Journal of Spatial Planning and Design
Mekansal Planlama ve Tasarım Dergisi

SAKARYA KARAMAN ENGELSİZ MİLLET BAHÇESİNİN EVRENSEL TASARIM İLKELERİ DOĞRULTUSUNDA İNCELENMESİ
(AN ANALYSIS OF THE SAKARYA KARAMAN BARRIER-FREE NATION'S GARDEN BASED ON UNIVERSAL DESIGN PRINCIPLES)

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Doi: https://doi.org/10.53463/splandes.202400

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ÖZET

Engelli bireyler; fiziksel, zihinsel, duygusal veya duyusal yeteneklerinde sınırlamaları olan ve bu nedenle belirli günlük yaşam aktivitelerinde veya etkileşimlerde desteğe, özel düzenlemelere ihtiyaç duyan kişilerdir. Engelliler; hareket kabiliyeti, görme veya işitme yeteneği, düşünme veya iletişim yeteneği gibi farklı alanlarda sınırlamalara sahip olabilirler. Tasarım açısından, engelli bireylerin ihtiyaçları ve engelleri göz önünde bulundurularak ortam, ürün veya hizmetlerin erişilebilir ve kullanılabilir olması gerekmektedir. Engelli bireylerin yaşamın her alanına katılabilmesi ve toplumsal eşitliklerinin desteklenmesi için tasarımcılar, evrensel tasarım ilkelerine ve erişilebilirlik standartlarına önem vermelidirler. Bu makalede, engelli bireylerin Sakarya Karaman Engelsiz Millet Bahçesi'ndeki kullanım alanları evrensel tasarım ilkeleri açısından irdelenmiştir. Evrensel tasarım ilkelerine göre çalışma alanımızda engelsiz park olarak tasarlanmış olmasına rağmen çok büyük eksiklikler göze çarpmıştır. İncelemeler sonunda park içi yollarda herkese eşit kullanım, koruma ve güvenlik, fiziksel efor, kullanım için boyut ölçü ve mekan ilkelerini bünyesinde barındırmadığı sonucuna varılmıştır. Bu durum parkın tekrar gözden geçirilerek engelliler için düzenlemelerin yapılmasını zorunlu kılmaktadır.

Anahtar Kelimeler: Evrensel Tasarım, Peyzaj Tasarımı, Engelli, Millet Bahçesi, Kentsel Tasarım, Eşitlik

ABSTRACT

Individuals with disabilities experience limitations in their physical, mental, emotional, or sensory capacities, often necessitating support or specific accommodations to navigate daily activities and interactions. These challenges may encompass mobility, vision, hearing, cognition, or communication. From a design perspective, it is imperative to ensure that environments, products, and services are accessible and usable, addressing the diverse needs and challenges faced by individuals with disabilities. To foster inclusion and promote social equality, designers must prioritize universal design principles and accessibility standards. This study evaluates the accessibility of the Sakarya Karaman Barrier-Free Nation's Garden through the lens of universal design principles. Although the park was designed as a barrier-free environment adhering to these principles, several significant deficiencies were identified. The evaluation revealed that the park fails to fully meet key principles such as equitable use, safety and security, minimized physical effort, and appropriate dimensions and spaces for pathways. These shortcomings underscore the necessity for a comprehensive reassessment of the park to implement requisite modifications, ensuring it accommodates the needs of individuals with disabilities effectively.

Keywords: Universal Design, Accessibility, Landscape Design, Disability, Nation's Garden, Urban Equality, Urban Design

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1. INTRODUCTION

Individuals with disabilities experience limitations in their physical, mental, emotional, or social capacities. These limitations may originate from congenital genetic factors, traumatic events, pathological conditions, or environmental influences. The World Health Organization (WHO), in its 2001 report on the International Classification of Functioning, Disability, and Health, emphasized the significance of evaluating functionality and disability by considering both health conditions and contextual factors in conjunction. (WHO, 2001). The WHO has reinforced this multidimensional approach in numerous subsequent reports, emphasizing the significance of ensuring that individuals with disabilities have access to adequate and high-quality services within society. The heterogeneity of disability manifestations among individuals underscores the necessity to develop inclusive approaches that address the needs of diverse disability groups.

The United Nations (UN) General Assembly enacted a significant resolution by designating 1981 as the "International Year of Disabled Persons" (Azarkan & Benzer, 2018). The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) mandates that states fulfill various obligations to ensure individuals with disabilities have full and equal access to all rights and freedoms (Kaya, 2018; Azarkan & Benzer, 2018). Enacted in our country through publication in Official Gazette No. 27288 in 2009, this convention marks a crucial advancement in protecting the rights of individuals with disabilities and facilitating their integration into social life.

Statistical data from the Turkish Statistical Institute (TurkStat) reveal that the elderly population in Turkey expanded from 8.5% to 9.9% between 2017 and 2022, demonstrating a 22.6% increase (Turkstat, 2024). This demographic shift is expected to continue in subsequent years, coinciding with a growing proportion of individuals experiencing mobility limitations. Additionally, persons with disabilities presently account for approximately 16% of the population (WHO., 2024). Notwithstanding these demographic trends, the provision of appropriate living spaces for individuals with special needs remains insufficient within society.

The evolution of societal complexities has led to a corresponding transformation in the challenges faced by communities (Ergen, Şehircilik, 1991). In this shifting landscape, barrier-free parks have emerged as critical components of landscape architecture, serving as catalysts for the social integration of individuals with disabilities, fostering their interpersonal connections, and contributing to an enhanced standard of living (Çelik, Ender, & Akdeniz, 2015). Accessible and inclusive designs provide individuals with disabilities greater mobility, enabling them to engage more effectively with the community. Universal design principles promote open space designs that accommodate all segments of society. These approaches not only improve the quality of life for individuals with disabilities but also create more functional spaces for those without disabilities.

In urban design practices, incorporating accessibility and universal design principles into landscape arrangements offers effective solutions for reducing environmental barriers faced by individuals with disabilities (Uslu & Shakouri, 2014). Accessible park designs aim to facilitate the unimpeded movement of individuals with disabilities within the physical environment. Public space designs—such as streets, squares, and parks—should include tailored solutions for diverse user groups, including visually impaired individuals, those with mobility challenges, elderly people, pregnant women, and mothers with infants. These efforts contribute to broadening the societal living spaces available to these groups (Uslu & Shakouri, 2014). Essential elements in such designs include ramps and elevator systems, wide and disability-friendly

walkways, tactile surfaces, and clear signage. These features not only foster societal awareness but also empower individuals with disabilities to assume a more active role in public spaces.

Contemporary urban environments face significant challenges, particularly in the realms of uncontrolled urbanization and insufficient infrastructure to support individuals with disabilities (Ergen & Ergen, Proposal for Abandoned Urban Areas in Regeneration Context; A Case Study of Yozgat, 2018). To mitigate these issues, it is imperative to implement inclusive design principles in urban amenities and fixtures, ensuring they conform to specific dimensional standards that accommodate the needs of disabled populations. (Pouya, 2021). Such approaches enhance inclusivity and accessibility, positively influencing the social, psychological, and physical well-being of individuals with disabilities. Landscape design is widely recognized as a discipline that facilitates human interaction with nature, delivering the beneficial effects of natural environments even in urban settings. Direct benefits of contact with nature on mental health include the reduction of psychological stress, depression, and anxiety, as well as the enhancement of focus and attention recovery (Lovell, Depledge, & Maxwell, 2018; Ma, Lin, & Williams, 2024). This research explores methodologies for enhancing the societal integration of individuals with disabilities, with a particular focus on the implementation of accessible landscape designs and the "universal design" concept. Additionally, it underscores the importance of fostering disability-inclusive architectural approaches, bolstered by appropriate legal structures, and examines innovative strategies within this field.

2. MATERIALS AND METHODS

2.1. Materials

This investigation focuses on the Sakarya Karaman Barrier-Free Nation's Garden, located in the Karaman neighborhood of Adapazarı district, Sakarya Province (Figure 1). The selection of this research site was influenced by the neighborhood's geographical and demographic attributes. Formerly known as "Bayraktepe" and renowned for its kite festivals, this area has historically functioned as a community focal point for social and cultural activities. At present, the park serves as a venue for a variety of recreational and social events. The park's amenities include standard and barrier-free children's playgrounds, a basketball court, urban furniture, walking and jogging trails, parking facilities, and a large cafeteria. These features cater to a wide range of activities for both younger and older visitors.

A notable aspect of the park is its barrier-free children's playgrounds, which represent a significant stride towards enhancing accessibility and inclusivity for individuals with disabilities. These specialized play areas are designed to facilitate equal participation and interaction between children with disabilities and their peers. Moreover, the park's athletic facilities, including the basketball court and walking-jogging paths, are instrumental in promoting physical activity and supporting community health, providing residents with accessible means to maintain their physical well-being.

Figure 1. Study Area

This research endeavor aims to conduct a comprehensive examination of the design limitations present in the Sakarya Karaman Barrier-Free Nation's Garden, specifically within the framework of challenges encountered in creating landscape designs for individuals with disabilities. The existing design issues within the park will be scrutinized through meticulous on-site observations. The selection of the Sakarya Karaman Barrier-Free Nation's Garden as the research site was predicated on various considerations. The investigation will assess the park's functionality for individuals with disabilities, its capacity to promote social integration, and its supportive amenities. Serving as an accessible and inclusive recreational space, the park caters to both individuals with disabilities and the general populace. The diverse functional areas within the park facilitate social engagement and physical activities, thereby enhancing the social and physical well-being of local residents. These characteristics position the park as a pivotal social hub at both the local and regional echelons.

2.2. Methodology

This study sought to identify the design deficiencies of the Karaman Barrier-Free Nation Garden for individuals with disabilities, guided by the principles of universal design. Ronald L. Mace, the founder of the universal design approach, emphasized in 1985 the necessity of integrating universal methodologies into design practices (Koç & Koç, 2022). Mace defined universal design as the creation of products and environments that are usable by the greatest number of people, regardless of age or ability, to the maximum possible extent (D'souza, 2004; Kuter & Erciyez Çapraz, 2020; Koç & Koç, 2022). Building upon Mace's vision, universal design principles were formally established in 1997 at North Carolina State University (NCSU), underscoring the significance of aligning designs with these inclusive principles.

2.2.1. Universal Design Principles

Universal design principles encompass environmental, product-based, and comprehensive design approaches aimed at addressing the needs of individuals across all age groups and ability levels. These principles ensure that all user groups can effectively utilize and benefit from such designs (Uslu & Shakouri, 2014). By applying these principles, outdoor designs promote social equity, enhance the quality of life for individuals with disabilities, and facilitate more effective use of public spaces. The universal design principles forming the foundation of this research are outlined below (Center for Universal Design, 2024):

Equitable Use

The principle of "Equitable Use" ensures that designs create functional spaces accessible to everyone. It emphasizes avoiding discrimination and providing the same methods of use for all users, fostering inclusivity and fairness.

Flexibility in Use

The "Flexibility in Use" principle addresses the adaptability of the design to accommodate individual preferences and needs. This flexibility enhances accuracy and usability for individuals of different ages and abilities, broadening the appeal and functionality of the design.

Simple and Intuitive Use

This principle focuses on eliminating complexity by ensuring the design is straightforward and easy to understand, regardless of the user's knowledge, language skills, or focus level. It aligns with user expectations and intuition, resulting in a naturally comprehensible and user-friendly experience.

Perceptible Information

"Perceptible Information" ensures that the design effectively communicates necessary information, irrespective of environmental conditions or the user's sensory abilities. Features are designed to differentiate and clarify usage, enhancing accessibility and independence for a diverse user base, including individuals with disabilities.

Tolerance for Error

This principle aims to minimize risks and hazards arising from potential user errors. It prioritizes safety by preventing design elements from posing threats and reducing the likelihood of mistakes. The goal is to create a secure, reliable, and user-friendly experience.

Low Physical Effort

The "Low Physical Effort" principle ensures that designs are easy to use with minimal physical exertion. It prioritizes physical accessibility and comfort, reducing fatigue and enabling efficient interaction with the design. This approach enhances usability and user satisfaction.

Size and Space for Approach and Use

This principle emphasizes creating spaces and elements with appropriate dimensions to facilitate easy approach, reach, and use by all users. It considers the needs of both seated and standing individuals, including their line of sight, ensuring usability, accessibility, and comfort for a wide range of users.

3. RESULTS

The creation of accessible and functional spaces for individuals with disabilities plays a crucial role in promoting social inclusion on a global scale. This study examines the Sakarya Karaman Barrier-Free Nation's Garden to assess the participation of disabled individuals in social activities and identify strategies that enhance their inclusion.

Transportation

Access to the Sakarya Karaman Nation's Garden is provided through public bus services and pedestrian routes, with two bus stops located within walking distance (Figure 2). However, local residents report that the park is situated on elevated terrain. Consequently, disabled individuals and elderly visitors must traverse an inclined road to reach the park, requiring significant physical effort. These factors suggest that the park's accessibility is not fully optimized, failing to meet the "low physical effort" criterion

While the park features multiple entry points, it lacks tactile surfaces (guiding paths) to assist visually impaired visitors. Moreover, the absence of warning indicators for bollard boundary elements at the entrances is notable. These shortcomings indicate that the park does not fully comply with the principles of "tolerance for error" or "perceptible information."

The park exhibits deficiencies in essential accessibility features, including the absence of Braille information signs and charging stations for mobility aids. These omissions demonstrate that the park falls short of meeting the principles of "equitable use" and "perceptible information."

Figure 2. Illustration of transportation pathways leading to the Sakarya Karaman Barrier-Free Nation's Garden, with a focus on restrictive features located at the pedestrian access point.

Internal Pathways

The Sakarya Karaman Nation's Garden features a concrete path, 1 meter in width, encircling the park's perimeter (Figure 3). This dimension proves inadequate for the concurrent passage of two wheelchairs. The park's interior is traversed by two main routes: a cobblestone-paved path connecting seating areas and an asphalt-surfaced thoroughfare serving as the central axis. These internal pathways possess sufficient width to accommodate wheelchair users, with the asphalt surface offering enhanced traction during wet conditions. An analysis of these features indicates

that the park's design aligns with several key principles: equitable use, protection and safety, minimal physical exertion, and appropriate dimensions for approach and utilization.

Figure 3. Paving variations and the bicycle path in the Sakarya Karaman Barrier-Free Nation's Garden.

The park's design eschews stairs in favor of gradients to manage elevation changes. However, these inclines pose significant challenges for individuals with mobility impairments and older visitors, requiring substantial physical exertion. Additionally, the deterioration of pathways due to insufficient upkeep has led to surface irregularities, introducing potential safety risks. As a consequence, the park falls short in its adherence to fundamental principles of universal design, including equitable access, user safety, minimal physical strain, and appropriate spatial dimensions for approach and utilization.

Ramps and Stairs

The Sakarya Karaman Nation's Garden is accessible via a gradual incline without steps (Figure 4). Nevertheless, within the park's confines, several pathways feature ramps that pose significant physical challenges for disabled individuals and senior visitors. Despite these obstacles, the park partially adheres to principles of equitable usage, safety measures, reduced physical exertion requirements, and appropriate spatial dimensions for approach and utilization.

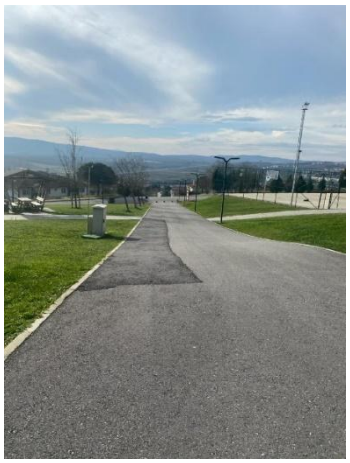

Figure 4. Pavement deformation and sloped path in the Sakarya Karaman Barrier-Free Nation's Garden.

Children's Play Areas

Within the Sakarya Karaman Nation's Garden, a significant area is dedicated to children's recreational facilities. This space incorporates an array of play structures, notably featuring an adventure park, which offers youth engaging opportunities for physical activity and leisure pursuits (Figure 5).

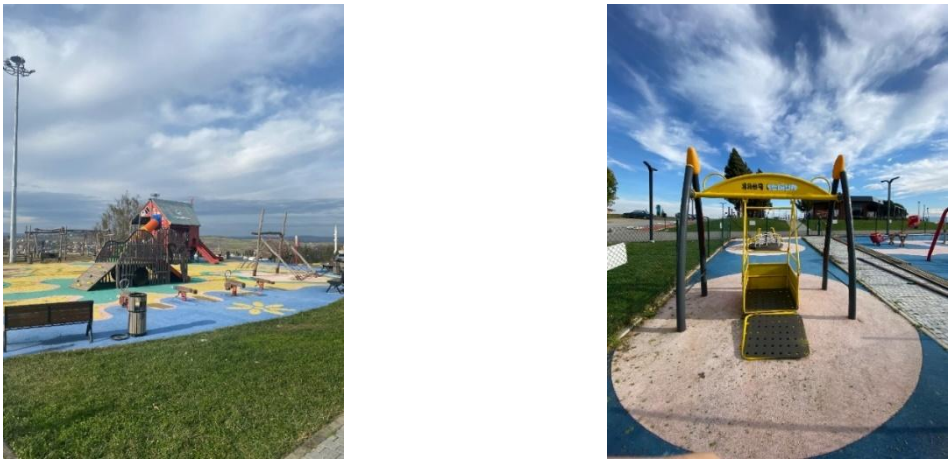

Figure 5. Children's play area and equipment in the Sakarya Karaman Barrier-Free Nation's Garden.

The playground incorporates a segregated area for children with disabilities, demarcated by fencing. This separation effectively isolates disabled children from their peers, thereby restricting opportunities for social interaction (Figure 6). Observational studies revealed that the designated area for disabled children was inaccessible, preventing free entry at all times. These findings suggest that the park fails to uphold the principles of equitable use and appropriate size and space for approach and use.

Although safety features are present on the playground equipment, the adventure park area lacks sufficient oversight. While the construction materials are generally deemed safe, the absence of a barrier between the enclosed play area and the adjacent roadway presents a potential safety hazard. Moreover, the fencing surrounding the play area for disabled children may introduce additional safety concerns. As a result, the park falls short of fully adhering to the principle of protection and safety.

Figure 6. Designated play area for children with disabilities in the Sakarya Karaman Barrier-Free Nation's Garden

Sports Facilities

The Sakarya Karaman Barrier-Free Nation's Garden features sports amenities, including a basketball court and areas with fitness equipment (Figure 7). However, the basketball court lacks adaptations for individuals with disabilities. Additionally, the fitness apparatus is positioned on an inclined grassy terrain, presenting potential safety hazards. Furthermore, the park lacks specialized fitness facilities for persons with disabilities. These inadequacies demonstrate the park's non-compliance with fundamental principles, including protection and safety, equitable use, minimal physical exertion, and appropriate dimensions and space for approach and utilization.

Figure 7. Sports area in the Sakarya Karaman Barrier-Free Nation's Garden

The Sakarya Karaman Barrier-Free Nation's Garden exhibits a deficiency in signage incorporating the sign language alphabet for individuals with auditory impairments. Additionally, the absence of directional indicators, tactile guidance systems for the visually impaired, and Braille-based informational signage is notable.These inadequacies suggest that the park fails to comply with the principles of equitable use, simple and intuitive use, and perceptible information

Figure 8. Sign language alphabet chart in the Sakarya Karaman Barrier-Free Nation's Garden

Urban Furniture

The waste receptacles in Sakarya Karaman Barrier-Free Nation's Garden are of appropriate dimensions, ensuring accessibility for individuals with disabilities. However, the inclined areas lack supportive handrails that could facilitate mobility for disabled persons. In light of these observations, the park incorporates the principles of equitable use, flexibility in use, and low physical effort.

Conversely, the seating facilities in the park are not adequately designed to accommodate individuals with disabilities (Figure 9). The dimensions of these units do not account for wheelchair accessibility. Consequently, the park fails to adhere to the principles of equitable use, flexibility in use, or low physical effort in this regard.

Figure 9. Seating units and trash bins in the Sakarya Karaman Barrier-Free Nation's Garden

Lighting Conditions

The Sakarya Karaman Barrier-Free Nation's Garden exhibits sufficient illumination in its pedestrian pathways, recreational areas for children, basketball facilities, and dining establishments, ensuring adequate visibility in these zones. However, the park's seating sections, athletic areas, vehicle storage space, and entry roads suffer from suboptimal lighting conditions

(Figure 10). Consequently, these inadequately illuminated regions fail to adhere to the fundamental principles of public safety and security.

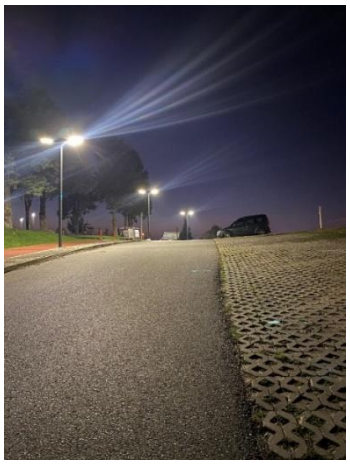

Figure 10. Lighting in the Sakarya Karaman Barrier-Free Nation's Garden

4. CONCLUSION and RECOMMENDATIONS

This investigation assesses the obstacles and inadequacies faced by individuals with disabilities when visiting the Sakarya Karaman Barrier-Free Nation's Garden, drawing upon comprehensive observations and analyses. The results indicate that the garden fails to adequately comply with universal design principles, necessitating substantial enhancements in accessibility and functionality.

An examination of the access routes to the garden underscores the necessity for disability-accommodating gradients and surfaces. The existing pathways present considerable mobility challenges for wheelchair users and visually impaired visitors. Access roads and internal walkways require redesign to incorporate smoother, more traversable surfaces. Moreover, the integration of tactile guidance systems for visually impaired individuals is crucial to enable autonomous navigation.

Internal pathways and recreational areas must be constructed with appropriate widths and inclines to accommodate wheelchair users, ensuring sufficient maneuverability for individuals with disabilities. Consistent upkeep and safety protocols for children's play zones are imperative. The current enclosed play areas, which establish both tangible and intangible barriers, marginalize children with disabilities from social inclusion. A fundamental restructuring of these spaces to promote inclusivity and safety is essential.

The garden's athletic facilities demand accessibility-oriented improvements. It is vital to reconfigure these areas to incorporate sports amenities tailored for individuals with disabilities. The implementation of level surfaces and suitable ground materials can significantly enhance the usability of these spaces. The introduction of adaptive sports equipment will ensure that physical activities and leisure pursuits are accessible to all visitors.

The provision of lucid and accessible signage and information displays is crucial for directing visitors to various sections and amenities within the park. Signage should incorporate Braille to assist visually impaired individuals in navigating independently. Directional indicators designed to meet the needs of all users will markedly improve the park's overall usability.

Resting areas and pergolas should undergo evaluation and redesign to enhance accessibility and comfort. These spaces must cater to the requirements of individuals with disabilities, featuring

elements such as height-adjustable seating, spacious rest areas, and shaded zones. Such modifications will create more accommodating and inclusive relaxation spaces.

This study delineates the requisite measures to address the accessibility and usability challenges in the Sakarya Karaman Barrier-Free Nation's Garden. The implementation of these recommendations is crucial for transforming the garden into an inclusive environment that can be enjoyed by all visitors. Furthermore, the insights gleaned from this investigation can serve as a blueprint for improving accessibility in comparable public spaces

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