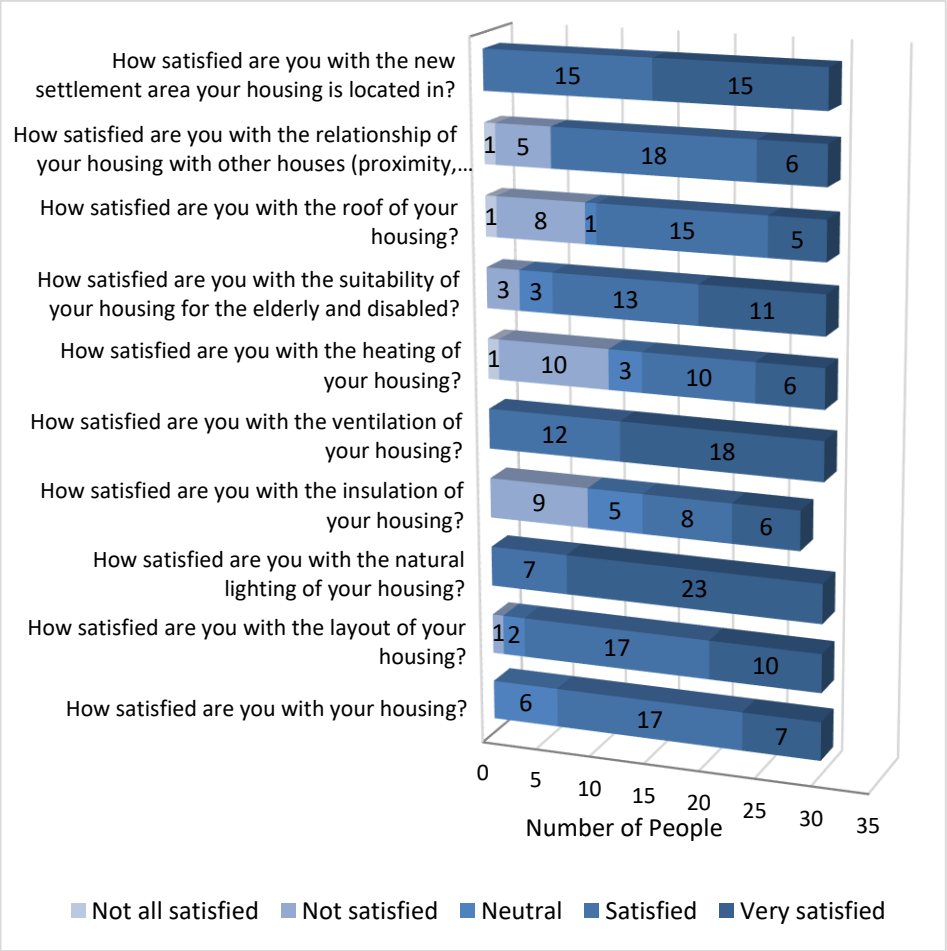

Figure 20. Kalecik Village AFAD Housing Resident Satisfaction

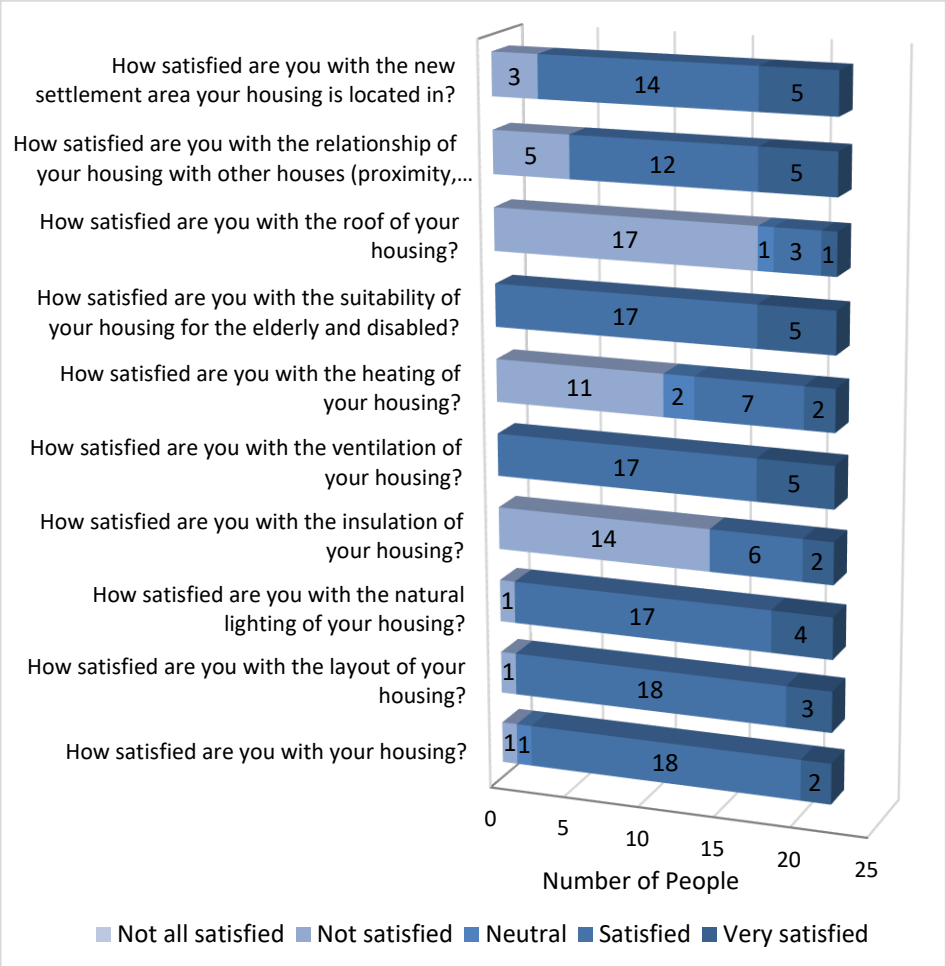

Figure 21. Kalecik Village resettlement housing resident satisfaction

According to the study conducted by Pormon et al. (2023) on housing satisfaction in newly established areas after Typhoon Haiyan in Tacloban, Philippines, it was found that satisfaction with post-disaster constructed housing was moderate to high. However, factors such as wall cracks and infrastructure deficiencies significantly affected housing satisfaction negatively. One of the results of this study in Kalecik village was the distance of post-disaster constructed housing from the settlement area, which similarly emerged as an undesirable situation among the results of Pormon et al.'s study. In another study, Wijegunarathna et al. (2018) found that in new resettlement areas in Sri Lanka after floods, landslides, and tsunamis, the adequacy of the number of rooms and the lighting and ventilation features of the houses increased housing satisfaction. Furthermore, the availability of opportunities for housing orientation, arrangement, expansion, and modification was associated with higher overall satisfaction (Wijegunarathna et al., 2018). Similarly, in our study's results, it was found that individuals were capable of making various changes to their housing in different areas, indicating that housing satisfaction can vary based on these alterations. In a study by Tas et al. (2007) examining the problems related to the usage of Kocaeli Güneşköy Permanent Housing area constructed after the 1999 Marmara Earthquake, it was determined that positive characteristics such as proximity to the city center and necessary social facilities (educational buildings, places of worship, healthcare facilities) and easy access to public transportation were associated with higher housing satisfaction. In Kalecik village, the results similarly indicate that inhabitants in the new settlement areas have high satisfaction with the layout, lighting, ventilation, suitability for the elderly, and the new settlement area itself. However, their satisfaction with insulation and roofing is lower. Karki et al. (2022) found that in Nepal, after the earthquake, the socio-political issues arising in the housing reconstruction process needed more involvement from participants. They also provided solutions such as improving the planning and implementation of reconstruction programs. Oo et al. (2018) highlighted the importance of objectively evaluating the long-term satisfaction and expectations of inhabitants participating in post-disaster

permanent housing reconstruction programs. They noted that user participation significantly affected long-term housing satisfaction, and inhabitants wanted housing designs that were suitable for cultural and local conditions, climate, and cultural sensitivities. In the case of Kalecik village, this study's results emphasize the importance of involving housing inhabitants in the reconstruction process and taking into account their lifestyles and cultures when designing new housing.

He et al. (2019) conducted a study in China's Sichuan region to understand the challenges faced by earthquake survivors and the reconstruction of settlements. According to face-to-face surveys with homeowners, many earthquake survivors felt worse after the reconstruction of settlements. They believed that the newly constructed buildings were more comfortable and modern, but were not satisfied with the size of their new apartments. In contrast, in Kalecik village, inhabitants were generally satisfied with the modern style of the newly constructed housing and found them to be more comfortable and cleaner. This difference may be attributed to the proximity of the new settlement areas in Kalecik village to the old ones.

4. Conclusion and Suggestions

Due to the underground water rise and landslide disaster in Kalecik village, Tercan district of Erzincan province, disaster housing settlements were established by AFAD (Disaster and Emergency Management Authority) with the purpose of consolidating the settlement area and organizing the physical layout of the village, alongside conventional housing settlements by ÇŞİDM (Ministry of Environment and Urbanization). In this study, both the new government-established settlements and the old Kalecik village settlement were examined, and surveys were conducted with inhabitants in the newly established settlements.

While an orthogonal grid system was preferred for AFAD settlement planning, a more flexible and curved grid system was chosen for the ÇŞİDM settlement. The slope of the land is nearly the same in both settlement areas (approximately 10%). Parcels containing conventional housing and barns were designed to be significantly larger compared to parcels with disaster housing. This suggests that AFAD's decision not to build barns but to focus solely on housing planning was effective. In both areas, main roads were designed to be 10 meters wide, while secondary roads were 7 meters wide, except for one axis in the AFAD settlement with a width of 9 meters. The natural vegetation is similar in both areas, consisting of thorny bushes, astragalus, and grasses.

Through the examination, it was observed that in the old village settlement, houses were constructed using stone as the building material and rubble masonry construction method. In contrast, disaster housing used brick as the building material and rubble masonry construction method, while conventional housing used brick and reinforced concrete construction. Despite stone being the main building material in the old settlement, a majority of survey participants expressed a preference for their houses to be made of reinforced concrete due to their cleanliness. As a result, it should be more appropriate and recommended to use reinforced concrete in the new houses to be built in the future.

Regarding the changes made or desired by inhabitants in their houses, survey questions revealed that in both disaster and conventional housing settlements, a significant portion of inhabitants enclosed their terraces, with some being unable to do so due to financial constraints but expressing the desire to enclose them. The primary reason for the terrace enclosure was to protect against the cold. Additionally, many inhabitants in both types of settlements expressed the desire to have wooden parquet flooring and ceramic tiling for wet areas in their disaster housing. İnhabitants generally expressed dissatisfaction with the plumbing system in both types of settlements, stating issues like water leaks and indicating a desire to renew the plumbing systems through the survey. It is recommended that designs for new houses consider climate conditions and are guided by the preferences of the inhabitants. Using high-quality materials and ensuring their correct implementation in the houses can increase user satisfaction and, in the long run, may not result in additional expenses.

In both new settlement areas, it has been determined that a majority of inhabitants have constructed additional structures either independently or in their gardens. For instance, in the settlement established by AFAD, only houses were provided to disaster-affected families, but a significant number

of inhabitants have constructed additional structures in their gardens, such as barns, chicken coops, hearth/oven houses, and wood/coal storage units. Similarly, in the conventional housing settlement, even though barns were provided for all inhabitants, some have expanded their barns through additions or constructed a second barn at a different location. Moreover, inhabitants in both settlement areas have constructed structures like chicken coops, hearth/oven houses, and wood/coal storage units. It is anticipated that designing new housing areas by considering the lifestyle, traditions, and needs of inhabitants, and incorporating structures such as barns, coops, hearths/tandoors, and wood/coal sheds into the design, can increase user satisfaction.

In addition to the findings of our study, the factors influencing housing satisfaction highlighted by the literature, such as neighbourhood experience (KamacI-Karahan & Kemeç, 2022), suitability of the project area, environmental factors (Kürüm Varolgüneş, 2021), customization of projects according to inhabitant needs (Khorshidian & Fayazi, 2023), involving inhabitants more in the decision-making process (Bouraoui & Lizarralde, 2013), sustainability (Bedur, 2011), a distance of housing from social areas and settlement (Pormon, 2023; Tas vd., 2007), climate conditions, and cultural sensitivity (Oo vd, 2018) should be considered in designing new housing areas in rural areas to ensure higher inhabitant satisfaction.

Based on the data obtained from this study, it is evident that when designing settlement areas and housing in rural areas, it is essential to consult with inhabitants to determine their needs and develop projects that are in line with their lifestyles and cultures. Otherwise, it has been observed that inhabitants tend to make changes to the constructed housing, add additional structures to their gardens, and modify the housing to suit their lifestyles. This research is expected to serve as an inventory for future projects in rural areas and guide public institutions in the planning of new settlement areas initiated by the government. This way, the preservation and enhancement of the identity of rural settlements can be supported.

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Author Contribution and Conflict of Interest Declaration Information

In the article, the first author contributed to the literature review, data collection, processing, analysis, and manuscript writing, while the second author provided guidance, literature review, and critical review. There are no conflicts of interest.

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