Predictive Model of Community Disaster Resilience Across Serbia: A BRIC–DROP Composite Index and Spatial Patterns

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Article

Predictive Model of Community Disaster Resilience Across Serbia: A BRIC–DROP Composite Index and Spatial Patterns

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Abstract

Community disaster resilience is increasingly guiding risk-reduction investments, but in many Southeast European settings, comparable subnational data remain scarce. This study develops and tests a predictive model of perceived community disaster resilience across Serbia by combining BRIC–DROP dimensions into a single index and analyzing differences across hazard types and sociodemographic factors. A cross-sectional household survey was conducted using multistage random sampling and the "next birthday" method for respondent selection. The final sample included 1, 1,200 adults from 22 local government units across four regions: Belgrade, Vojvodina, Šumadija & Western Serbia, and Southern & Eastern Serbia. Participants evaluated preventive measures and societal resilience for ten hazard types and considered five social dimensions: social structure, social capital, social mechanisms, social equity/diversity, and social beliefs. Descriptive statistics, bivariate analyses (including Pearson correlations, t- tests, and ANOVA), and multiple linear regression identified key predictors of preventive behavior and perceived resilience. Composite scores highlighted spatial resilience differences. Overall perceptions mostly fell below the midpoint, with the highest ratings for pandemic/epidemic preparedness (M = 2. 32), storms/hail (M = 2. 24), and floods (M = 2. 15). The lowest ratings were for environmental pollution (M = 1. 81) and droughts (M = 1. 87). Perceived societal resilience was highest for snowstorms (M = 2. 30), storms/hail (M = 2. 28), and pandemics/epidemics (M = 2. 26), and lowest for environmental pollution (M = 1. 91) and droughts (M = 1.87. 98). Respondents reported strong family ties (M = 3. 05) and good communication and supply access (e. g., communication tools M = 3. 19; water/food access M = 3. 07), but weak institutional capacity, especially in areas like budget allocation (M = 1. 84), early warning/public notifications (M = 2. 11), rapid decision- making without bureaucracy (M = 2. 08), and evacuation/shelter capacity (M = 2. 12). Regression results were statistically significant but explained only a small portion of variance (perceived resilience R^2 = 0. 051; preventive measures R^2 = 0. 060). Age and employment in the public sector positively predicted perceived resilience; fear, income, and, to a lesser extent, education showed negative associations. These findings highlight the structural

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and psychosocial factors that shape perceptions of resilience. The BRIC–DROP composite indicates generally low perceived preparedness and resilience, especially in risk communication, evacuation and shelter readiness, and financing—the key bottlenecks in strengthening local resilience. The results recommend combining institutional reform with targeted risk communication to reduce fear and build trust, especially focusing on hazard areas with the lowest confidence, such as environmental pollution and drought.

Keywords: community disaster resilience; BRIC–DROP; composite index; preventive measures; early warning; social capital; public-sector capacity; Serbia; spatial disparities; survey-based modeling

1. Introduction

Community disaster resilience has evolved from an aspirational concept into an essential practical focus for governments, emergency services, and local communities (Chapagain, Hochrainer-Stigler, Velev, Keating, & Mechler, 2025; Cvetković et al., 2025; Kessel et al., 2025). It increasingly guides disaster risk reduction (DRR) investments, enhances preparedness, and enables faster recovery after disruptions (Cvetković, 2023; Cvetković & Ivković, 2022; Cvetković, Rikanović, & Knežević, 2022; Cvetković et al., 2023). While resilience is often viewed as a broad trait of places, current research highlights that it depends on communities' ability to anticipate threats, manage impacts, adapt to changing conditions, and sustain critical functions under pressure (Arneson, Deniz, Javernick-Will, Liel, & Dashti, 2022; Cvetković & Šišović, 2024; Fisher & Porod, 2024; Jewett, Mah, Howell, & Larsen, 2021; Milenković & Cvetković, 2025). Despite these conceptual advances, many regions still lack detailed local data showing where resilience is weaker, which aspects are most vulnerable, and how residents perceive preparedness in daily life (Cvetković, 2016, 2025; Cvetković, Gole, Renner, Jakovljević, & Lukić, 2024; Ibrahim, Hassan, Saulnier, & Blanchet, 2025; Jones & Tanner, 2016; Kieu & Senanayake, 2023). These differences are driven by complex demographic, socioeconomic, and psychological factors influencing risk perception, resource access, and protective action (Gilbert, 2010; Ni et al., 2025). Additionally, while climate change may increase hazard frequency and intensity, the severity of impacts often depends mainly on non-climatic factors (Hochrainer-Stigler et al., 2021).

Historically, resilience emerged in the mid-nineteenth century and has become a core concept in climate adaptation and DRR studies, playing a key role in global policy frameworks such as the Sendai Framework and the Sustainable Development Goals (Hochrainer-Stigler et al., 2021; Zaman & Raihan, 2023). From a governance viewpoint, social resilience evidence is particularly valuable, aiding local decision-makers in choosing and applying preventive measures in disaster-prone communities (Cvetković & Ivković, 2022). Academic literature often views community disaster resilience as a multi-level concept—encompassing individuals, families, and social groups—and focuses on maintaining social order and functionality during and after major events (Cvetković & Šišović, 2024; Zaman & Raihan, 2023). This focus explains why resilience has become a key social goal for researchers and policymakers across multiple disciplines and sectors (Cvetković, 2023).

Recent research consistently concludes that community resilience should be viewed as a dynamic process rather than a fixed characteristic. It is commonly defined as enhancing a community's capacity to prepare for, absorb, recover from, and adapt more effectively to adverse events—whether actual or anticipated—promptly and efficiently (Zhao et al., 2025). More detailed descriptions specify that this process involves the abilities to adapt and transform, absorb and anticipate, prepare and prevent, self-organize and connect, include diverse groups, and manage hazards (Kessel et al., 2025). Importantly, this adaptive capacity is not solely a response to failure; it also involves reducing risk and limiting the impacts of crises at the community level (Zhai & Lee, 2024). In public health and social resilience frameworks, resilience is similarly characterized as an adaptive process operating across individual, community, and system levels to maintain positive outcomes despite hazards and crises (Hall et al., 2023). This process is facilitated by interconnected

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adaptive capacities such as economic development, social capital, information dissemination, and community competence, which collectively influence how communities respond to disturbances or adversity (Dückers, 2017; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2007). These capacities are often categorized into absorptive, adaptive, anticipatory, and transformative types—supporting recovery through assets, adjusting to adverse conditions, predicting and preventing vulnerabilities, and enacting system alterations to address new realities (Hall et al., 2023).

Simultaneously, resilience outcomes do not affect all populations equally. Empirical data show that community resources and disaster exposure can directly impact individual psychological resilience and alter how exposure affects adaptive outcomes (Lowe, Sampson, Gruebner, & Galea, 2015).

Socioeconomic status and higher income levels are often identified as key predictors of better adaptation following societal shocks and crises (Schäfer et al., 2024). Conversely, socioeconomic disadvantages and traumatic disaster experiences are linked with increased risks of psychiatric disorders, highlighting the complex interplay between vulnerability and capacity to adapt (Lowe, Sampson, Gruebner, & Galea, 2015). This complexity is further evidenced in cross-national studies that combine vulnerability indices, which include susceptibility, coping, and adaptive capacity; countries with less vulnerability often demonstrate stronger governance, healthcare access, and income equality, yet still face higher mental disorder risks when exposed to trauma (Dückers, 2017). Overall, these findings suggest that resilience is both structural and psychological, and that community context significantly influences individual outcomes.

Serbia offers a particularly relatable context for this discussion, given the wide differences in exposure patterns and local capacities across its various regions (Grozdanić, Cvetković, Lukić, & Ivanov, 2024). Municipalities differ in their hazard profiles—such as floods, droughts, storms, heatwaves, earthquakes, technological accidents, and environmental pollution—and they also operate under unequal conditions regarding institutional resources, infrastructure quality, financial capacity, demographic makeup, and social cohesion levels (Beli, Renner, Cvetković, Ivanov, & Gačić, 2025). As a result, resilience is rarely uniform across different localities. Some communities may benefit from strong informal networks but still face deficiencies in organized preparedness, evacuation plans, crisis communication, or the perceived trustworthiness of local institutions (Tollefson, Frickel, Gore, & Helgeson, 2025). Since disaster outcomes depend on both structural conditions (such as institutions, services, resources) and social-psychological factors (trust, fear, motivation, risk perception), resilience in Serbia—and elsewhere—should be viewed as a multidimensional social phenomenon rather than a single score (Chapagain, Hochrainer-Stigler, Velev, Keating, & Mechler, 2025; Nikolić, Cvetković, Renner, Cvijović, & Gačić, 2025). Even though many conceptual frameworks exist in the literature, measuring resilience remains difficult. Definitions differ across studies; many assessments focus on a single domain, and a large portion rely on administrative indicators that do not fully reflect residents' perceptions of prevention, coordination, or the visible readiness of services. Therefore, perception-based indicators should not replace objective capacity measures but should complement them by influencing trust, willingness to prepare, adherence to guidance, and collective action—elements that often determine the effectiveness of plans in real-world situations (Milenković & Cvetković, 2025; Takemoto et al., 2024).

Against this background, the present study develops and tests a predictive model of perceived community disaster resilience in Serbia by integrating the logic of BRIC (Baseline Resilience Indicators for Communities) and DROP (Disaster Resilience of Place) within a composite approach. This approach is valuable because it conceptualizes resilience as an interconnected set of capacities and links institutional and infrastructural conditions with social organization and inclusion. Building on this tradition, we examine five social dimensions widely recognized as central to community resilience: social structure, social capital, social mechanisms, social equity and diversity, and social beliefs (Cvetković & Ivković, 2022; Faulkner, Brown, & Quinn, 2018; Jewett, Mah, Howell, & Larsen, 2021; Nikolić, Cvetković, Renner, Cvijović, & Gačić, 2025). These dimensions capture, respectively,

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organization and planning, trust and networks, preparedness practices and learning, inclusion and access for vulnerable groups, and shared norms and meanings through which risk is interpreted.

The study is empirically based on a cross-sectional household survey conducted in 22 local self-government units across four regions of Serbia: Belgrade, Vojvodina, Šumadija & Western Serbia, and Southern & Eastern Serbia. Respondents assessed (a) the implementation of preventive measures and (b) societal resilience perceptions across ten hazard types, allowing direct comparison of preparedness and resilience rankings for specific risks—highlighting that communities may respond differently to floods, droughts, or pollution. The analysis also considers variations in sociodemographic and socioeconomic factors (such as age, gender, education, income, employment sector, and volunteering) and psychological factors, such as fear, as emotions and trust influence preparedness and cooperation with authorities. By integrating these perspectives, the research fills a crucial gap in understanding how social identity and individual traits interact with structural conditions to shape collective resilience (Cvetković, 2023). This approach aligns with recent studies that view resilience as a holistic system comprising interconnected capacities demonstrated through proactive measures, stress responses, and system recovery (Dinić, 2023).

This study presents three main contributions. First, it provides a hazard-specific profile of perceived preparedness and resilience across a wide range of risks, including drought and environmental pollution, which are often overlooked in household resilience research. Second, it develops a composite index based on the BRIC–DROP framework that uses survey data, enabling analysis of spatial patterns across regions and municipalities. Third, it evaluates a predictive model that identifies the most consistent factors influencing perceptions of prevention and resilience, offering a realistic view of how well common demographic, socioeconomic, and psychological variables explain these perceptions.

1.1. Literary Review

Systematic reviews have examined how demographic (Cheng, 2025; Nikolić, Cvetković, Renner, Cvijović, & Gačić, 2025; Sandoval-Díaz, Suazo-Muñoz, & Navarrete-Valladares, 2025), socioeconomic (Cheng, 2025; Milenković & Cvetković, 2025; Zaman & Raihan, 2023), and psychological factors (Cvetković et al., 2025; Janković, Cvetković, Gačić, Renner, & Jakovljević, 2025; Ni et al., 2025; Pellerin, Raufaste, Corman, Teissèdre, & Dambrun, 2022; Schäfer et al., 2023; Wijk, 2022) relate to resilience outcomes, including work that applies growth mixture modeling to test whether adding targeted predictors improves prediction beyond core sociodemographic characteristics (Schäfer et al., 2024). These reviews have identified a broad set of influences and commonly organize them into domains such as demographics, socioeconomic position, social context, psychosocial well-being, and prior experiences, clarifying how each contributes to coping and resilience (Meer et al., 2022). They consistently suggest that while sociodemographic characteristics provide a baseline profile, psychological and social components are essential for a more complete understanding of adaptive potential (Cvetković & Ivković, 2022; Milenković & Cvetković, 2025). By adopting a multi-domain lens, this approach deepens resilience scholarship by specifying how psychological processes, social relationships, and material resources jointly shape adaptive capacity across contexts (Cvetković & Šišović, 2024). In parallel, the concept of disaster resilience has shifted from a primarily engineering- and asset-centered view toward a more integrative model that includes physical, social, institutional, and psychological dimensions (Milenković & Cvetković, 2025). From this perspective, resilience is not limited to technical protection; it is framed as a core element of sustainable development and societal robustness, requiring attention to biophysical, social, institutional, and place-specific features as key drivers of effective responses and post-disaster recovery (Milenković & Cvetković, 2025). Outcomes tend to be better among people with greater economic resources because they can reduce the impacts of disasters and recover more quickly (Cvetković & Šišović, 2024; Ludin, 2018). Outcomes also improve because financial capital increases access to essential goods, services, and recovery assistance (Cvetković & Ivković, 2022; Cvetković, Rikanović, & Knežević, 2022).

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Regarding demographic correlates—such as gender, age, race/ethnicity, and educational attainment—research often treats these attributes as baseline factors that combine with psychosocial resources to shape the probability of resilient responses after traumatic exposures (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Schäfer et al., 2024). For instance, in analyses of gender differences, some findings indicate that links between resilience-related factors and resilient outcomes are stronger when samples include a higher proportion of women (Schäfer et al., 2024). In a similar vein, age-focused research suggests that, among adults, middle adulthood is more consistently associated with an increased risk of unfavorable outcomes than other age groups (Gilbert, 2010). Moving beyond individual traits, socioeconomic position and income are major social determinants, with low-SES groups facing elevated mental health risks due to financial strain and reduced self-worth (Cuthbertson, Archer, Robertson, & Rodriguez-Llanes, 2023; Mao & Agyapong, 2021). By contrast, higher income and higher socioeconomic position are frequently associated with more resilient responses, as economic stability helps secure resources that cushion disaster-related stress (Schäfer et al., 2024). Psychological assets—particularly supportive social ties and emotion-regulation capacities—act as protective resources across levels and are repeatedly linked to a greater likelihood of resilient trajectories during crises (Rodriguez-Llanes, Vos, & Guha-Sapir, 2013; Schäfer et al., 2024). Overall, the evidence suggests that individual resilience develops through person–environment interplay, combining dispositional characteristics (e.g., self-efficacy, optimism, internal locus of control) with relational and situational supports, such as social networks and problem-solving skills (Boon, Cottrell, King, Stevenson, & Millar, 2011).

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This cumulative pattern is reinforced by findings that resilience is better explained when demographic features (e.g., education and race/ethnicity) are considered together with sociocontextual conditions such as social support and recent stress exposure (Pangallo, Zibarras, Lewis, & Flaxman, 2014). Complementary theories describe resilience less as a fixed individual

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outcome and more as an unfolding process shaped by social determinants—support systems and accessible resources—operating through complex, structured pathways (Saltzman & Hansel, 2024). For example, empirical studies show that certain demographic profiles, including being female or younger, can function as meaningful risk factors for post-trauma mental health difficulties (Adu, Shalaby, Agyapong, Dias, & Agyapong, 2024; Godara, Silveira, Matthäus, & Singer, 2022). Conversely, older age has been reported to be protective, with adults aged 65+ more than three times as likely to show resilience as young adults aged 18–24 (Bonanno, Galea, Bucciarelli, & Vlahov, 2007). Beyond age, variables such as gender, ethnicity, and social support have been widely investigated as both vulnerability and protective factors shaping mental health and resilience outcomes among disaster-affected populations (Mao & Agyapong, 2021). Evidence further indicates that women and people with limited income or financial capacity are more likely to report higher post-disaster depressive symptoms and poorer mental health, implying that specific subgroups—such as unmarried older women with constrained financial resources—may face less favorable well-being outcomes following disasters (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Kwan, 2020). However, the literature does not converge on gender effects: some studies find that women employ more effective coping strategies, others report higher resilience scores among men, and others detect no statistically significant association (Meer et al., 2022; Rodriguez-Llanes, Vos, & Guha-Sapir, 2013; Sugiura et al., 2021).

These findings highlight the need for an integrated view of resilience that accounts for the interdependence of individual attributes (e.g., cognitive capacity and life-course history) and wider socio-environmental conditions such as ethnicity and socioeconomic position (Wyatt, 2021). In particular, lower socioeconomic attainment—often operationalized via education—has repeatedly been linked to less adequate coping and lower resilience (Meer et al., 2022). At the same time, the education–resilience relationship remains nuanced, as some adjusted multivariate models report that higher education predicts lower resilience once other demographics, exposure, resources, and life stress are held constant (Bonanno, Galea, Bucciarelli, & Vlahov, 2007). This pattern implies that education may generally be beneficial, but its effects can be mediated or confounded by related factors such as income, social support, and accumulated stress (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Meer et al., 2022).

In contrast, many studies associate higher education with better outcomes and "minimal-impact" resilience trajectories (Bonanno & Diminich, 2012; Boon, Cottrell, King, Stevenson, & Millar, 2011; Hobfoll et al., 2009). This pattern implies that education may generally be beneficial, but its effects can be mediated or confounded by related factors such as income, social support, and accumulated stress (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Meer et al., 2022). For example, older adults have sometimes been found to experience lower distress than younger adults during crises, which has been attributed to higher average resilience and greater capacity to process negative emotions (Oviedo et al., 2023). This apparent reduced susceptibility to depression and substance use in older groups suggests that aging does not automatically heighten vulnerability; instead, it may reflect life-course learning and experience that support more effective coping (Mao & Agyapong, 2021). Despite broadly protective patterns for age and socioeconomic resources, the evidence remains inconsistent regarding how specific demographics—age, sex, and education—relate to disaster outcomes (Sugiura et al., 2021). For instance, although education is often expected to predict resilient psychological outcomes, studies report effects ranging from positive to negative to null (Rodriguez-Llanes, Vos, & Guha-Sapir, 2013). Similarly, research on gender disparities yields mixed conclusions: some studies suggest more effective coping among women, others higher resilience among men, and others observe no association (Meer et al., 2022). These inconsistencies point to methodological difficulties in isolating demographic effects, given that demographics are closely entangled with socioeconomic and psychological resources that jointly shape adaptive capacity (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Mao & Agyapong, 2021). For example, while theory often argues that education strengthens resilience via improved financial and social resources, some studies report no significant association, potentially because of limited sample variability or event-specific stressors

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tied to particular disasters (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Ni, Chow, Jiang, Li, & Pang, 2015). One study found that respondents with a college degree were roughly half as likely to be resilient as those with less than a high school education, suggesting that higher education may hinder adaptation to massive, overwhelming, and difficult-to-comprehend disasters (Bonanno, Galea, Bucciarelli, & Vlahov, 2007). This unexpected pattern may indicate that greater cognitive awareness or stronger expectations of control among highly educated individuals can intensify distress when facing catastrophes that resist explanation or mitigation (Talamonti, Schneider, Gibson, & Forshaw, 2023). Such variation suggests that education's effect is context-dependent and may change with the nature of the disaster and the coping options available to those affected (Sugiura et al., 2021). Accordingly, adaptation to catastrophic events is not determined solely by static demographic indicators; it is strongly shaped by access to concrete and intangible resources that make recovery possible (Bonanno, Galea, Bucciarelli, & Vlahov, 2007). These resources include material assets and social networks as well as psychological coping capacities and spiritual beliefs, which together can buffer the harms of extreme adversity (Bonanno, Galea, Bucciarelli, & Vlahov, 2007; Kaim et al., 2024).

Psychological determinants of adaptation—such as cognitive flexibility, coping self-efficacy, and emotion regulation—are increasingly treated as central elements that interact with demographic characteristics to shape resilient functioning (Bonanno, Chen, Bagrodia, & Galatzer-Levy, 2023; Saltzman & Hansel, 2024).

Psychological determinants of adaptation—such as cognitive flexibility, coping self-efficacy, and emotion regulation—are increasingly treated as central elements that interact with demographic characteristics to shape resilient functioning (Bonanno, Chen, Bagrodia, & Galatzer-Levy, 2023; Saltzman & Hansel, 2024). However, predictors of resilient outcomes—including these psychological determinants—often show unexpectedly limited accuracy in forecasting future resilience, a pattern described as the "resilience paradox" (Bonanno, Chen, Bagrodia, & Galatzer-Levy, 2023). This paradox implies that attributes typically linked to positive adjustment—such as strong self-esteem, stress tolerance, and self-regulatory capacity in behavior and cognition (Carriedo et al., 2024)—do not ensure resilience or emotional immunity when catastrophic events are unpredictable and exceed coping limits (Bonanno, Chen, Bagrodia, & Galatzer-Levy, 2023; Janković, Cvetković, Gačić, Renner, & Jakovljević, 2025). In this view, resources operate within an interconnected system in which they reinforce one another through reciprocal, mutually strengthening pathways that support psychological adaptation (Tao, Li, Liang, Liu, & Hou, 2023). Internal strengths—such as self-esteem, stress resistance, and self-regulation—can help people sustain optimism, generate creative solutions, and preserve hope and motivation in the face of adversity (Carriedo et al., 2024). External supports—including social networks, financial stability, and community infrastructure—create the scaffolding that allows these internal capacities to be expressed effectively under stress (Bakić, 2019; Hobfoll et al., 2009). Conversely, when these key resources are absent or depleted—for example, due to severe economic loss or weak social support—stress tends to rise, and the likelihood of a minimal-impact resilience trajectory declines (Bonanno & Diminich, 2012; Tao et al., 2023). For instance, having children in the household has been associated with reduced resilience, plausibly because parenting demands intensified stress during lockdowns through home-schooling pressures and crowded living arrangements (Panzeri et al., 2021). Increasingly, psychological resilience is described not simply as the absence of psychopathology, but as a developmental process characterized by flexible adjustment to changing conditions through the deployment of internal and external resources (Öztürk & Maçkalı, 2023; Robles-Bello, Sánchez-Teruel, & Naranjo, 2020). Within this outcome-oriented framework, resilient outcomes are partly explained by multiple resilience factors presumed to buffer the harmful effects of stress exposure on mental health, operating through a smaller set of resilience mechanisms (Schäfer et al., 2024, 2023). These mechanisms include cognitive responses (e.g., appraisals), behavioral responses (e.g., active coping and help-seeking), and emotional responses that enable flexible adaptation to adversity depending on contextual demands (Milenković & Cvetković, 2025; Robles-Bello, Sánchez-Teruel, & Naranjo, 2020; Schäfer et al., 2024; Schäfer, Kunzler, Kalisch, Tüscher, & Lieb, 2022).

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Social organization and cohesion are central to collective efficacy and disaster resilience, insofar as robust kinship structures and social capital cultivate shared purpose and strengthen adaptive capacity (Ludin, 2018). From this standpoint, resilience can be viewed as the emergent product of a multilayered socio-ecological system in which many interacting factors activate and reinforce one another, producing a dynamic adaptive mechanism (Tao et al., 2023). Alongside growing scholarly attention, research has increasingly moved from an exclusive focus on internal traits toward an emphasis on contexts and strengths, marking an important step in recognizing resilience as inherently complex (Tao et al., 2023). This dynamic system incorporates psychological and social resources—such as coping self-efficacy, emotion regulation, and meaning-making—that reduce the negative consequences of trauma exposure and support adaptive functioning over time (Yılmazer, 2025). Within outcome-based models, resilient outcomes are understood as partly shaped by multiple resilience factors that buffer the mental health impacts of stress, acting through a smaller set of mechanisms such as regulatory flexibility (Schäfer et al., 2023). Regulatory flexibility refers to the capacity to adjust emotional responses and to deploy different coping strategies in response to contextual demands and feedback (Schäfer et al., 2024). In this framing, coping or emotion-regulation strategies are not universally "good" or "bad"; their adaptiveness depends on how well they match the specific requirements of a given stressor context (Schäfer, Kunzler, Kalisch, Tüscher, & Lieb, 2022).

Social capital is widely regarded as a key driver of community resilience because it captures the robustness of social ties, reciprocity, and trust in both people and institutions (Hall et al., 2023). This shared asset enables communities to mobilize aid, exchange information, and coordinate recovery activities more effectively during and after crises (Hechanova, Waelde, & Ramos, 2016). Community-level resilience is also supported by economic development—reflected in the amount, distribution, and diversity of economic resources—as well as by social capital indicators such as received and perceived support, sense of community, collective efficacy, and place attachment (Lowe, Sampson, Gruebner, & Galea, 2015). Information and communication capacities strengthen this adaptive base by supporting the spread of accurate messages through responsible media and trusted channels. At the same time, community competence empowers people through collective action, critical reflection, and problem-solving skills (Dückers, 2017). Strengthening collective resilience also involves reducing risk and resource inequities, involving residents in mitigation, building organizational linkages, expanding and protecting social supports, and preparing for uncertainty through flexibility, sound decision-making, and trusted information sources that function under unknown conditions ("American Journal of Community Psychology," 2016; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2007). Social resilience is further supported by community infrastructure—such as health facilities, schools, and volunteer organizations—which provide practical support and resources during disruption and recovery (Antonescu & Florescu, 2025). This integrative approach draws on empowerment principles, ecological perspectives, and strengths-based practice, while incorporating insights from collective efficacy, social cohesion, and group process research (Berkes, 2007). Ultimately, community adaptation becomes visible in population wellness, understood as high and non-disparate levels of mental and behavioral health, functioning, and quality of life ("American Journal of Community Psychology," 2016; Sanders, 2021). These capacities align with an ecological framework that integrates multiple forms of capital—economic, political, natural, cultural, and educational—to explain how communities organize in response to change and challenge (Silva, Nata, Silva, & Faria, 2022). In this tradition, community resilience is defined as a dynamic process that connects adaptive-capacity networks to successful adaptation after disturbance or adversity (Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2007).

Protective social processes operate through the availability of family, kin, and neighborhood support, as well as community assets such as respected elders, traditional healers, religious institutions, and services like schools and health facilities (Somasundaram & Sivayokan, 2013). Together, these formal and informal systems deliver psychosocial support, facilitate access to essential services, and preserve cultural continuity during disruption, making them central to sustained recovery and long-term adaptive capacity (Hall et al., 2023; Sanders, 2021). Core elements

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frequently identified include strengthening social capital, cultivating local leadership, diversifying resources, improving communication systems, and building institutional capacity (Berkes, 2007). Building community resilience, therefore, depends on understanding how social capital and networks function as foundational supports (Ma, Qirui, & Lv, 2023). Social capital includes trust, reciprocity, and cohesion, which encourage cooperation and mutual assistance in emergencies (Hall et al., 2023; Ma, Qirui, & Lv, 2023). Inter-organizational networks also facilitate collaboration and resource sharing among government agencies, NGOs, and private-sector actors (Ma, Qirui, & Lv, 2023). By leveraging partners' complementary strengths, such networks can improve response efficiency in complex disaster settings (Oliveira & Morais, 2018). Effective network functioning typically depends on pre-established relationships and clear communication protocols that support rapid decisions and coordinated action during crises (Parrott et al., 2023; Sippel, Pietrzak, V.S., Mayes, & Southwick, 2015). Research also suggests that while structural social capital helps mobilize resources, cognitive social capital—shared narratives, trust, and belonging—is more consistently linked to reduced risk of common mental disorders during and after public health emergencies (Hall et al., 2023). Belonging and shared responsibility are integral to cohesion, enabling residents to work collectively toward shared goals through coordinated action (Ma, Qirui, & Lv, 2023). Integrating social capital and networks within this framework supports collaboration among diverse actors and strengthens communities' capacity to mitigate and manage disaster impacts effectively (Ma, Qirui, & Lv, 2023). Sustaining resilience requires building partnerships and networks that enable the exchange of resources, information, and best practices via linkages among regional authorities, community organizations, academic institutions, and the private sector (Ma, Qirui, & Lv, 2023). Such cross-sector partnerships harness distinct capabilities to improve collective efficacy and ensure a comprehensive preparedness and response approach (Community Resilience Planning Guide for Buildings and Infrastructure Systems: Volume II, 2015; Wakil, Sun, & Chan, 2021).

Equity and diversity are essential to disaster resilience because demographic and socioeconomic differences strongly condition how communities prepare for, respond to, and recover from catastrophic events. Collaboration can be understood as a broad set of ties linking individuals, organizations, institutions, and public authorities into an integrated network that enables ongoing two-way communication and reciprocal influence over decisions that matter for community resilience in disasters (Milenković, Cvetković, & Renner, 2024). Because structural inequities generate uneven exposure and unequal capacity to absorb shocks, resilience-building often requires targeted measures that address the needs of marginalized subgroups to achieve more equitable outcomes (Cvetković, 2023; Cvetković & Šišović, 2024). Populations such as low-income households, older adults, and marginalized groups frequently experience disproportionate risk because they have reduced access to resources, information, and supportive networks (Lindsey, Goldenberg, & Wandersee, 2018). These gaps are often intensified by pre-existing inequalities in economic capital (e.g., income and savings) and unequal access to human capital (e.g., education and health services), both of which are critical for effective response and recovery (Coşkun & Ulusoy, 2024). Moreover, an intersectional lens is necessary to represent diversity within vulnerable groups, since natural hazards can amplify spatial and social inequalities (Graveline & Germaın, 2022; Siawsh, Peszynski, Vo-Tran, & Young, 2021). As a result, disaster policy increasingly emphasizes investment in social resources as a pathway to strengthen resilience and reduce inequities (Matthews et al., 2020). For example, policies that expand affordable housing, accessible public services, and equitable access to education and employment can address the structural disparities that often increase disaster vulnerability (Nguyen & Nguyen, 2024). Disasters, hazards, and vulnerability are tightly interlinked through relationships among natural resource management, poverty, and social inequality, meaning that the social, cultural, and economic settings of disadvantaged groups are often hit hardest during disasters (Wessel, Naz, & Sahoo, 2020). Addressing these overlapping vulnerabilities requires integrated strategies that incorporate social, economic, and environmental drivers, as community resilience is shaped by poverty levels and access to healthcare (Martínez, Liccioni, Corozo, Velazco, & Cejas, 2024). Standard emergency planning frequently fails to reflect the lived realities of marginalized

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groups, who encounter systemic barriers throughout preparedness, response, and recovery (Badiezadeh, Naseh, & Howard, 2025a, 2025b). Evidence from Serbia indicates that poorer households are more likely to be exposed to flooding than non-poor households, underscoring how housing quality can reduce the disproportionate vulnerability of the poor relative to other groups (Cvetković & Ivković, 2022).

Studies further show that socially powerless groups often have fewer resource options, which contributes to their concentration in higher-risk locations and to greater losses due to unequal power relations (Pant, 2024). One manifestation of this inequality is the siting of lower-income housing in hazard-prone areas—such as former wetlands—where protective infrastructure, such as levees or dykes, is insufficient (Gooley & Bakema, 2017; Stough, Kang, & Lee, 2018). Systemic obstacles reinforce these spatial injustices, as marginalized communities may lack the political capital needed to shape priorities and allocate resources for critical facilities (Blockstein, Tilt, & Salgado, 2024). When marginalized voices are excluded, vulnerability can unintentionally increase if residents choose alternative places that are even more exposed to hazards (Blockstein, Tilt, & Salgado, 2024). Social beliefs and customs are also an important component of vulnerability, shaping how risks are interpreted and how collective capacity is mobilized in disaster settings (Mohammadi, Salmani, & Farahmandnia, 2024). Cultural norms and ideological structures influence risk perception and coping behavior, and they often determine which groups can access resources and decision-making authority required for adaptive action (Eriksen et al., 2020). Demographic features such as age and gender also shape these dynamics by influencing risk perception and behavioral responses; identifying vulnerable groups by gender and age is therefore important for advancing human security and strengthening community resilience (Cvetković & Ivković, 2022).

For example, indigenous belief systems and customary practices may either reduce or intensify vulnerability depending on their alignment with contemporary preparedness measures (Daddoust et al., 2018). When beliefs diverge from recommended protocols, they can hinder the adoption of safety measures or restrict access to official assistance, particularly when traditional knowledge conflicts with scientific guidance or marginalized groups distrust institutions (Mohammadi, Salmani, & Farahmandnia, 2024; Painter et al., 2023). Such distrust often reflects historical exclusion and marginalization, where vulnerable groups have long been denied power and political representation (Enderami & Sutley, 2022). Consequently, power relations operating through formal and informal institutions shape vulnerability, as unequal power interacts with natural events to determine the degree of vulnerability produced by a given hazard (Ahmed, 2024). These differentials both arise from and reproduce social hierarchies that create unequal access to resources, thereby generating uneven vulnerability across communities (Thomas et al., 2018). A power-structure lens helps identify who is vulnerable, under what conditions, and what is needed to strengthen adaptive capacity (Ahmed, 2024). In this context, vulnerability refers to attributes of individuals or groups and their circumstances that influence their ability to anticipate, cope with, resist, and recover from natural-hazard impacts (Singh, Eghdami, & Singh, 2014). This framing emphasizes vulnerability as a social condition and describes it as socially produced, "rooted in historical, cultural, social, and economic processes" (Whytlaw et al., 2021). Seeing vulnerability as socially constructed challenges the idea that natural disasters affect everyone equally; instead, it argues that disasters are shaped by human systems and embedded within social structures (Fuchs, 2009; Galindo, Eslami, & Bashir, 2018). Therefore, identifying which demographic and socioeconomic characteristics shape adaptive capacity is critical for designing effective resilience interventions, because factors such as education directly influence a population's ability to respond appropriately to disasters (Milenković, Cvetković, & Renner, 2024).

2. Methods

This study develops and tests a predictive model of perceived community disaster resilience across Serbia by combining BRIC–DROP dimensions into a single index and analyzing differences across hazard types and sociodemographic factors. A cross-sectional household survey was

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conducted using multistage random sampling and the "next birthday" method for respondent selection. The research drew on a cross-sectional household survey administered in 22 local self-government units spanning Serbia's four regions (Belgrade, Vojvodina, Šumadija & Western Serbia, and Southern & Eastern Serbia). Participants evaluated both (a) the extent to which preventive measures were implemented and (b) perceived societal resilience across ten hazard types, enabling a direct comparison of preparedness and resilience rankings by specific risk and illustrating that communities may react differently to floods, droughts, or pollution. The analyses further examined differences by socio-demographic and socioeconomic characteristics (e.g., age, gender, education, income, employment sector, and volunteering). They incorporated psychological factors—such as fear—given that emotions and trust can shape preparedness and collaboration with authorities.

2.1. Sample

2.1.1. Sample of Population

The survey population comprised all adult residents of local communities across Serbia. The sample size was aligned with the geographic and demographic size of each community. The guideline for determining the survey sample size was based on the formula:

$$n = \frac{Z^2 p\,(1-p)}{E^2}$$

where n represented the sample size, Z denoted the desired confidence level (95% in this study), p was set to the expected proportion of 0.5 as a conservative estimate, and E was the margin of error (0.05). This guideline was adjusted using the finite population correction:

$$n_k = \frac{n}{1 + \frac{n-1}{N}}$$

where N represented the total population size, in essence, generally accepted sampling guidelines were followed, and sampling was conducted in accordance with standard procedures. In addition, to meet basic research quality requirements, the study aimed to include at least (or approximately) 100 respondents in each examined local community (region), while the minimum target was 30–50 respondents at the municipal level within regions as statistical units in Serbia (Cochran, 1977; Fowler, 2013; Krejcie, 1970).

During data collection, a household survey approach was applied using a multistage random sampling design. In the first stage (primary sampling units), parts of each local community in which the research was conducted were selected. This stage was followed by mapping and defining the percentage share of each segment within the overall sample. At the survey-cluster stage, streets or street segments within the primary sampling units were selected. Survey clusters were defined as routes with a designated starting and ending point. In the next stage, households in which the survey was administered were selected, and the number of households was adjusted to the size of the local community. The final stage involved selecting a respondent within each selected household using the "next birthday" method. Fieldwork in each local community was generally conducted for three days per week, including weekends. Surveys were administered at different times of day, i.e., across different time periods.

2.1.2. Sample of Local Communities

For the sample of local communities in Serbia, the region (including its municipalities and cities) served as the basic unit of the country's political-administrative organization. To enable the research,

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four regions were included: the Belgrade Region, the Vojvodina Region, the Šumadija and Western Serbia Region, and the Southern and Eastern Serbia Region (excluding Kosovo and Metohija). Accordingly, Serbia had 117 municipalities and 28 cities, excluding those in the Autonomous Province of Kosovo and Metohija. Using random sampling, at least 10% of the local communities in Serbia were selected from a total of 145 communities where the research could be conducted.

After the survey was completed, questionnaires were assigned unique codes for verification. The data were then entered into appropriate databases and prepared for analysis. Editing procedures were carried out, including reviewing details and checking completeness and consistency. Subsequently, the data were tabulated according to the relevant categories. The next step involved cross-tabulation to identify associations between variables.

Qualitative data collected through the survey questionnaire—particularly findings related to perceptions and subjective attitudes—were used to support a deeper analysis and interpretation of indicators and their values obtained through quantitative procedures. After all preparatory steps, descriptive statistical methods were applied, as initially specified.

In line with Table 1, the study included 1,200 respondents from 22 local self-government units in Serbia. A review of the survey indicates that the largest share of respondents was from the municipality of Svrljig (n = 120; 10.0%), followed by Belgrade (n = 94; 7.8%), Kraljevo (n = 76; 6.3%), Novi Pazar (n = 73; 6.1%), and Prokuplje (n = 67; 5.6%). Overall, these municipalities together account for more than one-third of the total sample (35.8%). On the other hand, the least represented municipalities were Čačak (n = 31; 2.6%), Stara Pazova (n = 36; 3.0%), and Novi Sad (n = 37; 3.1%). Such a distribution reflects good geographical diversity of the sample, enabling the analysis of attitudes across different socio-territorial contexts (Table 1).

Regarding gender, Table 1 shows that 53.2% of respondents were male, while 46.8% were female. This indicates a relatively balanced gender structure, which allows for an appropriate comparative analysis of gender-related differences in the examined attitudes and behaviours.

The age structure shows that the most represented group was 29–38 years (417 respondents; 34.8%), followed by 39–48 years (390; 32.5%), and the youngest group 18–28 years (197; 16.4%). Older age groups were less represented: 49–58 years (114; 9.5%) and 59 years and above (82; 6.8%). Overall, this indicates a predominantly younger population in the sample (Table 1).

Regarding education, the most significant proportion of respondents reported secondary education (50.0%). A substantial share also completed first-cycle studies (29.3%) and second-cycle studies (13.7%). Respondents with primary education accounted for 4.1%, while the smallest proportion had completed third-cycle studies (2.9%). This structure suggests that the sample predominantly consists of individuals with secondary and higher education, providing a relevant basis for analysing socio-cognitive aspects related to the study topic, while the presence of all educational levels enables comparisons across formal education attainment (Table 1).

With respect to marital status, the largest share of respondents were married or cohabiting (59.8%), followed by those single (23.2%) and those in a relationship (9.6%). Divorced respondents accounted for 5.3%, while widows/widowers comprised 2.2%. This distribution indicates a predominance of respondents in stable partnerships, which may influence risk perception, sense of safety, and social support, depending on the research focus (Table 1).

Concerning employment status, most respondents were employed (76.1%), indicating a high level of labour market participation within the sample. Unemployed respondents accounted for 15.7%, retirees for 5.9%, and those who earn income in another way (e.g., temporary jobs, freelance work, honoraria, informal employment) for 2.3%. This structure enables analyses that account for economic activity, as well as potential differences in perceptions, access to resources, and social security across employment statuses (Table 1). Additionally, by type of employment, the largest share worked in the private sector (44.1%), followed by the public sector (36.2%), while 19.8% were unemployed. These findings indicate a relatively balanced representation of both sectors, with a slight predominance of private-sector employment, while nearly one-fifth of respondents are

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unemployed, which may be relevant for examining socio-economic conditions, job security, and access to institutional resources (Table 1).

Regarding housing, most respondents lived in a house (64.0%), while 35.4% lived in an apartment, and only 0.6% reported another type of housing. This distribution may suggest a higher representation of rural or suburban households than of urban ones, which can be relevant for analysing living conditions, access to resources, or risk perception by settlement type (Table 1).

In terms of income per household member, most respondents (65.8%) reported incomes below the national average (EUR 930), while 20.8% reported average income, and 13.5% reported income above average. This distribution indicates a predominance of lower-income respondents, which may be relevant when analysing economic (in)security, risk perception, and access to resources (Table 1). At the same time, participation in volunteering shows that nearly half of respondents (47.7%) reported volunteering at some point, while 52.3% reported not volunteering. This suggests a relatively high level of civic engagement within the sample, which may be important for analysing community orientation, solidarity, social responsibility, or involvement in risk management (Table 1).

Finally, structural characteristics of households and the housing stock further complement the sample profile presented in Table 1. The largest share of respondents lived in buildings aged 41–60 years (49.3%), while smaller proportions lived in buildings aged ≤20 years (14.6%), 21–40 years (17.6%), 61–80 years (12.1%), and ≥81 years (6.5%). This distribution reflects the prevailing age structure of the housing stock in which respondents reside, with a relatively smaller share of newer construction (Table 1). Regarding household size, 3–4-member households were the most common (55.0%), followed by 5-member households (15.2%) and 2-member households (14.2%). Single-member households accounted for 6.8%, while households with six or more members accounted for 8.8%, overall indicating a predominance of nuclear-family household structures in the sample (Table 1).

Table 1. Sample structure by socio-demographic characteristics (N = 1200).

Variables	Category	**n**	**%**
Place of residence	Belgrade	94	7.8
	Boljevac	40	3.3
	Brus	48	4.0
	Čačak	31	2.6
	Ćuprija	41	3.4
	Kovin	38	3.2
	Kraljevo	76	6.3
	Kruševac	39	3.3
	Leskovac	48	4.0
	Niš	41	3.4
	Novi Pazar	73	6.1
	Novi Sad	37	3.1
	Prijepolje	71	5.9
	Prokuplje	67	5.6
	Šabac	34	2.8
	Smederevo	39	3.3
	Sombor	47	3.9
	Stara Pazova	36	3.0

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	Svrljig	120	10.0
	Užice	48	4.0
	Vranje	56	4.7
	Zrenjanin	37	3.1
Gender	Male	638	53.2
	Female	562	46.8
Age (years)	18–28	197	16.4
	29–38	417	34.8
	39–48	390	32.5
	49–58	114	9.5
	≥59	82	6.8
Education	Primary education	49	4.1
	Secondary education	600	50.0
	First-cycle studies	352	29.3
	Second-cycle studies	164	13.7
	Third-cycle studies	35	2.9
Marital status	Divorced	64	5.3
	Single	278	23.2
	Married or cohabiting	717	59.8
	In a relationship	115	9.6
	Widow/Widower	26	2.2
Employment status	Unemployed	188	15.7
	I earn income in another way	28	2.3
	Retired	71	5.9
	Employed	913	76.1
Type of employment	Public sector	434	36.2
	Unemployed	237	19.8
	Private sector	529	44.1
Type of housing unit	Other	7	0.6
	House	768	64.0
	Apartment	425	35.4
Income (per household member)	Below average (< EUR 930)	789	65.8
	Average (≈ EUR 930)	249	20.8
	Above average (> EUR 930)	162	13.5
Volunteering	Yes	572	47.7
	No	628	52.3
Building age	≤20 years	175	14.6
	21–40 years	211	17.6
	41–60 years	591	49.3
	61–80 years	145	12.1
	≥81 years	78	6.5

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Household size	1 member	82	6.8
	2 members	170	14.2
	3–4 members	660	55.0
	5 members	182	15.2
	6+ members	106	8.8

2.2. Study Area

The study took place in the Republic of Serbia (Southeast Europe, central Balkan Peninsula) and involved 22 local self-government units (municipalities/cities; LSGUs) spread across various administrative districts (okrug), ensuring extensive geographic coverage from the north to the south and from the west to the east of the country (see Figure 1). observed in Belgrade (7.8%) and Kraljevo (6.3%).

Figure 1. Study area and surveyed administrative districts (okrug) in Serbia. Districts where the survey was conducted are highlighted in yellow. Source: © d-maps.com (base map), adapted by the authors.

The sample comprised major urban centers—Belgrade (the capital), Novi Sad, and Niš—as well as smaller municipalities with different degrees of urbanization and development (e.g., Svrljig, Boljevac, Brus, and Stara Pazova). The surveyed LSGUs were located in Vojvodina (including Sombor, Novi Sad, Zrenjanin, Kovin, and Stara Pazova), central Serbia (including Belgrade, Šabac, Smederevo, Ćuprija, Čačak, Kraljevo, and Novi Pazar), and in the western, eastern, and southern parts of Serbia (including Užice, Prijepolje, Zaječar, Boljevac, Niš, Svrljig, Prokuplje, Leskovac, and Vranje). A total of N = 1,200 respondents participated from these 22 LSGUs. Participation in each LSGU ranged from 2.6% (Čačak) to 10.0% (Svrljig), with the highest shares

2.3. Questionnaire

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A structured questionnaire was developed to collect data on perceived resilience, including detailed information on citizens' demographic, socio-economic, and psychological attributes, as well as a religious aspect, within the context of disaster resilience—specifically, their perceptions of disaster preparedness and resilience. The data were cleaned, harmonized, and categorized for further analysis using various techniques. Descriptive statistics, such as measures of central tendency, dispersion, and distribution, were calculated. Additionally, response frequencies and percentages were determined, and Pearson's chi-square (χ^2) test of independence was used to identify significant differences between groups and associations between responses. Results were displayed in tables and graphs, with interpretation at the national level (Serbia) and through analysis of differences across indicator groups, especially in socio-economic and infrastructural areas. The questionnaire used a five-point Likert scale (1 = lowest, 5 = highest) to gauge citizens' attitudes toward disaster resilience and consisted mainly of closed-ended questions. An instrument previously developed and used in Serbia was utilized to explore how demographic and socio-economic factors influence disaster resilience. That earlier survey aimed to understand the development of local community resilience in Serbia (Cvetković & Šišović, 2024). For this study, the instrument was semantically refined and adapted while maintaining its core content and measurement validity. The questionnaire incorporated five groups of variables (Ur Rahman, Jian, Junrong, & Shafi, 2021), along with additional related questionnaires and methods. Specifically, it covered: 10 indicators of social structure (Group 1), 9 indicators of social capital (Group 2), 17 indicators of social mechanisms (Group 3), 13 indicators of social equity and diversity (Group 4), and 13 indicators of social beliefs (Group 5), totaling 62 indicators for a comprehensive assessment of community disaster resilience in Serbia. In addition to these indicators, the survey collected basic demographic data, attitudes toward these indicators, participation in resilience measures, and perceptions of resilience across various disaster types. This approach allowed an in-depth analysis of socio-economic factors affecting resilience. The choice of this questionnaire was also driven by the goal of adapting the BRIC approach and developing a predictive model specific to Serbia. The instrument was designed for Serbian research, informed by multiple established questionnaires, pilot-tested in 2023, and aligned with the ethical standards outlined in the Helsinki Declaration.

2.4. Analysis

Quantitative data from the household survey were processed for analysis through standard procedures, including coding, data entry, verification, and consistency checks. The dataset was then cleaned by identifying missing values and outliers, and negatively worded items were reverse-coded when applicable. Composite scores were calculated for each resilience dimension and for the overall perceived community disaster resilience measure, based on the questionnaire's indicator structure. Descriptive statistics summarized the sample and the distribution of key variables. Frequencies and percentages were reported for categorical variables, while means, standard deviations, and ranges were calculated for continuous variables, including resilience indicators and composite scores. These results offered an initial overview of perceived resilience patterns across hazard types and socio-demographic groups. To explore differences in perceived resilience across socio-demographic categories, inferential tests were performed. Independent-samples t-tests compared two groups (e.g., gender), while one-way ANOVA was used for three or more groups (e.g., age, education). Post-hoc tests identified specific group differences when ANOVA results were significant. Levene's test was used to assess the assumption of equal variances; when violated, robust alternatives, such as Welch's ANOVA and suitable post hoc tests, were used. Effect sizes accompanied p-values to support interpretation.

For categorical variables (e.g., participation in preparedness measures vs. socio-demographic factors), cross-tabulations and Pearson's chi-square tests assessed the significance of observed differences. Standardized residuals helped identify cells driving significant associations. Pearson's correlation coefficients examined linear relationships among continuous indicators and composite

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scores, including socio-economic, infrastructural, and within-domain interrelations. Diagnostics flagged potential multicollinearity before regression modeling.

Multiple linear regression was used to build and test a predictive model of perceived community disaster resilience. The dependent variable was the overall resilience score (and domain-specific scores where relevant), with independent variables including socio-demographics, socio-economics, and infrastructure indicators. The hierarchical model followed a theory-based sequence: (1) demographic controls, (2) socio-economic factors, and (3) infrastructure variables. Model performance was evaluated using R^2 and adjusted R^2, and the significance and size of standardized coefficients (β). Diagnostics included residual plots for linearity and homoscedasticity, variance inflation factors (VIF) for multicollinearity, and tests for residual normality. When assumptions were not fully met, robust errors or alternative specifications were employed.

3. Results

3.1. Results of Descriptive Statistical Analyses

3.1.1. Perception of the Implementation of Preventive Measures and Perceived Disaster Resilience

Respondents rated the implementation of preventive measures highest for pandemics and epidemics, with an average score of M = 2.32 (SD = 1.109). Storms and hail also received high ratings (M = 2.24; SD = 1.059), as did floods (M = 2.15; SD = 1.107). These three categories stand out as areas where respondents most strongly recognize the existence of preventive measures.

By contrast, mean values were recorded for earthquakes and snowstorms, both with an identical average of M = 2.06 (SD = 0.984 and SD = 0.971, respectively), as well as for extreme temperatures (M = 2.03; SD = 1.036) and technological accidents (M = 2.02; SD = 1.040). This indicates a moderate, yet still insufficient, perception of preventive engagement in these domains. However, at the lower end of the scale are landslides (M = 1.94; SD = 0.942) and droughts (M = 1.87; SD = 1.057). The lowest value was recorded for environmental pollution (M = 1.81; SD = 1.072), suggesting that respondents perceive almost no systemic and visible preventive measures in this area (Table 2 and Figure 2).

Table 2. Implemented preventive measures and perceived resilience by disaster type, rated on a Likert scale from 1 to 5.

Disaster type	Implemented preventive measures (Mean, SD)	Perceived societal resilience to disasters
Earthquakes (geological)	2.06 (0.984)	2.22 (0.994)
Landslides (geological)	1.94 (0.942)	2.13 (0.963)
Floods (hydrological)	2.15 (1.107)	2.08 (1.033)
Droughts (hydrological)	1.87 (1.057)	1.98 (1.014)
Snowstorms (meteorological)	2.06 (0.971)	2.30 (1.009)
Storms and hail (meteorological)	2.24 (1.059)	2.28 (1.035)
Extreme temperatures (climatic)	2.03 (1.036)	2.20 (1.020)
Pandemics and epidemics (biological)	2.32 (1.109)	2.26 (1.063)
Technological accidents	2.02 (1.040)	2.04 (0.992)
Environmental pollution	1.81 (1.072)	1.91 (1.059)

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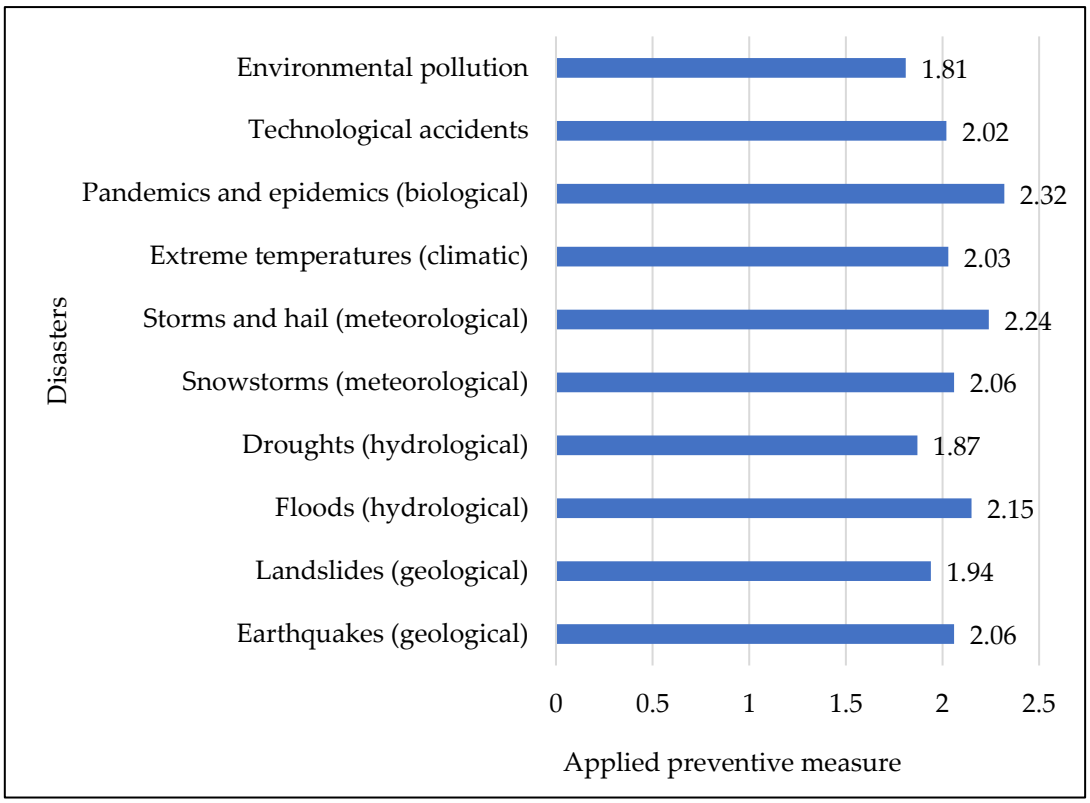

Figure 2. Percentage distribution of implemented preventive measures across different disaster types.

When it comes to societal resilience to disasters, the highest rating was assigned to snowstorms (M = 2.30; SD = 1.009), followed by storms and hail (M = 2.28; SD = 1.035) and pandemics and epidemics (M = 2.26; SD = 1.063). These three categories may be interpreted as those in which respondents have the greatest confidence in the system's capacity to respond to a crisis. Next are earthquakes (M = 2.22; SD = 0.994), extreme temperatures (M = 2.20; SD = 1.020), landslides (M = 2.13; SD = 0.963), floods (M = 2.08; SD = 1.033), and technological accidents (M = 2.04; SD = 0.992), indicating a relatively low to moderate perception of society's ability to cope with these risks. The lowest perceived societal resilience is associated with droughts (M = 1.98; SD = 1.014) and, in particular, with environmental pollution, which received the lowest score (M = 1.91; SD = 1.059). These results suggest that citizens have the least confidence in society's systemic capacities regarding these risks.

Thus, the highest-rated categories in terms of implemented preventive measures are pandemics and epidemics (M = 2.32), followed by storms and hail (M = 2.24), and floods (M = 2.15). In contrast, the hazards rated highest in terms of societal resilience are snowstorms (M = 2.30), storms and hail (M = 2.28), and pandemics and epidemics (M = 2.26). Respondents therefore perceive society as most resilient to snowstorms (M = 2.30; SD = 1.009), followed by storms and hail (M = 2.28; SD = 1.035) and pandemics and epidemics (M = 2.26; SD = 1.063), while it is perceived as least resilient to droughts (M = 1.98; SD = 1.014) and especially to environmental pollution (M = 1.91; SD = 1.059). Figure 3 presents the percentage distribution of perceived societal resilience to disasters.

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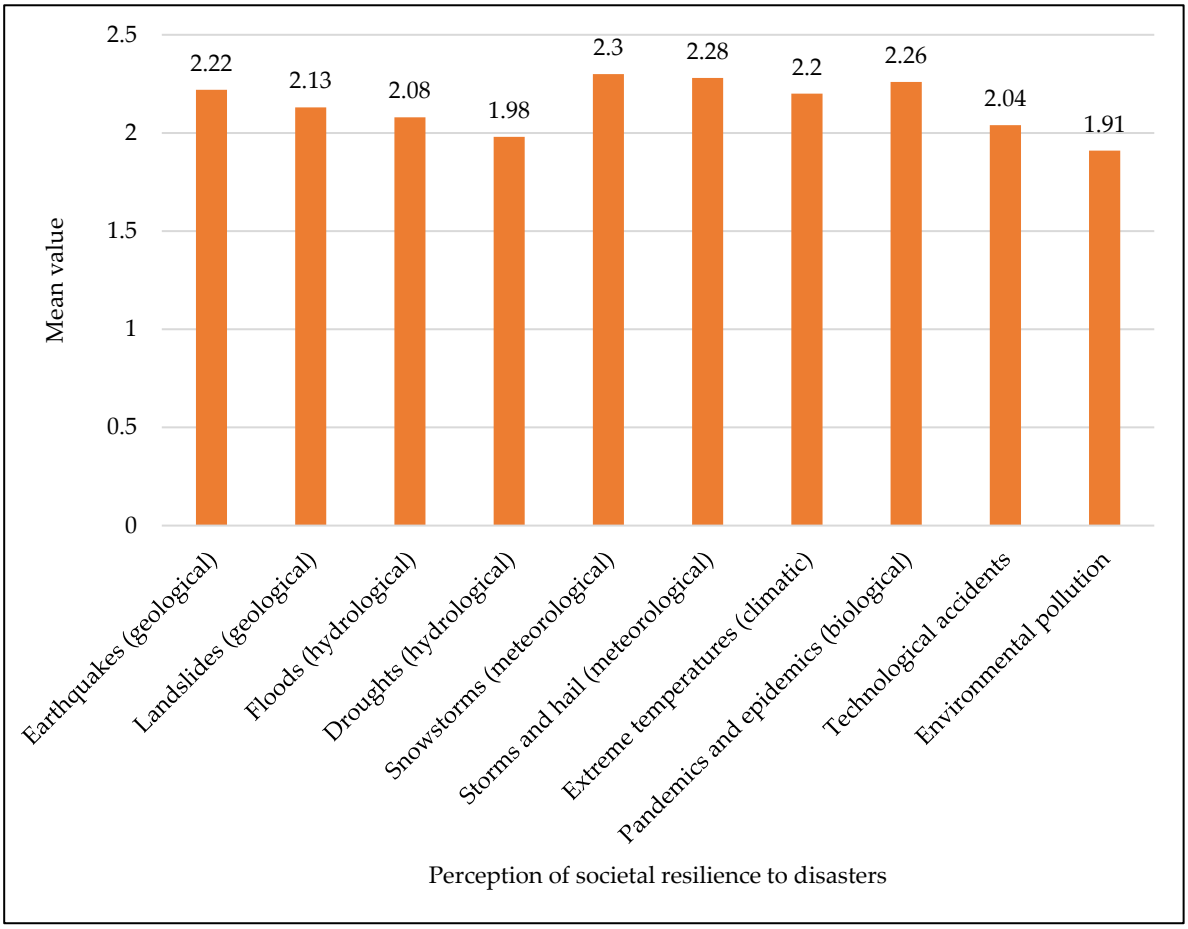

Figure 3. Percentage distribution of perceived societal resilience to disasters.

3.1.2. Social Structure

Regarding social structure, the highest average score was for the development of disaster response services, such as the police, firefighters, and civil protection, with a mean of 2.64 (SD = 1.120). While this rating remains below the scale's midpoint, it reflects greater confidence in immediate operational capabilities than in other areas. Second was access to healthcare, education, and social assistance during disasters, with a mean of 2.34 (SD = 1.057), indicating a somewhat better perception of the availability of key public services during crises. This was followed by municipal cooperation with relevant organizations (M = 2.21; SD = 1.029), the quality of regulations and documents for disaster management (M = 2.14; SD = 1.006), and risk assessment, protection, and rescue plans (M = 2.13; SD = 1.034). These scores suggest moderate to low confidence in institutional mechanisms (see Table 3 and Figure 4). Slightly lower scores appeared for the municipality's resource capacities (M = 2.09; SD = 0.997), the organizational structure and emergency management system (M = 2.04; SD = 0.999), and the expertise of local leadership regarding disasters (M = 2.02; SD = 1.056), indicating limited confidence in local governance. The lowest score was for budget allocations for protection and rescue, with a mean of 1.84 (SD = 0.984), clearly indicating a perceived chronic shortage of financial resources for risk and emergency management. Overall, all components scored below the scale's midpoint (3), reflecting a generally low perception of the institutional preparedness and capacity of local communities in Serbia to respond effectively to disasters.

Table 3. Perceptions of attitudes regarding the social-structure dimension of resilience.

Attitudes	Mean	SD
Quality of the municipality's organization and structure for disaster response	2.04	0.999
Access to healthcare, education, and social assistance during disasters	2.34	1.057

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Quality of regulations and documents for disaster management	2.14	1.006
Quality of risk assessment, protection, and rescue plans	2.13	1.034
Level of budget allocations for protection and rescue	1.84	0.984
Availability of resources for protection and rescue	2.09	0.997
Municipal cooperation with relevant organizations	2.21	1.029
Development of disaster response services (police, firefighters, civil protection)	2.64	1.120
Expertise of municipal leadership regarding disasters	2.02	1.056

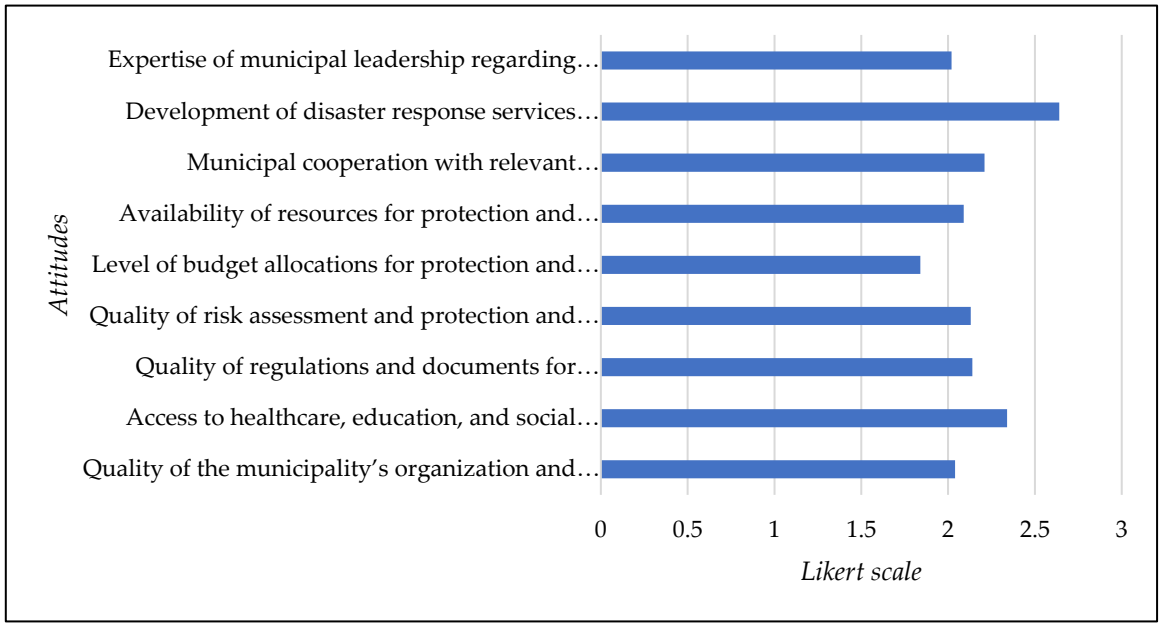

Figure 4. Percentage distribution of attitudes regarding the social-structure dimension of resilience.

3.1.3. Social Capital

The assessment of social structure and social capital in local communities reveals variations in perceptions across different indicators that influence community resilience. The highest average score was for the strength of family ties and personal relationships in emergencies, with M = 3.05 (SD = 1.154). This indicates that citizens rely most on informal, close, and personal support networks during disasters. Scores were also relatively high for social connectedness through associations and groups (M = 2.56; SD = 1.094) and participation in volunteer activities and projects (M = 2.56; SD = 1.210), reflecting a certain level of civic engagement, though still below the scale's midpoint. Mutual trust and support were rated at M = 2.43 (SD = 1.146), suggesting moderate trust among residents. Cooperation between the municipality and state authorities received the same rating as mutual trust (M = 2.43; SD = 1.077). Inter-municipal and inter-institutional cooperation in disaster contexts was assessed slightly lower (M = 2.33; SD = 1.043), indicating limited coordination at a broader territorial level. Economic cooperation among different social groups scored M = 2.17 (SD = 0.957), while the inclusion of diverse social groups in decision-making during disasters scored M = 2.08 (SD = 1.047), indicating low perceived inclusiveness. The lowest score was for local disaster preparedness initiatives, with M = 2.02 (SD = 1.009), highlighting their low visibility or frequency in practice (see Table 4 and Figure 5).

Table 4. Perceptions of attitudes regarding social capital.

Attitudes	Mean	SD
Level of mutual trust and support in the municipality	2.43	1.146
Level of social connectedness (associations, groups, etc.)	2.56	1.094
Participation in volunteer activities and projects	2.56	1.210
Cooperation between the municipality and state authorities	2.43	1.077
Involvement of diverse social groups in decision-making and planning	2.08	1.047

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Existence of local initiatives for disaster preparedness	2.02	1.009
Economic cooperation among different population groups	2.17	0.957
Municipal cooperation with other municipalities and organizations	2.33	1.043
Strength of family ties and personal relationships in emergency situations	3.05	1.154

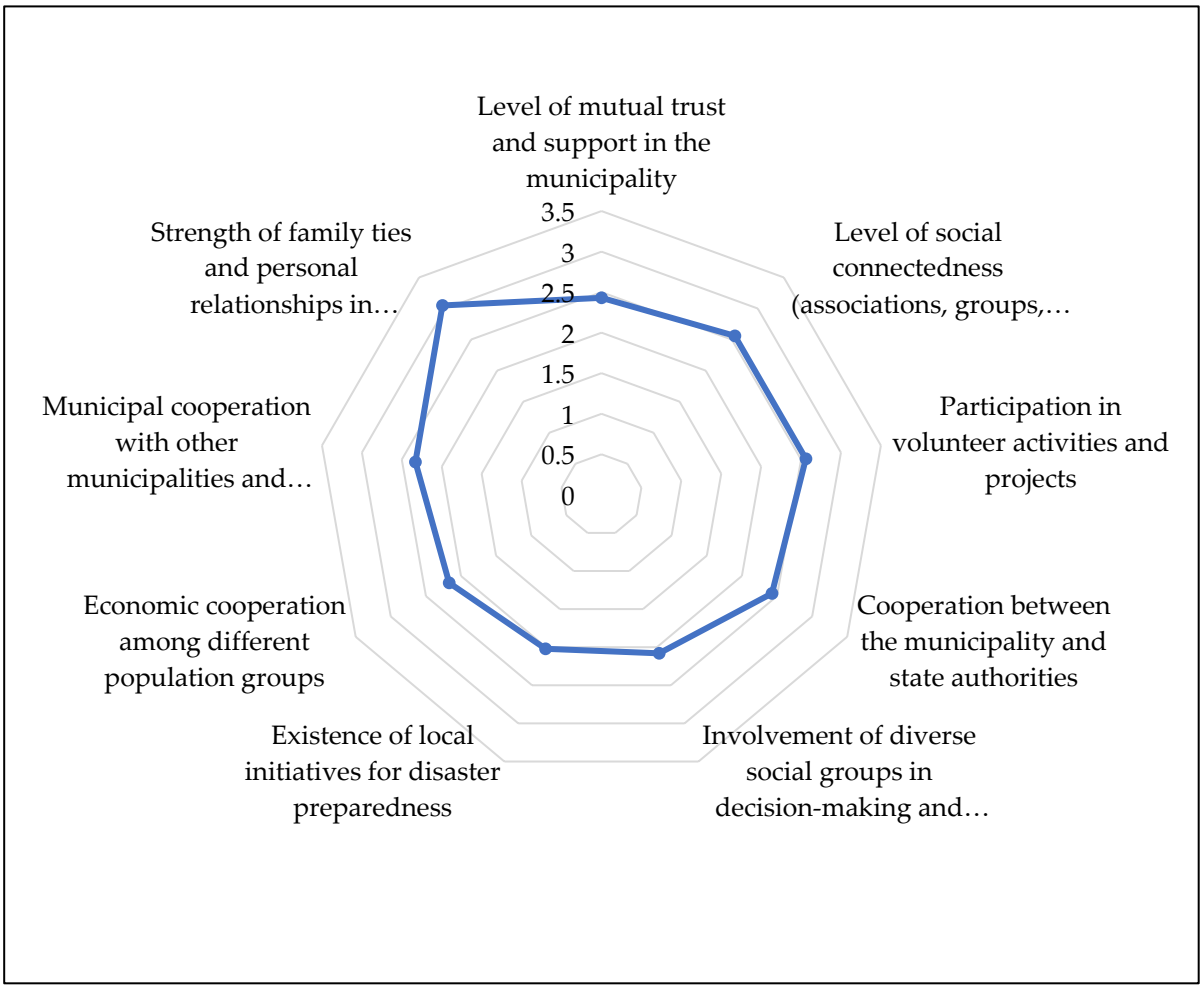

Figure 5. Percentage distribution of attitudes regarding social capital.

3.1.4. Social Mechanisms

The evaluation of social mechanisms in local communities shows a somewhat low perception of their capacity to respond to and adapt to disasters. The highest average score was for the indicator related to the influence of distance from major cities (Belgrade, Niš, Novi Sad, and Kragujevac), with M = 2.99 (SD = 1.330). This indicates that respondents view the geographic location of their municipality as a significant factor in its disaster response ability (Table 5). Scores were also high for the availability of public supplies of essential goods (M = 2.98; SD = 1.162) and for understanding and respecting cultural diversity (M = 2.78; SD = 1.149), implying better perceived capacities in basic infrastructure and social inclusion. Additionally, household preparedness for disasters (M = 2.74; SD = 1.023) indicates a degree of individual awareness and responsibility for protection.

Conversely, the lowest scores were related to institutional aspects of crisis management: the ability to make quick decisions in emergencies without bureaucratic delays (M = 2.08; SD = 1.073), the quality of early warning and public notification systems (M = 2.11; SD = 1.097), and the capacity for rapid evacuation and availability of shelters (M = 2.12; SD = 1.061). This suggests perceptions of limited efficiency and preparedness of local government structures in responding to crises.

Other indicators, such as public awareness/informedness (M = 2.15), protection of critical infrastructure (M = 2.25), insurance coverage (M = 2.21), and willingness to learn from past disasters (M = 2.32) are also below the scale's midpoint. This highlights the need to strengthen systemic

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support, education, and risk management policies. Overall, the findings indicate a perceived low level of institutional and structural preparedness, with a heavier reliance on individual and infrastructural resources. There is considerable potential to improve coordination, communication, and inclusiveness in community resilience strategies (Table 5 and Figure 6).

Table 5. Perceptions of attitudes regarding social mechanisms.

Variable	Mean	Std. Deviation
The level of education and training of people in your municipality for emergencies and disaster situations	2.44	1.076
The level of understanding and respect for cultural diversity among people in your municipality	2.78	1.149
Level of personal and collective responsibility for resilience and safety among people in your municipality	2.55	1.027
The degree of preparedness of your municipality as a community for disasters	2.19	0.977
The level of preparedness of your household for disasters	2.74	1.023
Availability of public supply of energy sources (electricity, gas, fuel, firewood)	2.98	1.162
How aware are people in your municipality of disaster risks	2.32	1.081
Level of public information in your municipality aimed at raising awareness of the need for disaster preparedness	2.15	1.097
Level of protection of critical infrastructure from disasters in your municipality (energy, transport, healthcare, communications, etc.)	2.25	1.016
Capacity for rapid evacuation and availability of shelters in your municipality during disasters	2.12	1.061
Ability to make rapid decisions in critical situations without bureaucracy in your municipality	2.08	1.073
Level of faith and optimism in your municipality's and community's ability to cope with disasters	2.34	1.088
The extent to which the distance of your municipality from major cities (Belgrade, Niš, Novi Sad, and Kragujevac) affects successful coping with disasters	2.99	1.33
Level of flexibility and adaptability of the local community to cope with disasters	2.43	1.011
How ready is the local community to learn from past disasters to respond better in the future	2.32	1.094
Quality level of the early warning and public notification system in your municipality	2.11	1.097
Level of insurance coverage against disasters in your municipality	2.21	1.066

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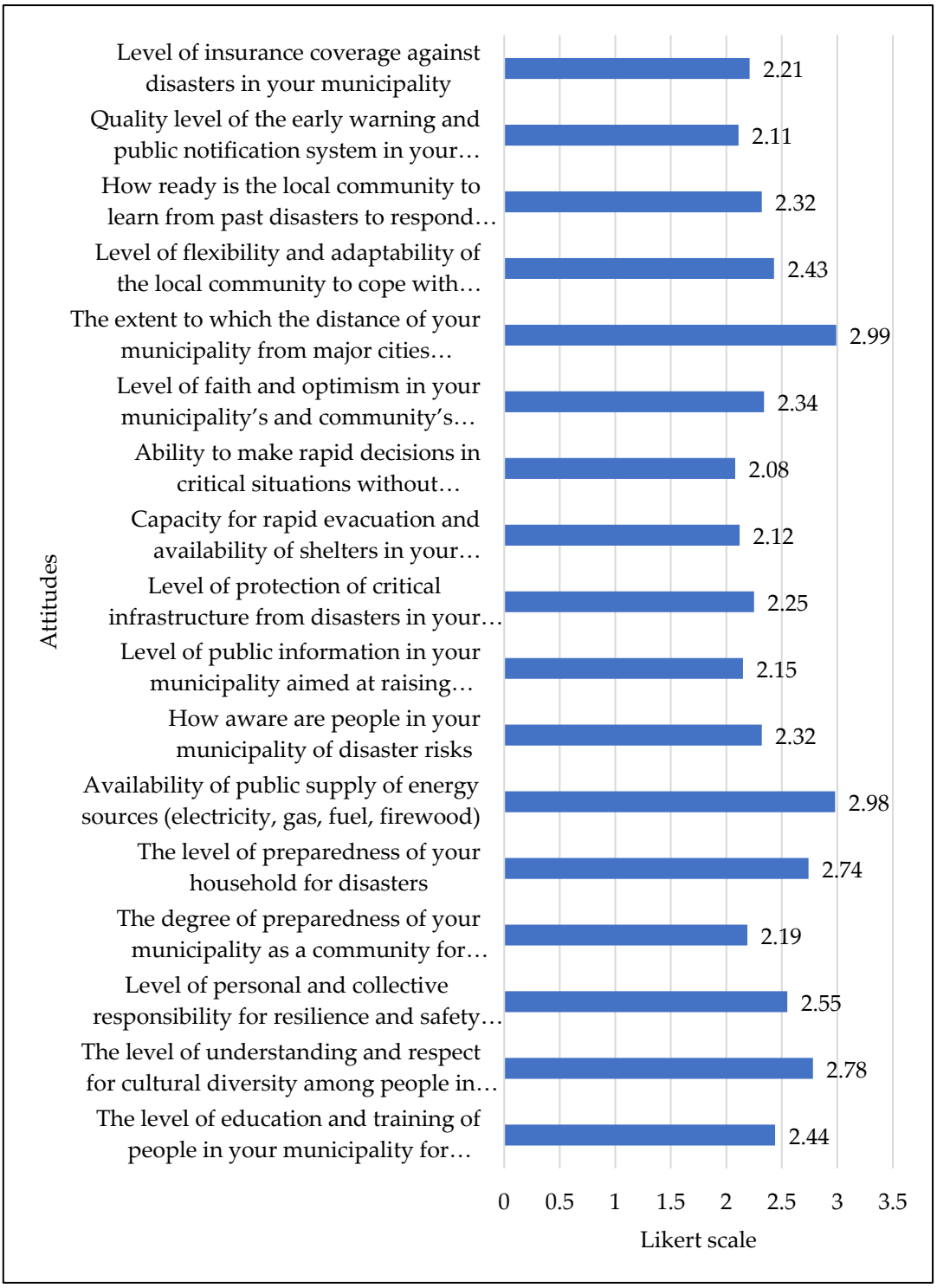

Figure 6. Percentage distribution of attitudes regarding social mechanisms.

3.1.5. Social Equality and Diversity

The evaluation of social equality and diversity within local communities reveals a somewhat low perception of inclusiveness and accessibility during emergencies. The highest scores were for the availability and quality of communication tools such as internet, telephone, and radio links, with an average of 3.19 (SD = 1.223), indicating a relatively adequate level of technical connectivity during crises. Similarly, resources like water and food supply (large stores and similar outlets) received high ratings, averaging 3.07 (SD = 1.234), reflecting existing basic supply infrastructure. Moderate ratings were observed for indicators like access to medical services and emergency interventions regardless of social status (M = 2.68; SD = 1.194), measures to protect minority rights (M = 2.55; SD = 1.151), and

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communication strategies adapted for linguistic and cultural diversity (M = 2.52; SD = 1.090). This suggests some efforts toward social justice and accessibility, but also indicates perceived deficiencies in their effectiveness. The lowest scores highlight limited social inclusion in decision-making and support for marginalized groups. For example, participation of diverse social groups in planning was rated at M = 2.13 (SD = 1.049), and trust in social institutions' work during disasters was M = 2.17 (SD = 1.039). Additionally, community readiness to address social injustice was low (M = 2.21; SD = 1.107), suggesting limited acknowledgment of collective responsibility for equality during crises. The existence of programs for vulnerable groups, like older adults or persons with special needs, received a rating of M = 2.28 (SD = 1.045), indicating limited visibility or implementation. Overall, citizens perceive social equality, fairness, and preparedness as low to moderate, with a greater reliance on technical resources than on institutional and social inclusion, as shown in Table 6 and Figure 7.

Table 6. Perceptions of attitudes regarding social equality and diversity.

Variable	Mean	Std. Deviation
Availability of large-capacity accommodation facilities in your municipality in case of a disaster	2.46	1.113
Level of personal savings and access to credit relative to your income	2.4	1.134
Access to resources and services without discrimination in your municipality	2.47	1.145
Existence of measures to protect and promote the rights of minority groups in your municipality	2.55	1.151
Community readiness to address social injustice in your municipality	2.21	1.107
Availability of key resources in your municipality, such as water and food	3.07	1.234
Access to medical services and emergency interventions in your municipality, regardless of social status	2.68	1.194
The extent of social assistance available to different groups during disasters in your municipality	2.42	1.078
Existence of programs and plans addressing the specific needs of vulnerable groups (e.g., older adults, persons with disabilities)	2.28	1.045
Availability of evacuation transportation that meets the diverse needs of people in your municipality	2.47	1.072
Openness and adaptability of communication strategies for different linguistic and cultural communities	2.52	1.09
Involvement of diverse social groups in planning, implementing measures, and decision-making processes	2.13	1.049
Trust in the work of social institutions and services during disasters in your municipality	2.17	1.039
Availability and quality of communication tools in your municipality (internet, telephone, radio links)	3.19	1.223

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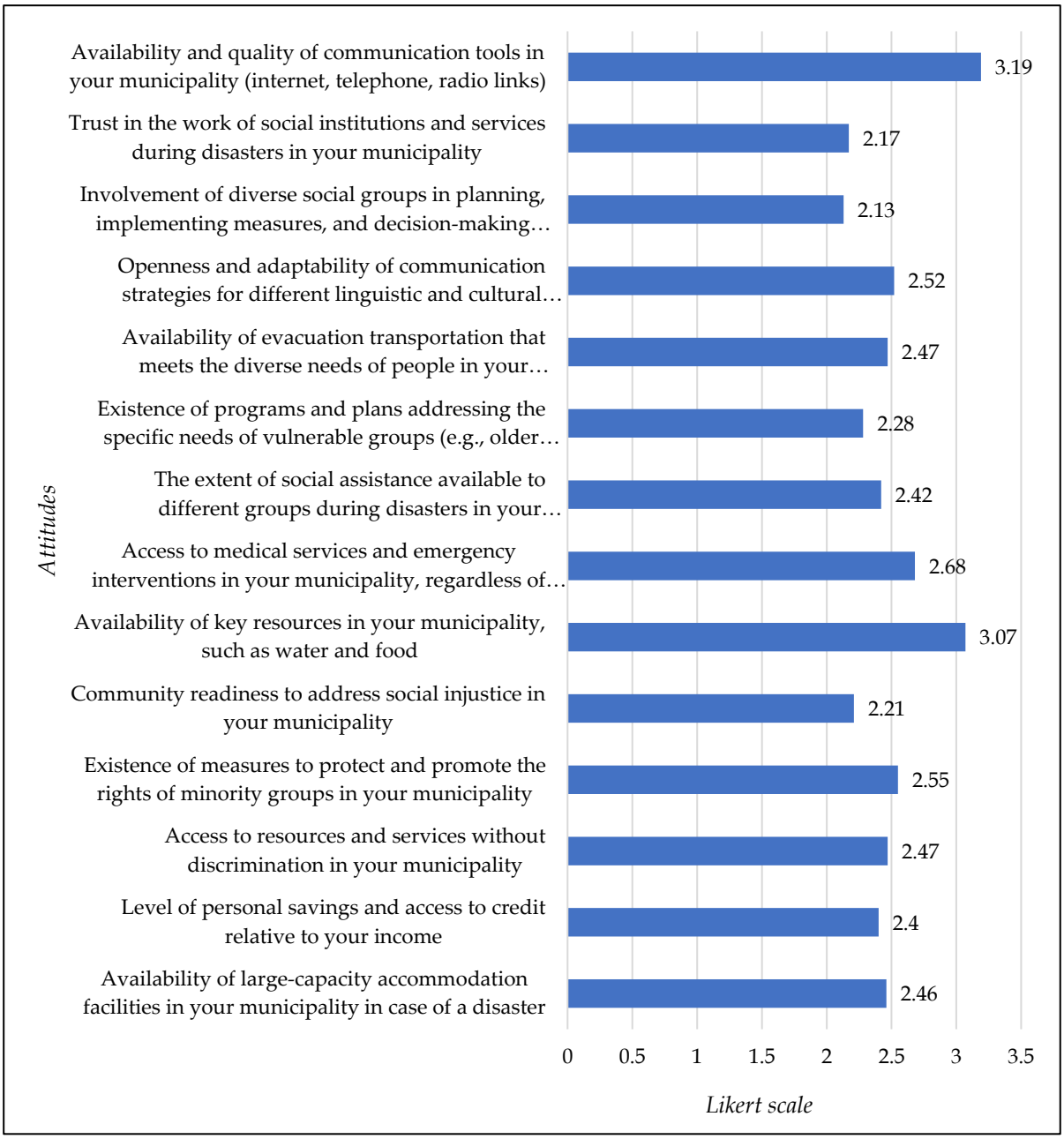

Figure 7. Percentage distribution of attitudes regarding social equality and diversity.

3.1.6. Social beliefs

The perception of social beliefs within the context of culture, tradition, and religion reflects a moderate level of societal awareness about the significance of intangible values in fostering community resilience. The highest average score was for the statement "To what extent do tradition and culture influence your understanding of what disasters are?" with M = 3.00 (SD = 1.211), indicating a relatively strong influence of cultural heritage on how risks and emergencies are interpreted. Additionally, high ratings were given to statements such as "Respect for traditional community norms and values" (M = 2.98; SD = 1.123), "The importance of cultural and religious values in community life" (M = 2.83; SD = 1.111), "Openness to dialogue and understanding between different cultural and religious groups" (M = 2.77; SD = 1.114), and "Participation in traditional and religious rituals" (M = 2.76; SD = 1.184). These results suggest a positive view of social cohesion and cultural connectedness as key aspects of collective identity. Moderate scores were observed for items like "Respect for and preservation of local customs and traditions during and after disasters" (M = 2.74; SD = 1.110), "Personal involvement in local cultural activities" (M = 2.64; SD = 1.090), and

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"Municipal participation in religious ceremonies" (M = 2.60; SD = 1.073), indicating some level of engagement from citizens and institutions in maintaining the community's cultural dimension. The lowest scores were for items related to the institutional role of religious structures, such as "The influence of religious leaders and institutions on decision-making" (M = 2.35; SD = 1.087) and "The activity level of religious institutions in disaster preparedness" (M = 2.45; SD = 1.099), reflecting a limited role and presence of these actors in formal risk governance and response planning. Overall, the findings suggest respondents recognize the importance of cultural and traditional values for social resilience, though the role of formal religious institutions in disaster management appears underdeveloped and perceived as weak (Table 7 and Figure 8).

Table 7. Perceptions of attitudes regarding social beliefs.

Variable	Mean	Std. Deviation
Level of development of a disaster resilience culture in your municipality	2.39	1.021
The importance of cultural and religious values in the life of your community in the municipality	2.83	1.111
Openness to dialogue and understanding between different cultural and religious groups in your municipality	2.77	1.114
Your participation in traditional and religious rituals that strengthen collective identity in your municipality	2.76	1.184
Respect for traditional community norms and values in your municipality	2.98	1.123
Level of personal participation in local cultural activities and community events in your municipality	2.64	1.09
Level of respect for and preservation of local customs and traditions during and after disasters in your municipality	2.74	1.11
Influence of religious leaders and religious institutions on decision-making in your municipality	2.35	1.087
Level of activity of religious institutions in disaster preparedness and emergencies in your municipality	2.45	1.099
Extent of your municipality's participation in religious ceremonies	2.6	1.073
To what extent do tradition and culture influence your understanding of what disasters are	3.0	1.211

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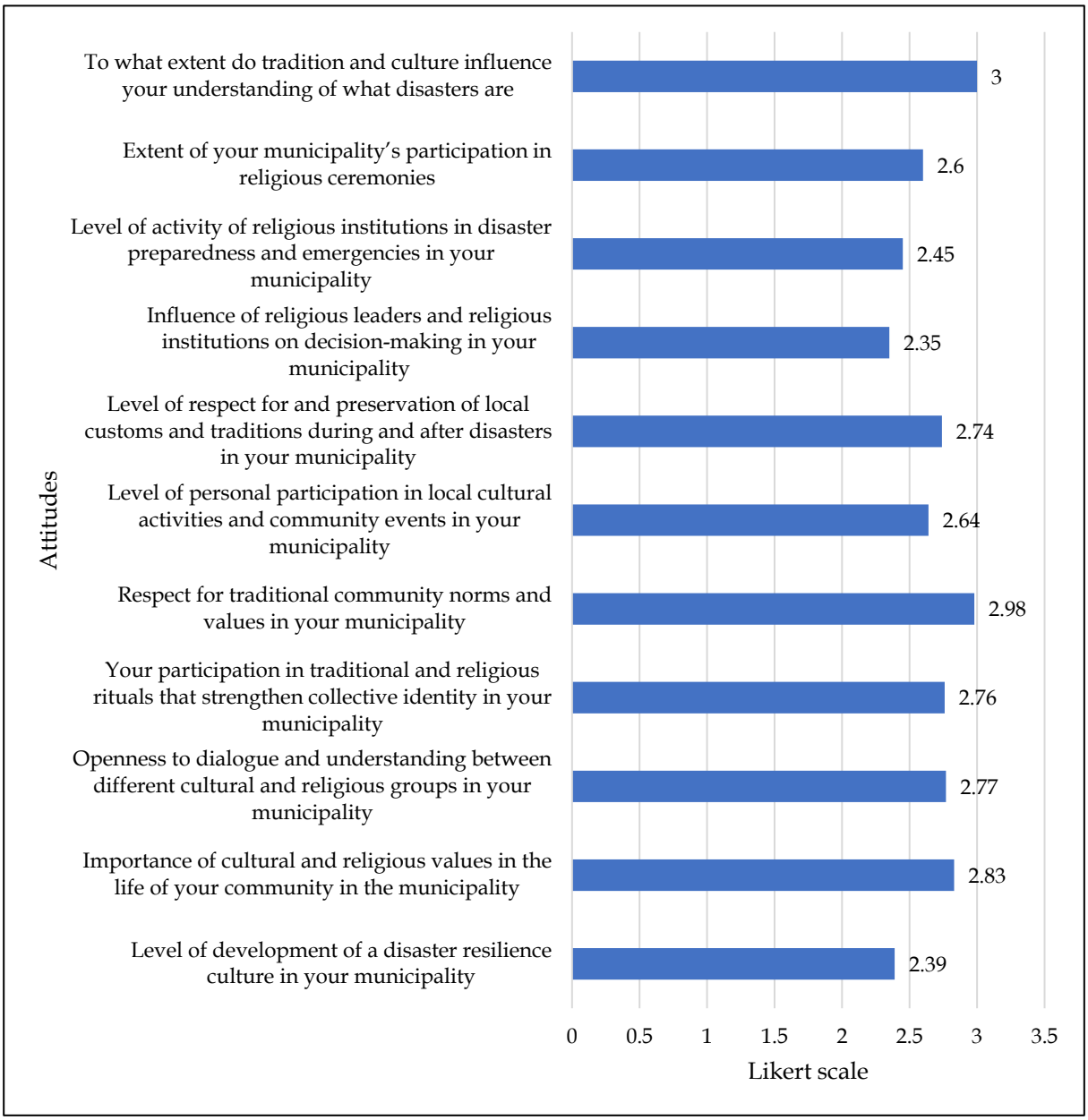

Figure 8. Percentage distribution of attitudes regarding social beliefs.

3.2.. Results of Inferential Statistical Analyses

3.2.1. Correlational Analyses of Demographic and Socioeconomic Factors with the Perception of Preventive Measures and Community Disaster Resilience

3.2.1.1. Pearson Correlation Between Age (in Years) and the Perception of Preventive Measures and Community Disaster Resilience

The Pearson correlation analysis indicates a statistically significant association between respondents' age and their perception of the implementation of preventive measures in the context of societal preparedness for earthquake-induced disasters ($r = -0.100$, $p \leq 0.01$; low correlation). Specifically, the calculations show that age explains 1.00% of the variance in the assessment of earthquake measure implementation. The negative relationship suggests that older individuals tend to rate preventive activities related to earthquakes lower. A similar pattern was observed for landslides ($r = -0.090$, $p \leq 0.01$; low correlation), where age explains 0.81% of the variance. For snowstorms ($r = -0.094$, $p \leq 0.01$; low correlation), the explained variance is approximately 0.88%. The

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same trend was found for storms and hail (r = -0.098, p ≤ 0.01; low correlation), as well as for environmental pollution (r = -0.102, p ≤ 0.01; low correlation). Taken together, these findings suggest a consistent trend: older respondents are less likely to perceive communities as adequately prepared for these types of disasters. A slightly weaker, yet still statistically significant, negative correlation was identified for floods (r = -0.060, p ≤ 0.05), high temperatures (r = -0.071, p ≤ 0.05), and technological accidents (r = -0.074, p ≤ 0.05). These results indicate very weak negative associations, explaining variance ranging from 0.36% to 0.52%. The strongest negative correlation was observed between epidemics and pandemics (r = -0.139, p ≤ 0.01; small to moderate), with age explaining 1.93% of the variance. This suggests that older respondents are significantly more likely to question societal preparedness for biological disasters.

In contrast, no statistically significant association was found between age and perceptions of preventive measures during drought (r = -0.041, p > 0.05), suggesting that age does not affect societal preparedness in this context. Overall, the findings demonstrate a weak but consistent negative relationship between age and perceptions of preventive measures for most of the disasters examined. This suggests that older individuals have slightly lower confidence in society's capacity to implement effective preventive actions, which is important for developing targeted risk communication and education strategies (Table 8).

Table 8. Pearson Correlations Between Age (Years) and the Perception of Preventive-Measure Implementation Across Different Types of Disasters.

	Age (years)	Earthquakes	Landslides	Floods	Droughts	Snowstorms	Storms and hail	High temperatures	Epidemics and pandemics	Technological accidents	Environmental pollution
Age (years)	1.00										
Earthquakes	–0.10**	1.00									
Landslides	–0.09**	0.73**	1.00								
Floods	–0.06*	0.50**	0.60**	1.00							
Droughts	–0.04	0.50**	0.57**	0.67**	1.00						
Snowstorms	–0.09**	0.64**	0.64**	0.52**	0.61**	1.00					
Storms and hail	–0.10**	0.56**	0.59**	0.53**	0.56**	0.69**	1.00				
High temperatures	–0.07*	0.54**	0.58**	0.57**	0.68**	0.63**	0.69**	1.00			
Epidemics and pandemics	–0.14**	0.59**	0.60**	0.62**	0.59**	0.61**	0.68**	0.63**	1.00		
Technological accidents	–0.07*	0.57**	0.56**	0.55**	0.60**	0.61**	0.61**	0.62**	0.69**	1.00	
Environmental pollution	–0.10**	0.49**	0.49**	0.56**	0.63**	0.45**	0.52**	0.60**	0.63**	0.71**	1.00

In the next phase of the analysis, the Pearson correlation results confirmed a statistically significant association between respondents' age and their assessment of societal resilience in the context of earthquake-related disasters (r = -0.125, p ≤ 0.01; low correlation). A similar pattern was observed for landslides (r = -0.127, p ≤ 0.01; low correlation). For snowstorms (r = -0.078, p ≤ 0.01), storms and hail (r = -0.093, p ≤ 0.01), and high temperatures (r = -0.110, p ≤ 0.01), similarly weak negative correlations were identified.

The strongest negative association was observed for environmental pollution (r = -0.092, p ≤ 0.01; low correlation), indicating that older respondents are less likely to believe in society's resilience to industrial and environmental stressors. By contrast, correlations with perceived resilience to

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epidemics and pandemics (r = -0.056, p = 0.052) and technological accidents (r = -0.042, p = 0.149) were not statistically significant, although the former approached statistical significance.
In addition, no statistically significant relationship was found for floods (r = -0.032, p = 0.274) or droughts (r = -0.028, p = 0.335), suggesting that respondents' age does not influence perceptions of societal resilience to these hydrological disasters (Table 9).

Table 9. Pearson Correlation Between Age (Years) and the Perception of Societal Resilience to Different Types of Disasters.

	Age (years)	Earthquakes	Landslides	Floods	Droughts	Snowstorms	Storms and hail	High temperatures	Epidemics and pandemics	Technological accidents	Environmental pollution
Age (years)	1.00										
Earthquakes	–0.13**	1.00									
Landslides	–0.13**	0.76**	1.00								
Floods	–0.03	0.57**	0.65**	1.00							
Droughts	–0.03	0.52**	0.62**	0.72**	1.00						
Snowstorms	–0.08**	0.67**	0.70**	0.60**	0.63**	1.00					
Storms and hail	–0.09**	0.64**	0.66**	0.61**	0.59**	0.76**	1.00				
High temperatures	–0.11**	0.59**	0.63**	0.64**	0.70**	0.69**	0.75**	1.00			
Epidemics and pandemics	–0.06	0.64**	0.64**	0.64**	0.59**	0.66**	0.70**	0.64**	1.00		
Technological accidents	–0.04	0.66**	0.69**	0.62**	0.61**	0.63**	0.67**	0.61**	0.71**	1.00	
Environmental pollution	–0.09**	0.58**	0.62**	0.63**	0.64**	0.56**	0.61**	0.62**	0.65**	0.74**	1.00

3.2.1.2. T-test Analysis of the Associations of Gender, Fear, and Type of Housing with the Perception of Preventive Measures and Community Disaster Resilience

Table 9 presents the results of the t-test analysis of gender differences in perceptions of the implementation of preventive measures in society across different types of disasters. In most cases, no statistically significant differences were found between men and women. For example, in the assessment of measure implementation in the case of earthquakes, the mean ratings were identical (men: M = 2.06; women: M = 2.06), with t = 0.105 and p = 0.917. Similarly, differences in perceptions of measures for landslides (t = 1.361; p = 0.174), floods (t = 1.934; p = 0.053), droughts (t = -0.219; p = 0.827), snowstorms (t = 1.196; p = 0.232), storms and hail (t = 1.195; p = 0.232), epidemics and pandemics (t = 1.383; p = 0.167), technological accidents (t = 1.766; p = 0.078), and environmental pollution (t = 0.192; p = 0.848) did not reach statistical significance. The only significant difference was observed for perceptions of measure implementation in the case of high temperatures, where men gave higher ratings (M = 2.10) than women (M = 1.95), which was statistically significant (t = 2.507; p = 0.012). This indicates a modest gender difference in the perception of climate-related threats, whereas for other types of disasters, perceptions of preventive measures were largely similar across genders (Table 10).

Table 10. T-test Analysis of the Association Between Gender and the Perception of Preventive Measures.

Disaster category	F	t	Sig.(2-tailed)	df	Male M (SD)	Female M (SD)
Earthquakes	1.426	0.105	0.917	1198	2.06 (0.99)	2.06 (0.98)
Landslides	0.658	1.361	0.174	1198	1.98 (0.96)	1.90 (0.92)
Floods	2.729	1.934	0.053	1198	2.20 (1.11)	2.08 (1.10)
Droughts	1.662	-0.219	0.827	1198	1.86 (1.09)	1.88 (1.02)

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Snowstorms	3.137	1.196	0.232	1198	2.10 (0.94)	2.03 (1.00)
Storms and hail	0.224	1.195	0.232	1198	2.27 (1.06)	2.20 (1.06)
High temperatures	2.456	2.507	0.012*	1198	2.10 (1.06)	1.95 (1.01)
Epidemics and pandemics	0.016	1.383	0.167	1198	2.36 (1.11)	2.27 (1.10)
Technological accidents	0.409	1.766	0.078	1198	2.07 (1.03)	1.96 (1.05)
Environmental pollution	0.114	0.192	0.848	1198	1.82 (1.07)	1.81 (1.07)

The presented t-test results indicate that respondents who report fear evaluate the implementation of preventive measures for certain types of disasters differently compared with those who do not feel fear. Significantly lower ratings were given for the implementation of measures in the case of snowstorms (M = 1.98 among those with fear vs. M = 2.13 among those without fear; t = -2.618; p = 0.009), as well as for storms and hail (M = 2.14 vs. M = 2.32; t = -2.840; p = 0.005). These differences are statistically significant at the $p < 0.01$ level. For other types of disasters—including earthquakes, landslides, droughts, epidemics, technological accidents, and environmental pollution—the differences did not reach statistical significance, although trends were observed in some cases (e.g., landslides: p = 0.080; droughts: p = 0.079). Overall, these findings suggest that fear may influence perceptions of societal preparedness in specific contexts, particularly regarding meteorological risks (Table 11).

Table 11. T-test Analysis of the Association Between Fear and the Perception of Preventive Measures Across Different Types of Disasters.

Disaster category	F	t	Sig.(2-tailed)	df	Fear M (SD)	No fear: M (SD)
Earthquakes	0.204	-1.509	0.131	1198	2.01 (1.03)	2.10 (0.95)
Landslides	0.612	-1.754	0.080	1198	1.89 (0.94)	1.99 (0.94)
Floods	0.101	0.406	0.685	1198	2.16 (1.11)	2.13 (1.11)
Droughts	4.514	1.757	0.079	1198	1.93 (1.03)	1.82 (1.08)
Snowstorms	0.150	-2.618	0.009*	1198	1.98 (0.98)	2.13 (0.96)
Storms and hail	0.821	-2.840	0.005*	1198	2.14 (1.11)	2.32 (1.02)
High temperatures	0.301	-1.719	0.086	1198	1.97 (1.02)	2.08 (1.04)
Epidemics and pandemics	4.352	-1.007	0.314	1198	2.28 (1.16)	2.34 (1.07)
Technological accidents	1.696	-1.058	0.290	1198	1.98 (1.07)	2.05 (1.01)
Environmental pollution	3.512	1.369	0.171	1198	1.86 (1.10)	1.78 (1.05)

Next, the t-test results indicate a statistically significant difference in how respondents perceive and interpret the implementation of preventive measures between volunteers and non-volunteers. Volunteers consistently rated the implementation of measures lower for earthquakes (M = 1.97) than non-volunteers (M = 2.14), and this difference was statistically significant (t = -3.086; p = 0.002). Significantly lower ratings were also reported for snowstorms (t = -3.632; $p < 0.001$), high temperatures (t = -2.242; p = 0.025), epidemics and pandemics (t = -3.333; p = 0.001), and technological accidents (t = -1.999; p = 0.046). These differences suggest that volunteer experience may be associated with a more critical assessment of institutional preparedness for various types of disasters. For the remaining categories (landslides, floods, droughts, storms and hail, and environmental pollution), the differences did not reach statistical significance (Table 12).

Table 12. T-test Analysis of the Association Between Volunteering and the Perception of Preventive Measures.

Disaster category	F	t	Sig.(2-tailed)	df	Volunteers M (SD)	Non-volunteers M (SD)
Earthquakes	9.126	-3.086	0.002*	1198	1.97 (0.94)	2.14 (1.02)
Landslides	0.001	-1.632	0.103	1198	1.90 (0.92)	1.99 (0.96)
Floods	0.368	1.127	0.260	1198	2.18 (1.13)	2.11 (1.09)
Droughts	2.796	-1.241	0.215	1198	1.83 (1.02)	1.90 (1.09)
Snowstorms	13.214	-3.632	0.000**	1198	1.96 (0.90)	2.16 (1.02)
Storms and hail	4.482	-1.873	0.061	1198	2.18 (1.03)	2.29 (1.09)
High temperatures	2.722	-2.242	0.025*	1198	1.96 (0.99)	2.10 (1.07)

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Epidemics and pandemics	2.395	-3.333	0.001**	1198	2.20 (1.09)	2.42 (1.12)
Technological accidents	0.276	-1.999	0.046*	1198	1.96 (1.03)	2.08 (1.05)
Environmental pollution	0.105	-1.495	0.135	1198	1.77 (1.07)	1.86 (1.08)

The results show that male respondents rated society as more resilient to earthquakes (M = 2.31; SD = 1.00) more often than female respondents (M = 2.12; SD = 0.98), t(1198) = 3.22, p = 0.001. Men also perceived society as more resilient to landslides (M = 2.18; SD = 0.95) than women (M = 2.07; SD = 0.97), t(1198) = 2.03, p = 0.043, as well as to floods (M = 2.15; SD = 1.05) compared with women (M = 2.00; SD = 1.00), t(1198) = 2.41, p = 0.016. A significant difference was also observed in perceived resilience to snowstorms, with men rating higher (M = 2.40; SD = 1.02) than women (M = 2.18; SD = 0.98), t(1198) = 3.85, p < 0.001. Similarly, for technological accidents, men rated society as more resilient (M = 2.10; SD = 0.99) compared with women (M = 1.97; SD = 0.99), t(1198) = 2.23, p = 0.026. For other disaster types—droughts, storms and hail, high temperatures, epidemics and pandemics, and environmental pollution—no statistically significant differences were found between men and women (p > 0.05). These results indicate that gender may influence perceptions of resilience for some disaster categories but not for others (Table 13).

Table 13. T-test Analysis of the Association Between Gender and Community Disaster Resilience.

Disaster category	t	Sig.(2-tailed)	df	Male M (SD)	Female M (SD)	Difference
Earthquakes	3.220	0.001**	1198	2.31 (1.00)	2.12 (0.98)	+0.19
Landslides	2.028	0.043*	1198	2.18 (0.95)	2.07 (0.97)	+0.11
Floods	2.410	0.016*	1198	2.15 (1.05)	2.00 (1.00)	+0.15
Droughts	0.362	0.717	1198	1.99 (1.02)	1.97 (1.00)	+0.02
Snowstorms	3.848	0.000***	1198	2.40 (1.02)	2.18 (0.98)	+0.22
Storms and hail	1.643	0.101	1198	2.33 (1.03)	2.23 (1.04)	+0.10
High temperatures	1.808	0.071	1198	2.25 (1.05)	2.14 (0.99)	+0.11
Epidemics and pandemics	1.856	0.064	1198	2.32 (1.06)	2.20 (1.07)	+0.12
Technological accidents	2.228	0.026*	1198	2.10 (0.99)	1.97 (0.99)	+0.13
Environmental pollution	0.460	0.646	1198	1.92 (1.05)	1.90 (1.07)	+0.02

Testing differences in perceived societal resilience to disasters between respondents who experience fear and those who do not revealed statistically significant differences for several categories. Respondents who reported fear rated societal resilience significantly lower for: earthquakes—those with fear gave a mean score of 2.02 (SD = 0.97), whereas those without fear reported 2.37 (SD = 0.99), t = -6.093, p < 0.001; landslides—ratings were 1.98 (SD = 0.96) among those with fear and 2.24 (SD = 0.96) among those without fear, t = -4.560, p < 0.001; snowstorms—those with fear rated society at 2.09 (SD = 0.98), while others reported an average of 2.46 (SD = 1.01), t = -6.464, p < 0.001; storms and hail—the mean in the fear group was 2.07 (SD = 1.00), compared with 2.44 (SD = 1.03) among those without fear, t = -6.254, p < 0.001; high temperatures—the difference was also significant: 2.07 (SD = 0.98) with fear versus 2.30 (SD = 1.04) without fear, t = -3.962, p < 0.001; epidemics and pandemics—2.12 (SD = 1.09) with fear and 2.37 (SD = 1.03) without fear, t = -3.961, p < 0.001; and technological accidents—respondents with fear rated resilience at 1.93 (SD = 0.98), compared with 2.11 (SD = 1.00) in the other group, t = -3.107, p = 0.002. For other disaster types, such as floods, droughts, and environmental pollution, the differences did not reach statistical significance. Overall, these results indicate that fear of disasters is associated with lower ratings of perceived societal resilience, particularly for geological, meteorological, and biological risks (Table 14).

Table 14. T-test Analysis of the Association Between Fear and the Perception of Community Disaster Resilience.

Disaster category	F	t	Sig.(2-tailed)	df	Fear M (SD)	No fear M (SD)
Earthquakes	4.447	-6.093	0.000***	1198	2.02 (0.97)	2.37 (0.99)
Landslides	1.57	-4.56	0.000***	1198	1.98 (0.96)	2.24 (0.96)
Floods	0.831	-1.231	0.219	1198	2.04 (1.02)	2.11 (1.04)

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Droughts	0.968	-0.875	0.382	1198	1.95 (0.97)	2.00 (1.05)
Snowstorms	2.189	-6.464	0.000***	1198	2.09 (0.98)	2.46 (1.01)
Storms and hail	5.946	-6.254	0.000***	1198	2.07 (1.00)	2.44 (1.03)
High temperatures	5.964	-3.962	0.000***	1198	2.07 (0.98)	2.30 (1.04)
Epidemics and pandemics	1.9	-3.961	0.000***	1198	2.12 (1.09)	2.37 (1.03)
Technological accidents	0.186	-3.107	0.002**	1198	1.93 (0.98)	2.11 (1.00)
Environmental pollution	0.037	-1.371	0.171	1198	1.86 (1.03)	1.95 (1.08)

Based on the t-test results, it can be concluded that volunteering is a factor that statistically significantly differentiates perceptions of societal resilience for specific disaster categories. Respondents who volunteer rated societal resilience to snowstorms lower (M = 2.22, SD = 0.99) than those who do not volunteer (M = 2.36, SD = 1.02), t(1198) = -2.393, p = 0.017. Similarly, significant differences were found in perceived resilience to storms and hail (M = 2.21, SD = 1.01 vs. M = 2.35, SD = 1.06; t(1198) = -2.359, p = 0.018), as well as to epidemics and pandemics (M = 2.20, SD = 1.05 vs. M = 2.32, SD = 1.07; t(1198) = -1.997, p = 0.046). Other differences did not reach statistical significance (Table 15).

Table 15. T-test analysis of the association between volunteering and the perceived resilience of communities to disasters.

Disaster category	F	t	Sig.(2-tailed)	df	Volunteers M (SD)	Non-volunteersM (SD)
Earthquakes	8.500	-1.765	0.078	1198	2.17 (0.97)	2.27 (1.01)
Landslides	2.161	-1.500	0.134	1198	2.08 (0.96)	2.17 (0.96)
Floods	0.538	0.964	0.335	1198	2.11 (1.03)	2.05 (1.04)
Droughts	0.428	1.133	0.257	1198	2.01 (1.02)	1.95 (1.01)
Snowstorms	1.621	-2.393	0.017*	1198	2.22 (0.99)	2.36 (1.02)
Storms and hail	3.207	-2.359	0.018*	1198	2.21 (1.01)	2.35 (1.06)
High temperatures	0.745	0.064	0.949	1198	2.20 (1.04)	2.20 (1.00)
Epidemics and pandemics	0.929	-1.997	0.046*	1198	2.20 (1.05)	2.32 (1.07)
Technological accidents	1.910	-1.545	0.123	1198	1.99 (0.98)	2.08 (1.01)
Environmental pollution	0.236	-1.175	0.240	1198	1.87 (1.06)	1.94 (1.06)

3.2.1.3. ANOVA Analysis of the Associations of Education, Marital and Employment Status, and Income with the Perception of Preventive Measures and Community Disaster Resilience

The results of the one-way analysis of variance (ANOVA) indicate that education level has a statistically significant effect on assessments of the implementation of preventive measures in society in the case of earthquakes (F(3, 1196) = 2.86, p = 0.036) and environmental pollution (F(3, 1196) = 4.08, p = 0.007). For other types of disasters—such as landslides, floods, droughts, snowstorms, storms and hail, high temperatures, epidemics and pandemics, and technological accidents—the analysis did not reveal statistically significant differences in ratings by respondents' education level (p > 0.05).

Further analysis based on mean values shows that respondents with doctoral education (M = 2.03) rated the implementation of preventive measures in the case of earthquakes higher than the other groups: primary education (M = 1.99), secondary education (M = 2.14), and master/specialist education (M = 1.95). In the case of environmental pollution, the highest ratings were given by respondents with the highest level of education—doctoral studies (M = 2.31)—while the lowest values were recorded among those with master's/specialist education (M = 1.70), as well as among respondents with lower levels of education (M = 1.75 and M = 1.86).

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Mean values and standard deviations across all education groups and disaster types provide additional insights into group differences. The highest mean rating for preventive measures in the case of earthquakes was given by respondents with secondary education (M = 2.14, SD = 1.01), whereas the lowest was among respondents with third-cycle academic education (doctoral studies) (M = 1.95, SD = 1.00). For environmental pollution, the highest rating was given by respondents with third-cycle academic education (doctoral studies) (M = 2.31, SD = 1.45). This finding is statistically the most notable because it exceeds the ratings of the other groups.

Although larger differences were not statistically significant, trends can be observed for certain disaster types. For example, in the case of floods, respondents with doctoral education reported the highest mean rating (M = 2.43, SD = 1.17), and they also gave higher ratings for technological accidents (M = 2.40, SD = 1.27). These findings may suggest that higher education is associated with greater awareness of certain types of risks, particularly in domains with more complex technical or environmental dimensions (Table 16).

Table 16. One-way ANOVA: Association between education level and perceptions of preventive measures.

Hazards	df	F	Sig.
Earthquakes	(3, 1196)	2.864	0.036*
Landslides	(3, 1196)	0.567	0.637
Floods	(3, 1196)	0.989	0.397
Droughts	(3, 1196)	1.971	0.117
Snowstorms	(3, 1196)	0.245	0.865
Storms and hail	(3, 1196)	1.186	0.314
High temperatures	(3, 1196)	1.180	0.316
Epidemics and pandemics	(3, 1196)	0.578	0.629
Technological accidents	(3, 1196)	2.087	0.100
Environmental pollution	(3, 1196)	4.081	0.007*

In the study, the effect of marital status on perceptions of the implementation of preventive measures across different types of disasters was examined using a one-way analysis of variance (ANOVA). Respondents were classified into five categories: divorced, single, married or cohabiting, in a relationship, and widowed. The assumption of homogeneity of variances was tested using Levene's test, and, when violated, results from Welch's test were used as a more robust indicator (Table 17).

The analysis showed that respondents' marital status is a factor that statistically significantly differentiates mean ratings of perceived preventive measures for several types of disasters. For geological disasters, such as earthquakes, a significant difference was found ($F(4, 1195) = 3.57$, $p = 0.007$), with the lowest mean ratings recorded among divorced respondents (M = 1.92, SD = 1.03) and the highest among those who were married or in a cohabiting partnership (M = 2.29, SD = 1.02). Similarly, for landslides, a significant difference was also obtained ($F = 2.94$, $p = 0.020$), with lower values among widowed respondents (M = 1.88, SD = 1.07) and higher values among single respondents (M = 2.09, SD = 0.95).

Regarding hydrological disasters, statistically significant differences were observed in perceptions of preventive measures for floods ($F = 4.74$, $p = 0.001$) and droughts ($F = 4.09$, $p = 0.003$). In both cases, single respondents reported higher ratings (M = 2.45, SD = 1.11 for floods; M = 2.17, SD = 1.12 for droughts) compared with divorced respondents (M = 1.95, SD = 1.15; M = 1.58, SD = 0.97). For meteorological disasters, such as snowstorms ($F = 2.56$, $p = 0.037$) and hailstorms ($F = 3.92$, $p = 0.004$), statistically significant differences in ratings were also found, though with smaller group differences.

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Particularly pronounced differences were identified in perceptions of preventive measures for biological disasters—epidemics and pandemics ($F = 6.98$, $p < 0.001$)—as well as for technological accidents ($F = 3.34$, $p = 0.010$) and environmental pollution ($F = 7.58$, $p < 0.001$). For example, in the case of epidemics/pandemics, single respondents reported the highest mean rating ($M = 2.67$, $SD = 1.15$), whereas widowed and divorced respondents showed lower levels of perceived preventive measures ($M = 2.14$, $SD = 1.14$ and $M = 1.88$, $SD = 0.99$, respectively).

On the other hand, for climate-related disasters—specifically high temperatures—no statistically significant difference in mean ratings by marital status was found ($F = 2.22$, $p = 0.064$), indicating relatively similar views across all groups in this domain. Overall, these findings suggest that marital status is a relevant factor in shaping perceptions of society's preparedness to respond to certain types of disasters.

Table 17. One-way ANOVA: Association between marital status and perceptions of preventive measures.

Hazard	df	F	Sig.
Earthquakes	(4, 1195)	3.574	0.007*
Landslides	(4, 1195)	2.939	0.020*
Floods	(4, 1195)	4.741	0.001**
Droughts	(4, 1195)	4.089	0.003*
Snowstorms	(4, 1195)	2.563	0.037*
Storms and hail	(4, 1195)	3.916	0.004*
High temperatures	(4, 1195)	2.224	0.064
Epidemics and pandemics	(4, 1195)	6.984	0.000**
Technological accidents	(4, 1195)	3.345	0.010**
Environmental pollution	(4, 1195)	7.580	0.000**

In the study, the effect of employment status on perceptions of the implementation of preventive measures across different types of disasters was examined using a one-way analysis of variance (ANOVA). Respondents were classified into three groups: unemployed, employed, and "other" (retirees, students, homemakers, etc.). The assumption of homogeneity of variances was assessed using Levene's test, and the ANOVA results indicated statistically significant differences in perceptions for certain disaster types. The most notable difference was observed in perceptions of preventive measures for floods ($F(2, 1197) = 4.35$, $p = 0.013$). Unemployed respondents reported higher ratings ($M = 2.34$, $SD = 1.18$) than employed respondents ($M = 2.10$, $SD = 1.09$) and the "other" category ($M = 2.21$, $SD = 1.08$), suggesting that unemployed citizens perceived greater implementation of measures in this area. A similar statistically significant difference was also found for environmental pollution ($F(2, 1197) = 4.40$, $p = 0.013$), where unemployed respondents again reported a higher mean rating ($M = 2.01$, $SD = 1.25$) than employed respondents ($M = 1.77$, $SD = 1.03$) and others ($M = 1.79$, $SD = 0.98$). For earthquakes ($F = 2.85$, $p = 0.058$), the difference was at the level of marginal significance, with the "other" group reporting the lowest rating ($M = 1.82$, $SD = 0.82$) compared with unemployed ($M = 2.01$, $SD = 1.06$) and employed respondents ($M = 2.09$, $SD = 0.98$). For the remaining disaster types—landslides, droughts, snowstorms, storms with hail, high temperatures, epidemics/pandemics, and technological accidents—no statistically significant differences by employment status were found ($p > 0.05$), indicating relatively similar perceptions across groups in these domains. Overall, these findings suggest that employment status influences how citizens perceive the implementation of preventive measures in society, particularly in relation to hydrological and environmental hazards, whereas for other risk types the effect is weaker or absent (Table 18).

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Table 18. Association between employment status and perceptions of preventive measures (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(2, 1197)	2.847	0.058
Landslides	(2, 1197)	1.738	0.176
Floods	(2, 1197)	4.353	0.013*
Droughts	(2, 1197)	1.416	0.243
Snowstorms	(2, 1197)	0.673	0.510
Storms and hail	(2, 1197)	1.685	0.186
High temperatures	(2, 1197)	0.072	0.930
Epidemics and pandemics	(2, 1197)	1.868	0.155
Technological accidents	(2, 1197)	0.032	0.968
Environmental pollution	(2, 1197)	4.398	0.013*

In the study, the effect of housing type on perceptions of preventive measure implementation across different types of disasters was analyzed using a one-way analysis of variance (ANOVA). Respondents were classified into three categories: apartment in a building (1), house (2), and other forms of housing (3). The analysis examined whether there were statistically significant differences in mean ratings across disaster types by housing type. The ANOVA showed a statistically significant difference in perceptions of the implementation of preventive measures only in the case of climate-related disasters, specifically high temperatures ($F(2, 1197) = 6.50$, $p = 0.002$) (Table 54). The highest rating was given by respondents living in houses ($M = 2.36$, $SD = 1.13$), followed by those living in apartments in buildings ($M = 2.01$, $SD = 0.97$), while the lowest rating was reported by those in "other" housing types ($M = 1.98$, $SD = 1.08$). This suggests that residents of houses are more likely to perceive that measures related to high temperatures are implemented in society, which may be associated with greater direct exposure or experience with this type of risk. In all other disaster cases (earthquakes, landslides, floods, droughts, snowstorms, storms and hail, epidemics and pandemics, technological accidents, and environmental pollution), no statistically significant differences in perceptions were found by housing type ($p > 0.05$). Although mean values varied slightly (e.g., floods: $M = 2.25$ for houses, $M = 2.12$ for others, $M = 2.15$ for apartments), the differences did not reach statistical significance. These results indicate that housing type generally does not affect perceptions of the implementation of preventive measures in society, except in the case of climate-related disasters such as high temperatures, where house residents report greater sensitivity or awareness (Table 19).

Table 19. Association between housing conditions and perceptions of preventive measures (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(2, 1197)	2.219	0.109
Landslides	(2, 1197)	0.231	0.794
Floods	(2, 1197)	0.627	0.534
Droughts	(2, 1197)	1.966	0.141
Snowstorms	(2, 1197)	1.665	0.190
Storms and hail	(2, 1197)	0.886	0.412
High temperatures	(2, 1197)	6.499	0.002
Epidemics and pandemics	(2, 1197)	1.353	0.259

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Technological accidents	(2, 1197)	1.035	0.356
Environmental pollution	(2, 1197)	1.462	0.232

Within the study, the effect of income level on perceptions of the implementation of preventive measures in society across different types of disasters was analyzed. Respondents were categorized into three income groups: below average (1), average (2), and above average (3). The results of the one-way analysis of variance (ANOVA) showed statistically significant differences across several areas. The most pronounced differences were observed for hydrological and climate-related disasters. In the case of floods, a statistically significant difference was confirmed ($F(2, 1197) = 15.49$, $p < 0.001$), with respondents with average ($M = 2.39$, $SD = 1.13$) and above-average incomes ($M = 2.38$, $SD = 1.10$) reporting markedly higher perceptions of measure implementation compared with those with below-average incomes ($M = 2.02$, $SD = 1.08$). Similarly, for droughts, a significant difference was also found ($F(2, 1197) = 4.83$, $p = 0.008$), with the lowest perceived implementation among low-income respondents ($M = 1.80$, $SD = 1.06$) and the highest among high-income respondents ($M = 2.06$, $SD = 1.07$). For high temperatures, results also indicated significant differences in perceptions ($F(2, 1197) = 3.17$, $p = 0.042$), where higher-income respondents showed greater sensitivity and assessed implementation as better ($M = 2.20$, $SD = 0.98$) compared with lower-income respondents ($M = 1.98$, $SD = 1.03$). For biological disasters (epidemics and pandemics), a statistically significant difference was also found ($F(2, 1197) = 3.18$, $p = 0.042$), with the highest rating among high-income respondents ($M = 2.50$, $SD = 1.15$) and the lowest among low-income respondents ($M = 2.27$, $SD = 1.08$). Additionally, regarding environmental pollution, differences in perceptions were identified ($F(2, 1197) = 3.63$, $p = 0.027$), with higher-income respondents again reporting higher ratings ($M = 2.02$, $SD = 1.14$) than lower-income respondents ($M = 1.78$, $SD = 1.05$). However, the analysis did not show statistically significant differences for other disaster types—earthquakes ($p = 0.399$), landslides ($p = 0.122$), snowstorms ($p = 0.640$), storms and hail ($p = 0.405$), and technological accidents ($p = 0.167$)—indicating relatively similar perceptions regardless of income level in these domains. These results suggest that an individual's economic situation influences perceptions of societal preparedness and the implementation of preventive measures, especially for disasters that more directly affect living conditions and health (Table 20).

Table 20. Association between income and perceptions of preventive measures (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(2, 1197)	0.919	0.399
Landslides	(2, 1197)	2.110	0.122
Floods	(2, 1197)	15.486	0.000
Droughts	(2, 1197)	4.832	0.008
Snowstorms	(2, 1197)	0.446	0.640
Storms and hail	(2, 1197)	0.904	0.405
High temperatures	(2, 1197)	3.171	0.042
Epidemics and pandemics	(2, 1197)	3.183	0.042
Technological accidents	(2, 1197)	1.790	0.167
Environmental pollution	(2, 1197)	3.629	0.027

Within the study, the effect of education level on perceptions of society's resilience to different types of disasters was analyzed. Respondents were classified into four categories: primary education (1), secondary education (2), higher education—master/specialist studies (3), and doctoral studies (4). A one-way analysis of variance (one-way ANOVA) was applied to all examined disaster types. The findings confirm statistically significant differences in the assessment of society's resilience regarding

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landslides (F(3, 1196) = 2.77, p = 0.040), storms and hail (F(3, 1196) = 3.31, p = 0.020), technological accidents (F(3, 1196) = 2.94, p = 0.032), and environmental pollution (F(3, 1196) = 4.58, p = 0.003). For landslides, the highest perceived resilience was reported by respondents with secondary education (M = 2.19, SD = 0.97), while the lowest ratings were given by those with doctoral studies (M = 1.91, SD = 0.82). For technological accidents, respondents with secondary education again reported the highest perceived resilience (M = 2.11, SD = 1.03), whereas doctoral respondents reported the lowest (M = 1.86, SD = 0.91). Regarding environmental pollution, respondents with secondary education received the highest ratings (M = 2.02, SD = 1.15), while those with primary education and doctoral studies reported lower ratings (M = 1.78, SD = 0.96, and M = 1.83, SD = 0.98, respectively). For storms and hail, the highest resilience assessment was again provided by respondents with secondary education (M = 2.36, SD = 1.07), and the lowest by respondents with doctoral studies (M = 1.91, SD = 0.78). At the same time, the analysis did not show statistically relevant differences in perceptions for the remaining disaster categories: earthquakes (p = 0.051), floods (p = 0.467), droughts (p = 0.084), snowstorms (p = 0.163), high temperatures (p = 0.375), and epidemics and pandemics (p = 0.399). These results indicate that education level has a limited influence on perceptions of societal resilience, and that differences are most pronounced in the context of specific disasters involving technological or environmental risks (Table 21).

Table 21. Association between education and perceptions of community resilience to disasters (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(3, 1196)	2.594	0.051
Landslides	(3, 1196)	2.774	0.040
Floods	(3, 1196)	0.849	0.467
Droughts	(3, 1196)	2.221	0.084
Snowstorms	(3, 1196)	1.713	0.163
Storms and hail	(3, 1196)	3.310	0.020
High temperatures	(3, 1196)	1.037	0.375
Epidemics and pandemics	(3, 1196)	0.984	0.399
Technological accidents	(3, 1196)	2.942	0.032
Environmental pollution	(3, 1196)	4.578	0.003

Comprehensive analyses show that marital status statistically significantly affects perceptions of society's resilience to earthquakes (F = 3.63, p = 0.006), landslides (F = 3.03, p = 0.017), floods (F = 2.63, p = 0.033), droughts (F = 2.90, p = 0.021), and environmental pollution (F = 3.78, p = 0.005). In contrast, differences are not significant for snowstorms (F = 1.38, p = 0.241), storms and hail (F = 1.79, p = 0.129), and epidemics/pandemics (F = 1.75, p = 0.136), while for high temperatures (F = 2.24, p = 0.062) and technological accidents (F = 2.36, p = 0.052) results are at the threshold of significance. Furthermore, mean values indicate that respondents in a marital or cohabiting partnership most often report the highest levels of perceived resilience (e.g., earthquakes: M = 2.29; floods: M = 2.45; droughts: M = 2.17; environmental pollution: M = 2.16), while the lowest values are observed among divorced respondents (earthquakes: M = 1.92; droughts: M = 1.58; environmental pollution: M = 1.48) and widowed respondents (earthquakes: M = 1.88; floods: M = 1.81; technological accidents: M = 1.69). Single respondents generally fall between these two extremes, while those "in a relationship" most often have slightly lower values compared with the married/cohabiting group; however, compared with divorced and widowed respondents, they report higher values. Overall, results suggest that more stable partnerships are associated with higher expectations and perceptions of societal resilience to geological, hydrological, and environmental disasters. In contrast, for other disaster types, assessments generally do not differ significantly by marital status (Table 22).

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Table 22. Association between marital status and perceptions of community resilience to disasters (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(4, 1195)	3.629	0.006
Landslides	(4, 1195)	3.029	0.017
Floods	(4, 1195)	2.633	0.033
Droughts	(4, 1195)	2.895	0.021
Snowstorms	(4, 1195)	1.375	0.241
Storms and hail	(4, 1195)	1.787	0.129
High temperatures	(4, 1195)	2.243	0.062
Epidemics and pandemics	(4, 1195)	1.753	0.136
Technological accidents	(4, 1195)	2.360	0.052
Environmental pollution	(4, 1195)	3.779	0.005

In the study, the effect of employment status on perceptions of society's resilience to different types of disasters was examined using a one-way analysis of variance (ANOVA). Respondents were classified into three groups: employed (1), unemployed (2), and other (3), including retirees, students, etc. The ANOVA results confirm statistically relevant differences in perceptions of society's resilience to earthquakes ($F = 5.03$, $p = 0.007$), high temperatures ($F = 3.77$, $p = 0.023$), and environmental pollution ($F = 9.39$, $p < 0.001$) by employment status. For earthquakes, employed and unemployed respondents reported similar mean ratings ($M = 2.24$, $SD = 1.21$ and $M = 2.24$, $SD = 0.94$), while the "other" group rated societal resilience significantly lower ($M = 1.86$, $SD = 0.88$). For high temperatures, employed respondents expressed the highest perceived resilience ($M = 2.35$, $SD = 1.14$), followed by unemployed respondents ($M = 2.18$, $SD = 1.00$), while the "other" group reported the lowest ratings ($M = 2.00$, $SD = 0.81$). The largest differences were found for environmental pollution, where employed respondents reported the highest perceived resilience ($M = 2.19$, $SD = 1.29$), while values were notably lower among unemployed respondents ($M = 1.86$, $SD = 1.00$) and others ($M = 1.75$, $SD = 0.86$). On the other hand, for most other disaster types—landslides ($F = 1.55$, $p = 0.213$), floods ($F = 1.30$, $p = 0.273$), droughts ($F = 2.42$, $p = 0.089$), snowstorms ($F = 0.11$, $p = 0.895$), storms and hail ($F = 0.73$, $p = 0.483$), epidemics and pandemics ($F = 0.48$, $p = 0.618$), and technological accidents ($F = 0.03$, $p = 0.966$)—differences were not statistically significant. This indicates relatively similar understandings of societal resilience to these disasters regardless of employment status. These results imply that economic and professional engagement may influence perceptions of institutional preparedness and protective infrastructure, particularly in domains perceived as climate- or environmentally driven risks (Table 23).

Table 23. Association between employment status and perceptions of community resilience to disasters (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(2, 1197)	5.031	0.007
Landslides	(2, 1197)	1.548	0.213
Floods	(2, 1197)	1.300	0.273
Droughts	(2, 1197)	2.421	0.089
Snowstorms	(2, 1197)	0.111	0.895
Storms and hail	(2, 1197)	0.729	0.483
High temperatures	(2, 1197)	3.773	0.023

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Epidemics and pandemics	(2, 1197)	0.481	0.618
Technological accidents	(2, 1197)	0.034	0.966
Environmental pollution	(2, 1197)	9.388	0.000

In the study, the effect of housing conditions on perceptions of society's resilience to different disaster types was analyzed using a one-way analysis of variance (ANOVA). Respondents were classified into three groups based on housing status: 1—own property, 2—rented accommodation, 3—other forms of housing. The ANOVA results show statistically significant differences in perceptions of society's resilience in the case of floods ($F = 6.23$, $p = 0.002$), droughts ($F = 12.20$, $p < 0.001$), high temperatures ($F = 10.91$, $p < 0.001$), and environmental pollution ($F = 3.86$, $p = 0.021$). A follow-up comparison of mean ratings indicates that respondents living in rented apartments more strongly perceive society as resilient to floods ($M = 2.40$, $SD = 1.26$), droughts ($M = 2.39$, $SD = 1.23$), and high temperatures ($M = 2.56$, $SD = 1.26$), compared with those living in owned property (e.g., droughts: $M = 1.88$, $SD = 0.95$) or other housing types (e.g., floods: $M = 2.05$, $SD = 0.99$). Regarding perceptions of resilience to environmental pollution, the lowest mean rating was reported by respondents living in owned property ($M = 1.84$, $SD = 0.98$). In contrast, those in rented apartments reported a somewhat higher mean rating ($M = 2.12$, $SD = 1.10$). Although the difference is small, it proved statistically significant. In contrast, for the remaining disaster categories—earthquakes ($F = 0.037$, $p = 0.964$), landslides ($F = 0.115$, $p = 0.891$), snowstorms ($F = 0.259$, $p = 0.772$), storms and hail ($F = 0.881$, $p = 0.415$), epidemics and pandemics ($F = 1.79$, $p = 0.167$), and technological accidents ($F = 0.183$, $p = 0.833$)—no statistically significant differences were detected in mean ratings between groups based on housing status. This indicates relatively similar perceptions of society's resilience in these domains regardless of housing conditions (Table 24).

Table 24. Association between housing conditions and perceptions of community resilience to disasters (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(2, 1197)	0.037	0.964
Landslides	(2, 1197)	0.115	0.891
Floods	(2, 1197)	6.231	0.002
Droughts	(2, 1197)	12.200	0.000
Snowstorms	(2, 1197)	0.259	0.772
Storms and hail	(2, 1197)	0.881	0.415
High temperatures	(2, 1197)	10.911	0.000
Epidemics and pandemics	(2, 1197)	1.795	0.167
Technological accidents	(2, 1197)	0.183	0.833
Environmental pollution	(2, 1197)	3.862	0.021

In the study, the effect of income level on perceptions of society's resilience to different disaster types was analyzed using a one-way analysis of variance (ANOVA). Respondents were classified into three groups: 1—below-average income, 2—average income, 3—above-average income. The ANOVA results indicate statistically significant differences in perceptions of societal resilience in the case of floods ($F = 18.03$, $p < 0.001$), droughts ($F = 15.26$, $p < 0.001$), snowstorms ($F = 4.78$, $p = 0.009$), storms and hail ($F = 4.48$, $p = 0.012$), high temperatures ($F = 11.15$, $p < 0.001$), epidemics and pandemics ($F = 5.01$, $p = 0.007$), and environmental pollution ($F = 9.45$, $p < 0.001$). The data show that respondents with higher incomes, on average, provide higher ratings of societal resilience. For example, in the context of floods, those with above-average incomes rated resilience as ($M = 2.41$, $SD = 1.10$) compared with those with below-average incomes ($M = 1.96$, $SD = 1.02$). A similar pattern was observed for

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droughts (above-average: M = 2.24, SD = 1.01; below-average: M = 1.86, SD = 0.99), as well as for high temperatures (above-average: M = 2.48, SD = 1.11; below-average: M = 2.11, SD = 0.98). In the case of snowstorms, citizens with average (M = 2.43, SD = 1.06) and above-average incomes (M = 2.41, SD = 1.03) assessed a higher level of societal resilience than those with below-average incomes (M = 2.23, SD = 0.98). For epidemics and pandemics, an increase in perceived resilience with rising income is also evident (above-average: M = 2.43, SD = 1.14; below-average: M = 2.19, SD = 1.01). The lowest values for environmental pollution were reported by low-income respondents (M = 1.82, SD = 1.02), whereas higher income levels were associated with higher perceptions of resilience (average: M = 2.04, SD = 1.14; above-average: M = 2.15, SD = 1.07). On the other hand, for earthquakes (F = 1.39, p = 0.25), landslides (F = 2.98, p = 0.051), and technological accidents (F = 2.48, p = 0.084), no statistically meaningful differentiation in perceptions of resilience was recorded between income groups, indicating relatively uniform assessments regardless of economic status (Table 25).

Table 25. Association between income and perceptions of community resilience to disasters (One-way ANOVA).

Hazard	df	F	Sig.
Earthquakes	(2, 1197)	1.388	0.250
Landslides	(2, 1197)	2.975	0.051
Floods	(2, 1197)	18.026	0.000
Droughts	(2, 1197)	15.264	0.000
Snowstorms	(2, 1197)	4.778	0.009
Storms and hail	(2, 1197)	4.477	0.012
High temperatures	(2, 1197)	11.154	0.000
Epidemics and pandemics	(2, 1197)	5.012	0.007
Technological accidents	(2, 1197)	2.481	0.084
Environmental pollution	(2, 1197)	9.454	0.000

3.2.2. Correlational Analyses of Demographic and Socioeconomic Factors with the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity and Diversity, and Social Beliefs

3.2.2.1. Pearson Correlation Between Age and the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity and Diversity, and Social Beliefs

The Pearson correlation results (Table 26) show that, of the nine observed variables within the social structure domain, only one is statistically significantly associated with age—namely, the development of disaster response services in the municipality (e.g., police, firefighters, civil protection): r = −0.076, p = 0.009. This negative correlation suggests that older respondents tend to perceive disaster response services in their municipality as less developed. Although the correlation is weak, its statistical significance indicates that this perception is consistently present in the sample. This may reflect greater skepticism among older adults or higher expectations shaped by prior life experiences with disasters and institutions. For the remaining eight dimensions, no statistically significant association with age was found: the quality of municipal organization and structures for disaster response (r = −0.035, p = 0.227), access to healthcare, education, and social assistance during disasters (r = −0.027, p = 0.343), the quality of regulations and documents related to disaster management (r = −0.043, p = 0.134), the existence and quality of risk assessments and protection-and-rescue plans (r = −0.035, p = 0.221), the level of financial allocations for disaster protection and response (r = 0.015, p = 0.600), the availability of municipal resources for protection and rescue (r = −0.054, p = 0.063), municipal cooperation with relevant organizations and institutions to develop

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preventive measures ($r = -0.022$, $p = 0.438$), and the expertise of municipal leadership regarding disasters ($r = -0.024$, $p = 0.407$).

Within the analysis of the association between social capital and age, nine variables were examined reflecting different dimensions of social connectedness, trust, cooperation, and community participation. The analysis showed that for eight of the nine aspects of social capital, a statistically significant negative association with age was identified, indicating that older respondents, on average, perceive these aspects of collective action as somewhat less developed: social connectedness among people (associations, groups, etc.): $r = -0.156$, $p < 0.001$; participation in voluntary (volunteering) activities and projects: $r = -0.147$, $p < 0.001$; cooperation between the municipality and state authorities: $r = -0.085$, $p = 0.003$; inclusion of different social groups in decision-making and planning during disasters: $r = -0.062$, $p = 0.033$; the existence of local disaster-preparedness initiatives involving different population groups: $r = -0.099$, $p = 0.001$; economic cooperation among different population groups: $r = -0.166$, $p < 0.001$; municipal cooperation with other municipalities, organizations, and companies: $r = -0.094$, $p = 0.001$; and the strength of family ties and personal relationships in emergencies: $r = -0.166$, $p < 0.001$.

These associations are negative, meaning that as age increases, perceived connectedness, cooperation, and community initiative decrease. The most pronounced correlations are with social and economic connectedness and family relations, suggesting that younger respondents are more likely to recognize or value these aspects of community and collective resilience. These findings may indicate generational differences in perception and/or participation in the community and its collective coping mechanisms.

Further Pearson correlation results showed statistically significant negative associations between age and a range of aspects of social mechanisms in local communities. Respondents' age correlated weakly but significantly negatively with the level of education and training of people in the municipality for emergencies and disaster situations ($r = -0.152$, $p \leq 0.001$), as well as with the level of understanding and respect for cultural diversity ($r = -0.158$, $p \leq 0.001$). Older individuals also rated the level of personal and collective responsibility for safety and resilience in their communities ($r = -0.156$, $p \leq 0.001$), the overall preparedness of the community ($r = -0.121$, $p \leq 0.001$), and of their own household ($r = -0.126$, $p \leq 0.001$) for disasters.

A negative correlation was also found with perceived availability of public energy supply ($r = -0.060$, $p \leq 0.05$) and with the level of community awareness of disaster risks ($r = -0.107$, $p \leq 0.001$). As age increases, perceived community informedness about the importance of disaster preparedness also decreases ($r = -0.118$, $p \leq 0.001$), as does the assessment of the level of critical infrastructure protection ($r = -0.127$, $p \leq 0.001$) (Table 61).

Older respondents evaluated the capacity for rapid evacuation and the availability of shelters less positively ($r = -0.170$, $p \leq 0.001$), as well as the ability to make decisions in critical situations without bureaucratic obstacles ($r = -0.126$, $p \leq 0.001$). An association was also found with the level of optimism and belief in the community's capacity to cope with disasters ($r = 0.145$, $p \leq 0.001$), as well as with the perceived impact of the municipality's distance from larger cities on successful disaster response ($r = -0.106$, $p \leq 0.001$).

Furthermore, statistically significant associations were found with the perceived flexibility and adaptability of the community ($r = -0.161$, $p \leq 0.001$) and the community's willingness to learn from previous disasters ($r = -0.132$, $p \leq 0.001$). Age was also associated with a lower assessment of the degree of insurance coverage against disasters ($r = -0.118$, $p \leq 0.001$). On the other hand, no statistically significant association was identified between age and the perceived quality of early warning and notification systems ($r = -0.023$, $p = 0.424$).

These findings indicate that as age increases, positive perceptions of various social mechanisms relevant to risk and disaster management decrease. Although all correlations are weak, their consistency and statistical significance suggest the need for special attention when planning measures to include older persons in disaster preparedness and response.

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Additionally, the Pearson correlation analysis showed a statistically significant, weak negative association between respondents' age and several aspects related to availability, equality, and social justice in the context of disasters. Age was weakly but significantly negatively associated with the perceived availability of larger accommodation capacities in disasters, such as hotels, halls, and hospitals ($r = -0.085$, $p \leq 0.01$), as well as with the level of personal savings and access to credit ($r = -0.088$, $p \leq 0.01$). Older respondents also rated the extent to which their communities provide access to resources and services without discrimination slightly lower ($r = -0.083$, $p \leq 0.01$), as did the existence of measures to protect and promote the rights of minority groups ($r = -0.065$, $p \leq 0.05$).

Negative correlations were also observed for the perceived community readiness to address social injustice ($r = -0.099$, $p \leq 0.01$) and the degree of social assistance available to different groups during disasters ($r = -0.059$, $p \leq 0.05$). Older respondents also assigned lower values to the existence of programs for the specific needs of vulnerable groups ($r = -0.078$, $p \leq 0.01$) and to the availability of adapted transport for evacuation ($r = -0.065$, $p \leq 0.05$). Similar associations were found for openness to communication strategies across different language and cultural communities ($r = -0.063$, $p \leq 0.05$) and for trust in the work of social institutions during disasters ($r = -0.098$, $p \leq 0.01$).

Conversely, no statistically significant association was found between age and perceptions of the availability of key resources such as water and food ($r = -0.034$, $p = 0.238$), access to medical services regardless of social status ($r = -0.026$, $p = 0.374$), or the inclusion of different social groups in disaster-related planning and decision-making ($r = -0.039$, $p = 0.173$).

Overall, the findings indicate that older people perceive somewhat lower service availability and reduced inclusiveness in the community regarding disaster response, which may point to the need for stronger intergenerational connectedness and policies adapted to the specific needs of older populations in risk reduction planning.

The Pearson correlation results further show that respondents' age is statistically significant but negatively correlated with a range of variables related to social beliefs, cultural patterns, and value systems. Specifically, older respondents are less likely to perceive favorable conditions for communication during disasters; a weak negative correlation was found between age and the assessment of the availability and quality of communication infrastructure in the municipality (internet, telephone, radio links, etc.) ($r = -0.068$, $p \leq 0.05$).

Age was also significantly negatively associated with perceived development of a disaster resilience culture ($r = -0.099$, $p \leq 0.01$) and with the importance attributed to cultural and religious values in community life ($r = -0.127$, $p \leq 0.01$). Older respondents also gave lower ratings to openness to dialogue and understanding among different cultural and religious groups ($r = -0.097$, $p \leq 0.01$) and to their own participation in traditional and religious rituals that strengthen collective identity ($r = -0.127$, $p \leq 0.01$). A similar weak negative association was identified with respect for traditional social norms and community values ($r = -0.125$, $p \leq 0.01$) and with personal participation in local cultural activities and community events ($r = -0.147$, $p \leq 0.01$).

The strongest negative relationship in this set was found for the variable measuring the level of respect for and preservation of local customs and traditions during and after disasters ($r = -0.185$, $p \leq 0.01$), indicating that older respondents, on average, give lower ratings to the preservation of tradition in such situations. A significant negative association was also found between age and perceptions of the influence of religious leaders and institutions on municipal decision-making ($r = -0.100$, $p \leq 0.01$) and the extent to which those institutions are active in disaster preparedness ($r = -0.172$, $p \leq 0.01$). Older respondents also rated their municipality's participation in religious rituals ($r = -0.117$, $p \leq 0.01$).

On the other hand, the only variable in this group that did not show a statistically significant association with age relates to the belief that tradition and culture influence the understanding of disasters ($r = -0.053$, $p = 0.066$), indicating the absence of a consistent relationship between respondents' age structure and this aspect of social belief. Overall, the results suggest that with increasing age, perceptions of social, cultural, and religious cohesion in the community decline, as does belief in the role of these elements in building disaster resilience.

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Table 26. Pearson correlation between age and the perception of social structure, social capital, social mechanisms, social equity, diversity, and social beliefs.

Variables		Age
The quality of the organization and structures of your municipality for disaster response	*r*	–0.035
	p	0.227
What is access to healthcare, education, and social assistance like during disasters in your municipality	*r*	–0.027
	p	0.343
What is the quality of regulations and documents in disaster management like	*r*	–0.043
	p	0.134
Whether risk assessment, protection, and rescue plans exist in your municipality, and what their quality is like	*r*	–0.035
	p	0.221
What is the level of budget allocation in your municipality for protection, rescue, and disaster response?	*r*	0.015
	p	0.600
What is the level of availability of resources in your municipality for protection and rescue, like	*r*	–0.054
	p	0.063
What is the level of cooperation of your municipality with relevant organizations and institutions for the development of preventive measures like	*r*	–0.022
	p	0.438
What is the level of development of disaster response services in your municipality, such as the police, firefighters, civil protection, and similar services	*r*	–0.076**
	p	0.009
What is the level of expertise of the leadership in your municipality regarding disasters?	*r*	–0.024
	p	0.407
What is the level of mutual trust and support among people in your municipality like	*r*	–0.056
	p	0.053
What is the level of social connectedness among people (associations, groups, etc.) in your municipality like	*r*	–0.156**
	p	0.000
What is the level of people's participation in voluntary (volunteering) activities and projects in your municipality like	*r*	–0.147**
	p	0.000
What is the level of cooperation between your municipality and state authorities like	*r*	–0.085**
	p	0.003
How many different social groups are included in decision–making and planning during disasters in your municipality	*r*	–0.062*
	p	0.033
The existence of local disaster–preparedness initiatives with the participation of different population groups in your municipality	*r*	–0.099**
	p	0.001
The existence and strength of economic cooperation among different population groups in your municipality	*r*	–0.166**
	p	0.000
The level of cooperation of your municipality with other municipalities, organizations, and companies when it comes to disasters	*r*	–0.094**
	p	0.001
The strength of family ties and personal relationships among people in your municipality in various emergencies and disasters	*r*	–0.166**
	p	0.000
The level of education and training of people in your municipality for emergencies and disaster situations	*r*	–0.152**
	p	0.000
The level of understanding and respect for cultural diversity among people in your municipality	*r*	–0.158**
	p	0.000
The level of personal and collective responsibility for resilience and safety among people in your municipality	*r*	–0.156**
	p	0.000
The level of preparedness of your municipality as a community for disasters	*r*	–0.121**
	p	0.000
The level of preparedness of your household for disasters	*r*	–0.126**
	p	0.000
The degree of availability of public energy supply (electricity, gas, fuel, firewood)	*r*	–0.060*
	p	0.037
How aware are people in your municipality of disaster risks	*r*	–0.107**
	p	0.000
The level of information in your municipality aimed at raising awareness of the need for disaster preparedness	*r*	–0.118**
	p	0.000

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The level of protection of critical infrastructure from disasters in your municipality (energy, transport, healthcare, communications, etc.)	*r*	–0.127**
	p	0.000
The ability for rapid evacuation and the availability of shelters in your municipality during disasters	*r*	–0.170**
	p	0.000
The ability to make quick decisions in critical situations without bureaucracy in your municipality	*r*	–0.126**
	p	0.000
What is the level of belief and optimism in the ability of your municipality and community to cope with disasters like	*r*	–0.145**
	p	0.000
How much does the distance of your municipality from major cities (Belgrade, Niš, Novi Sad, and Kragujevac) affect successful disaster response	*r*	–0.106**
	p	0.000
What is the level of flexibility and adaptability of the local community to cope with disasters like	*r*	–0.161**
	p	0.000
How ready is the local community to learn from previous disasters in order to respond better to disasters in the future	*r*	–0.132**
	p	0.000
The level of quality of the early warning and notification system in your municipality	*r*	–0.023
	p	0.424
The degree of insurance coverage provided by insurance companies against disasters in your municipality	*r*	–0.118**
	p	0.000
The availability of larger accommodation capacities in your municipality in case of a disaster (hotels, larger schools, halls, hospitals, and similar)	*r*	–0.085**
	p	0.003
The level of your savings and access to credit relative to your income	*r*	–0.088**
	p	0.002
Access to resources and services without discrimination in your municipality	*r*	–0.083**
	p	0.004
The existence of measures to protect and promote the rights of minority groups in your municipality	*r*	–0.065*
	p	0.024
The readiness of the community to address social injustice in your municipality	*r*	–0.099**
	p	0.001
The level of availability of key resources in your municipality, such as water and food (large stores and similar)	*r*	–0.034
	p	0.238
Access to medical services and emergency interventions in your municipality, regardless of your social status	*r*	–0.026
	p	0.374
The degree of social assistance available to different groups during disasters in your municipality	*r*	–0.059*
	p	0.042
The existence of programs and plans for the specific needs of certain vulnerable groups, such as older people and persons with disabilities, and similar in your municipality	*r*	–0.078**
	p	0.007
The availability of transport for evacuation that meets different people's needs and activities in your municipality, such as roads and railways	*r*	–0.065*
	p	0.025
The openness and adaptation of communication strategies for different linguistic and cultural communities in your municipality	*r*	–0.063*
	p	0.029
The involvement of different social groups in planning and implementing measures and in the decision–making process related to disasters in your municipality	*r*	–0.039
	p	0.173
Trust in the work of social institutions and services during disasters in your municipality	*r*	–0.098**
	p	0.001
The availability and quality of communication means in your municipality (internet, telephone, radio links, and similar)	*r*	–0.068*
	p	0.019
The level of development of a disaster resilience culture in your municipality	*r*	–0.099**
	p	0.001
The level of importance of cultural and religious values in the life of your community in the municipality	*r*	–0.127**
	p	0.000
The openness to dialogue and understanding between different cultural and religious groups in your municipality	*r*	–0.097**
	p	0.001
Your participation in traditional and religious rituals that strengthen collective identity in your municipality	*r*	–0.127**
	p	0.000
	r	–0.125**

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Respect for traditional social norms and values of the community in your municipality	*p*	0.000
The level of personal participation in local cultural activities and joint community events in your municipality	*r*	–0.147**
	p	0.000
The level of respect for and preservation of local customs and traditions during and after disasters in your municipality	*r*	–0.185**
	p	0.000
The level of influence of religious leaders and religious institutions on decision–making in your municipality	*r*	–0.100**
	p	0.001
The degree of activity of religious institutions in disaster and emergency preparedness in your municipality	*r*	–0.172**
	p	0.000
How much does your municipality take part in religious rituals	*r*	–0.117**
	p	0.000
How much tradition and culture influence your understanding of what disasters are	*r*	–0.053
	p	0.066

3.2.2.2. T-test Analysis of the Associations of Gender, Fear, and Volunteering with the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity and Diversity, and Social Beliefs

The t-test results show a statistically significant gender difference only in the perception of social structure (t = 2.245; p = 0.025), with men (M = 2.21; SD = 0.86) reporting a slightly higher mean score than women (M = 2.10; SD = 0.84). For the other variables (social capital, social mechanisms, social equity, and social beliefs), the observed differences were not statistically significant at the $p < 0.05$ level, although some were close to the significance threshold (e.g., social mechanisms, p = 0.055; social equity, p = 0.064) (Table 27).

Table 27. T-test Analysis of the Association Between Gender and the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity and Diversity, and Social Beliefs.

Variable	F	t	Sig. (2-Tailed)	df	Male M (SD)	Female M (SD)
Social structure	0.241	2.245	0.025*	1198	2.21 (0.86)	2.10 (0.84)
Social capital	0.601	1.707	0.088	1198	2.44 (0.84)	2.36 (0.85)
Social mechanisms	1.348	1.922	0.055	1198	2.45 (0.76)	2.37 (0.81)
Social equity	5.054	1.852	0.064	1198	2.49 (0.82)	2.40 (0.88)
Social beliefs	4.597	1.469	0.142	1198	2.76 (0.80)	2.69 (0.86)

Respondents who reported fear rated social structure significantly lower (M = 2.05) compared with those who did not report fear (M = 2.25), and this difference was statistically significant (t = –4.119; $p < 0.001$). A similar pattern was observed for social capital, where individuals who felt fear reported lower ratings (M = 2.29) than those without fear (M = 2.49), with the difference also statistically significant (t = –4.177; $p < 0.001$). A significant difference was likewise found for social mechanisms: respondents who experienced fear had a lower mean (M = 2.25) than those who did not (M = 2.54), with a high statistical significance (t = –6.551; $p < 0.001$). Regarding social equity, respondents with fear (M = 2.26) also reported lower ratings compared with those without fear (M = 2.59), with strong statistical support (t = –6.737; $p < 0.001$). The most pronounced difference was observed for social beliefs, where the mean in the fear group was M = 2.56 and in the no–fear group M = 2.85; this difference was highly statistically significant (t = –5.992; $p < 0.001$). Overall, these results consistently indicate that fear is associated with lower perceptions of social structure, trust, fairness, and general social beliefs (Table 28).

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Table 28. T-test Analysis of the Association Between Fear and the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity and Diversity, and Social Beliefs.

Variable	F	t	Sig. (2-Tailed)	df	Fear M (SD)	No fear M (SD)
Social structure	2.878	–4.119	0.000***	1198	2.05 (0.81)	2.25 (0.88)
Social capital	0.246	–4.177	0.000***	1198	2.29 (0.84)	2.49 (0.84)
Social mechanisms	3.766	–6.551	0.000***	1198	2.25 (0.80)	2.54 (0.76)
Social equity	1.848	–6.737	0.000***	1198	2.26 (0.85)	2.59 (0.82)
Social beliefs	10.529	–5.992	0.000***	1198	2.56 (0.86)	2.85 (0.79)

Further analyses show that respondents who volunteered reported significantly higher scores in the domain of social beliefs (M = 2.78) than those who did not volunteer (M = 2.68), and this difference was statistically significant (t = 2.071; p = 0.039). For the other dimensions—social structure (t = –0.324; p = 0.746), social capital (t = 1.805; p = 0.071), social mechanisms (t = –1.129; p = 0.259), and social equity (t = –0.282; p = 0.778)—the differences between volunteers and non-volunteers were not statistically significant. These findings suggest a potential role of volunteering engagement in strengthening general social beliefs, but not in perceptions of other social aspects (Table 29).

Table 29. Association Between Volunteering and the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity, and Social Beliefs.

Variable	F	t	Sig. (2-Tailed)	df	Volunteers M (SD)	Non–volunteers: M (SD)
Social structure	3.430	–0.324	0.746	1198	2.15 (0.83)	2.17 (0.88)
Social capital	3.417	1.805	0.071	1198	2.45 (0.81)	2.36 (0.88)
Social mechanisms	3.664	–1.129	0.259	1198	2.39 (0.74)	2.44 (0.83)
Social equity	2.405	–0.282	0.778	1198	2.44 (0.82)	2.46 (0.87)
Social beliefs	1.862	2.071	0.039*	1198	2.78 (0.80)	2.68 (0.86)

3.2.2.3. ANOVA Analysis of the Associations of Education, Marital and Employment Status, Housing Conditions, and Income with the Perception of Social Structure, Social Capital, Social Mechanisms, Social Equity and Diversity, and Social Beliefs

Based on the results of the one-way analysis of variance (ANOVA), respondents' level of education does not have a statistically significant effect on perceptions of the key dimensions of social resilience. The following dimensions were analyzed: social structure, social capital, social mechanisms, social equity, and social beliefs. In all cases, the obtained F-values did not reach statistical significance ($p \geq 0.05$). Specifically, for the domain of social structure, the ANOVA yielded $F(3, 1196) = 0.22$, $p = 0.882$. Mean values of perceived resilience by education level were: primary education (M = 2.15, SD = 0.88), secondary education (M = 2.16, SD = 0.86), master/specialist studies (M = 2.21, SD = 0.81), and doctoral studies (M = 2.17, SD = 0.82). The differences in perceptions were minimal and within the range of sampling error. Similarly, for social capital, the value $F(3, 1196) = 0.36$, $p = 0.781$ was obtained. Mean values were: primary education (M = 2.41, SD = 0.86), secondary education (M = 2.38, SD = 0.86), master/specialist (M = 2.46, SD = 0.78), and doctoral studies (M = 2.38, SD = 0.83), again indicating a uniform perception without notable deviations.

With respect to social mechanisms, although somewhat larger differences in mean values were observed (highest for secondary education: M = 2.46, SD = 0.78; lowest for doctoral studies: M = 2.32, SD = 0.80), the result $F(3, 1196) = 1.80$, $p = 0.145$ indicates that this difference is not statistically significant. For social equity, $F(3, 1196) = 0.69$, $p = 0.556$, with mean values ranging from M = 2.44 (SD = 0.88) for primary education to M = 2.56 (SD = 0.96) for doctoral education, which also does not suggest meaningful differences. Finally, for social beliefs, $F(3, 1196) = 0.19$, $p = 0.906$, confirms the absence of significant differences, with all groups reporting similar mean ratings (M ≈ = 2.72), and somewhat higher SD values among respondents with doctoral education (SD = 1.03). Overall, the results indicate that respondents' formal education level is not a significant factor in shaping their views on social resilience across the examined dimensions (Table 30).

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Table 30. Association of education with perceptions of social structure, capital, mechanisms, equity, and social beliefs (ANOVA).

Dimension	df (between, within)	F	Sig. (p)
Social structure	(3, 1196)	0.221	0.882
Social capital	(3, 1196)	0.361	0.781
Social mechanisms	(3, 1196)	1.802	0.145
Social equity	(3, 1196)	0.694	0.556
Social beliefs	(3, 1196)	0.186	0.906

In this study, the effect of marital status on the dimensions of social resilience was examined using one-way ANOVA. Respondents were classified into five groups: 1 = single, 2 = in a relationship, 3 = married/cohabiting, 4 = divorced, 5 = widowed. Before the analysis, the assumption of homogeneity of variances was assessed using Levene's test, and since no serious violations were detected, the standard ANOVA procedure was applied.

The results confirmed statistically significant differences in social structure assessment by marital status ($F(4, 1195) = 2.52$, $p = 0.040$). The highest mean value was reported by respondents who were married/cohabiting ($M = 2.35$, $SD = 0.84$), followed by those in a relationship ($M = 2.23$, $SD = 0.95$). In contrast, the lowest mean value was reported by divorced respondents ($M = 2.08$, $SD = 1.17$).

Regarding social capital, a significant difference between groups was also found ($F(4, 1195) = 5.64$, $p < 0.001$). Respondents who were married/cohabiting ($M = 2.58$, $SD = 0.81$) and those in a relationship ($M = 2.56$, $SD = 0.94$) assigned the highest importance to social capital. In contrast, the lowest ratings were recorded among divorced individuals ($M = 2.19$, $SD = 1.17$).

A statistically significant difference was also observed for social mechanisms ($F(4, 1195) = 4.17$, $p = 0.002$). In this case, the highest mean values were reported by respondents in a relationship ($M = 2.54$, $SD = 0.86$) and those married/cohabiting ($M = 2.54$, $SD = 0.82$). In contrast, the lowest were reported by single respondents ($M = 2.28$, $SD = 0.73$) and divorced respondents ($M = 2.24$, $SD = 1.17$).

By contrast, for social equity, no significant group differences were found ($F(4, 1195) = 1.86$, $p = 0.115$). However, for social beliefs, differences were statistically significant ($F(4, 1195) = 4.31$, $p = 0.002$), with the highest mean values reported by respondents in a relationship ($M = 2.88$, $SD = 0.91$) and the lowest by divorced respondents ($M = 2.48$, $SD = 1.02$). These findings indicate differences in perceptions and evaluations of social resilience elements by marital status (Table 31).

Table 31. Association of marital status with perceptions of social structure, capital, mechanisms, equity, and social beliefs (ANOVA).

Dimension	df	F	Sig. (p)
Social structure	(4, 1195)	2.517	0.040
Social capital	(4, 1195)	5.638	<0.001
Social mechanisms	(4, 1195)	4.167	0.002
Social equity	(4, 1195)	1.863	0.115
Social beliefs	(4, 1195)	4.312	0.002

The effect of employment status on the dimensions of social resilience was examined using one-way ANOVA. Respondents were classified into three groups: 1 = employed, 2 = unemployed, 3 = retired. Prior to the analysis, the homogeneity of variance assumption was checked and found not to be substantially violated, which justified the use of the standard ANOVA procedure.

For social structure, no statistically significant differences were found by employment status ($F(2, 1197) = 0.23$, $p = 0.795$). Mean values were: employed ($M = 2.13$, $SD = 0.88$), unemployed ($M = 2.17$, $SD = 0.84$), and retired ($M = 2.17$, $SD = 0.97$).

For social capital, the result was at the borderline of statistical significance ($F(2, 1197) = 2.97$, $p = 0.052$). Employed respondents reported the highest mean value ($M = 2.49$, $SD = 0.87$), followed by

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unemployed respondents (M = 2.40, SD = 0.84), while retired respondents reported the lowest (M = 2.21, SD = 0.92).

For social mechanisms, the results indicate a statistically significant difference between groups (F(2, 1197) = 3.31, p = 0.037). The highest values were reported by employed respondents (M = 2.48, SD = 0.86), followed by unemployed respondents (M = 2.41, SD = 0.76), while retirees reported the lowest (M = 2.21, SD = 0.90).

For social equity, no statistically significant differences were found by employment status (F(2, 1197) = 0.35, p = 0.702), with similar mean values across all three groups: employed (M = 2.46, SD = 0.93), unemployed (M = 2.45, SD = 0.82), and retired (M = 2.37, SD = 0.98).

The most pronounced difference was observed for social beliefs (F(2, 1197) = 6.52, p = 0.002), where employed respondents reported the highest mean value (M = 2.82, SD = 0.91), followed by unemployed respondents (M = 2.73, SD = 0.80), and retirees the lowest (M = 2.41, SD = 0.90). These values suggest that employment status may influence certain aspects of social resilience, particularly social mechanisms and beliefs, with employed respondents expressing greater engagement and optimism than unemployed and retired respondents (Table 32).

Table 32. Association of employment status with perceptions of social structure, capital, mechanisms, equity, and social beliefs (ANOVA).

Dimension	df	F	Sig. (p)
Social structure	(2, 1197)	0.230	0.795
Social capital	(2, 1197)	2.969	0.052
Social mechanisms	(2, 1197)	3.311	0.037
Social equity	(2, 1197)	0.353	0.702
Social beliefs	(2, 1197)	6.517	0.002

The effect of housing conditions on the dimensions of social resilience was examined using one-way ANOVA. Respondents were grouped into three categories based on housing status: 1 = owner-occupied, 2 = rented housing, 3 = collective/other housing arrangements. Prior to the ANOVA, the assumption of homogeneity of variances was assessed and found not to be significantly violated (Table 33).

For social structure, a statistically significant difference was found (F(2, 1197) = 4.71, p = 0.009). Respondents in rented housing reported the highest mean value (M = 2.39, SD = 0.91), compared with owner-occupied respondents (M = 2.13, SD = 0.84) and those in collective/other housing (M = 2.14, SD = 0.86).

For social capital, a significant difference was also identified (F(2, 1197) = 8.96, p < 0.001). The highest values were reported by respondents in rented housing (M = 2.70, SD = 0.88), followed by those in collective arrangements (M = 2.41, SD = 0.88). In contrast, the lowest values were reported by owner-occupied respondents (M = 2.33, SD = 0.80).

For social mechanisms, no significant differences were found (F(2, 1197) = 1.84, p = 0.160). Mean values were similar: owner-occupied (M = 2.40, SD = 0.77), rented housing (M = 2.55, SD = 0.84), and collective/other (M = 2.39, SD = 0.79).

For social equity, the results indicated a difference at the borderline of statistical significance (F(2, 1197) = 2.75, p = 0.065). Respondents in rented housing had slightly higher values (M = 2.63, SD = 0.91) than the other groups: owner-occupied (M = 2.42, SD = 0.80) and collective/other (M = 2.44, SD = 0.89).

For social beliefs, a statistically significant differentiation was observed (F(2, 1197) = 4.15, p = 0.016). Respondents in rented apartments reported the highest values (M = 2.81, SD = 0.83), followed by those in collective arrangements (M = 2.79, SD = 0.86), while the lowest values were reported by owner-occupied respondents (M = 2.65, SD = 0.81). These results suggest that housing conditions—

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especially renting—may be associated with higher perceived social connectedness and mobility, as well as a stronger sense of social structure and capital.

Table 33. Association of housing conditions with perceptions of social structure, capital, mechanisms, equity, and social beliefs (ANOVA).

Dimension	df	F	Sig. (p)
Social structure	(2, 1197)	4.713	0.009
Social capital	(2, 1197)	8.964	<0.001
Social mechanisms	(2, 1197)	1.837	0.160
Social equity	(2, 1197)	2.746	0.065
Social beliefs	(2, 1197)	4.152	0.016

The effect of income level on the dimensions of social resilience was examined using a one-way ANOVA, and statistically significant differences were found across all five dimensions. Respondents were divided into three categories: 1 = below average, 2 = around average, 3 = above average.

For social structure, a statistically significant effect was obtained ($F(2, 1197) = 15.03$, $p < 0.001$). Respondents with above-average income reported the highest mean values ($M = 2.37$, $SD = 0.89$), followed by those with average income ($M = 2.34$, $SD = 0.89$). In contrast, the lowest values were reported by respondents with below-average income ($M = 2.07$, $SD = 0.83$) (Table 34).

For social capital, a significant difference was also found ($F(2, 1197) = 22.60$, $p < 0.001$). The highest values were reported by respondents with above-average income ($M = 2.62$, $SD = 0.85$), followed by those with average income ($M = 2.63$, $SD = 0.85$). In contrast, the lowest were reported by those with below-average income ($M = 2.29$, $SD = 0.82$).

For social mechanisms, results also showed statistically significant differences ($F(2, 1197) = 12.12$, $p < 0.001$). The highest mean values were reported by respondents in the above-average income group ($M = 2.57$, $SD = 0.83$), followed by those in the average income group ($M = 2.56$, $SD = 0.82$). In contrast, the lowest were reported by those in the below-average income group ($M = 2.33$, $SD = 0.76$).

The largest difference was observed for social equity ($F(2, 1197) = 49.31$, $p < 0.001$). Respondents with above-average income reported the highest mean rating ($M = 2.81$, $SD = 0.88$), followed by those around average ($M = 2.75$, $SD = 0.87$). In contrast, the lowest were reported by the below-average group ($M = 2.28$, $SD = 0.79$).

Finally, for social beliefs, the difference was statistically significant ($F(2, 1197) = 14.79$, $p < 0.001$). Respondents with around-average income ($M = 2.93$, $SD = 0.84$) and above-average income ($M = 2.85$, $SD = 0.88$) reported higher levels compared with those below average ($M = 2.63$, $SD = 0.81$).

Overall, these values consistently indicate that higher income levels are associated with higher perceived social resilience across all dimensions, particularly social equity, social capital, and social beliefs.

Table 34. Association of income with perceptions of social structure, capital, mechanisms, equity, and social beliefs (ANOVA).

Dimension	df (between, within)	F	Sig. (p)
Social structure	(2, 1197)	15.025	<0.001
Social capital	(2, 1197)	22.600	<0.001
Social mechanisms	(2, 1197)	12.123	<0.001
Social equity	(2, 1197)	49.307	<0.001
Social beliefs	(2, 1197)	14.785	<0.001

7.4. Results of Predictor Analyses Using a Regression Model

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A multiple linear regression analysis was conducted to examine the effects of various sociodemographic and psychological factors on undertaken preventive measures in the context of disasters. The results indicate that the model is statistically significant, $F(10, 1189) = 7.643$, $p < 0.001$, and that the predictors jointly explain 6.0% of the variance in the dependent variable ($R^2 = 0.060$; adjusted $R^2 = 0.052$). This suggests that the specified factors predict preventive behavior to a limited extent, yet the relationship remains statistically significant (Table 35). Among all included predictors, four were statistically significant. Older respondents reported undertaking preventive measures to a greater extent ($\beta = 0.163$, $t = 5.495$, $p < 0.001$), as did public-sector employees ($\beta = 0.176$, $t = 6.031$, $p < 0.001$). In contrast, divorced respondents reported implementing preventive measures to a lesser extent than others ($\beta = -0.059$, $t = -2.099$, $p = 0.036$), and the same was true for respondents who volunteered ($\beta = -0.073$, $t = -2.550$, $p = 0.011$). Gender, education level, income, fear of disasters, unemployment, and housing status did not emerge as significant predictors ($p > 0.05$). Although the model is significant, the modest R^2 value suggests that a broad range of relevant factors not included in this analysis may also influence individuals' willingness to undertake preventive measures against risks and disasters.

A multiple linear regression analysis further indicated that a model including ten independent variables—gender, age, education level, marital status, employment in the public sector, income level, perceived fear, participation in volunteering activities, unemployment, and housing conditions—statistically significantly explains variations in the level of societal perceived disaster resilience, $F(10, 1189) = 6.423$, $p < 0.001$. The model explains 5.1% of the total variance in the composite resilience index ($R^2 = 0.051$; adjusted $R^2 = 0.043$), indicating modest but statistically significant predictive power.

An examination of individual predictors showed that age was positively and statistically significantly associated with resilience ($\beta = 0.073$, $t = 2.464$, $p = 0.014$), meaning that older respondents reported slightly higher levels of societal resilience. Similarly, employment in the public sector was a positive and significant predictor ($\beta = 0.100$, $t = 3.410$, $p = 0.001$), suggesting better access to information or greater involvement in institutional response mechanisms. In contrast, three variables showed statistically significant negative effects: education level ($\beta = -0.068$, $t = -2.365$, $p = 0.018$), income ($\beta = -0.109$, $t = -3.719$, $p < 0.001$), and fear ($\beta = -0.117$, $t = -3.934$, $p < 0.001$). These results suggest that higher levels of education and income, as well as greater fear, may be associated with lower subjective perceptions of societal resilience. The remaining variables—gender, marital status, volunteering, unemployment, and housing status—did not show statistically significant effects on perceived resilience ($p > 0.05$). Despite the relatively small proportion of explained variance, these findings may point to specific social and psychological characteristics that shape perceptions of society's capacity to cope with disasters. This supports the need to extend the model in future research by including cultural and institutional factors.

Table 35. Multiple linear regression results for predictors of disaster resilience: preventive measures and perceived resilience.

Predictor variables	Preventive measures			Perceived resilience		
	B	SE	β	B	SE	β
Gender	0.040	0.052	0.023	0.065	0.052	0.039
Age (years)	0.369	0.067	0.163**	0.166	0.067	0.073*
Education	–0.043	0.051	–0.024	–0.121	0.051	–0.068*
Marital status	–0.222	0.106	–0.059*	–0.064	0.106	–0.017**
Employment	0.308	0.051	0.176**	0.175	0.051	0.100**
Income	–0.085	0.052	–0.048	–0.192	0.052	–0.109**
Fear	–0.026	0.050	–0.015	–0.199	0.051	–0.117
Volunteering	–0.122	0.048	–0.073*	–0.072	0.048	–0.043

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Employment status	0.010	0.052	0.006	0.043	0.052	0.024
Housing conditions	0.052	0.050	0.031	–0.090	0.050	–0.053

The set of predictors significantly predicts the perception of social structure in the context of disaster response, $F(10, 1189) = 13.848$, $p < 0.001$. The model explains 10.4% of the total variance in the dependent variable ($R^2 = 0.104$; adjusted $R^2 = 0.097$), indicating a relatively moderate predictive power for this type of social research (Table 36). The most significant individual predictor in the model is public-sector employment ($\beta = 0.233$, $t = 8.183$, $p < 0.001$), suggesting that members of this group are more likely to perceive a functional social structure. Age also has a significant and positive effect ($\beta = 0.158$, $t = 5.451$, $p < 0.001$), as does unemployment status ($\beta = 0.064$, $t = 2.279$, $p = 0.023$), which may indicate that older individuals and unemployed citizens, despite limited resources, recognize or expect the existence of certain social protection mechanisms. By contrast, three predictors show statistically significant negative effects: lower income ($\beta = -0.135$, $t = -4.756$, $p < 0.001$) and higher fear ($\beta = -0.110$, $t = -3.805$, $p < 0.001$). Gender shows a small effect but is not statistically significant ($\beta = 0.027$, $p = 0.369$). These findings may suggest that economic insecurity and heightened fear reduce perceptions of social cohesion and organization during emergencies. Other variables—education, marital status, volunteering, and housing status—did not show statistically significant effects ($p > 0.05$). Despite the relatively modest explained variance, the results highlight the importance of institutional connectedness and economic security as key factors in shaping a disaster-resilient social structure.

Next, the multiple linear regression results indicate that the proposed model significantly predicts perceptions of social capital in the examined sample, $F(10, 1189) = 13.623$, $p < 0.001$. The model explains 10.3% of the variance in the dependent variable ($R^2 = 0.103$; adjusted $R^2 = 0.095$), reflecting moderate predictive strength in social research (Table 36). The strongest positive predictors of social capital were age ($\beta = 0.179$, $t = 6.183$, $p < 0.001$) and public-sector employment ($\beta = 0.160$, $t = 5.608$, $p < 0.001$). These results indicate that older respondents and those working in the public sector are more likely to perceive trust, solidarity, and connectedness within the community. On the other hand, several predictors had statistically significant negative effects. Respondents with lower income reported lower levels of social capital ($\beta = -0.156$, $t = -5.499$, $p < 0.001$), as did those experiencing higher fear ($\beta = -0.106$, $t = -3.651$, $p < 0.001$). Housing status also showed a negative, though weaker, effect ($\beta = -0.071$, $t = -2.442$, $p = 0.015$), suggesting inequalities in community belonging across different housing conditions. Other predictors, including gender, education, marital status, volunteering, and employment status, were not statistically significant ($p > 0.05$). Although the overall explained variance is not high, the results underscore the roles of age, employment, income, and fear as relevant factors in shaping social capital, an important component of societal resilience in contexts of risk and crisis.

Further analyses show that the model significantly predicts the social mechanisms indicator ($F(10, 1189) = 12.258$, $p < 0.001$), explaining 9.3% of the total variance in the dependent variable ($R^2 = 0.093$; adjusted $R^2 = 0.086$). Although the predictive strength is moderate, multiple individual factors exert statistically significant effects on perceptions of social mechanisms (Table 36). Age emerged as the strongest positive predictor ($\beta = 0.165$, $t = 5.684$, $p < 0.001$), indicating that older respondents are more likely to perceive the existence of functional social mechanisms such as cooperation, mutual support, and organized forms of social response. Public-sector employment also positively influenced this perception ($\beta = 0.132$, $t = 4.604$, $p < 0.001$), likely due to closer ties with institutional structures and greater trust in mechanisms of collective action. Conversely, respondents with lower income were significantly less likely to perceive social mechanisms in their environment ($\beta = -0.111$, $t = -3.892$, $p < 0.001$). Similarly, fear had a strong negative effect ($\beta = -0.178$, $t = -6.091$, $p < 0.001$), suggesting that heightened threat perception reduces confidence in organized forms of social support. Education also showed a mild negative effect ($\beta = -0.068$, $t = -2.433$, $p = 0.015$), possibly reflecting a more critical stance among more educated respondents toward the actual functionality of existing social structures. Variables such as gender, marital status, volunteering, employment

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status, and housing status were not statistically significant predictors of social mechanisms ($p > 0.05$). These results emphasize the importance of age, employment, income, and emotional stability (fear) as key factors in evaluating the effectiveness and accessibility of social support and coping mechanisms in crisis situations.

Table 36. Multiple linear regression results for predictors of disaster resilience: social structure, social capital, social mechanisms, and social equity.

	Social structure			Social capital			Social mechanisms			Social equity		
Predictor variables	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Gender	0.046	0.051	0.027	0.055	0.051	0.032	−0.002	0.048	−0.001	−0.006	0.050	−0.003
Age (years)	0.364	0.067	0.158**	0.409	0.066	0.179**	0.351	0.062	0.165**	0.264	0.065	0.115**
Education	−0.073	0.051	−0.040	−0.037	0.050	−0.021	−0.114	0.047	−0.068*	−0.075	0.049	−0.042
Marital status	−0.035	0.105	−0.009	−0.054	0.104	−0.014	−0.108	0.097	−0.031	−0.047	0.102	−0.012
Employment	0.416	0.051	0.233**	0.282	0.050	0.160**	0.216	0.047	0.132**	0.307	0.049	0.174**
Income	−0.244	0.051	−0.135**	−0.279	0.051	−0.156**	−0.184	0.047	−0.111**	−0.457	0.050	−0.255**
Fear	−0.191	0.050	−0.110**	−0.181	0.050	−0.106**	−0.282	0.046	−0.178**	−0.307	0.049	−0.179**
Volunteering	−0.034	0.048	−0.020	0.061	0.047	0.036	−0.056	0.044	−0.036	−0.056	0.046	−0.033
Employment status	0.117	0.051	0.064*	0.023	0.051	0.013	−0.009	0.047	−0.005	0.088	0.050	0.049
Housing conditions	−0.056	0.050	−0.033	−0.120	0.049	−0.071	−0.010	0.046	−0.006	−0.064	0.048	−0.038

Finally, the multiple linear regression analysis with social beliefs as the dependent variable showed that the model has statistically significant predictive value ($R^2 = 0.093$; adjusted $R^2 = 0.086$), with the set of independent variables explaining 9.3% of the variance. The model was statistically significant, $F(10, 1189) = 12.17$, $p < 0.001$, indicating that the overall set of predictors significantly predicts social beliefs.

Among individual predictors, significant positive predictors were age ($\beta = 0.153$, $t = 5.26$, $p < 0.001$) and public-sector employment ($\beta = 0.119$, $t = 4.16$, $p < 0.001$), while fear was a significant negative predictor ($\beta = -0.162$, $t = -5.56$, $p < 0.001$), indicating that older respondents and those employed in the public sector—and those experiencing less fear—report higher levels of social beliefs. Lower income was negatively associated with social beliefs ($\beta = -0.111$, $t = -3.90$, $p < 0.001$), as was home ownership ($\beta = -0.071$, $t = -2.43$, $p = 0.015$), suggesting that respondents with lower incomes and those living in owner-occupied housing report lower levels of these beliefs. Other predictors such as gender, marital status, education, employment status, and volunteering experience were not statistically significant. Multicollinearity diagnostics did not indicate problems, as no Condition Index value exceeded critical thresholds, and tolerance and VIF values were within acceptable ranges.

Overall, the results suggest that demographic and structural factors—particularly age, employment status, and income—significantly influence the formation and maintenance of social beliefs in the analyzed population.

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4. Discusion

A comprehensive study was conducted to examine social mechanisms of resilience 'from below,' enabling us to understand how citizens themselves perceive their society's preparedness and resilience, and which demographic and socioeconomic factors shape these perceptions. The survey sample was carefully designed to represent the population of local self-government units across Serbia. The geographic distribution of respondents was balanced, and the main demographic characteristics (gender, age, education, employment status, etc.) did not deviate substantially from census data. This ensured that the findings could, with relative confidence, reflect broader societal trends. The analysis showed that perceptions of disaster preparedness vary by risk type. Respondents assessed that the greatest number of preventive measures are undertaken in the case of pandemics/epidemics and severe storms (including hail). This is not surprising given the recent experience with the COVID-19 pandemic, as well as the increasing frequency of storms and hail in recent years—threats that society has recognized and, to some extent, normalized (Cvetković, Čvorović, & Beriša, 2023; Vladimir Cvetković, Nikolić, Nenadić, Ocal, & Zečević, 2020; Cvetković, Nikolić, Ocal, Martinović, & Dragašević, 2022; Janković & Cvetković, 2020; Öcal, Cvetković, Baytiyeh, Tedim, & Zečević, 2020).

In contrast, environmental pollution (e.g., industrial contamination of water and air) received the lowest ratings for preventive activities, implying that in this domain, there are virtually no visible, systematic prevention measures. This corresponds to the reality that environmental risks in Serbia are often neglected in public discourse until they escalate into an acute problem (Cvetković, Sudar, Ivanov, Lukić, & Grozdanić, 2024; Hira, 2025; Nikolić, Cvetković, Renner, Cvijović, & Gačić, 2025; Sudar, Cvetković, & Ivanov, 2024). "When it comes to perceived societal resilience across different types of disasters, citizens believe that we are most capable of coping with snowstorms, strong winds/hail, and pandemics. This perception suggests that they place the greatest trust in institutions precisely in those risk domains that are familiar to them and that have already occurred (Vladimir Cvetković, Lipovac, Renner, Stanarević, & Raonić, 2025). Snow and storms are relatively frequent events to which emergency services and communities have become accustomed, while the pandemic—although extraordinary—prompted the mobilization of the state apparatus and thus left an impression in collective consciousness that this risk can, nevertheless, be managed.

Conversely, droughts and environmental pollution appear to be the 'Achilles' heel' of resilience from the citizens' perspective. In other words, these are the areas in which respondents have the least confidence that institutions are prepared and resilient enough to respond to the challenges (Cvetković, Grozdanić, Milanović, & Lukić, 2024; Cvetković, Tanasić, Renner, Raupenstrauch, Roković, & Beriša, 2024; Grozdanić, Cvetković, Lukić, & Ivanov, 2024). These differences in perception indicate that citizens distinguish between different types of threats: where there is direct experience or frequent interaction with a particular hazard, perceived preparedness (or at least confidence in preparedness) is higher. Conversely, risks that are less frequent or more 'silent'—such as droughts that gradually damage agriculture, or pollution that affects health over time—tend to be underestimated in terms of preparedness. This finding aligns with well-established phenomena in risk perception research, namely that people tend to take more seriously those hazards they have experienced recently or about which they possess tangible information (Bronfman, Cisternas, Repetto, Castañeda, & Guic, 2020; V. M. Cvetković, 2024a, 2024b; Evans, Stuckey, & Macdonald, 2022; Hulse, Galea, Thompson, & Wales, 2020; Knuth, Kehl, Hulse, & Schmidt, 2014; Milenković, Cvetković, Ivanov, & Renner, 2025; Renner, Cvetković, & Lieftenegger, 2025; Sagberg & Bjørnskau, 2006; Siegrist & Arvai, 2020; Vidović, Cvetković, & Beriša, 2025). In a study conducted in China, it was found that women—who more often take responsibility for family health—have a heightened subjective perception of disaster risk compared to men (Gendeshmin, Rostamzadeh, & Dowlati, 2025). A similar interpretation could be applied to our respondents regarding, for example, pollution: those who have personally experienced, or are aware of, certain consequences are likely to be more sensitive. More broadly, these results imply the need to raise awareness of underestimated risks (e.g.,

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through campaigns on the dangers of drought, climate change, or chronic pollution), so that resilience capacity is built for them as well, and not only for 'spectacular' disasters.

Citizens' attitudes were then examined with respect to various aspects of social structure and response capacity. It was observed that citizens express the highest trust in emergency intervention services (the police, firefighters, emergency medical services, and similar) (Cvetković, 2016b; Cvetković, 2017; Cvetković, 2017; Цветковић, 2017). Although these institutions were not rated as excellent, they received more favorable evaluations than other components. This suggests that the public recognizes the importance and on-the-ground commitment of these services. Immediately after them, the availability of key public services during a crisis (such as water and electricity supply, hospital operations, and similar) was assessed more moderately, suggesting a degree of confidence that basic infrastructure will continue to function, at least for some time after a disaster.

However, all other components of institutional preparedness were rated below the midpoint of the scale. Particularly notable is dissatisfaction with investments in protection and rescue: citizens perceive budget allocations as chronically insufficient and believe that local communities lack the financial capacity to build resilience independently. This pessimism has a basis in reality. At the local level, Serbia indeed allocates limited resources to risk prevention, and most municipalities depend on central-state interventions when disasters strike. Such a picture of institutional weakness is not specific to Serbia alone. Research in countries with similar socio-political systems shows that a lack of transparency and trust in institutions can seriously constrain the adoption of preventive measures at the household level (Robinson, Choi, & McNair, 2025). In other words, if citizens believe that "the state does not invest enough," they may see little value in personal preparedness and instead rely on luck or improvisation. The results obtained in this study point to this problem: overall assessments of social structure (including the organization of local response systems, plans, resources, and personnel) indicate a prevailing view that local communities are not adequately institutionally prepared.

Furthermore, the domain of social capital—i.e., mutual trust, connectedness, and citizens' collective action—was examined. Interestingly, citizens identified family ties and personal relationships as the strongest assets in emergencies. In practical terms, most respondents believe that family members, friends, or neighbors would be the first to come to their aid in the event of an accident or disaster (Cvetković, Gačić, & Jakovljević, 2017; Cvetković et al., 2019). This is a highly important finding, as it implies that informal support networks in Serbia are strong. In other words, people tend to rely on one another more than on formal systems. This aligns with the broader understanding that social capital is a key resource for resilience. According to Daniel Aldrich, the difference between a community that recovers quickly after a disaster and one that descends into chaos often lies in the depth of its social ties (Aldrich, 2012). Our respondents confirm precisely this: in the absence of trust in institutions, they turn to one another.

On the other hand, the existence of local civic initiatives for disaster preparedness was rated the lowest. This indicates that citizens rarely witness organized activities such as voluntary trainings, drills, or planned community meetings in their locality. This lack of formalized collective action points to clear room for improvement. The existing willingness to help "within households" and among personally known people should be strengthened through stronger community-level organization. In this regard, local authorities and civil society organizations have a crucial role in channeling trust and solidarity into structured programs (Cvetković & Šišović, 2024a, 2024b; Cvetković & Šišović, 2024). In that context, it is worth noting that research in other countries shows that citizens' participation in volunteering activities and associations increases community resilience by building "bridges" between different groups and enabling faster exchange of information and assistance (Cvetković, Milašinović, & Lazić, 2018; Forbes & Zampelli, 2014; Marceta & Jurišic, 2024; Molnár, 2024; Taniguchi & Marshall, 2014). Unfortunately, in Serbia, this culture of volunteering is still underdeveloped, as reflected in the fact that respondents with volunteering experience constitute a minority, yet they are more critical of societal resilience. Those "insiders" who have been involved in certain activities have likely observed system shortcomings firsthand and, therefore, apply stricter

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evaluations (volunteers, on average, gave lower ratings of societal resilience than those who had never been involved). This difference was also statistically confirmed in our analyses: individuals with volunteering experience were significantly more likely to believe that community resilience is low than those without such experience (who may be more inclined to assume that "everything will be fine") (Robinson et al., 2025). A similar trend has been observed in international studies: direct experience—whether through surviving a disaster or participating in response activities—often "opens people's eyes" to the complexity of the problem, making them less complacent in their preparedness assessments.

The segment on social mechanisms and institutional processes yielded perhaps the most interesting individual results. Respondents indicated that an objective factor—proximity to a large city—also significantly affects community resilience. Municipalities that are farther from major urban centers perceive themselves as considerably more vulnerable. This perspective is understandable: being closer to a large city means being closer to hospitals, fire brigades, a larger number of rescuers, supplies, and alternative sources of provision (Ahmed, Adams, Islam, Hasan, & Panciera, 2019; Brito, Ribeiro, Melo, Netto, & Sarinho, 2024; Brown, Watts, Turner, & Wallace, 2024; Green et al., 2017; McCrum, Wan, Han, Lizotte, & Horns, 2022; McGaughey & Peters, 2024). Ultimately, this implies a faster response in the event of a disaster. This awareness is highly realistic, as peripheral and rural areas worldwide are often disadvantaged precisely because of geographic isolation. It is therefore unsurprising that citizens in our study identify this factor as important. However, while proximity to a city is perceived as beneficial, certain institutional mechanisms were identified as seriously weak. Three interrelated segments received particularly low ratings: the speed of response by competent authorities, the level of bureaucracy during emergencies, and early warning and evacuation systems. In other words, citizens believe that if a disaster occurs, the institutional apparatus will not act with sufficient urgency; instead, procedures and inefficiency will slow down response and assistance. In addition, most respondents have little confidence that a functional early warning system exists (such as timely SMS notifications, sirens, or other forms of alerting) or that sufficient capacity is available to evacuate those at risk and provide shelter. These perceptions reflect what has also been observed in practice during certain emergencies. For example, during the 2014 floods, shortcomings in timely warning and evacuation coordination were evident (Cvetković, Bošković, & Öcal, 2021; Cvetković & Martinović, 2020; Cvetković, Lipovac, & Milojković, 2017; Cvetković, Roder, Öcal, Tarolli, & Dragićević, 2018).

The low ratings in this domain signal an urgent need to strengthen civil protection capacities, shorten and de-bureaucratize decision-making chains during crises, and ultimately build public trust in these mechanisms. If people believe that warnings will not arrive or that authorities will delay decisions, they may respond passively or incorrectly when confronted with danger (Cvetković; Vibhas, Adu, Ruiyi, Anwaar, & Rajib, 2019). Studies show that trust in institutions is crucial for effective disaster risk reduction: in contexts where people trust authorities, they are more willing to evacuate when instructed and to comply with orders and recommendations, whereas distrust fosters resistance and delays in response (Al-ramlawi, El-Mougher, & Al-Agha, 2020; Cvetković & Gačić, 2016; Hulida, Pasnak, Koval, & Tryhuba, 2019; Mumović & Cvetković, 2019). The research reveals a worrying lack of such trust, which should be understood as a serious call to action. It could be argued that institutions must appear faster, more transparent, and more competent in the eyes of citizens for a culture of prevention to take hold. Experience suggests that when local authorities are proactive in communicating with and training the population, citizens become more willing to participate and take protective measures (Hira, 2025; Nikolić et al., 2025; Renner & Mayr-Veselinovic, 2025).

The areas of social equality and diversity, as well as social beliefs, shed light on important aspects of inclusiveness and culture within resilience. Citizens rated the availability of communication means and key resources (food, water) for all groups in the event of a disaster relatively positively. At first glance, this is encouraging, as it indicates a belief that, should a crisis occur, basic necessities would be provided and that communication (mobile telephony, radio, the internet) would not completely fail. This perception is likely shaped by experience that even in difficult situations (such as heavy

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snowdrifts or floods), the most basic social functions persist, at least at a minimal level (Cvetković, Tanasić, Ocal, Kešetović, Nikolić, & Dragašević, 2021). Nevertheless, a problem arises regarding perceived fairness and social inclusion. Respondents believe that there is insufficient concern for marginalized groups in disaster contexts. Meaningful social inclusion in decision-making is seen as almost non-existent, as are dedicated support programs for vulnerable categories (older adults, persons with disabilities, and the poor). This is a significant weakness because emergencies typically affect the most vulnerable the hardest, thereby deepening existing inequalities (Cvetković et al., 2024; Jevtić, Cvetković, Gačić, & Raonić, 2025). If there are no mechanisms to mitigate such injustice (e.g., priority evacuation or accommodation for people with limited mobility, special stockpiles for at-risk groups, or the inclusion of minority representatives in evacuation planning), then societal resilience is, in principle, low. The results imply that Serbia faces a deficit in this regard, further reinforced by the insight that citizens tend to conceptualize societal resilience primarily through technical and institutional capacities rather than through the dimensions of justice and equality. Changing this paradigm would need to be part of a broader transformation of the culture of security: resilience is not only a matter of the number of bulldozers or the quality of flood embankments, but also the degree of care for the most vulnerable among us.

The domain of social beliefs, culture, and tradition in the context of resilience also reveals an interesting contrast. Respondents acknowledge that culture and tradition shape how disasters are understood. For example, those who come from communities with a collective memory of a particular event (a flood, an earthquake) may, through oral traditions or customary practices, have a more developed sense of what such events mean and how one should respond. This influence received the highest average rating within this segment. By contrast, the influence of religious institutions on decision-making in crisis situations was rated as very low. Clearly, citizens do not perceive religious leaders or the church as relevant actors in disaster management, at least not in a formal sense (Cvetković, Romanić, & Beriša, 2023). This may reflect the secular nature of decision-making in Serbia and the lack of active integration of religious communities into civil protection systems. International experiences on this issue vary—for instance, in the United States and some Asian countries, faith-based organizations are important partners in supporting people during evacuations (e.g., providing shelters in church facilities and distributing aid), whereas in Serbia, such practices are rarer or ad hoc. In any case, respondents do not believe that religious actors contribute substantially to resilience, suggesting that in a crisis, they rely more on secular state or civil structures, as well as on personal relationships.

Statistical analyses of relationships between sociodemographic characteristics and the perceptions described above provided additional insights. First, age was found to significantly influence how people assess disaster preparedness. Older respondents (e.g., those aged 60+) tend to believe that their community is not adequately prepared; compared with younger respondents, they gave lower ratings to preventive measures and overall resilience. This difference may have several causes. Older people have longer life experience and have likely witnessed various crises, and therefore may have higher expectations of institutions (shaped under a former system in which the state may have intervened more strongly across all spheres) (Cvetković, 2024; Cvetković & Šišović, 2024a; Janković, Cvetković, Gačić, Renner, & Jakovljević, 2025; Tanasić & Cvetković, 2024). If they now perceive that local systems lack the capacity they once had, their assessments are more critical. Moreover, with age, immediate social connectedness often declines: retirees may move less and participate less in community life than younger people, which can contribute to a sense of social exclusion. The data support this: older respondents provided lower ratings for components such as informedness, communication, collective connectedness, and even their own participation in prevention. It appears that with age, feelings of helplessness and dependence on others increase, while confidence that individuals or neighborhoods can do much decreases. Their attitudes are also shaped by natural concerns for health and safety: older adults are aware that they are physically more vulnerable and therefore perceive risks more seriously.

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Interestingly, the statistics indicate that older adults are also more inclined to shift responsibility to institutions: they have less faith in citizens' personal and collective responsibility for resilience and instead see it as "the state's job." When people have high trust (or expectations) that the government will manage everything, they are less likely to take their own preparedness measures (Tanasić & Cvetković, 2024). In the case of older respondents in our study, this appears to be less about trust and more about dependence: many are genuinely dependent on state pensions, healthcare, and assistance from others, and they project that dependence onto disaster contexts—"if something happens, we cannot do much ourselves; institutions will have to rescue us."

Furthermore, the subjective feeling of fear of disasters proved to be a significant factor: respondents who stated that the thought of a disaster frightens them, on average, gave lower ratings of societal resilience. This finding is expected—fear is often accompanied by a sense that we are not sufficiently prepared (Cvetković et al., 2022; Cvetković, Öcal, & Ivanov, 2019; Cvetković, Öcal, Lyamzina, Noji, Nikolić, & Milošević, 2021; Cvetković & Sandić, 2016; Cvetković, 2016). Fear can amplify risk perception and lead people to assess shortcomings around them more critically. In the results, more fearful citizens rated institutional preparedness and fairness particularly low. It appears that fear goes hand in hand with distrust in institutions and with the feeling that "the system will not take care of us when it matters." Some research supports this by showing that extreme anxiety can "suppress" the role of trust: when fear is very high, people may care less about whether authorities are reliable because they assume they are threatened regardless.

Respondents' gender also affects perceived resilience. Men rated societal resilience statistically significantly higher than women. In other words, women tend to be more critical and more likely to notice deficiencies in preparedness. This difference is consistent with numerous prior findings: women generally have higher risk perceptions and a stronger desire for protection compared to men (Ariyabandu, 2009; Combs, Slate, Moore, Bustamante, Onwuegbuzie, & Edmonson, 2010; Cvetković, Čvorović, & Beriša, 2023; Cvetković, Dragašević, Protić, Janković, Nikolić, & Milošević, 2022; Gačić et al., 2019; Garba, Amuka, & Akaan, 2025). Men, on the other hand, may be more inclined to express confidence (due to socially conditioned expectations to "be strong"), and therefore provide somewhat more optimistic ratings. This insight is important because it suggests that a gender perspective should be incorporated into risk communication and preparedness planning: women should be empowered to translate perceived risk into preventive action (rather than worry), while men should be encouraged to acknowledge these concerns and assess risks more realistically. A good example of integrating this perspective includes training programs that target women as "guardians of family safety" (e.g., educating mothers on assembling household emergency kits), as research shows that households in which women take the initiative tend to have higher levels of preparedness (Cvetković, Roder, Öcal, Tarolli, & Dragićević, 2018).

Education, income, marital and employment status, and housing conditions were also examined in relation to perceived resilience. The results are complex, but several regularities can be identified.

It turned out that higher levels of education do not necessarily lead to a more optimistic assessment of resilience. In fact, highly educated respondents were equally—if not more—critical in judging collective preparedness, especially for complex risks such as technological accidents or environmental crises. This can be explained by the fact that more educated individuals possess more information and better understand the complexity of these threats, and may therefore recognize that the system lacks adequate capacities (for example, an engineer may more readily notice poor dam maintenance or the absence of industrial filters) (Cvetković, 2016a; Cvetković et al., 2017; Cvetković & Filipović, 2018; Stanišić & Maksić, 2014). In the study, participants gave lower ratings for preventive measures against technological and environmental hazards, indicating awareness of preparedness shortcomings in these domains. This aligns with the thesis that knowledge is a precondition for critical judgment, but not necessarily for better conditions. Highly educated respondents may recognize the problem, but if the system fails to heed expert input, the problem persists. At the same time, it is noteworthy that education was not a strong predictor of overall

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perceived resilience in the models. This may be because community resilience also depends on factors not directly linked to formal schooling (e.g., solidarity, experience, and leadership).

Household income level also exerted some influence. Wealthier respondents were more inclined to believe in existing societal resilience, especially in the dimensions of social capital, equality, and beliefs. This can be interpreted to mean that materially secure individuals have greater confidence that they will "manage" in adversity—either thanks to their own resources or through better social connections. This interpretation is supported by the well-known fact that disasters disproportionately affect poorer populations; therefore, wealthier people, aware of their advantages, may perceive society as more resilient than poorer groups do (Benson & Clay, 2004). Encouragingly, higher income was also positively correlated with a sense of social connectedness. Thus, at least some better-off respondents are not living "in the clouds," but remain engaged in their communities and rely on them.

Marital status revealed another psychosocial pattern: respondents who were married or in long-term relationships showed greater concern about resilience (giving lower ratings) than single respondents. This can be interpreted through the lens of responsibility. Those with families are concerned for more lives and are therefore more aware of what can go wrong and how prepared they actually are (for example, parents of young children are more likely to ask whether they have enough food, diapers, medicines, and similar supplies at home, just in case).

Employment status in itself (employed vs. unemployed) did not have a strong effect on perceptions of preventive measures, but differences in emphasis were observed. Employed respondents—especially those in the public sector—rated institutional aspects somewhat more favorably, whereas unemployed respondents attached greater importance to existential risks (e.g., climatic and environmental), likely because the consequences would affect them more severely in the absence of stable income.

Finally, the type of housing unit and home ownership influence perceptions in specific segments. It emerged that people living in detached houses (often in smaller communities) have a more pronounced perception of climate-related risks and undertake more preventive measures themselves (e.g., repairing roofs, creating drainage channels around the house, and similar actions). On the other hand, those living in apartments (especially renters) worry less about structural hazards, partly because they feel it is "not their responsibility" but rather the obligation of the owner or the building, and partly because they are more often in urban environments where they expect faster assistance or the option to relocate if necessary. Interestingly, however, renters reported a stronger sense of social connectedness and mobility—possibly because they are largely younger people who are more socially active and more willing to move and adapt. These nuances suggest that risk communication and resilience planning should take such differences into account; messages designed for house owners in rural areas are not the same as those for apartment residents in cities.

Predictive models (multiple regression analyses) further clarified the influence of these factors when considered jointly. The model explaining the propensity to undertake preventive measures indicated that older individuals and those employed in the public sector are more proactive in implementing measures (e.g., acquiring equipment, insuring their homes, developing plans). At first glance, this may seem counterintuitive in light of earlier findings, since older respondents reported lower overall perceptions of resilience. However, one explanation is that older adults may have become more aware of weaknesses and therefore take whatever individual actions they can (e.g., stocking essential medicines, regularly monitoring weather forecasts), while still lacking confidence in collective preparedness. Public-sector employees likely have better insight into institutional mechanisms (some may participate in emergency headquarters, protection-and-rescue structures, the Red Cross, and similar organizations) and, due to this awareness, may be more personally engaged in prevention. They were also identified in our model as the group that most strongly recognizes and values the social-structure dimension of resilience, which is logical, given that their everyday professional activities are linked to system functionality.

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By contrast, divorced individuals and those who had participated in volunteer activities showed a lower propensity to take preventive action in the model. This points to an interesting nuance: people who have engaged in volunteering or experienced personal stress (such as divorce) may experience a degree of "fatigue" or cynicism toward prevention because they have encountered the realities of the system. Nevertheless, caution is needed in interpretation, as the effects of these variables were not dominant.

When it comes to perceived societal resilience overall, the models showed that men have statistically higher ratings (as already noted), while high levels of fear and volunteering experience reduce these ratings. Furthermore, more educated and wealthier respondents tend to assess resilience more critically, partially dispelling the myth that "the wealthy live under the illusion that everything is excellent." It appears that higher social strata become aware of the complexity of modern threats and recognize that money does not guarantee protection from everything, and therefore express a need for stronger systems as well. Indeed, the literature notes that in developed societies, educated people often have higher expectations of institutions and a more critical stance toward them, which can serve as a stimulus for improving public services (Cvetković & Šišović, 2024; Domingo Dela Cruz & Ormilla, 2022; Jawahar, Varghese, & Shenai, 2018). In our case, this may mean that precisely this population (educated and financially stable citizens) should be an ally to decision-makers through professional or local-community engagement, where they can help advance the disaster risk reduction agenda (e.g., engineers working on building safety, IT specialists contributing to early warning systems, business leaders supporting corporate social responsibility, etc.).

The models also confirmed some earlier indications: age and employment in the public sector positively predict perceptions of social capital, mechanisms, and beliefs. Older respondents and public-sector employees therefore feel a greater presence of trust, solidarity, and tradition in their communities, as expected, given their generational and professional roots in them. By contrast, individuals with lower incomes, as well as those expressing fear or lacking stable housing (renters), show statistically weaker perceptions of social connectedness and support. This is an important indicator that social exclusion and economic insecurity erode social capital. Those without financial security or a stable home are less integrated into social life (because they are preoccupied with basic survival or are frequently moving). Consequently, they have less trust in neighbors, are less likely to belong to associations, and have less time for volunteering—in short, more vulnerable groups are also less socially connected, which creates a double risk. On the one hand, they are the ones who would benefit most from community support; on the other hand, because of the absence of ties, they may be left out when assistance is needed.

This finding resonates with the global observation that social inequality and resilience are negatively correlated: societies with greater inequalities tend to have weaker collective responses in crises because cohesion and a sense of "we are all in this together" are lacking. This is indirectly confirmed by comparative research; for example, a study in England found that a resilience index is moderately negatively correlated with an index of deprivation (Camacho, Webb, Bower, & Munford, 2024), suggesting that resilience adds a new dimension to the understanding of poverty. Similarly, Hobfoll's concept of the so-called *resource caravan* suggests that individuals with abundant resources are better able to gain additional resources, whereas those with few resources are particularly vulnerable (Hobfoll, 1989; Hobfoll, 2001). The conducted research—both quantitative and qualitative—points in the same direction: where social exclusion exists, whether due to age, poverty, or marginalization, resilience is weaker, and targeted efforts are needed to include and empower these groups as part of the wider collective.

5. Conclusion

This study improves the assessment of community disaster resilience in Serbia by incorporating BRIC–DROP–aligned dimensions into a composite index and by testing a predictive model linking sociodemographic and psychosocial factors to perceived resilience and preventive actions. Besides providing a structured measurement method, the analysis offers an interpretable, hazard-sensitive

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profile showing where citizens see resilience as strongest and where systemic weaknesses are most apparent, thereby aiding evidence-based prioritization at the local level. Beyond basic demographics, the analysis underscores that resilience perceptions are embedded in broader social-resilience dimensions—covering institutional arrangements, social connectedness, functional mechanisms, equity-related accessibility, and shared beliefs—highlighting where governance and community systems can be strengthened. While the predictive models are statistically significant, they provide only a partial explanation of resilience perceptions, suggesting that additional structural and contextual determinants should be incorporated into future work.

The results reveal a consistent perception gap between informal coping abilities and formal institutional preparedness. While social support from close personal networks acts as a stabilizer, confidence in institutional arrangements—especially those needing ongoing funding, coordination, and quick decisions—remains comparatively limited. This pattern suggests that resilience-building should not focus solely on social cohesion as a substitute for governance, but should leverage community strengths while tackling institutional bottlenecks that hinder prevention, preparedness, and response. An important contribution of the predictive analysis is confirming that perceptions of resilience are influenced by structural factors as well as fear and trust dynamics. This emphasizes that resilience policies should integrate technical and social strategies: improving systems (planning, warning, evacuation logistics, service continuity) alongside communication tactics that reduce uncertainty, foster realistic risk awareness, and enhance trust through transparency and proven effectiveness.

Additionally, the impact of socioeconomic differences highlights the need for equitable resilience governance, ensuring resources for preparedness, protective services, and recovery are accessible to lower-capacity households and communities. In practice, the composite index provides a reproducible baseline for tracking resilience over time and for identifying critical areas for targeted investment and policy reform. It can serve as a decision-support tool linking resilience profiles to specific interventions (e.g., risk communication, early warning updates, evacuation plans, and budget alignment), thus bridging measurement and practical action. Several limitations should be noted, such as reliance on cross-sectional, perception-based data that capture public confidence but cannot, alone, establish causality or fully reflect objective performance.

The main patterns identified here are consistent across descriptive profiling, bivariate tests, and multivariable models, which boosts confidence in the stability of these associations. An additional point is that community resilience varies by hazard, meaning 'one-size-fits-all' interventions are unlikely to succeed. Besides basic demographics, perceptions of resilience are linked to broader social-resilience factors—such as institutional setups, social connectedness, functional mechanisms, access related to fairness, and shared beliefs—highlighting specific governance levers to enhance local capacity. At the same time, the models only partly explain resilience perceptions, suggesting that other structural and contextual factors should be included. Future research should use multilevel and longitudinal approaches and validate composite indices against objective performance metrics, such as early-warning coverage, service continuity, response capacity, and recovery outcomes.

Also, the next research should combine this index with administrative, financial, and geospatial data and validate it against disaster outcomes and service continuity. Multilevel and longitudinal studies would clarify how reforms, hazard experience, and social changes influence resilience trajectories. Overall, the study shows that a BRIC–DROP–based composite can effectively characterize local resilience and guide policy priorities. Strengthening disaster resilience in Serbia will require coordinated efforts to improve institutions, restore trust, and incorporate equity into preparedness and response plans.

Author Contributions: V.M.C. and D.M. conceived the original idea for this study and led the study design and overall methodological approach. V.M.C. coordinated the research process and manuscript development. D.M. and V.M.C. developed the indicator framework, collected, processed, and curated the data, and compiled the final dataset. D.M. conducted the primary analyses and produced the initial results and figures, while V.M.C.

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performed additional analyses, verified and validated the results, and refined the methodological and interpretation sections. V.M.C. drafted and substantially expanded the manuscript and led the revision and editing process, with input from D.M. T.L. contributed domain-specific input and critical review, providing comments and minor revisions. J.B., A.K., and R.R. contributed to review and editing, provided constructive feedback, and approved the final version. All authors have read and agreed to the published version of the manuscript.

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