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Method Approach to Landscape Design of Child-Friendly Green Space for Post Disaster Children's Recovery

A Case Study: Elementary School Environment in Cianjur Earthquake-Affected Areas West Java Indonesia

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Abstract

Natural disasters, particularly earthquakes, can have severe and long-lasting impacts on children, affecting their physical, emotional, and social well-being. This research investigates the role of landscape design, specifically child-friendly school green spaces, in supporting children's recovery after such disasters. Focused on the aftermath of the 2022 Cianjur earthquake in Indonesia, this study aims to develop guidelines for designing schoolyard environments that enhance resilience and recovery in children. Using a mixed-methods approach, the research combines qualitative data from interviews and focus groups with quantitative data from surveys and observations, conducted across elementary schools in the Cugenang District, a region severely impacted by the earthquake. The findings are expected to provide evidence-based recommendations for creating therapeutic and restorative green spaces within school environments, contributing to the development of resilient communities in disaster-prone areas. The study highlights the need for integrated landscape design that considers children's emotional and social needs as part of disaster recovery and resilience strategies.

Keywords

Child-friendly green spaces, landscape design, school environments, resilience, post-disaster recovery.

1. Introduction

Natural catastrophes, such as earthquakes, can profoundly and devastatingly affect communities, leading to extensive damage, fatalities, and forced relocations. This traumatic event can have a profound and lasting impact on children's well-being, academic achievement, and physical and social development (Norris et al., 2002; Greca, 2006; Pfefferbaum et al., 2012). As defined by the United Nations Convention on the Rights of the Child (1989), a child is anyone below the age of 18, unless the age of majority is reached earlier under national legislation (Nations, 1989). Children comprise the majority of individuals impacted by disasters (Gaillard and Pangilinan, 2010; Muzenda-Mudavanhu, 2016; Amri et al., 2018). Children can interact with peers in a secure and supportive school setting, participate in educational activities, and receive emotional support from teachers and parents (Prinstein et al., 1996; Franks, 2004; Dombo and Sabatino, 2019). By offering opportunities for social interaction, outdoor play, and physical movement, well-designed schoolyards can enhance the therapeutic and restorative benefits of educational settings (USLU and KÖRMECLİ, 2016). Despite their significance, the design of school environments is often overlooked in broader discussions on disaster recovery. However, it represents a critical yet understudied opportunity to promote resilience, disaster mitigation, and recovery process.







This Research addresses a significant gap in existing knowledge by investigating the impact of landscape design on the recovery of children in school environments following natural disasters. By expanding the understanding of how well-designed environments can enhance children's recovery (Mooney et al., 2021; Atmodiwirjo et al., 2023), this study has the potential to shape policies and practices for the development of more resilient communities.

Although there is an increasing recognition of the importance of schoolyard design for the wellbeing of children, there is limited understanding of the specific contribution of landscape design in facilitating the recovery of children from natural disasters. Current studies on schoolyard design primarily focus on its impact on children's physical activity and social interactions, overlooking a thorough exploration of its potential therapeutic and restorative benefits (Bell and Dyment, 2008; Health, 2017; Russo and Andreucci, 2023). The absence of evidence-based guidelines for designing school environments in the context of recovery post-natural disaster poses a challenge for educators, landscape architects, government, and related stakeholders involved in the planning and design process. Ensuring that schoolyards are adapted to facilitate children's recuperation and resilience following natural catastrophes (Taylor et al., 1998; Dadvand et al., 2015) is challenging without clear guidelines.

This research aims to develop landscape design criteria, modelling and guidelines for childfriendly school green spaces in areas of Indonesia vulnerable to natural disasters. Using a case study approach, the research will examine the impact of school green space design on supporting children's recovery in the aftermath of natural disasters in Indonesia. Employing a mixed-methods approach, the data collection will be conducted in two phases: initial qualitative data collection followed by a second quantitative data collection (Creswell, 2014). The data collection will commence by gathering secondary data before fieldwork. Subsequently, it will involve observations, surveys, and workshops with children, as well as focus group discussions with parents, teachers, community members, and various stakeholders directly affected by the repercussions of natural disasters. The research findings aim to contribute to the development of evidence-based guidelines for designing school environments that effectively support children's recovery and resilience in the aftermath of natural disasters.

2. Material and Method

This research employs a case study approach with a mixed-method design. The case study aims to assess the effectiveness of landscape design in identifying suitable green space sites for post-natural disaster recovery within elementary school environments. Elementary schools, centrally located within communities, provide accessible locations for children and integrate research activities into their curriculum, enhancing educational experiences and preparing children for recovery. This study aims to illuminate children's needs and the potential of landscape design in facilitating post-disaster recovery. The findings will refine landscape design models and provide recommendations for creating child-friendly green spaces.

Focused on the landscape design of child-friendly school green spaces for post-disaster recovery, the case study is situated against the backdrop of the 2022 Cianjur earthquake in West Java, highlighting the impact on children's well-being and the importance of green spaces, particularly within elementary schools. A UNICEF report emphasizes the urgency of this research, indicating that 37% of the total deaths in Cianjur were children under 15 years old, underscoring the significance of the study.

The selection of the case study location is based on criteria for observation and surveys to collect qualitative and quantitative data. The Cugenang District, with a high-risk index and proximity to the earthquake's epicenter, is chosen due to its intersection with the Cugenang Fault. The district encompasses 52 public and 3 private elementary schools across 16 villages.





One elementary school will be selected to represent the earthquake-affected environment. The research specifically focuses on elementary school children, whose age range falls within middle childhood, from a psychological perspective.



Figure 2 Case Study selection

To achieve the research objectives, this study will employ a mixed-methods approach for data collection. The data collection process for this study involves a diverse set of participants, including students, parents, teachers, members of communities, and various stakeholders who have directly encountered the repercussions of natural disasters. To gain a comprehensive understanding of experiences and preferences related to green spaces in child-friendly schools for post-disaster recovery, this study begins with qualitative data collection. Employing a qualitative phenomenological approach, the research aims to investigate the experiences, perspectives, and needs of children in the aftermath of natural disasters.

Phenomenological studies, as explained by Creswell and Poth (2018), aim to elucidate the shared meanings individuals attribute to their lived experiences of a concept or phenomenon. In this context, the focus is on delineating shared elements among participants as they navigate the aftermath of a natural disaster, constructing meaning from their subjective experiences (Mooney et al., 2021). The study specifically investigates children's varied perspectives within their school environment, striving to capture the nuanced effects of a disaster across various age groups.







To ensure a comprehensive understanding, data will be gathered not only from the children but also from their parents, teachers, and stakeholders. This multi-perspective approach not only enriches the information gathered from the children but also enables cross-referencing of data between participants (Mooney et al., 2021). Recognizing the diverse circumstances and perceptions of different participants affected by disasters, Lei (2014) underscores the importance of considering this diversity in experiences and perspectives. This approach ensures a thorough exploration of the impact of disasters, acknowledging the unique perspectives brought forth by each participant group.





Figure 3 Case Study Location (google map, 2023)



Figure 4 Participant's selection



Figure 5 Data Collection Method

3. Findings and Discussion

The results from the methodology outlined above would likely include findings related to the effectiveness of landscape design in identifying suitable green space sites for post-natural disaster recovery within elementary school environments. These findings may evaluation of the identified green space sites, integration of research activities into the curriculum, children's needs and the potential of landscape design, specific insights from the chosen case study location, and recommendations for future child-friendly landscape design guidelines for recovery in elementary schools. Overall, the results would provide valuable insights into the role of landscape design in promoting children's recovery from natural disasters and contribute to the development of evidence-based guidelines for creating resilient and child-friendly environments in disaster-prone areas.

The discussion section of the research could delve into various aspects and implications based on the outlined methodology. Firstly, it could analyze the efficacy of landscape design in identifying suitable green space locations for facilitating recovery after natural disasters within elementary school settings. This analysis would examine how well-designed green spaces contribute to children's overall well-being and resilience in the aftermath of such events. The research explores the integration of research activities into the elementary school curriculum and its impact on children's educational experiences and preparedness for recovery. This aspect would investigate the potential benefits of incorporating research-based learning activities into the curriculum to enhance children's understanding of disaster preparedness and response strategies. Furthermore, this could address the identified needs of children following natural disasters and how landscape design can effectively address these needs. This analysis would shed light on the role of green spaces in providing avenues for social interaction, play, and emotional support for children who have experienced traumatic events.

Moreover, it is focus on refining existing landscape design models and developing evidence-based guidelines for creating more effective and child-friendly green spaces. This aspect would offer specific recommendations for enhancing design criteria and implementing strategies based on the research findings. Additionally, reflections on insights gained from the chosen case study location, particularly in the context of the Cianjur earthquake in West Java, could provide valuable contributions. This would involve discussing the specific challenges and opportunities encountered in supporting children's recovery within the affected community, emphasizing the significance of green spaces within elementary schools for facilitating this process. Finally, the result might offer recommendations for future research endeavors and practical implications for landscape design projects aimed at supporting post-disaster recovery





in similar contexts. This could include suggestions for further studies to explore additional factors influencing children's recovery and strategies for implementing evidence-based design guidelines in disaster-prone areas. Overall, the discussion section would provide a comprehensive analysis of the research findings and their implications for theory, practice, and future research directions in the field of landscape design for post-disaster recovery in elementary school environments.

4. Conclusion

The research findings underscore the critical role of landscape design in promoting children's recovery and resilience in the aftermath of natural disasters. By integrating research activities into the curriculum, refining design models, and addressing children's specific needs, the study offers valuable insights and recommendations for creating more effective and child-friendly green spaces in elementary school environments.

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