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CURRENT APPROACHES IN ARCHITECTURE, PLANNING AND DESIGN

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CHAPTER 1

What is Kitsch? Definitions Through *The Identity in Furniture* Course

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Introduction

The concept of kitsch has been the subject of debate in the context of art, design and aesthetics for many years, and has been defined in various ways in different periods and disciplines. Kitsch, which first emerged in the 19th century as a term of German origin, was generally used to express exaggerated and imitative aesthetic understandings with low artistic value. (Ulusoy,1999). However, it is difficult to reduce this concept to a single definition because kitsch is a phenomenon that varies in different contexts and is reinterpreted depending on time and cultural perceptions. For this reason, a comparative perspective on the definitions of kitsch in the literature is an important method to understand the historical development of the concept and to determine how it is perceived today.

This study aims to reveal the similarities and differences between the definitions by addressing how the concept of kitsch has been defined in the historical process within the scope of the literature. The definitions of kitsch in academic sources were analyzed and the perspectives each of them brought to the concept were evaluated. Then, this theoretical framework was supported by a practical study within the scope of a course. The students were given different definitions of kitsch in the literature, and then they were expected to make presentations on furniture examples that support the definition of kitsch they chose in line with these definitions. At the end of the process, it was tried to obtain a current perspective on the concept of kitsch in today's design understanding by looking at which kitsch definitions the students preferred more.

In this context, the study is expected to make significant contributions to the concept of kitsch both academically and pedagogically. From an academic point of view, a comprehensive comparison of different definitions of kitsch in the literature is made, and the transformation of the concept in the historical process and its relationship with changing aesthetic understandings are discussed in detail. This analysis will allow us to understand how kitsch is positioned not only in popular culture or in the world of design, but also in disciplines such as philosophy of art and sociology.

Pedagogically, through in-class practices, students were enabled to explore the concept of kitsch not only theoretically, but also by using visual and critical thinking skills. Based on the definitions determined by the literature review, this class study allowed students to evaluate different perspectives, question the role of kitsch in today's design understanding and interpret the concept through specific examples. At the end of the process, by analyzing which definitions the students adopted the most, it was tried to develop an up-to-date perspective on

the perception of kitsch in today's design culture. Thus, the study both contributed to the production of academic knowledge and presented an original method for addressing the concept of kitsch in an educational context.

Basic Definitions of Kitsch

Kitsch has been defined differently in different disciplines and historical contexts. Although it is often associated with aesthetic or cultural "low quality", it has deep socio-cultural roots. According to Kulka (1996), kitsch is an art form that aims to create an emotional response in violation of aesthetic norms. Kitsch often focuses on superficial beauty and does not offer a deep intellectual layer. Kundera (2004) defines kitsch as "the aesthetic ideal of a categorical agreement with existence"; according to him, kitsch rejects the negative aspects of reality. He defines it as the idealization of universal emotional experiences. According to Kundera, kitsch also functions as the aesthetic ideal of totalitarian regimes that "exclude all individuality and doubt". Therefore, kitsch represents an aesthetic understanding that rejects the disturbing aspects of human existence and seeks unquestioning conformity.

Clement Greenberg's role in modernist art criticism (1993) crystallized the concept of kitsch as a counterpoint to high art. According to Greenberg, kitsch was an art form associated with mass production and far from individual creativity. This expression refers to the detachment of art from individual creativity and originality due to mass production processes. Mass production refers to objects produced on a large scale and in a standardized manner, usually through fabrication techniques. However, in the context of art and design, this kind of production process can be seen as a factor that limits the individual artist's or designer's unique touch and creative process. For example, while an original painting bearing the artist's personal interpretation brings individual creativity to the fore, mass-produced prints of the same painting can become a mechanical repetition, far from originality. Likewise, a handcrafted piece of furniture may reflect the personal touches of the maker, while a large-scale fabricated piece of furniture may lack artistic and original details. This kind of art form can also be associated with the concept of kitsch, since mass-produced, easily consumable objects that lack aesthetic and artistic depth are often considered kitsch for this reason. Situations in which art and design are shaped by commercial concerns, according to market demands rather than artistic value, can lead to a shift away from individual creativity.

Hermann Broch considered this as a moral problem and characterized kitsch as an "unethical" phenomenon (2001). According to Broch, art carries a moral

responsibility and should encourage the individual to confront reality, to think deeply and question. Kitsch, on the other hand, offers people a comforting aesthetic that looks beautiful but lacks depth, eliminating the need for questioning and trapping them in a false sentimentality. Therefore, kitsch is seen as a moral problem because it leads people to ignore reality and surrender to a superficial sense of beauty. Art and design have important functions such as making us think, raising awareness and developing the individual, but kitsch promotes an understanding of art that is only pleasing to the eye and consumption-oriented. Broch considered this a violation of the ethical responsibility of art.

In contrast, Emmer (2007) argues that kitsch should be treated not only as an aesthetic or ethical issue, but also as an emotional phenomenon. According to Emmer, the evaluation of kitsch is largely subjective and context-dependent; that is, an object may be perceived as kitsch for a particular person or cultural group, while in another context it may take on a completely different meaning. This shows that kitsch is a concept that changes depending on individual and cultural experiences rather than having a universal and fixed definition. In this framework, Emmer argues that kitsch should be considered as a phenomenon related to the individual's personal taste and emotional reactions rather than a moral or intellectual problem. People may value certain objects or works of art because of personal memories, nostalgia or emotional attachments. In this context, an object that seems deeply meaningful and aesthetically satisfying to one person may be superficial and kitsch to another. Emmer's approach is based on the idea that kitsch should be considered as a simple matter of taste. According to him, kitsch is a phenomenon shaped by an individual's emotional perceptions and experiences rather than an aesthetic judgment. Therefore, instead of judging an object or artistic production as kitsch based not only on its form, content or production process, the emotional reactions it evokes in the individual should be taken into consideration. This perspective challenges the view of kitsch as a universal category of bad art and positions it as an aesthetic phenomenon that varies according to individual and cultural contexts.

Leeanna Barnes (2016) examines Theodor Adorno's modernist and postmodernist perspectives on the concept of kitsch (1980), emphasizing that kitsch is one of the least understood phenomena, especially in music. In the context of Adorno's critical theory, kitsch is often associated with popular culture, commercial art and aesthetic superficiality. However, Barnes argues that kitsch in music is more difficult to define and analyze than in other art forms because music by its very nature does not have a tangible physical form, but is rather an art form that is experienced through emotions and perceptions. According to

Barnes, kitsch has its origins in German aesthetic consciousness and this concept has gained various meanings over time by finding its place in different art forms. First discussed in the context of painting and decorative arts, kitsch later began to manifest itself in different forms in different fields such as architecture, design, literature, cinema, music, and furniture. This transformation is important as it shows that kitsch is not limited to a certain aesthetic understanding, but is reshaped depending on time, context and cultural changes. Barnes argues that one of the main reasons for the poor understanding of kitsch in music is the blurring of the line between artistic and commercial music. While the modernist understanding of music glorified high art and experimental music, the postmodernist approach has taken a more flexible and inclusive approach to kitsch, associating it with popular music, nostalgia and emotional excess. In this context, while Adorno's modernist critique evaluated kitsch as a superficial and standardized product with no artistic value, postmodernist theories treated kitsch more as a cultural phenomenon and a phenomenon related to aesthetic preferences. Barnes' work provides an important framework for understanding how kitsch is perceived in various fields of art and how it transforms over time. It supports the idea that kitsch cannot be treated merely as a superficial phenomenon in the context of art and design, but rather as an important phenomenon that sheds light on the transformation of art history, cultural identity and aesthetic taste.

Ecker (2016), on the other hand, deepens the debate on how kitsch is evaluated in cultural and aesthetic contexts. He comprehensively addresses the place of this concept within theories of art and aesthetics. From the perspective of traditional art criticism, kitsch has often been seen as inferior to “pure” artistic manifestos and is often associated with the superficialization, popularization and emotional manipulation of art. However, he emphasizes that kitsch cannot be treated as a unidirectional concept and that it requires different aesthetic and cultural readings beyond this positioning. In this context, he also examines the interpretations that suggest that kitsch should not be considered only as a “sub-aesthetic” or “a degenerated form of art”. In the postmodernist understanding of art, kitsch has come to be seen as a phenomenon that questions the boundaries between high and low culture, gaining new meanings through nostalgia and emotional excess. Accordingly, instead of defining kitsch as a kind of “artistic mistake”, it is necessary to examine its impact on aesthetic experiences and how it is interpreted in a cultural context. García Ecker also refers to Hermann Broch's definition of kitsch, stating that Broch defines kitsch as a transition between a “moral” category and an aesthetic category. According to Broch, kitsch should be

considered not only as a matter of artistic judgment but also as an ethical problem. Because kitsch offers a relaxing and superficial aesthetic experience by distracting the individual from artistic and intellectual questioning. This point of view reveals that kitsch cannot be evaluated solely on the basis of aesthetic qualities, but also its cultural, psychological and ideological aspects should be taken into consideration.

García Ecker's “extremism” essentially parallels Eco's definition of kitsch as “a form of extremism” and reveals the complex nature of this concept. In addition to these definitions, Ecker also emphasizes Gómez de la Serna's (url2) distinction between “good” and “bad” kitsch, stating that kitsch is not only a negative concept, but can also be considered as “the art of happiness”, revealing that kitsch cannot only be positioned as an inferior category in the art world, but rather a complex, multi-layered concept that can be reinterpreted in different contexts. By analyzing critics' different perspectives on kitsch, it aims to provide a more comprehensive understanding of how kitsch is situated within art theory and how it shapes aesthetic debates.

The term kitsch, which has German equivalents such as “tastelessness”, “worthless thing” or “vulgarity” (url 1), has been extensively analyzed in Turkish academic literature in aesthetic, artistic and cultural contexts. Kitsch is used to describe works that are superficial, imitative and aim for emotional impact (TDK, 2024). Uysal and Kibar (2021) define kitsch as “degenerate, shabby, vulgar, unqualified, emotional products that appeal to the general level of taste” and state that such works lack aesthetic value.

Kavrakoğlu (2012), on the other hand, associates kitsch with concepts such as “degenerate taste, cheapening, depersonalization, bad taste, counter art, counter aesthetics” and explains it as a term used to refer to images or objects that have no aesthetic value or are disliked. The author discusses the concept of kitsch in a cultural and social context; states that although kitsch contains elements of social memory and nostalgia, it lacks original artistic depth. Drawing attention to the aspects of kitsch that are also perceived as “depersonalization” and “bad taste”, Kavrakoğlu states that this is a complex phenomenon that needs to be discussed in both aesthetic and ethical dimensions.

Baudrillard (2012) defines kitsch as “all ‘imitation’ objects, accessories, folkloric trinkets, memorabilia, lampshades or a pile of masks produced by blacks, generally made of foreign marbles” and draws attention to the imitation and superficiality features of kitsch. Baudrillard's analysis is frequently referenced in Turkish academic circles. Baudrillard evaluates kitsch as the

structures of modern society that are intertwined with commercialized and standardized cultural products. According to him, kitsch has replaced original art and become a negative indicator of consumer culture and industrial production reflected in the aesthetic world. In this context, Baudrillard's approach reveals that the concept of kitsch is not only a criterion of "worthlessness" but also an important part of the critique of modernity.

Adorno aims to develop a theory of culture based on historical and material foundations by addressing the concept of kitsch within the framework of culture industry and cultural management (1980). In this respect, Adorno did not directly get involved in the kitsch debates, which would become clichéd and arbitrarily used over time, and preferred to make a critical analysis of the concept. Adorno makes evaluations that point to the relationship of kitsch with art and its future transformation. According to Adorno, kitsch is not only a superficial phenomenon or one that devalues art; on the contrary, it is an element that is constantly present in art, surfacing whenever the opportunity arises. It is not like trash that is added to art from the outside, but rather like a "poison" that has penetrated and intertwined with it. For this reason, the boundary between art and kitsch is not sharp; art can sometimes approach kitsch, just as kitsch can also acquire an artistic quality in certain contexts. This view reveals that it is not meaningful to define kitsch as a universal and absolute aesthetic category. Adorno also emphasizes that the term kitsch evolved in the context of the aesthetic and political discourse of "purification" that developed in New York art circles during World War II, rather than its European origins. In this process, the concept of kitsch was incorporated into the debates of modernism and became the center of aesthetic speculation. Therefore, to stigmatize kitsch as merely low or vulgar is to ignore its intertwined nature with artistic processes.

Moreover, some academic studies suggest that kitsch should be considered not only as a negative phenomenon, but also as a reflection of social memory and shared experiences. Within the framework of this approach, Öztürk (2018) states that kitsch can be used as a tool to question the boundaries between "high" and "low" culture. Thus, kitsch is recognized as an important analytical tool in understanding the dynamics of art criticism and cultural studies. In the literature, the concept of kitsch is not only used to describe imitative and superficial products with low aesthetic value, but also with its social, cultural and ethical dimensions. This multi-layered approach shows that kitsch is not only a negative phenomenon, but also a concept that is open to discussion and gives important clues about the transformation processes of modern and postmodern art.

Materials and Methods

ICM 319 Identity in Furniture course, which is given within the scope of the V. Semester in Mimar Sinan Fine Arts University Faculty of Architecture Interior Architecture Undergraduate Program, has a content that aims to analyze how furniture design is shaped in the context of individual, institutional and social identity. Within the scope of the course, it is aimed to provide students with a critical perspective by creating a theoretical background and the relationship between furniture and identity is examined from aesthetic, cultural and sociological perspectives.

The concept of identity in furniture refers to the capacity of a piece of furniture to reflect a particular cultural, institutional or individual identity through its aesthetic, functional and symbolic properties. This concept allows furniture to be seen not only as an object of use, but also as a tool that represents the values, traditions and identity of the society to which it belongs (Özçam & Uzunarslan, 2016).

Identity in furniture design is shaped by the designer's talent and education and develops in line with user demands (Uzunarslan, 2010). The designer makes sense of the information and message he wants to convey by using various symbols and thus gives the furniture a unique identity. In this process, the designer's knowledge and skills ensure that the resulting product has artistic value and reflects a certain identity (Özel & Örük, 2021).

The role of furniture in creating identity becomes more evident especially in public and institutional spaces (Akın and Kavasoğulları, 2022). Because the process of identity formation is a reflection on the common values of the community.

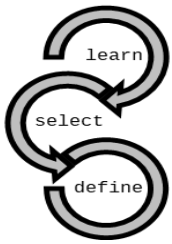


Figure 1. Practice Model

According to the practice model shown in Figure 1, each student was asked to choose one definition of kitsch from the definitions of kitsch discussed in the theoretical course and to explain these definitions in their own words. This process was designed to encourage students not only to understand the existing definitions, but also to interpret the concept of kitsch and generate new definitions from their own perspectives. In this context, a study was conducted in which theoretical knowledge was reinforced with a practical application in order for students to comprehend the concept of kitsch in depth. During the practical study, different definitions of kitsch in the literature were presented to the students and they were encouraged to analyze these definitions.

When considered as part of the concept of identity, kitsch offers important clues to the aesthetic preferences, cultural values and ideological orientations of individuals, institutions or societies. In this context, within the scope of ICM 319 Identity in Furniture course, how kitsch is shaped as an element of identity and how it gains meaning is examined. One of the main objectives of this phase of the course is for students to comprehend how identity is constructed in furniture design and what role kitsch plays in this process. At the end of the study, the definitions of kitsch used by the students were analyzed and an evaluation was made on how the perception of kitsch is shaped today.

Figure 2. Students making Kitsch presentations.

As can be seen in Figure 2, this practice allowed students to question concepts such as aesthetic perception, cultural codes and popular taste in furniture design, while at the same time allowing them to evaluate the place of kitsch in art and design disciplines in a more comprehensive way.

Results and Discussion

In the 21st century, the rapid development of communication media has caused the phenomenon of globalization to penetrate more deeply into the daily lives of individuals. While this transformation has led to changes in individual needs and aesthetic preferences, it has also contributed to the reshaping of the concept of identity. Today, furniture has gone beyond being merely functional objects and has become an indicator of individual identity and social status. In this context, furniture with symbolic value assumes an indirect function as a means of reflecting and expressing the identities of its users.

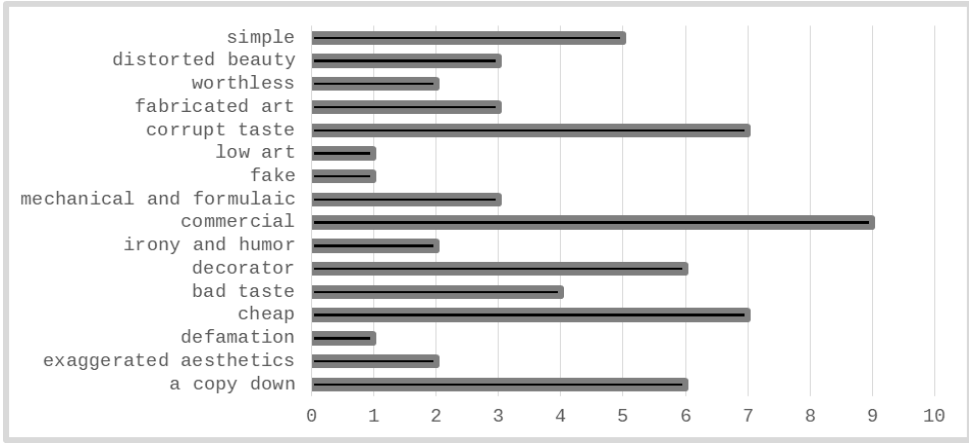
While socio-cultural factors play a decisive role in the shaping of furniture design, the interaction environment brought about by globalization has led to the transformation of traditional and local design approaches. Furniture designs shaped by the influence of popular culture, consumption habits and digital media are directly related to individuals' sense of belonging, lifestyle and aesthetic understanding. This process has brought about an important transformation in modern societies that has transformed furniture from being merely an object of use to an indicator of personal identity and cultural belonging.

Today, user needs have become a determining factor in the process of preferring symbolic furniture. Each individual makes furniture choices in line with his/her identity, personality, lifestyle, belief system, world view, individual needs and aspirations, develops a taste in this direction and shapes his/her purchasing decisions. Furniture is no longer just functional objects, but also a form of self-expression. The symbolic meanings that individuals attribute to furniture, the motivations that guide their preferences and their usage expectations vary according to the conceptual frameworks they create in personal and social contexts. This situation reveals the subjective nature of the identity phenomenon and shows that individual preferences are shaped within the framework of different social, cultural and aesthetic dynamics. Therefore, symbolic furniture plays an important role as a tool that reinforces the individual's sense of belonging, reflects social identity and creates personal narratives.

In this context, the process of creating an identity based on the definition of kitsch learned in the literature by 66 students enrolled in ICM 319 Identity in

Furniture will show significant differences in line with individual perceptions, cultural backgrounds, aesthetic preferences and academic approaches. This diversity will directly affect how students interpret kitsch and the identities they will form accordingly.

Table 1. Definitions in classroom practice.



According to the data in Table 1, out of 62 students who participated in the in-class practice (62 out of 66 students participated.) 5 of them interpreted kitsch as simple, 3 as distorted beauty, 3 as fabricated art, 3 as mechanical and formulaic, 2 as worthless, 2 as ironic and humorous, 2 as exaggerated aesthetics, 7 as degenerated taste, 7 as cheap, 1 as low art, 1 as fake, 1 as defamation, 9 as commercial, 6 as ostentatious, 6 as an inferior copy and 4 as bad taste.

In the practice phase, just like the historical process, the concept of kitsch was handled in many different contexts, and while some researchers considered kitsch as an emotional phenomenon (Emmer, 2007), others considered it as an aesthetic and moral problem (Broch, 2001). For example, six students who associated kitsch with nostalgia were able to form a romantic and ornamental identity that reflected a longing for the past, while nine students who considered kitsch in the context of consumer culture formed an identity based on popular and mass production and included the object of supply and demand. While a student from a modernist perspective could create an ironic identity by defining kitsch as a “low” form of art and design, a student adopting a postmodern perspective came up with an eclectic and exaggerated identity that focused on how kitsch is reproduced through shifts in meaning.

In addition, students' personal backgrounds, cultural environment and aesthetic perceptions are also important factors affecting this process. For example, a student who is close to elements of popular culture may interpret kitsch in an exaggerated manner, while a student who adopts a minimalist approach may treat kitsch ironically. In this context, how each student reflected his/her perception of kitsch to the identity formation process differed within the framework of individual and social references.

The fact that each student in the class interpreted the definitions of kitsch in the literature according to his/her own aesthetic and cultural understanding explains the significant diversity in the process of identity creation. These differences both reveal the multidimensionality of the concept of kitsch and contribute to understanding how students assimilate and transform academic knowledge in the construction of personal identity.

Conclusions

The effects of kitsch in design education have the power to transform students' aesthetic perceptions and understanding of design. The example of “kitsch” in practice encouraged students to think critically, question artistic values and re-evaluate aesthetic norms. This process helped students to develop their artistic creativity, while at the same time making art accessible to a wider audience, taking it out of the monopoly of an elite. The place of kitsch in popular culture provided students with different perspectives in understanding the social function and cultural context of art, a factor that broadened the scope of art education.

Design education not only teaches aesthetic beauty and works of high art, but also aims to further develop students' critical thinking skills by examining popular and pervasive aesthetic forms such as kitsch. By pushing the boundaries of originality and creativity in art, kitsch becomes a valuable tool in art education, showing its influence in popular culture and how it shapes society's aesthetic perceptions. By analyzing kitsch, students can gain a deeper understanding of the social and cultural dynamics of art. Such an approach encourages them not only to evaluate works of art, but also to think about issues of social memory and cultural identity. As kitsch expresses itself in different ways in various media and art forms, it allows students to understand different perspectives so that individuals can develop their relationship with art.

As a result of the general evaluation of the study, it is understood that kitsch represents an important cultural and aesthetic area beyond its perception as an ordinary and devalued phenomenon. The development of kitsch in the historical

context and its intense relationship with popular culture reveals that it leaves a much deeper and layered mark on art and daily life than we think with its structure affecting social values and layers. In this context, in the light of the results of the study, it is emphasized that kitsch should be handled from a broader perspective and this issue should be examined in depth.

As a suggestion for future studies, how kitsch affects not only aesthetic values but also social norms and cultural transformations can be investigated more comprehensively on design objects. In this context, the way kitsch is handled in design education programs should be diversified and a much broader perspective should be provided. Furthermore, detailed investigations on the effects of kitsch on contemporary digital culture will contribute to a better understanding of the new dynamics between popular culture, art and design. Future research should explore the relationship between art, culture, design, and society in more depth and develop innovative and engaging perspectives in this field. Such studies will provide a thought-provoking enrichment and pave the way for important discussions not only in the academic field but also at the societal level.

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CHAPTER 2

Campus Landscapes and Climate Resilient Campuses

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1. Introduction

University campuses are important urban open spaces where buildings and landscapes exist within a certain boundary (Chou, Lee, & Chang, 2016). University campus areas, which are considered as small models of the city because they have spatial areas that support education and training environments and allow physical activity and social interaction is quite intense, are an important urban component that provides many benefits for the city and users. Many experts have studied and continue to study the relationship between the physical conditions of the campus areas and the users, and to determine the results of the interaction. Because campus areas are very rich in terms of both physical environmental conditions and user diversity, as well as the time spent in campus areas is an important part of a process that provides very important gains for human life. Therefore, determining the results of this interaction and the existence of variables can lead to great gains (Abd Razak, Utaberta, Abdullah, Tahir, & Che Ani, 2011; Hajrasouliha, 2017; Malaney, 2002; Mehaffy, Salingaros, & Lavdas, 2023) In order to increase these gains, it is necessary to determine the existing gains and benefits, and to create planning, design and management plans in accordance with ecological gains, aesthetic, social values, user demands and needs.

Many scientific studies have proven that the natural environment reduces stress, increases concentration, reduces mental fatigue and supports learning processes. The nature-based design and planning of the green areas of university campuses positively affects the stress levels of students and other users. In addition, walking and cycling paths and sports fields within the campus provide opportunities for physical activity of the users, which encourages healthy living. It is known that increased physical activity has a positive effect on mental health, as physical activity increases, people's focusing capacity increases and contributes positively to learning. In addition to providing physical and mental gains, the green areas in the campus are places where people can come together, socialize and transfer culture. However, since campus areas are systemic spaces that have gone through serious processes from past to present and have a certain history, they are urban components that reflect the spirit of the place where the city identity and university identity are formed quite intensely. These areas are places that reflect the identity of the university as well as the identity of the city, create and reinforce the sense of belonging with the spaces they contain, and encourage the formation of important memories in people's lives.

In addition to the environmental and user gains within the campus, the integration of campuses with the urban landscape has many benefits. Campus green spaces have ecological, aesthetic and social values as a component of the urban landscape and provide important benefits for users. Therefore, the planning and management of campus landscapes is critical to both the well-being of the university community and the sustainability of the urban environment. The integration of university landscapes with urban landscapes provides many benefits such as ecological connectivity of urban components, biodiversity, ecosystem gains, enhancement of aesthetic and visual quality, and maturation of urban identity. Thanks to its landscape, campus areas have the potential to have a high proportion of green areas. The presence of these green areas can contribute to the shaping of important environmental dynamics within the city. This contribution can be a qualitative contribution as well as a role model. Therefore, the design of green spaces in campus areas is also critical for the city.

Campus areas have become open green spaces that users frequently use and prefer, especially in the Co-vid-19 process that affects the whole world, by showing the feature of “emergency shelter” that meets the need for open green spaces, allowing urban users to meet with nature (Onur & Acar, 2024; Peters & Penna, 2020). The fact that the campuses have their own unique nature, microclimate and biodiversity (Gomez & Derr, 2021; Ha & Kim, 2021) has increased their preferability in this process. In order for university campuses to preserve their natural structure and provide healthy and sustainable gains for the city, it is necessary for the campuses to adapt to climate change.

Climate change is one of the most striking problems threatening life on a global scale. Although the change and its impacts are predicted, most urban components are not ready for the foreseeable future. However, various reports are prepared and strategies are developed for cities to adapt to climate change (IPCC, 2021; Sekban & Acar, 2024) These strategies affect urban components at different scales from the whole to the specific. Since residential areas are an important component of the city, it is inevitable that these areas should be planned, designed and managed according to climate change adaptation strategies. For this purpose, concepts and strategies are developed under the titles of green campus and sustainable campus, and climate adaptation plans are made by university administrations. However, it is observed that these plans and strategies generally remain as theory and that there are problems in turning them into practice. It is thought that the reason for these problems may be that strategies are carried out on large scales, multivariate and complex systems(Groffman et al., 2017). In addition, the complexity of the ecosystem makes it difficult for

settlements to respond to climate change adaptation strategies (Carter, 2018). However, some innovative studies have focused on the green fabric of settlements, aiming to translate adaptation strategies into practice to prepare them for climate change (Hoyle & Sant'Anna, 2020; Pauleit, Liu, Ahern, & Kazmierczak, 2011). With the transformation of the adaptation strategies of settlements to climate change into a green focus, the basis of the strategies has evolved from "equilibrium-centered resilience" to "transformational resilience" (Al-berini, Chiabai, & Muehlenbachs, 2006; L Figueiredo, T Honi-den, & A Schumann, 2018; Meerow et al., 2016). In order to provide this flexibility to the campus within the scope of climate change adaptation strategies, it is necessary to analyze how the existing plant texture is shaped and plan how this texture can be adapted to the climate.

2. Climate adaptation strategies in climate resilient campus areas

When developing climate adaptation strategies in climate-resilient campus areas, making decisions on a habitat scale rather than on a species basis means making holistic decisions that cover the whole area. Namely; although it may seem like the right decision to select plant species with high ecosystem services and use them side by side, it would be better to understand what kind of identity and characteristics the habitat to be formed in line with this decision actually has. For this, it is more appropriate to develop habitat management systems and habitat planning strategies in campus areas. In this direction, many university administrations around the world are making habitat management plans to protect their campus areas, adapt them to climate change and provide urban benefits. Within these management plans, they support environmental sustainability and instill environmental awareness in students by taking important steps in the fields of energy efficiency, water management, biodiversity, sustainable transportation and education.

Many well-established universities such as Stanford University, University of Nottingham, University of Copen-hag, National University of Singapore, Cornell University, University of British Columbia, University of Melbourne, University of California make various habitat development decisions for adaptation to climate change and make land use planning and habitat management plans in line with these decisions (Table 1).

Table 1. Universities' habitat management plans and sustainability features (URL 1, 2024; URL 2, 2024; URL 3, 2024; URL 4, 2024; URL 5, 2024; URL 6, 2024; URL 7, 2024; URL 8, 2024).

University Name / Country	Habitat Management and Biodiversity	Water Management and Protection	Sustainability
Stanford University /USA	Use of local plant species, formation of natural habitats	Protection of wetlands	Energy efficient buildings and solar installations
University of Nottingham /UK	Local and endemic conservation, control of invasive species	Rainwater collection and management	Renewable energy and green buildings
University of Copenhagen /Denmark	Establish biodiversity support programs, protect natural habitats	Developing water conservation and management strategies	Renewable energy and green buildings
National University of Singapore /Singapore	Conservation of local flora and fauna species	Rainwater collection and management	Green roofs, vertical gardens and renewable energy systems
Cornell University /USA	Programs to support native plant species, conservation of natural habitats, control of invasive species	Creating a rain garden, protecting water resources	Energy efficient buildings and solar installations
University of British Columbia /Canada	Local and endemic conservation, control of invasive species	Rainwater harvesting areas, wetlands management	Solar panels and green roofs
University of Melbourne /Australia	Conservation of local flora and fauna species	Water asset protection, restoration of natural waterways	Renewable energy and green buildings
University of California/USA	Natural corridors, greenways, green spaces that increase ecosystem services	Rain gardens and water harvesting systems	Solar energy and sustainable buildings

Although these universities have similar strategies for habitat management and adaptation to climate change, each has developed customized approaches according to its own regional and environmental conditions. This is because both the regional ecological values and internal management dynamics of each university are the most important factors in shaping these strategies (Table 2).

Table 2. Regional conditions and planning of universities

University	Planning	Features
Stanford University (USA)	Habitat Management Plans	Stanford focuses on protecting natural reserve areas and ecosystems around campus. Land use policies promote the conservation of biodiversity.
	Climate Change Adaptation Strategies	Energy efficiency, investment in renewable energy sources, water conservation and sustainable transportation solutions. In addition, sustainable building standards are applied throughout the campus.
	Regional and Environmental Conditions	Stanford University in California faces the challenges of drought and limited water resources.
	Customized Approaches	Water conservation and management, the use of drought-resistant plant species and water efficiency projects. Also, investing in renewable energy sources such as solar energy.
National University of Singapore	Habitat Management Plans	Despite its dense urban structure, the settlement places great emphasis on preserving natural habitats. Measures such as green roofs, vertical gardens and the protection of water sources.
	Climate Change Adaptation Strategies	Energy conservation, investment in renewable energy sources, water management and waste reduction programs. Sustainable building designs and green infrastructure projects.
	Regional and Environmental Conditions	With a tropical climate, high humidity and heavy rainfall, Singapore is located in an urbanized environment.
	Customized Approaches	rainwater harvesting and management of water resources aims to make efficient use of heavy rainfall.
Cornell University (USA)	Habitat Management Plans	Conservation of local ecosystems, nature reserves and biodiversity promotion. Sustainable management of natural resources and habitat restoration.
	Climate Change Adaptation Strategies	Energy efficiency, renewable energy sources, water conservation and sustainable agricultural practices. Infrastructure and building designs that are resilient to climate change.

	Regional and Environmental Conditions	It is located in the Finger Lakes region of New York State. It has a mild climate, with four distinct seasons.
	Customized Approaches	Cornell University has established extensive natural reserves and conservation areas on and around its campus. In these areas, efforts are made to preserve local flora and fauna.
University of British Columbia	Habitat Management Plans	Protecting biodiversity, supporting natural habitats and environmental sustainability throughout the campus. Protection of green areas and natural habitats
	Climate Change Adaptation Strategies	Carbon neutral campus target, renewable energy, energy efficiency and sustainable transportation. Climate resilient buildings and infrastructure.
	Regional and Environmental Conditions	Temperate rainforests and mountainous areas have abundant rainfall and rich biodiversity.
	Customized Approaches	Protection of natural habitats and sustainable management of rainforests. The goal of a carbon neutral campus and investment in renewable energy sources include strategies to utilize Canada's abundant water and wind resources.

3. Conclusions

As a result of the researches, it is seen that universities take and implement various decisions to make their campus areas resilient to climate change and to ensure the sustainability of these areas in line with their own characteristics, vision and missions. While some universities give more importance to water management, others focus on biodiversity. In addition to these differences, the common point of all of them is the protection and development of the green texture. For this, they have taken habitat planning decisions.

In Turkey, Boğaziçi University and Istanbul Technical University have developed various strategies and practices in habitat management and sustainability (URL 9, 2024; URL 10, 2024). By offering projects and programs tailored to the needs of their regions and communities, they are taking important steps to adapt to climate change and create a sustainable campus. Similar to global examples, these universities use a variety of methods to raise environmental awareness and achieve sustainability goals. In particular, they have developed

projects to support local flora and fauna and have developed strategies for water management.

As a result of the examinations, it is seen that in order for the university campus areas to adapt to climate change, it is essential to make planning, design and management decisions for the habitats that make up the green areas. For this, the existing structure should be analyzed and habitats should be shaped in line with the university's objectives.

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CHAPTER 3

Spatio-Temporal Monitoring of Land Use/Land Cover (LULC) Change From Clas-sified Images Supported By Artificial Intelli-gence (AI) at the Provincial Scale

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1. Introduction

Land use and land cover (LULC) change and its modeling are considered the best tools for understanding the dynamics of future urban expansion, identifying the directions of development and change in land uses, and addressing these issues (Gaur and Singh, 2023). Currently, 54.5% of the world's population lives in urban areas, and by 2050, uncontrolled population increase is expected to impact 66% of the global population. (Farhan et al., 2024). In this context, unplanned expansion, particularly in urban areas, has placed significant pressure on other land uses in order to accommodate the growing human population (Kafy et al., 2021; Li et al., 2021). This pressure alters natural ecosystem dynamics, contributes to the increase in deforestation, leads to biodiversity loss, and causes irreparable damage to ecosystem services (Puplampu and Boafo, 2021; Karakuş and Selim, 2022). Therefore, the identification of LULC change remains relevant and important today, as it enables the early identification of potential environmental issues, the implementation of necessary measures, and the development of comprehensive strategies by planners (Chughtai et al., 2021).

LULC consists of two components: land use and land cover. Land use refers to human-defined categories such as transportation infrastructure, residential infrastructure, commercial areas, and agriculture. On the other hand, land cover refers to natural features such as water bodies, forests, bare ground, and rangeland (Kumar and Agrawal, 2023). However, since these two terms have a dynamic relationship on the terrestrial surface, they influence each other and should be assessed together rather than separately (Esendağlı and Selim, 2024). Remote sensing (RS) and Geographic Information System (GIS) technologies offer significant advantages in the identification and evaluation of LULC (Abebe et al., 2022). LULC characteristics can be easily detected from aerial or satellite imagery, and changes and trends in LULC over a specific time period can be analyzed through these images (Thien et al., 2023). Remote sensing data, depending on various resolutions, provides rapid and reliable information (Ardahanlıoğlu et al., 2020). The accessibility of these images as open-source data has made them a valuable resource for LULC change studies. Therefore, the analysis of LULC change through remote sensing data and GIS technologies is a continuously developing research field globally (Sarif et al., 2022; Selim et al., 2022; Hossain et al., 2023).

The classification of satellite images is one of the key priorities in determining LULC change (Esendağlı and Selim, 2024). Geographic spatial techniques for image interpretation and classification are used for natural resource management

and planning purposes, as they can help predict future scenarios (Kumar and Agrawal, 2023; Olgun et al., 2024). Various techniques are employed in the classification of satellite images, depending on current technological developments. These techniques can be divided into three categories: unsupervised, supervised, and semi-supervised. The classifiers can further be categorized into rigid and flexible (diffuse), parametric and non-parametric, or based on pixel/subpixel and object levels (Macarringue et al., 2022). To effectively simulate LULC change, various static and dynamic models - such as logistic regression, Markov chain (Saha et al., 2022), artificial neural networks (ANN) (Souza et al., 2022), cellular automata (Halder et al., 2023), modified cellular automata–based SLEUTH (Singh et al., 2024), and artificial intelligence (Himeur et al., 2022; Alshari et al., 2023) - have been developed and integrated with GIS and remote sensing (RS) in recent years. However, the use of these methods often requires expertise. In this context, pre-classified and openly accessible images are a preferred option for making quick and efficient decisions (Gao et al., 2021; Patel et al., 2024; Yılmaz and Selim, 2024). In particular, classified images, prepared with the participation of millions of expert labelers and made available as open access, stand out as a key resource for rapidly detecting LULC change with high accuracy, thus providing valuable data for decision-makers (Prasetyadi et al., 2024). The world's most comprehensive collection of geographic data is ArcGIS Living Atlas of the World. It supports LULC research with data layers, apps, and maps (ESRI, 2025). From 2017 to 2023, the global 10m land cover was included to the time series of the LULC's annual global maps. The maps are created using 10m-resolution ESA Sentinel-2 data. To create a fair snapshot of each year, each map is a composite of LULC projections for nine classes over the course of the year. Impact Observatory created this dataset by training a deep learning model for terrain classification using billions of human-labeled pixels that were curated by the National Geographic Society. This model was used to the Sentinel-2 annual scene collections on the Planetary Computer to create the world map. The estimated average accuracy of each map is greater than 91%. These Impact Observatory-produced datasets, which Esri licensed, were obtained from Impact Observatory (Karra et al., 2021; ESRI, 2025).

The aim of this study is to monitor LULC change between 2017 and 2023 at the scale of Antalya province using classified Sentinel 2 satellite images produced with artificial intelligence support, which are available in open access, and to generate information that can support decision-makers by interpreting the results at the city level. In this context, classified satellite images provided by ESRI and

available in open access were used, the accuracy of each image was evaluated, and the produced results were assessed. The innovation of the study can be outlined as follows: 1. There is a lack of sufficient studies in the literature regarding the tracking of LULC change at the provincial scale using ArcGIS Living Atlas data, 2. The need to assess the impact of the Covid-19 pandemic, which affected the entire world in 2019, on LULC, 3. The need for up-to-date information on LULC change in Antalya, one of Turkey's most important tourism and agricultural cities, 4. The need to determine the direction and magnitude of the increase in secondary housing in Antalya due to recent earthquakes in Turkey. It is anticipated that the information produced at the end of this study will make significant contributions to decision-making processes for planners, as well as central and local authorities.

2. Study area

The study area covers the boundaries of Antalya province, one of Turkey's most important tourism and agricultural destinations, and is located at coordinates 36°53'19.20"N and 30°40'48.12"E (Fig. 1).

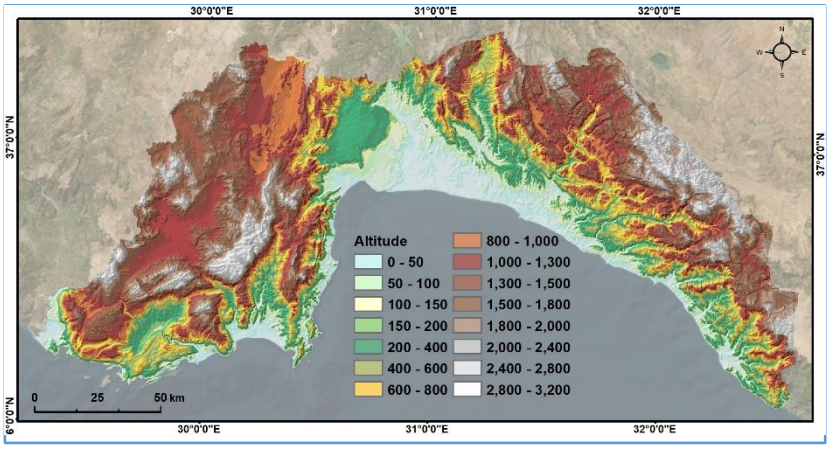

Figure 1. Study area location

The study area is 20,802 km² and is predominantly surrounded by the Taurus Mountains (Selim et al., 2023). The research area experiences warm winters and extremely hot and dry summers due to the Mediterranean climate, which is defined by the Köppen–Geiger climate classification as the Csa climatic type (Karakuş et al., 2024). The climate has mild mean annual minimum temperatures (4.8–11 °C) and maximum temperatures (17–25 °C), with 443–620 mm of precipitation, mostly in the winter. The Taurus Mountains protect the region from the northerly winds. In the South, the elevation is sea level, whereas in the North,

it is almost 3000 meters. From 0° to 60°, the slopes are steep (>18°) in high elevation and hilly areas and mild (<10°) in the southern region and valleys (Viedma et al., 2017). The plains and gently sloping regions of the South are dominated by agriculture and urban land uses, whereas the mountainous and hilly regions of the North are dominated by open and dense forests (i.e., conifer, mixed, and broadleaf forests). *Pinus brutia*, and *Pinus nigra* make up coniferous woods; broadleaf forests are rare and primarily composed of pure maquis or maquis-oak combinations, as well as oaks (*Quercus sp.*). Lastly, *Pinus brutia* and maquis typically create mixed forests (Mutlu et al., 2017; Selim et al., 2018). Antalya province, consisting of 19 districts (Akseki, Aksu, Alanya, Demre, Döşemealtı, Elmalı, Finike, Gazipaşa, Gündoğmuş, İbradı, Kaş, Kemer, Kepez, Konyaaltı, Korkuteli, Kumluca, Manavgat, Muratpaşa, Serik) and 913 neighborhoods, has a total population of 2,696,249 as of 2023. It is known that the majority of this population resides in urban settlements close to the sea (TUIK, 2024; Eyileten and Selim, 2023).

3. Data sets

In this study, a 10-meter annual map of Earth's land surface from 2017-2023 was used. These maps are published in open access by Esri in collaboration with Impact Observatory and Microsoft. Artificial Intelligence (AI) land classification models have been used in these maps. The maps were created by applying these models to the whole Sentinel-2 scene collection for every year, which consists of more than 2,000,000 Earth observations from six spectral bands. Six bands of Sentinel-2 L2A surface reflectance data—visible blue, green, red, near infrared, and two shortwave infrared bands—are used by the underlying deep learning model. The model is run on several imaging dates throughout the year to produce the final map, and the results are combined to produce a final representative map for each year. The output provides a 9-class map of the surface, including vegetation types, bare land, rangeland, water, crops and built areas (ESRI, 2025).

4. Methods

The methodology of the study consists of the key stages of obtaining satellite data, defining classes, conducting accuracy analysis, and comparing and evaluating the LULC classified images for different years (2017-2021-2023). Satellite data for the relevant years were downloaded free of charge from the website https://livingatlas.arcgis.com/landcoverexplorer. Subsequently, subset operations were applied based on the boundaries of Antalya province. In the

satellite images, LULC classes were defined (Table 1), and thematic maps were created.

Table 1. Defined LULC classes (Karra et al., 2021)

No	Class Name	Description
1	Water	Water areas such as ponds, lakes, oceans, flooded salt plains.
2	Trees	Any significant clustering of tall (~15 feet or higher) dense vegetation, typically with a closed or dense canopy
4	Flooded vegetation	Heavily irrigated and inundated lands.
5	Crops	Human planted cereals, grasses, and crops not at tree height.
7	Built Area	Human made structures; examples: houses, dense villages / towns / cities, paved roads, asphalt.
8	Bare ground	Areas of rock or soil with very sparse to no vegetation, examples: exposed rock or soil, desert and sand dunes, dry salt flats/pans, dried lake beds, mines.
9	Snow/Ice	Large homogenous areas of permanent snow or ice.
10	Clouds	No land cover information due to persistent cloud cover.
11	Rangeland	Open areas covered in homogenous grasses with little to no taller vegetation

Accuracy assessment was conducted separately for the LULC maps of the three different years. For this, 500 random points were assigned to each map, and the class corresponding to each point was compared with the actual land cover, and percentage accuracy was calculated. The segmentation and classification tool in ArcGIS spatial analysis was used for this process.

Finally, area data for each class in the classified satellite images of the three different years were generated, and the increases and decreases in the areas covered were visualized through graphs. The results were interpreted based on the 2019-Covid pandemic and potential earthquake agendas.

5. Results

Accuracy assessments for the maps produced with artificial intelligence support for the years 2017, 2021, and 2023, and revised according to the boundaries of Antalya province, are provided in Table 2.

Table 2. Accuracy rate of classified satellite images

Years	True value	False value	Accuracy rate
2017	462	38	92.4
2021	452	48	90.4
2023	459	41	91.8

In these maps, expert labelers used a convolutional neural network (CNN) with a UNet architecture containing nine class outputs to classify each individual image, and it is reported that the generated maps achieved at least 91% accuracy (Karra et al., 2021). In the accuracy assessment created using 500 randomly distributed sample points within the study area, the result was also an average of 91%. The accuracy assessment in the study revealed that the rangeland class and the crops class were mixed in some areas. Additionally, it was observed that fragmented settlements, especially in rural areas, caused changes in the build area class values. The Water class was easily distinguishable from other classes with very high accuracy, although there was some mixing with flooded vegetation in rivers, streams, and lakes. In areas where agricultural production takes place under greenhouses (glass and plastic), the crops class was partially mixed with the rangeland class, causing changes in the spatial extents. However, when evaluated at the provincial scale, it can be said that the AI-supported LULC classification produced high accuracy.

The maps produced by Impact Observatory's deep learning AI land classification model, trained using billions of human-labeled image pixels from the National Geographic Society, show LULC classes for Antalya province for the years 2017, 2021 and 2023 (Fig. 2,3,4).

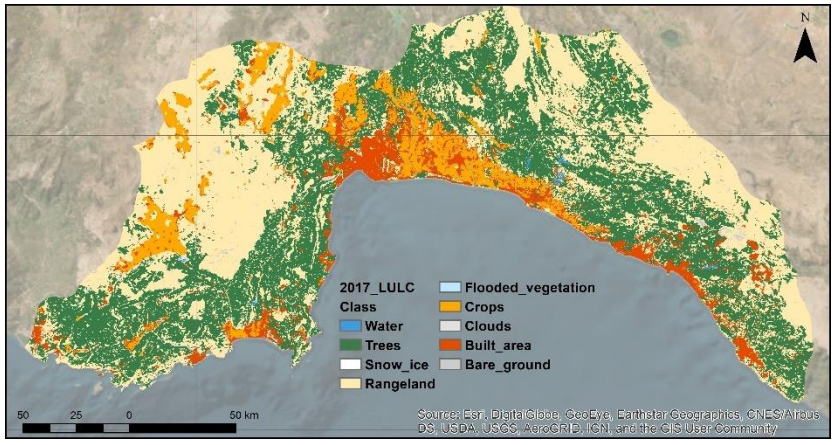

Figure 2. LULC map of Antalya province in 2017

In 2017, within the boundaries of Antalya province, nine classes were defined in the AI-supported classified images. The snow-ice class, clouds class, and flooded vegetation class were filtered and excluded from the assessment, as they had values below 1%. The area data for other LULC classes were determined as follows: built area 156,189.76 ha, crops 166,086.38 ha, trees 787,925.42 ha, bare ground 19,156.68 ha, rangeland 908,383.18 ha, and water class 7,159.97 ha. The total land asset of the province was determined to be 2,044,901.39 ha.

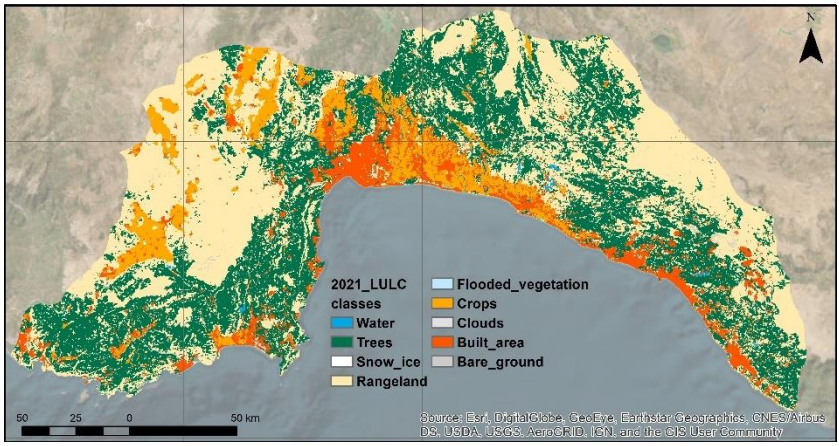

Figure 3. LULC map of Antalya province in 2021

In the 2021 LULC classes, the classes with the highest share were rangeland with 906,870.00 ha and trees with 762,622.40 ha. These were followed by built area with 184,957.47 ha, crops with 171,885.35 ha, bare ground with 11,240.38 ha, and water with 7,335.89 ha.

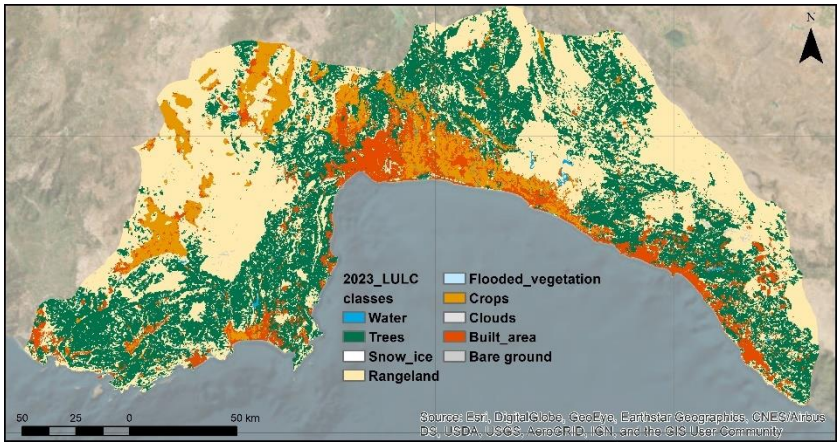

Figure 4. LULC map of Antalya province in 2023

In the 2023 LULC classes, the following areas were recorded: 916,247.98 ha for rangeland, 745,366.21 ha for trees, 199,789.55 ha for built area, 166,240.77 ha for crops, 9,407.64 ha for bare ground, and 7,849.34 ha for water.

The changes in LULC classes over the years for the classified images of the three different years, in terms of both hectares and percentages, are provided in Table 3.

Table 3. Percentage and ha rates of LULC classes by year

Class / years	**2017**	**%**	**2021**	**%**	**2023**	**%**
Built area	156,189.76	7.64	184,947.47	9.04	199,789.55	9.77
Crops	166,086.38	8.12	171,885.35	8.41	166,240.77	8.13
Trees	787,925.42	38.53	762,622.4	37.29	745,366.21	36.45
Bare ground	19,156.68	0.94	11,240.38	0.55	9,407.64	0.46
Rangeland	908,383.18	44.42	906,870.00	44.35	916,247.98	44.81
Water	7,159.97	0.35	7,335.89	0.36	7,849.34	0.38
Total ha / %	2,044,901.39	100%	2,044,901.49	100%	2,044,901.49	100%

According to Table 3, over the 6-year period, the built area class has shown a significant increase, while the trees class has decreased by a similar proportion. It can be said that the increase in the built area class has exerted pressure on the trees and bare ground classes, leading to a reduction in the bare ground class. Compared to 2017, the built area class has increased by approximately 40,000 ha in 2023. This increase is mostly concentrated in the eastern-western and northern inner parts of the city center. Due to the steep mountainous terrain in the western part of the city, urban sprawl has primarily expanded toward the east and north. Although the crops class showed an increase from 2017 to 2021, it has decreased back to approximately its previous level in 2023. A consistent decrease has been observed in the trees class, with an estimated reduction of approximately 40,000 ha. The bare ground class, which includes bare rock or soil ground with very sparse or no vegetation throughout the year; large sandy areas with little or no vegetation, and vacant lands, has decreased by approximately 10,000 ha over the 6-year period. No significant change was detected in the rangeland class, which includes open areas covered with homogeneous grasses with little or no tall vegetation; pastures with no obvious human settlement; small plant clumps with exposed soil or rock; and clearings covered with shrubs. No significant changes were observed in the water class over the years.

6. Discussion and Conclusion

In this study, which involves the evaluation of AI-supported classified satellite images within the boundaries of Antalya province, provided by Esri in collaboration with Impact Observatory and Microsoft using the UNet architecture with a CNN model, the changes in LULC from 2017 to 2023 were identified. According to the accuracy assessment applied to the classified images, the achieved accuracy of approximately 91% aligns with the accuracy specified by the producer (at least 91%) (Karra et al., 2021). The literature indicates that high accuracy is required for the interpretation of results in image classification processes to ensure the results are logical and realistic (Chughtai et al., 2021; Mehmood et al., 2022; Dou et al., 2024), and it is clear that the results obtained from this study were produced with high accuracy. Increasing the accuracy rate in classified maps will allow for more accurate interpretation of the results (Maxwell et al., 2021; Tripathi, 2021). However, increasing the number of sample points requires significant time and effort. In this context, the lack of studies aimed at determining the optimal sample size for specific areas stands out (Selim et al., 2023). The main limitation of the study is the time and effort loss involved in comparing a large number of sample points for each year's satellite images with real land data to achieve high accuracy in the classified images.

The determination of LULC changes in Antalya province for the years 2017, 2021, and 2023 has been influenced by the effects of the Covid-19 pandemic, which affected the entire world in 2019, as well as the 2023 Kahramanmaraş earthquake and the pre-earthquake concerns. During the pandemic, people were confined to apartments for months, and after the pandemic, they started to prefer houses with gardens or villas based on their economic situation (Çukurlu et al., 2024). This led to the expansion of settlements towards rural areas and, in this study, resulted in a significant increase in the built area class. However, this increase in the built area class has naturally led to a decrease in the trees and bare ground classes. The Crops class experienced a periodical increase between 2017 and 2021; however, it saw a significant decrease between 2021 and 2023 (Fig. 5).

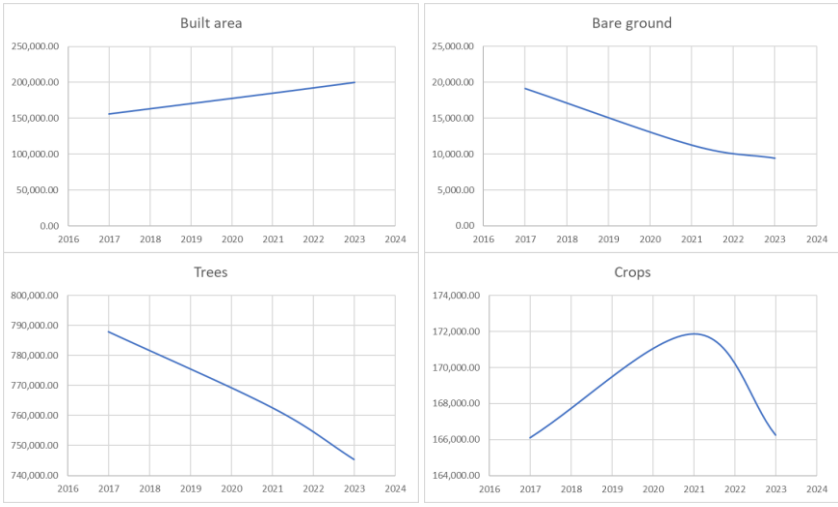

Figure 5. Change trends for some LULC classes

Similarly, Turkey's largest earthquake and earthquake concerns can be considered as factors contributing to the rise of secondary housing and urban sprawl. On February 6, 2023, at 4:17 AM, an M7.8 earthquake occurred close to the boundary between the provinces of Kahramanmaraş and Gaziantep. Nine hours later, and 95 kilometers northeast, an M7.5 earthquake occurred. Approximately 60,000 people were killed and millions more were homeless as a result of the terrible effects of the earthquake sequence that struck a large area of southern Turkey and northern Syria (EERI, 2025). The pre-earthquake news regarding seismic concerns and the occurrence of this earthquake have had a significant impact on the increase in secondary housing (Murakami et al., 2017; Silva and Poul, 2021; Huang et al., 2022; Wang and Ng, 2023). In this context, for the population of Antalya province, which is near the East Anatolian Fault, the need for more reliable and individual housing has become a prominent issue, particularly after the major earthquake and the pandemic. This has led to a rapid increase in the production and spread of one- or two-story houses. According to the results obtained, this increase is approximately 2.5%. Considering the direction and magnitude of this increase, as can be understood from the produced maps, reductions in the trees and bare ground classes have occurred, urban sprawl has exerted pressure on these classes, and this has led to changes in LULC.

In conclusion, the LULC maps, which are freely provided by ESRI and generated with artificial intelligence support, can be easily used for determining LULC change due to their accessibility, cost-effectiveness, and high accuracy. The use of these maps in determining LULC change can provide a valuable data

source and serve as a guide for central and local governments, as well as non-governmental organizations. Furthermore, in this study conducted specifically for Antalya province, the relationship between LULC change and pandemic and earthquake agendas was discussed without considering other factors (population growth, climate change, social and cultural influences etc.), and it was found that there was a significant increase in the built area class in the short term. This study provides a scientific basis for evaluating AI-supported classified images at the provincial scale, determining LULC change, and potentially guiding planners and stakeholders in the process.

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