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**Enhancing Youth Resilience in Disaster Risk Reduction: Insights from a
systematic literature review**

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Abstract

This systematic literature review examined youth resilience in disaster risk reduction, addressing young people's heightened vulnerability to natural disasters. Following PRISMA guidelines, researchers analyzed peer-reviewed articles from 2021- January 2025, screening 1,657 studies and including 52 that met the criteria. Key findings identified five critical factors for building youth resilience: engagement and empowerment, mental and emotional health, education and capacity development, community and family support, and technology integration. The study emphasizes the need for targeted strategies and coordinated collaboration between youth and institutions. Future research should evaluate intervention sustainability and examine how cultural differences impact youth resilience outcomes in disaster-prone regions.

Keywords: disaster risk reduction; youth; resilience; systematic literature review

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1.0 Introduction

Over the past decade, natural-induced disasters such as floods, earthquakes, typhoons, and forest fires have intensified in frequency and severity, profoundly impacting human life, infrastructure, and the global economy. Community empowerment and resilience, particularly among youth, play a crucial role in Disaster Risk Reduction (DRR). Youth represent a vibrant and innovative demographic with significant potential to build disaster-resilient communities (Forbes-Genade & Van Niekerk, 2019; MacDonald et al., 2023). Nevertheless, the involvement of youth in DRR is not given enough attention in relevant policies and programs. This scholarly article aims to systematically organize and critically analyze contemporary research concerning the resilience exhibited by young individuals in the face of disasters. The primary objective is to explore the diverse factors that enhance the resilience of youth.

Being resilient means individuals or communities can recover and adjust after facing disruption or disaster (Cerè et al., 2017; Thornley et al., 2015). The purpose of youth resilience in DRR is to give them skills to respond to disasters and involve them in taking action to protect their community (Atmojo et al., 2023). Youth provide protection and also assist their communities in getting ready for as well as handling disasters (Topno, 2021).

Many experts are now focusing on how youth can be more involved in disaster risk reduction due to the rising scale and urgency of climate change. A common definition of youth empowerment is when young people gain power, skills, and self-assurance to impact their lives and the communities around them (Jennings et al., 2006). In DRR, youth empowerment means giving them the knowledge, abilities, and resources that allow them to participate in preparing for, dealing with, and recovering from disasters (United Nations Office for Disaster Risk Reduction, 2020).

2.0 Literature Review

2.1 Current Initiatives in Youth Engagement in DRR

The theme for the 2024 International Day for Disaster Risk Reduction, "Empowering the Next Generation for A Resilient Future," stresses the importance of youth in DRR activities (United Nations for Disaster Risk Reduction, n.d.). UNDRR believes in empowering youth to take part in planning and using new ideas to face climate difficulties as well as increase disaster resilience globally. This thematic focus ties in with worldwide efforts calling for youth to be involved in decision-making, with an urgent need for more support for youth-driven initiatives aimed at making the world resilient in disasters.

Youth are now considered valuable players in disaster risk reduction, not only because they are vulnerable. Young people in Canada are appreciated for having technical knowledge, creativity, and new ideas that support DRR efforts (Cox et al., 2019). The Youth Creating Disaster Recovery and Resilience (YCDR) project demonstrates how using creative arts can be valuable in helping young people share their experiences of disasters as well as the recovery process (Fletcher et al., 2016). Studies have found that more youth are becoming involved in disaster risk reduction, showing their support through policy work as well as creative projects in accordance with the UNDRR's Words into Action guidelines (United Nations Office for Disaster Risk Reduction, 2020). Australian community planning initiatives highlight the valuable role youth play in reducing disaster risks (Fernandez & Shaw, 2013; Heffernan et al., 2024).

Ronan et al. (2015) point out that young people help increase awareness of disasters in their communities. Young people help others by sharing knowledge, which creates a culture of preparedness in their communities. Engaging youth in disasters includes using social media and apps to gather needed resources as well as get important information (Bonati et al., 2023; Sobowale et al., 2020).

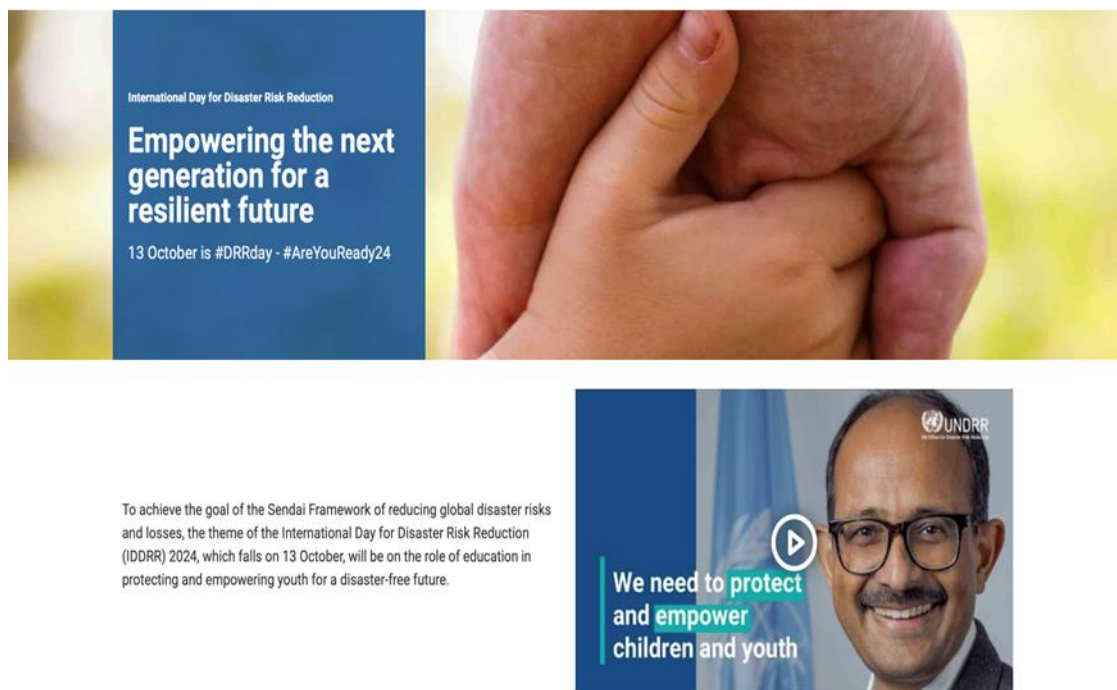


Figure 1: The International Day for Disaster Risk Reduction (IDRR) 2024 website shows its theme of "Empowering the next generation for a resilient future"

3.0 Material and Methods

3.1 Identification

This systematic review employed three critical steps for selecting relevant publications. During the exploratory phase, keywords were identified using thesauri, lexicons, encyclopaedic references, and existing research. Search strings were subsequently formulated for Scopus and Web of Science databases (Table 1), incorporating all relevant keywords. A total of 1,657 publications were procured from both databases during the initial systematic review phase.

Table 1. The search string

Scopus	TITLE-ABS-KEY ((youth OR adolescent OR teen* OR "young people" OR "young person") AND (resilien* OR volatile OR "quick to recover" OR rebound* OR tough OR strong) AND ("disaster" OR flood OR earthquake OR tsunami OR landslide OR drought OR storm OR wildfire OR "extreme temperature" OR "volcanic activity" OR "climate change" OR "DRR" OR "disaster risk reduction")) AND (LIMIT-TO (SUBJAREA , "SOC")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2023) OR LIMIT-TO (PUBYEAR , 2024) OR LIMIT-TO (PUBYEAR , 2025))
	Date of access: January 2025
Web of Science	(youth OR adolescent OR teen* OR "young people" OR "young person") AND (resilien* OR volatile OR "quick to recover" OR rebound* OR tough OR strong) AND ("disaster" OR flood OR earthquake OR tsunami OR landslide OR drought OR storm OR wildfire OR "extreme temperature" OR "volcanic activity" OR "climate change" OR "DRR" OR "disaster risk reduction") (Topic) and Article (Document Types) and English (Languages) and 2025 or 2024 or 2023 or 2022 or 2021 or 2020 (Publication Years) and Social Sciences Other Topics (Research Areas)
	Date of access: January 2025

3.2 Screening

The screening procedure analysed potentially pertinent research materials to identify content corresponding with established research questions. Content criteria focused on youth resilience within DRR contexts. All duplicate articles were eliminated during this phase. Preliminary screening excluded 1,567 publications, while the subsequent phase evaluated 90 papers according to diverse exclusion and inclusion criteria shown in Table 2. The predominant criterion utilized was literature (research papers), excluding reviews, meta-syntheses, meta-analyses, books, book series, chapters, and conference proceedings. The review was confined to English-language publications spanning 2021- January 2025. One (1) publication was rejected based on duplication criteria.

Table 2. The selection criterion is searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2021 – January 2025	< 2021
Literature type	Journal (Article)	Conference, Book, Review
Subject Area	Social Science	Non-Social Science

3.3 Eligibility

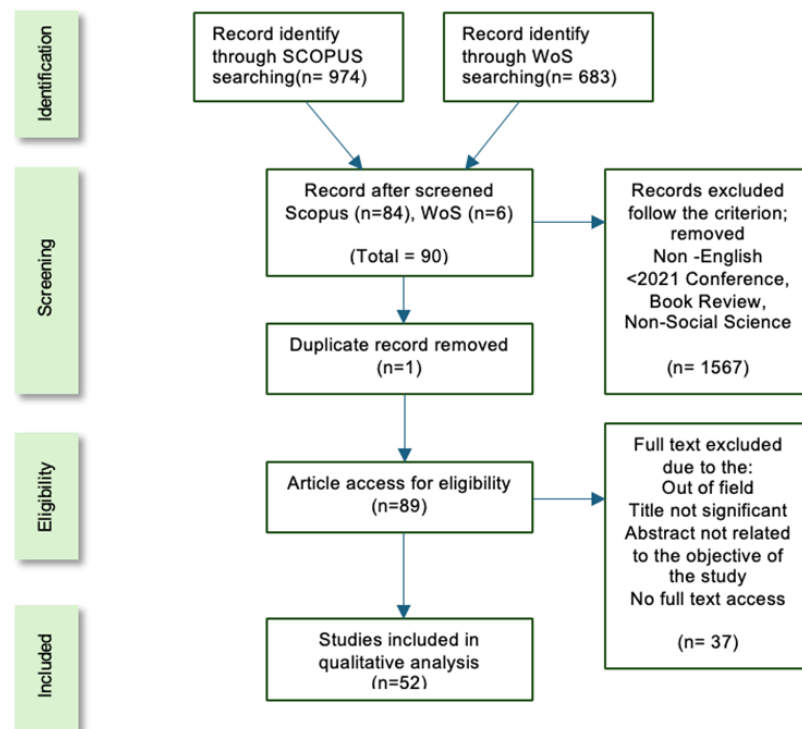


Figure 2: Flow diagram of the proposed search study (Moher et al., 2009)

During the third phase, 89 articles were compiled for eligibility assessment. Thorough scrutiny of titles and fundamental content validated concordance with inclusion criteria and research objective relevance. Consequently, 37 articles were excluded for reasons including being out-of-field, insignificant titles, irrelevant abstracts, and absence of full-text access with empirical evidence. A total of 52 articles remained for review.

3.4 Data Abstraction and Analysis

As illustrated in Figure 2, integrative analysis served as the principal evaluative methodology for examining and synthesizing diverse quantitative research paradigms. The comprehensive inquiry aimed to identify relevant themes and subcategories. The authors thoroughly examined 52 publications for pertinent statements or content, maintaining meticulous logs throughout data analysis. Two specialists, one in community studies and another in disaster management validated the analysis to ensure each subtopic's clarity, significance, and relevance, establishing domain validity.

4.0 Findings

A comprehensive review of 52 selected literature on youth resilience in DRR identified five themes: (i) Youth Engagement and Empowerment, (ii) Mental and Emotional Health, (iii) Education and Capacity Development, (iv) Roles of Community and Family, and (v) Technology Integration. These themes were developed based on recurring concepts and findings across multiple studies, ensuring a robust representation of diverse factors influencing youth resilience.

4.1 Youth Engagement and Empowerment in Disaster Risk Reduction (DRR)

Youth Engagement and Empowerment in DRR emphasizes the critical importance of incorporating young individuals as active participants in disaster preparedness and mitigation. This thematic focus encompasses extensive strategies involving youth in risk-reduction efforts, decision-making processes, and advocacy activities across local and global contexts. It has emerged as crucial for enhancing community resilience and sustainability. Various studies emphasize that empowering youth to participate actively in disaster management generates innovative solutions and fosters a preparedness culture. Pickering et al. (2022) highlight involving youth through methodologies like Photovoice, providing platforms for young people to share perspectives while helping stakeholders understand diverse youth perceptions of disaster risk and climate change. They identified themes of youth-adult partnerships, political action, and accessibility, which are essential for inclusive youth approaches. Similarly, Dixon et al. (2022) evaluated a successful youth-led program in Myanmar, where youth were trained as Landslide Response Volunteers operating community-based landslide early warning systems. This participatory engagement empowered youth in disaster preparedness while building broader local community resilience.

However, several articles highlight the challenges youth face in achieving recognition and influence in disaster management policy-making. Chigwanda et al. (2023) critically analyzed adolescent girls' participation in climate action in Zimbabwe's rural Eastern Highlands, emphasizing structural change importance for overcoming barriers to adolescent girls' agency. The study viewed adolescent girls as potential change agents capable of affecting local climate action. This aligns with Vogel et al. (2022), describing young activists' and local government officials' journeys in South Africa to gain policy table seats on climate change. The results here show that youth want to participate in social and political decisions, pointing out that appropriate training, platforms, and development allow them to play a role in policy-making.

4.2 Mental and Emotional Health in Youth Resilience

By exploring mental and emotional health, it becomes clear that adolescents experience various results as well as feelings from natural disasters, including post-traumatic stress disorder (PTSD), anxiety, changing in their resilience. An et al. (2022) reported that academic burnout and post-traumatic growth are connected to PTSD changes in adolescent survivors of the Yancheng Tornado in China. Among these survivors, researchers identified three distinct patterns: recovery, recurrent dysfunction, and delayed dysfunction. Edwards et al. (2024) expanded this understanding by investigating relationships between multiple natural disasters and self-harm/suicidal behavior among Australian adolescents, revealing that fire and flood exposure increased suicidal ideation risk, while recurrent droughts appeared to build resilience over time, suggesting a complex interplay between risk and protective mental health factors.

Liang et al. (2021) examined modulatory associations between PTSD symptoms and creative thinking in adolescents exposed to the Lushan Earthquake, demonstrating that high-trait resilience moderated PTSD's detrimental influences on creative thinking, indicating resilience may promote cognitive expansion when facing trauma. Philip and Vithya (2023) examined flooding's impact on mental health and resilience among Kerala, India adolescents, revealing higher depression, anxiety, and stress levels among flood-affected adolescents compared to unaffected peers, emphasizing psychological support services and preparedness training needs (Dedić et al., 2023).

Börner (2023) introduced the EMPOWER framework incorporating emotions into disaster preparedness strategies through a participatory community-based study of São Paulo, Brazil youth, revealing that participants often normalized risks and used humor for emotional coping, yet consciously acknowledging and validating feelings facilitated hope and individual coping behaviors. Simon et al. (2022) investigated the Climate Change Anxiety Scale (CCAS) psychometric properties among Filipino adolescents, reporting that climate anxiety's cognitive-emotional component significantly mediated links between climate change experience and behavioral engagement in climate mitigation.

Such studies reveal that mental and emotional health is vital for building resilience in disaster situations. It shows that resilience can still be improved through personality traits, support systems, and aspects of the trauma experienced, thus directing interventions for mental well-being in disaster-affected youth.

4.3 Education and Capacity Development

In modern disaster risk reduction, education and capacity development act as key pillars, enabling youth to understand risks better, strengthen their communities, as well as be ready to respond to disasters. This research review explores new directions in educational innovation, covering revolutionary learning models, innovative methods for teaching, and active educational techniques.

Digital technologies are now a key part of how disaster education is taught. Bell et al. (2024) introduced digital curricula that involved intergenerational storytelling to increase children's participation in El Niño disaster preparation in Peru, proving that digital platforms can revolutionize disaster education by offering interactive online learning. This view is supported by Sakurai and Shaw's (2022) research on cloud-based learning platforms, which found significant improvements in Japanese high school students' awareness of disaster risks.

The effectiveness of working in multiple fields is highlighted by Atmojo et al. (2023), who thoroughly reviewed the SETS (Science, Environment, Technology and Society) disaster education model in Indonesia. Students experienced major improvements in their resilience and skills to deal with disasters due to the program's empirical validation. Experts in the field now see storytelling that involves people and creativity as major transformative forces. Heinemeyer et al. (2024) found that using these storytelling approaches in climate change classes allows young people to collaborate with the community and develop emotional as well as social skills. In addition, Leckey et al. (2021) concluded that filmmaking for local climate change coverage opens up meaningful ways to explore community challenges, encouraging more people to take action on climate change.

Innovative teaching practices involve multimedia integration, as seen in Sujinah et al.'s (2023) use of digital comics to teach disaster mitigation, making learning about such topics more engaging by including visual arts. Those with superior metacognitive abilities were found to be much more prepared emotionally and physically.

According to Khan (2021), educational responses in times of crisis demonstrate their adaptability by aiding youth in handling life transitions affected by several crises at once. Likewise, Finnegan (2023) noted that digital education encourages English secondary school students to be hopeful and take action about climate change, sharing strategies that include both hope as well as emotional intelligence training using digital tools.

4.4 Roles of community and family

Having strong communities and families helps youth become more resilient when recovering from disasters as well as preparing for them. Modern research shows that youth resilience is enhanced by community support, family relationships, educational programs, and culturally sensitive strategies that work together to protect as well as support them.

According to Parrott et al. (2023), survivors of the 2018 earthquake in Central Sulawesi, Indonesia, noted that being part of the community and sharing experiences with others in the community were the main resilience factors greatly affected by the networks of caregivers, teachers, as well as peers. McDonald-Harker et al. (2021) found that participating in community sports gives young people a safe place to socialize, share their experiences, and learn how to manage difficulties (McDonald-Harker et al., 2021). Udas et al. (2021) showed that having youth lead projects in rural British Columbia, Canada, increased their resilience by promoting community responsibility and links.

Family involvement is a key part of resilience. A ten-year longitudinal study by Niu et al. (2021) observed that Tibetan adolescents who had family support and higher academic performance became more resilient thanks to increased self-esteem, better coping abilities, and enhanced social skills. Culture-minded intervention programs have supported the family approach, showing important benefits for mental health and coping.

Educational institutions play a part in strengthening communities in two important ways. According to Edmeade and Buzinde (2022), educators in the US Virgin Islands offered formal educational lessons as well as counseling after disasters, assisting students with their psychological issues and helping build community resilience.

Being culturally responsive is very important in intervention. According to Niu et al. (2021), programs that consider Tibetan traditions and values perform better in strengthening the psychosocial well-being of adolescents. The same idea is supported by Pimprikar et al. (2023), who pushed for using indigenous practices as well as knowledge in disaster risk management, noting that such strategies are more effective and can be sustained over the long term.

4.5 Technological innovation in youth resilience and disaster risk reduction

Technological innovation plays a major role in improving how young people withstand disasters, allows for more ways for them to get involved, and boosts their community's ability to be prepared for emergencies. Besides technology, youth engagement includes being active leaders and rallying others in the community.

Social media platforms are important tools for youths to coordinate disaster response. In the case of Nepal's earthquakes, youth networks depended on Facebook, WhatsApp, and Viber to help spread information and organize crowd-sourced aid during governmental response gaps (Dabral et al., 2021; Khan, 2021). Educational technologies, particularly photo-based digital comics, represent innovative disaster mitigation pedagogies that combine visual and narrative elements to enhance concept accessibility while promoting critical thinking and cultural relevance through local wisdom integration (Sujinah et al., 2023). Digital storytelling and filmmaking programs further empower youth as science communicators and environmental advocates through local environmental change exploration (Leckey et al., 2021). Long-term resilience building is exemplified through initiatives in Muroran City, Japan, where cloud-based platforms

facilitate personalized DRR education, transforming knowledge into actionable preparedness measures (Sakurai & Shaw, 2022). Japan's Society 5.0 vision demonstrates comprehensive digital governance integration, aligning technology with DRR objectives to create inclusive, resilient communities through tailored services and strategic risk communication.

Technology fundamentally enhances youth resilience by fostering engagement, facilitating knowledge dissemination, and enabling context-specific solutions, positioning youth as innovators, communicators, and mobilizers within increasingly complex risk landscapes.

5.0 Discussion

The findings collectively demonstrate that youth resilience in disaster contexts emerges through a multifaceted interplay of individual, social, and systemic factors. Mental and emotional well-being serves as a foundational element, with research indicating that resilience capacity can be enhanced through targeted interventions addressing personality development, support network strengthening, and trauma-informed approaches. Educational initiatives and capacity-building programs constitute critical pillars in contemporary disaster risk reduction frameworks, empowering youth with essential knowledge and skills while fostering innovative pedagogical approaches that emphasize active learning and community preparedness. The significance of social cohesion is particularly evident, as robust family and community support systems create protective environments that facilitate both disaster recovery and preparedness efforts. Furthermore, youth demonstrate strong motivation for civic engagement and participation in policy-making processes, though this potential requires appropriate platforms, training opportunities, and institutional support to be fully realized. Technology emerges as a transformative force in this landscape, not only enhancing engagement and knowledge sharing but also enabling youth to assume roles as innovators and community mobilizers within increasingly complex risk environments. These interconnected dimensions suggest that effective youth resilience strategies must adopt holistic approaches that simultaneously address psychological well-being, educational empowerment, social support systems, civic participation, and technological integration.

6.0 Conclusion & Recommendations

Within DRR contexts, youth involvement encompasses three key aspects: youth as disaster victims, youth as change agents, and community empowerment for youth (United Nations Office for Disaster Risk Reduction, 2015). These aspects provide comprehensive perspectives on youth involvement, acknowledging vulnerabilities and proactive participation potential. The alignment between selected themes and the three key aspects validates their relevance and significance in DRR and youth resilience discourse (Figure 3).

Table 3. Alignment of four themes with three aspects of Youth in DRR

Theme	Alignment with 3 Aspects of Youth in DRR (Sendai Framework)		
	Youth as Victims of Disasters	Youth as Agents of Change	Community Empowerment for Youths
	Para 19(d): It (DRR) also requires empowerment and inclusive, accessible, and non-discriminatory participation, paying special attention to people disproportionately affected by disasters, especially the poorest.	Para 7: The government should engage with relevant stakeholders, including youth, in designing and implementing policies, plans, and standards. Para 19(d): A gender, age, disability, and cultural perspective should be integrated into all policies and practices, and women and youth leadership should be promoted. Para 36(a)(ii): Youth as agents of change should be given the space and modalities to contribute to DRR.	Para 19(d): DRR requires an all-of-society engagement and partnership.
Youth Engagement and Empowerment		✓	
Mental and Emotional Health	✓		✓
Roles of Community and Family			✓
Education and Capacity Building	✓	✓	
Technology Integration	✓	✓	

This comprehensive review elucidates youth's multifaceted positioning within DRR frameworks, revealing complex interactions between youth agencies, policy-making, digital participation, gender dynamics, and social innovations. Youth function simultaneously as vulnerable populations and transformative change agents, necessitating inclusive platforms positioning them as resilience co-creators. Youth demonstrate substantial contributions across policy engagement, community mobilization, early warning systems, social innovation, and participatory research, advancing climate and community resilience. Strategic youth-led approaches surmount structural barriers while promoting social integration.

Several limitations warrant acknowledgment in this review. The synthesis primarily draws from English-language publications, potentially excluding valuable insights from non-English research and limiting cultural diversity in findings. Variations in methodological approaches across reviewed studies may affect the comparability and generalizability of results. The rapidly evolving nature of disaster contexts and technological innovations means some findings may have limited temporal relevance. Additionally, the predominant focus

on specific geographic regions or disaster types may restrict the applicability of conclusions to diverse global contexts. Future research should prioritize cross-cultural studies, standardized methodologies, and longitudinal designs to address these constraints.

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Paper Contribution to Related Field of Study

This paper contributes to the field by deepening the understanding of youth resilience in flood disaster contexts. It contributes to community-level resilience strategies, supporting more youth-inclusive disaster risk reduction policies and practices.

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