Evaluation of Graduate Theses of Landscape within the Disaster-Prone Country of Turkiye

Nebahat Kalkan [1,*], Fatma Aycim Turer Baskaya [2]

[1] Graduate School, Istanbul Technical University, Ayazaga Campus, 34496 Maslak/Istanbul, Turkiye.
E-mail: kalkan16@itu. edu.tr

[2] Department of Landscape Architecture, Faculty of Architecture, Istanbul Technical University, Harbiye Mahallesi, Taskisla Cad., 34437 Sisli/Istanbul, Turkiye. E-mail: turerfat@itu.edu.tr

* Nebahat Kalkan

Abstract

21st century: It brings disasters with increasing types, frequencies, and sizes. In today's world, where studies on sustainability have become a priority, every professional discipline has responsibilities and must determine strategies for how their profession will evolve. This study discusses the status of landscape architecture and urban design disciplines in disaster-prone Turkiye. To determine future strategies in education policies, it is necessary to decide on the current situation, especially the approaches in graduate education. In this context, determining the relationship between theses, which are the production of graduate education studies, and disaster-related issues is critical. In this study, a 9-stage evaluation method is defined. 22 disaster types were determined through literature reviews and expert opinions from the Landscape Architecture professional discipline. Considering the beginning years of graduate education in Landscape Architecture departments, a total of 2397 master's and doctoral theses conducted under the disciplines of Landscape Architecture and Urban Design between 2002 and 2023 were examined. The total number of theses and the rates produced regarding thematic disaster types were examined quantitatively according to years, keywords, universities, faculties, and global and national developments. (scrutinize) In this context, during the examinations, it was determined that there were deficiencies and inadequacies in the number and content of the theses, and general solution strategies for the future were introduced to eliminate these problems in the graduate theses examined. Graduate theses should be done in quality and quantity, providing innovation and having applicable and sustainable values.

Keywords

Disasters; Landscape Architecture; Graduate Education; Education Strategies; Turkiye.

1. Introduction

Natural disasters are catastrophic events resulting from the Earth's natural processes. They can be classified into various types, such as hurricanes, earthquakes, floods, droughts, and storms. These disasters can damage infrastructure, cause loss of lives, and cause economic repercussions (Panwar & Sen, 2018). Moreover, natural disasters can substantially impact various sectors, including agriculture, public health, and infrastructure (Yu & Wei, 2022). They can have severe implications on food security, as evidenced by significant agricultural losses in regions like China due to typhoons and floods (Guo et al., 2019). Furthermore, the effects of natural disasters are not solely attributed to environmental factors, as social reasons often play a crucial role (Mikoš, 2021). Additionally, assessing social vulnerability and response to natural disasters is essential for understanding the impacts and formulating effective disaster management strategies (Kabir & Hossain, 2021).

Understanding natural disasters is crucial globally due to their increasing frequency and severe impacts on economies and societies (Cutter et al., 2006; Kellens et al., 2013). Integrating disaster management into the educational curriculum, especially landscape architecture programs, is vital. Landscape architects are uniquely positioned
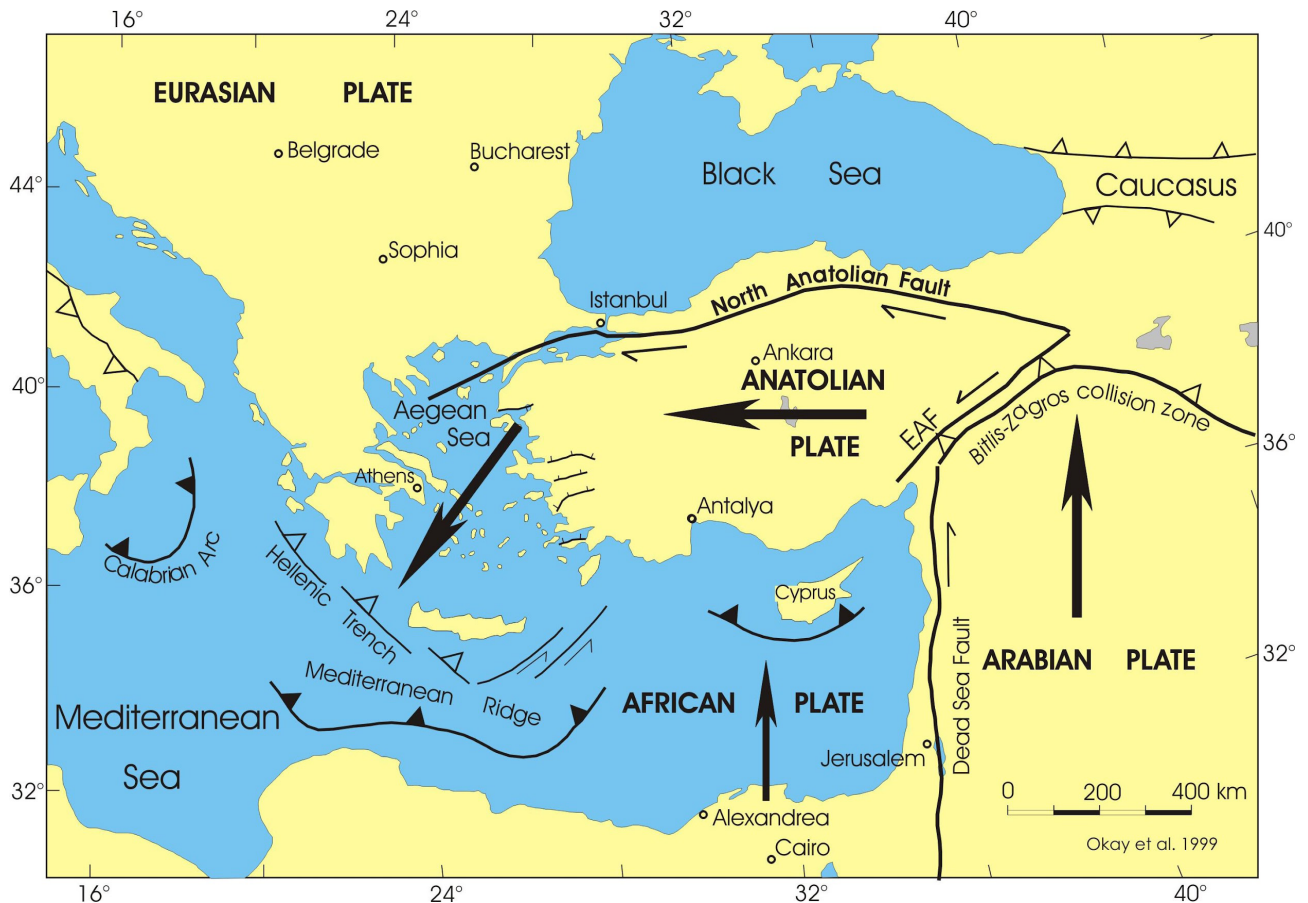
Figure 1. Simplified active tectonic map of the eastern mediterranean region (Afad, 2018)

to design resilient and sustainable environments that mitigate the effects of natural disasters through innovative and practical applications (Sandink & Peacock, 2008). By combining these principles into urban planning and community engagement, landscape architecture can play a pivotal role in enhancing infrastructural and community resilience against the unpredictable challenges posed by natural disasters. This approach enriches educational outcomes and fortifies societal responses to environmental adversities.

Natural disasters are regional concerns and global issues affecting various regions and communities worldwide. Among the most common natural disasters, earthquakes are a significant threat, particularly in Turkiye, the most common type of disaster (Ozturk & Kirca, 2023). Turiye, located in the Mediterranean-Alpine-Himalayan belt, one of the most active earthquake regions due to its geographical location, is a stark reminder of the global impact of natural disasters (Figure 1).

This region is active, where approximately 20% of the world's earthquakes occur, and causes an earthquake of at least 5.0-6.0 magnitude in Turkiye every year (Afad, 2018). The country experiences frequent earthquakes, some reaching devastating magnitudes. The 1999 Marmara Earthquake (magnitude 7.5) and two consecutive earthquakes centered in Kahramanmaras in 2023 (magnitudes 7.8 and 7.5, respectively) demonstrate the reality of Turkiye's seismicity and its exposure to disaster risk. The earthquakes that hit Turkiye on February 6, 2023, affected multiple provinces, leading to over 50,000 lives and more than 14 billion dollars in economic losses (Un, 2023). The seismic activity in the region, particularly along the East and North Anatolian Fault Zone, has historically been associated with destructive earthquakes, emphasizing the seismic vulnerability of Eastern Turkiye (Bulut et al., 2012). Additionally, a study by Bayraktar and Yildirim (2016) stated that natural disasters such as landslides, floods, and fires occur most frequently after earthquakes and

cause many deaths, injuries, infrastructure damage, and economic losses. The high frequency of earthquakes in Turkiye underscores prioritizing disaster management education and preparedness (Topcu & Ataoglu, 2023). A profound understanding of ecological processes and sustainable design principles becomes accessible to students specializing in landscape architecture, with a critical emphasis on nature and ecology (Danaci, 2014). This knowledge proves essential for crafting landscapes resilient to natural disasters, capable of regeneration, and contributing to the overall strengthening of ecosystems and communities. As highlighted by Kempenaar (2021), landscape architecture assumes a critical role in addressing global challenges, including energy transition, escalating urbanization, and adapting to climate change. When disaster education is integrated into landscape architecture programs, students actively engage in participatory, transdisciplinary, and collaborative design processes. This fosters the development of innovative solutions, effectively mitigating the impact of disasters and supporting sustainable development. Incorporating a democratic framework into landscape architecture education emphasizes the significance of public engagement in the landscape design process. Teqja and Karaj (2022) underline the importance of education in promoting inclusive and participatory landscape design methods, which are essential for fostering social cohesion and community resilience in the face of disasters.

The rapid increase in the number of universities in Turkiye has contributed to the development of graduate education trends, and the volume of scientific research in various fields has also increased. (Guven and Ozcelik, 2017: 697; Ozmen and Sever, 2019). Many comprehensive thesis studies have been conducted in graduate education universities, dealing with natural disasters from different dimensions. However, no study has been found in the literature examining graduate theses on natural disasters in Landscape Architecture. Comprehensive studies integrating disaster management and landscape architecture must be more extensive, especially in Turkiye, where natural disasters occur frequently. This study focuses on graduate thesis studies. Examining graduate theses addressing natural disasters in landscape architecture programs has the potential to reveal whether there are gaps or deficiencies in

academic research and education. Existing literature often examines natural disasters from a broader ecological and engineering perspective, ignoring landscape architecture's specific contributions and needs. The primary purpose of this study is to evaluate the extent to which disaster management is integrated into landscape architecture and urban design programs in Turkiye and to make a significant contribution to the existing literature in these fields. This research addresses a significant gap in the existing academic literature and encourages educational practices and professional paradigms to create strategies toward more holistic, disaster-resilient approaches in landscape architecture. Based on this, Turkiye is a country with high risk and fragility; 'Does the Department of Landscape Architecture in Turkiye, which is very prone to disasters, prioritize disasters and studies in graduate education? If not, what should be done?' The question constitutes the problem statement of this research. In the research, firstly, 'Which keywords related to disasters are emphasized by experts in Turkiye?' is asked to reveal the Landscape Architecture profession's change and development process. What is the number of state and foundation universities according to the establishment years of the universities where Landscape Architecture-Urban Design departments are located? 'What is the change in the faculties to which Landscape Architecture-Urban Design departments are affiliated over time?' questions have been addressed. In order to reveal the scope of disaster-related studies, 'How does the number of disaster-related theses change over the years?', 'Which type of disaster stands out with keywords?' 'What educational strategies should universities use that stand out with their studies on disasters and well-established universities?' Answers to these questions were sought.

2. Materials and methods
2.1. Data Collection and Analysis
Within the scope of the study, graduate theses written in the Department of Landscape Architecture and Urban Design between 2002 and 2023 were obtained from the Council of Higher Education (CHE) thesis search engine. Queries based on keywords in the titles of theses are a component of the method developed within the scope of this study. While determining the number of Landscape

Architecture - Urban Design undergraduate and graduate departments together with the faculties they are affiliated with, the official page of the Council of Higher Education (CHE) was used. This study includes a nine-stage evaluation process.

In the first stage, universities/programs offering graduate education in Landscape Architecture and Urban Design departments were identified.

In the second stage, 22 keywords were created in line with the literature review and surveys conducted with 30 spatial planning-design experts. These keywords are natural disasters, disaster, earthquake, flood, overflow, flood and overflow, tsunami, fire, terrorism, risk reduction, adaptation, resilience, climate change, sea level rise, drought, salinization, landslide, landslide, disaster management, crisis landscapes, urban heat island, and pandemic. The specific selection of keywords strengthened the study's scientific basis regarding the types of disasters seen in Turkiye.

In the third stage, the number of master's and doctoral theses in the Department of Landscape Architecture and Urban Design was determined using the 22 keywords from the Council of Higher Education (CHE) thesis scanning page. Theses, whose compatibility was checked based on keywords, were integrated into the study, and 62 theses were reached.

In the fourth stage, the research period was determined. A study was conducted on the reason for the selection of the year 2002 by the Council of Higher Education (CHE) thesis screening page. First, when the search was made with the specified keywords, it was determined that no publications were started till 2002. Afterward, it was examined whether there was a relationship between the departments and the specified year 2002. Hence, this study inspected the founding years of universities through graphics, with each column representing universities founded five years apart.

In the fifth stage, the departments in the faculties to which the Landscape Architecture and Urban Design Departments are affiliated were examined one by one. It was determined which graduate programs these departments run, under which faculties, and with which departments under the same faculty they provide education. Thus, according to the qualifications of the departments they are affiliated with, the faculties are grouped. This analysis emphasizes

the importance of multi-disciplinary work by revealing the difficulty of studying disasters in the planning and design dimension at a university where the Landscape Architecture department is alone.

In the sixth stage, the IBM SPSS Statistics 29.0.1 program was used, and the non-parametric Kruskal Wallis analysis method was applied to compare the values of the total number of theses according to faculty types, the total number of theses produced per year and the number of theses produced regarding disasters, evaluated within the same group. The reason for using this analysis is that the Kruskal-Wallis test is a non-parametric statistical method used to test central tendency differences on data obtained from three or more independent samples, and the number of data in the study groups is small.

In the seventh stage, comparative analyzes of the percentage (%) distributions of keywords in disaster-related theses between 2002 and 2023 were made. The percentage values were calculated by proportioning the number of theses for each keyword to the total number of theses, and the keywords were ranked according to their frequency of use. In addition, in order to analyze the distribution of theses among universities comparatively, the total values of graduate theses (master's - doctorate) related to the keywords determined by the universities over the years were calculated.

In the eighth stage, two different coefficients, coefficient-a and coefficient-b, were created to compare universities' graduate thesis productions. The created coefficient-a was obtained by dividing the number of theses made by the universities since their establishment year into the total production year. The other coefficient-b was obtained by dividing the total number of universities' disaster-related theses by the total production year. Examining these coefficient values is critical in terms of identifying departments that tend towards disasters within their thesis production capacities and diversity of study subjects and discussing the differences between young and well-established universities.

In the ninth stage, the current status of master's and doctoral theses related to disasters in the Department of Landscape Architecture was determined. In a country with a high risk of exposure to disasters and a high potential for damage, on the importance of including disaster-
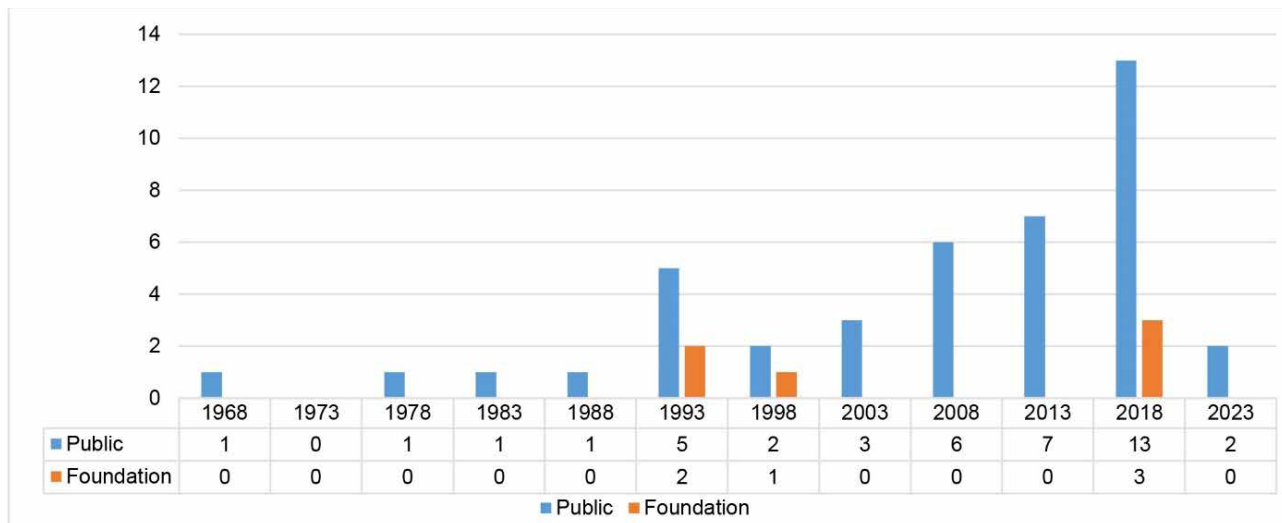
Figure 2: Number of state and foundation universities with landscape architecture and urban design departments according to their establishment years

related courses interdisciplinary Landscape Architecture graduate curricula in a country with a high risk of exposure to disasters and a high potential for damage, identifying deficiencies in disaster management and integrating them into the education curriculum, creating approaches in the context of disaster risk and encouraging interdisciplinary collaboration strategies are presented.

3. Results and Discussion

3.1. Examination of Graduate Theses from Landscape Architecture and Urban Design Departments

This research aims to examine how effectively disaster management is integrated into landscape architecture and urban design education programs in Turkiye and to make an original contribution to academic resources in this field. The study identifies gaps between educational methodologies and professional approaches, encouraging the development of more robust and integrated strategies against disasters. In this context, it aims to highlight innovative educational practices that increase resilience to disasters in landscape architecture and urban design.

The Department of Landscape Architecture and Urban Design studies between 2002 and 2023 were examined using specified keywords on the Council of Higher Education (CHE) thesis scanning page. As a result of the study, 62 graduate theses, comprising 11 doctoral and 51 master's theses, were identified. These theses were analyzed based on the years in which the studies were conducted, the faculties involved, the types of graduate programs, the universities, and the usage of keyword concepts.

In the research, what is the number of state and foundation universities, according to the number of years of establishment of the universities with Landscape Architecture-Urban Design departments? The answer to the question has been sought. When the establishment years of the universities with Landscape Architecture and Urban Design departments were examined, a total of 48 universities were reached, 42 state and 6 foundation universities. When we look at the period between 1999 and 2013, it was determined that this increase was only in state universities, but no increase was observed in foundation universities. It shows that the state's importance to higher education is increasing (Figure 2).
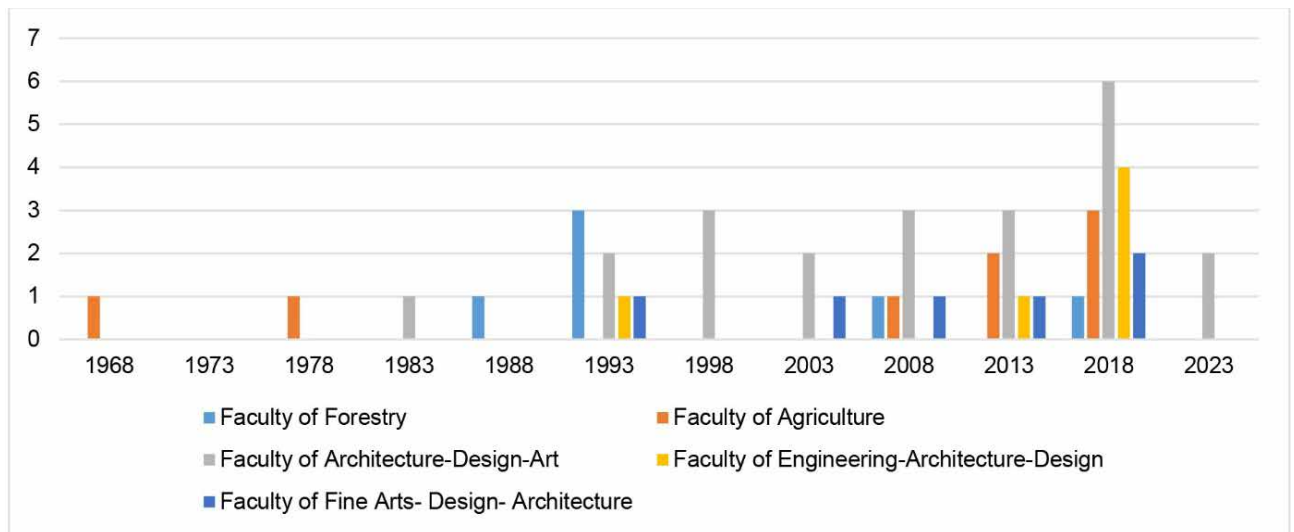
Figure 3: Distribution of temporal changes in the faculties to which landscape architecture-urban design departments are affiliated, according to their establishment years

At this research stage, 'How do the faculties to which the Landscape Architecture-Urban Design departments are affiliated change over time?' The answer to the question has been sought. The distribution of the universities established between 1968 and 2023 and the faculties to which they are affiliated were calculated, and comparisons were made between faculties. The Department of Landscape Architecture started its education within the Faculty of Agriculture, but this situation has gradually changed over the years. Especially while the Faculty of Forestry peaked in 1993, then a significant increase began in the Faculty of Architecture-Design-Art. Since 1998, it has been observed that the number of Architecture-Design-Art faculties has increased more than other faculties. The Faculty of Engineering-Architecture-Design reached the highest number in 2018 but generally showed a smaller increase in different years. While the Faculty of Fine Arts-Design-Architecture had a low number in general, it experienced the highest increase in 2018 (Figure 3). The fact that Landscape Architecture initially started education within the Faculties of Agriculture shows the close relationship of the origins of this discipline with natural and agricultural sciences. However, over time, this department's transition to faculties such as Architecture-Design-Art emphasizes the integration of the discipline with spatial design, social sciences, and art and, thus, the contributions of scientific approaches in these fields to landscape architecture.

At this research stage, 'What is the total number of theses in Landscape Architecture-Urban Design departments according to the types of faculties they are affiliated with?' The answer to the question has been sought. The Kruskal Wallis analysis method, a non-parametric method, was used to compare the total number of theses according to faculty types, the number of theses produced per year, the number of theses related to the disaster, coefficient a and coefficient b values. This method was used in comparison because the amount of data in the groups was low, and there were more than two groups. Accordingly, according to faculty types, the total number of theses ($\chi2=4.432$, $p>.05$), the number of theses produced per year ($\chi2=6.213$, $p>.05$), the number of disaster-related theses ($\chi2=4.814$, $p>.05$) There is no significant difference between coefficient a ($\chi2=3.051$, $p>.05$) and coefficient b ($\chi2=7.588$, $p>.05$) values (all p-values are greater than 0.05). This result shows that different faculties perform similarly regarding the mentioned criteria, and there is no statistically significant difference between them (Table 1). It is thought that as the number of samples increases over the years, such analyzes may become more helpful in evaluating the differences between academic programs and developing educational policies in the future.

Variables	Faculty	N	Mean	sd	Mean Rank	χ2	p
Total Graduate Thesis (t)	Forestry	9	52,89	48,51	32,17	4,432	0,351
	Agriculture	9	82,56	163,47	21,67		
	Architecture design art	19	51,47	69,20	24,68		
	Engineering and architecture design	5	25,40	38,04	22,30		
	Fine arts design architecture	6	12,17	15,20	18,50		
Total Production Year (y)	Forestry	9	12,44	10,20	33,06	6,213	0,184
	Agriculture	9	11,33	20,68	21,00		
	Architecture design art	19	12,79	17,19	25,24		
	Engineering and architecture design	5	4,60	5,73	22,00		
	Fine arts design architecture	6	2,17	2,40	16,67		
Number Of Thesis Related To Disaster (d)	Forestry	9	2,22	1,86	32,39	4,814	0,307
	Agriculture	9	1,00	2,12	20,11		
	Architecture design art	19	1,05	1,65	23,05		
	Engineering and architecture design	5	1,00	1,00	25,40		
	Fine arts design architecture	6	1,33	2,16	23,08		
Coefficient A (t/y)	Forestry	9	4,20	1,55	30,50	3,051	0,549
	Agriculture	9	3,21	4,36	21,89		
	Architecture design art	19	2,67	2,66	22,47		
	Engineering and architecture design	5	3,87	3,06	28,70		
	Fine arts design architecture	6	2,78	3,45	22,33		
Coefficient B (d/y)	Forestry	9	0,47	0,80	33,11	7,588	0,108
	Agriculture	9	0,02	0,06	17,61		
	Architecture design art	19	0,13	0,27	22,79		
	Engineering and architecture design	5	0,48	0,86	28,90		
	Fine arts design architecture	6	0,31	0,52	23,67		

Table 1: Distribution of graduate theses by faculties, annual production, and statistical analysis of disaster-focused studies

At this research stage, 'What is the distribution of graduate theses on disasters in Landscape Architecture-Urban Design departments over the years?' The answer to the question has been sought. Looking at the distribution of graduate theses over the years, it was determined that the studies were carried out mainly in 2019, 2020, 2021, 2022, and 2023 (Figure 4). In recent years, as in all professional disciplines, it has been observed that the perception of disasters has increased, and the number of studies has increased. Considering the number of doctoral and master's theses examined, it was determined that 51 of them (82.2%) were made in master's programs, and 11 of them (17.8%) were made in doctoral programs. It can be seen that there has been a sharp increase in master's theses produced on disasters in recent years. Although the reason for this increase will be examined in the following pages of the study, a similar increase does not appear at the doctoral level. The reasons for this are that the doctoral
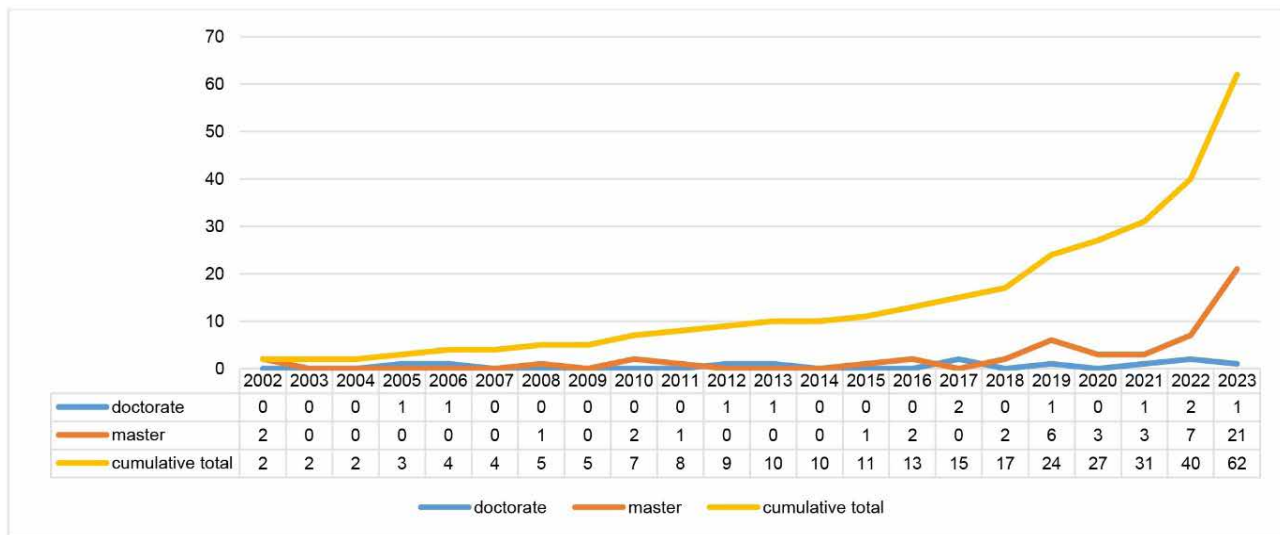
Figure 4: Distribution of disaster-related theses in graduate programs between 2002-2023

thesis production process is long, and students have had the option to pause their thesis studies due to the major earthquakes that the country experienced both during and after the pandemic. As a result, doctoral studies, which can take place over a long time, have become even longer. (Figure 4).

At this research stage, 'What is the distribution of graduate theses on the disaster in Landscape Architecture-Urban Design departments according to keywords?' The answer to the question has been sought. Ranking of keywords determined by experts in the theses examined: 33.8% climate change, 14.5% resilience, 11.3% earthquake, 9.6% disaster, 6.4% drought, 6.4% urban heat island, 4.8% fire, 3.2% natural disasters, 3.2% pandemic, 1.6% flood-overflow-terror-crisis landscapes (Figure 5).
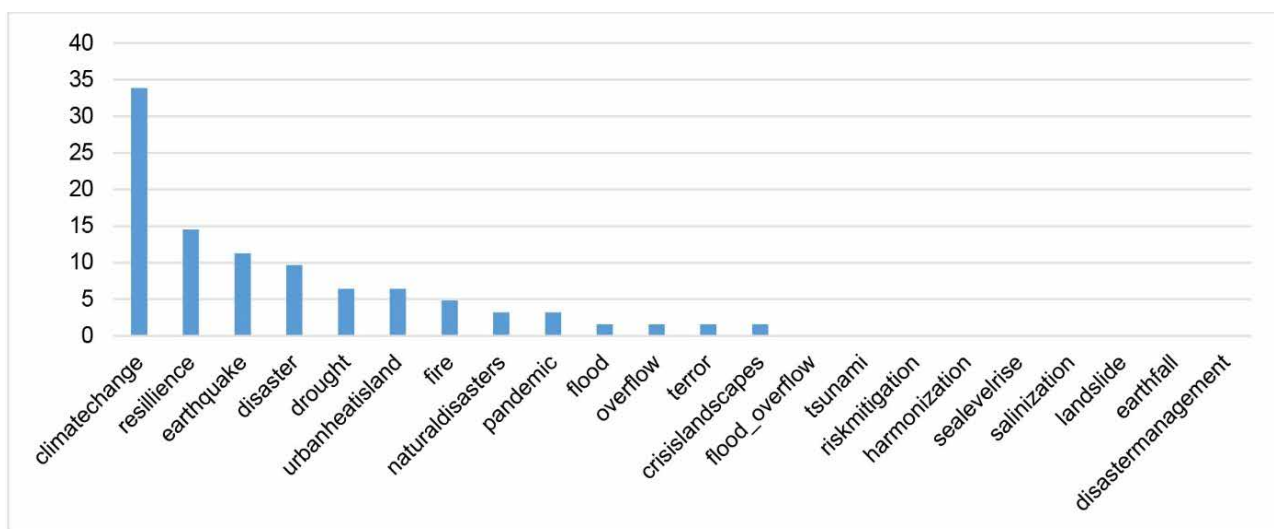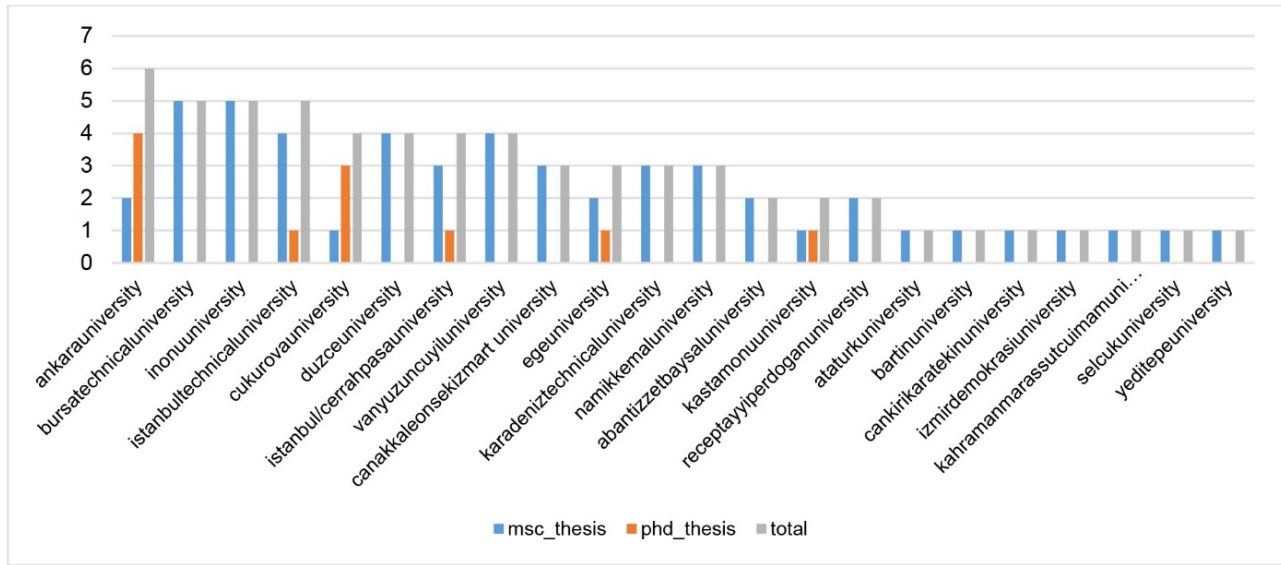

Figure 5: Percentage (%) distribution of keywords in disaster-related theses between 2002-2023

Figure 6: Distribution of disaster-related theses within universities between 2002-2023

According to the results obtained from the scans, most thesis studies were conducted on climate change. It is possible to attribute the reason for this to the fact that newly established universities have addressed the issue of climate change in recent years; besides, there is an increase in the number of universities (Figures 3 and 4). Since no studies on the keywords flood, tsunami, risk reduction, adaptation, sea level elevation, salinization, landslide, landslide, and disaster management could be found in the scans, these concepts were not included in the calculation, and their impact values were accepted as zero (Figure 5).). It is noteworthy that in a country surrounded by seas on three sides, with different coastal and river formations, and at risk of tsunami, the concepts of water management, sea level rise, salinization, and especially flood had not come to the fore in the theses. This situation also points to a lack of interdisciplinary cooperation. The fact that no study has been conducted on these keywords at either the master's or doctoral level shows that the concept of disaster cannot be addressed in a multidimensional way in graduate education.

At this research stage, 'What is the distribution of graduate theses on disasters in Landscape Architecture-Urban Design departments according to universities?' The answer

to the question has been sought. Landscape Architecture-Urban Design departments conducting graduate thesis studies on disasters were included in this study phase. When we look at the distribution of disaster-related theses written in universities by year, Ankara University is ahead. The universities with the highest number of graduate theses between 2002 and 2023 are ranked as follows: Ankara University is in first place, Bursa Technical University, İnönü University, and Istanbul Technical University are in second place, and Çukurova University, Düzce University, Istanbul/ Cerrahpaşa University, and Van Yüzüncü Yıl University are in third place (Figure 6). According to Figure 3, the faculty type with the most landscape architecture departments is the Faculty of Architecture-Design-Art. However, when the distribution of disaster-related theses within universities is examined, the faculties that stand out by far are the Faculty of Architecture-Design-Art and Forestry Faculties. According to the data in Figure 3, although the Faculty of Forestry has an average distribution, it can be said that it prioritizes disaster-related studies. In addition, the fact that the universities with the highest distribution are state universities and there are no foundation universities among them confirms the information shown in Figure 2 that the increase in the number of state universities is increasing, but no increase is observed in the number of foundation

Universities with the highest t score	coefficient_a (t/y)	total_graduate_thesis (t)	total_production_year (y)
ankarauniversity	12.67	469	37
suleymandemireluniversity	7.47	127	17
vanyuzuncuyiluniversity	6.57	46	7
inonuuniversity	6.2	31	5
bartinuniversity	6.06	91	15
bursauludaguniversity	5.4	27	5
istanbultechnicaluniversity	5.18	140	27
namikkemaluniversity	5.16	31	6
duzceuniversity	5	80	16
cukurovauniversity	4.82	241	50
Universities with the highest d score	**coefficient_b (d/y)**	**number_of_thesis_related_to_disaster (d)**	**total_production_year (y)**
bursatechnicaluniversity	1.66	5	3
inonuuniversity	1	5	5
receptayyiperdoganuniversity	1	2	2
vanyuzuncuyiluniversity	0.57	4	7
namikkemaluniversity	0.5	3	6
kastamonuuniversity	0.28	2	7
duzceuniversity	0.25	4	16
izmirdemokrasiuniversity	0.25	1	4
yeditepeuniversity	0.25	1	4
cankirikaratekinuniversity	0.2	1	5

Table 2: Distribution of universities according to coefficient-a/b values

universities. Some universities have been given the title of "research university" by the central government since 2017. In this context, an additional budget is provided to these universities each year to develop their research, and then their performance is measured (Council of Higher Education, 2024). When the universities in Figure 6 are examined, it is revealed that 7 out of 22 universities and 3 out of the first five universities were appointed as research universities by the central government. It is seen that only 1 of the last 7 universities is a research university (Figure 6). All cities in Turkiye have an earthquake risk, but when examined in terms of cities that have been and are at the center of major earthquakes, it is seen that 13 of the universities in Figure 6 are located in these cities. Besides the disaster-prone locations, the reason for the distribution among universities can be said to be factors such as universities having an old founding date in their fields, having more faculty members, and being the most preferred universities in university exams.

The analysis of the two tables reveals that universities show different performances in general graduate thesis production and disaster-related thesis production. The first part contains the coefficient (coefficient_a), called "t score," which is obtained by dividing each university's total number of theses by the total production year. The maximum and minimum of Coefficient_a are (12.67–1.50). The first 10 universities determined according to Coefficient_a calculations are state universities. Figure 3 shows they are under the Faculty of Architecture-Design-Art faculty with the highest value. The second part shows another coefficient (coefficient_b) called "d score," which is obtained by dividing the number of disaster-related theses of each university by the total production year. The maximum and minimum of coefficient_b are (1.66–0.017). Of the top 10 universities determined according to Coefficient_b calculations, 9 are state universities, and 1 is a foundation university. In addition, according to Figure 3, while there is the highest number of Faculty of Architecture-Design-Art faculties, it has been observed that the thesis production of the Forestry Faculties, which have the middle level, is above expectations. This situation can be explained by the fact that disaster-related studies are given priority in Forestry Faculties. A critical situation at this stage is that 6 of the 10 universities with the highest Coefficient b value are at risk of major earthquakes due to

their disaster-related activities. This table is an important data source for analyzing the quantitative and qualitative dimensions of research outputs in the Turkish higher education system. In particular, it reveals how different universities' research focuses vary and how they develop specialization in particular areas. According to the "t score" data, Ankara University has the highest coefficient (12.67), reaching 469 graduate theses in 37 years. This situation shows that Ankara University has academic productivity and stable research performance in the long term and has an advantage in accessing general research funds and resources. The fact that Ankara University is an old university as of its establishment date, that it has many academicians, and that its fields of interest vary depending on the number of academicians has increased the total number of theses produced. However, there is a relatively limited number of graduate thesis studies on disasters since the university is far from the risk of disaster exposure due to its location and has a high number of academics working on specific subjects. On the other hand, the "d score" data indicates which universities' disaster-related research is more intense. For example, Bursa Technical University produced five disaster-related theses in three years and reached the highest coefficient (1.66) in this field. The Bursa Technical University is a top priority for several reasons. As a young university located in an earthquake-prone area, it's evident that the study subjects have evolved to encompass disasters, especially with the rise in events such as pandemics, climate change, and earthquakes in 2019, 2022, and 2023, as shown in Figure 4. In addition, it is possible to explain the high disaster-focused thesis production coefficients of Van Yuzuncu Yıl University, Duzce University, and Inonu Universities with the major earthquake hits that happened in the cities of these universities. Although the coefficient-b value seems high in young universities, time is needed to understand whether their continuity will carry on steadily. Due to the time parameter, it is not available to compare young universities with old universities. The data of this study, supported by figures and tables, show the research focuses of universities, the variety of interdisciplinary studies, and research areas in higher education in Turkiye. Universities that specialize in a particular field, such as disaster management, are strategically important due to the potential impact of

such research on society. In this context, how universities shape their strategic research areas and what capacity they develop in these areas constitutes an important subject of analysis for policymakers and education administrators. The literature review and findings of this study reveal that there are a limited number of studies on the integration of disaster management in landscape architecture education. Hamin and Brabec (2009) stated that disaster management courses in urban planning and design programs are generally given within the framework of general planning principles but are often inadequate. This points to the need for interdisciplinary approaches and more intensive curriculum integration. Additionally, a study by Brody, Highfield, and Kang (2011) revealed that disaster management and risk reduction strategies are generally limited to elective courses in urban and regional planning programs and are outside the compulsory curriculum. Lyles, Berke, and Smith (2014) evaluated how disaster preparedness and response issues were addressed within planning education and showed that students and professionals were not sufficiently equipped for disaster management issues. While Cutter, Ash, and Emrich (2014) emphasized the role of landscape architecture and urban design in increasing community resilience against disasters, Kapucu and Garayev (2011) highlighted the importance of collaborative decision-making processes in emergency management. Montoya and Jain (2015) and Pelling (2003) discussed the importance of integrated urban planning and disaster management integration in education to reduce natural disasters. When addressing disaster management integration in landscape architecture and urban design programs in the Turkish context, these references are compatible with the existing literature and show that more research is needed in this area. This research indicates that there is a need for more in-depth coverage of disaster management issues in academic studies and educational curricula, especially at the doctoral level. The scarcity of specific disaster-related courses in landscape architecture education contradicts the emphasis on the importance of disaster management education in the literature. Methodological criticisms include the study's reliance primarily on data obtained from the Higher Education Institution thesis screening page, which may limit the scope of the analysis. Additionally, the lack of

other interdisciplinary studies on disaster management in the literature may create limitations in developing solutions specific to landscape architecture. As a result, although the study's findings significantly contribute to the existing literature, they show that the subject should be examined more comprehensively and in-depth. More comprehensive research and interdisciplinary approaches are needed to integrate disaster management education more effectively into landscape architecture and urban design disciplines.

3.2. Final Discussion

As of the end of 2023, in the scans made with the keywords determined from the National Theses Center of the Council of Higher Education (CHE), it is seen that a total of 62 theses have been made, including 51 master's theses and 11 doctoral theses. In the graduate theses examined, the characteristics of the types of disasters experienced in Turkiye were explained, and the importance of integrating the concept of disaster in landscape architecture education was emphasized. The inadequacy in the number of doctoral theses is one of the results obtained. Landscape Architecture-Urban design departments in Turkiye, a country prone to disasters, must prioritize disasters and studies in graduate doctoral education. In addition, the examinations revealed deficiencies in the number and content of the theses. The study's primary limitation is the numerical and contextual inadequacies of the theses examined. When the types of disasters experienced in Turkiye are examined within the key concepts, one of the major deficiencies seen in the study is that no studies can be found on the keywords flood, tsunami, risk reduction, adaptation, sea level elevation, salinization, landslide, landslide, and disaster management. Although 11 of the landscape architecture departments that work on disasters are located in coastal cities at risk of tsunami, sea level rise, and flood, it is seen that water-related disasters still need to be addressed even in these departments. Eliminating these deficiencies is possible by integrating the concept of disaster into graduate education and increasing disaster awareness. When we look at the distribution of universities according to the Coefficient-a/b value, Ankara University and Bursa Technical University stand out as the universities with the highest coefficients in their categories (12.67 and 1.66, respectively). This shows that Ankara University has a

leading position in the total number of theses, while Bursa Technical University has a leading position in the number of disaster-related theses. Both universities continue their productivity in these fields and significantly contribute to academic studies. Since Ankara University has the highest number in this field with 469 theses, it can be considered the best-performing university in terms of academic productivity. However, Bursa Technical University can be considered a leader in disaster-related studies, as it has the highest coefficient (1.66) in this field and has produced five theses. Areas sensitive to natural disasters need to be designed as spaces with multi-layered and multi-functional features, away from the risk of exposure to disaster, within the framework of transformable and durable spatial planning approaches. In this context, in Turkiye, which is frequently exposed to natural disasters, it should be mandatory to include disaster and crisis landscapes in the education curriculum in all departments providing undergraduate and graduate education in Landscape Architecture Departments.

The insufficient number of studies found as a result of the study confirms this view. In practical applications, integrating disaster management issues in educational curricula forms the basis for future landscape architects and urban designers to develop more resilient and sustainable solutions to disasters. When making disaster-resistant designs, it is necessary to evaluate ecosystem-based approaches and green infrastructure solutions in the context of disaster risk management, prioritizing sustainability principles. Courses on disaster management should include field studies, studio studies, and simulations, along with theoretical knowledge. In this way, students can turn theoretical knowledge into practice while designing landscapes against disasters. Disaster management courses should be conducted in collaboration with disciplines other than landscape architecture. Encouraging interdisciplinary approaches and collaborations in disaster management (disaster-related units, universities, and non-governmental organizations that care about disaster) may enable the development of more innovative and comprehensive solutions. This allows them to develop both global and local solution strategies. Universities designated as research-oriented universities by the central government must lead in disaster-related issues.

Master's and PhD students encourage the transformation of academic studies into practice by contributing to regional risk analyzes and developing solution proposals while determining thesis topics related to disaster management. The strategies outlined can help landscape architecture programs equip students to design more disaster-resistant and sustainable environments.

CONCLUSION

In order to train landscape architects who can produce practical and creative solutions to the challenges brought by the 21st century, there is a need for academic studies and educational strategies that produce adaptive and regenerative spatial studies with innovative approaches in the pre- and post-disaster processes. This study discusses landscape architecture departments' roles that can be undertaken in disaster-sensitive countries, starting from Turkiye. Due to the complex structure of disasters, spatial planning and design disciplines must be included in a multidisciplinary, interdisciplinary, or even transdisciplinary setting. The discussion environment created by this study is intended to be a starting point for further studies that can be conducted in the future to develop educational strategies in the context of training young landscape architects who can read and interpret spatial dynamics well and produce solutions for the benefit of resilient landscapes.

Acknowledgments

Declaration of Interest
None.

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